



CARBON MECHANISMS REVIEW

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Business as Usual?

COVID-19 pandemic jeopardizes Art. 6 negotiations while work on market development forges ahead

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editorial

Dear Reader!

This issue of CMR is published in times of crisis. At the time of writing, the coronavirus continues to spread across the globe, and for now it is unclear how long the pandemic is going to last. It will have serious impacts not only on health and wellbeing, but also on the global economy. Some predict that the economic downturn will dwarf the Great Depression of the 1930s. Thus, the challenge that lies ahead is to ensure that the huge economic stimulus packages being set up right now also take the climate crisis into account and are designed in a way that they support the transition to a low-carbon world.

Yet for the world of market-based climate action, the current crisis might also be seen as an opportunity. An opportunity to reflect on the current impasse in the negotiations on Article 6 of the Paris Agreement, recalibrate the talks and open them up to new routes that lead to compromise. Read more on this in the adjacent opener of this issue.

The other articles in this issue cover more prosaic topics such as new ways of setting crediting baselines or using auctions as an innovative climate financing tool. We also look at carbon pricing developments in Pakistan and the role Article 6 can play in this respect. The issue is rounded off by an update on the current trends in carbon market digitisation and technology.

My special thanks at this point go to the contributing authors to this particular issue, who despite difficult working conditions have taken the time to put together their articles and submit their pieces.

On behalf of the editorial team, I wish you an inspiring 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 off-setting 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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An Unforeseen Opportunity

Negotiating in times of crisis might refocus Article 6 talks

by Thomas Forth, Advisor to BMU

Given the impact of the Covid-19 pandemic, UNFCCC negotiations will be delayed in a worst case scenario for one year, although it is hoped that this can be cut to six months and have SB52 begin in September/October this year. From the current perspective, virtual conferencing might be the only way of communicating for several months to come.

The question is, how we can get the best out of this way of working? The use of virtual conferences experienced in the past weeks highlights some limits on staffing capacities to work under such conditions and not least on the need for inclusivity in UN conferences. At the moment, we are waiting for working arrangements and plans to be announced shortly by the SB chairs and the secretariat.

For the Article 6 negotiations, with the need to consider specific technical items in depth and

in circular consultation, the Covid-19 crisis may provide the opportunity to organize virtual meetings on specific technical issues, perhaps also at regional level, so that official negotiations can restart well prepared. Capacity building and knowledge sharing, not least to gain insights into potential landing ground, could be both the challenge and the opportunity of the day – it appears that such virtual activities cannot substitute the physical meetings involved in the official negotiation work mode.

Of course, this is simply said in an abstract way. Looked at from the outside, Article 6 negotiations tend to involve unlimited differentiation and mutually blocking issues. From the inside, it would be good to understand that the outside world is only following the negotiations to a limited extent and could at times be convinced that life without Article 6 is easier.



Time for Action – the Chile/Madrid COP was meant to send a strong signal on the need for enhanced ambition



Photo by IISD/Kiara Worth (enb.iisd.org/climate/cop25/enb/7dec.html)



Photo by IISD/Kiara Worth (enb.iisd.org/climate/cop25/enb/2dec.html)

Blocked and postponed – COP 25 did not deliver a step-up in climate action

In addition, many see that COP26 will be the last stop in the climate negotiations, where Article 6 decisions would make sense for the first NDC period. If these decisions fail, the question will arise as to what the Article 6 contribution to the global stocktake will look like. For many, the answer may rather lead to alternatives: Which instruments and mechanisms are available for international cooperation and could build both on the levers provided in the Paris Agreement and the decisions already achieved and set out in the rule book. And how can cooperatively induced GHG emissions influence fulfillment of conditioned NDCs and help increase ambition?

Should the Article 6 talks at COP26 fail, comparability of the approaches and fungibility of certificates in an emerging carbon market would be jeopardized. It is questionable whether high-level declarations on the basic principles of the international carbon market, such as the San José Principles, are currently helpful.¹ Such principles can, of course, help if a reasonable set of regulations within the UNFCCC framework has laid the foundation for further, mutually-accepted rules of

cooperation. In this respect, it makes sense to continue working on the San José Principles. But perhaps one must also accept that these principles are not shared by everyone and will not, therefore, be fully included in the UNFCCC decision-making. The San José Principles, even if improved, may have an add-on function in creating a reliable international market, but they are not going to provide the minimum set of requirements set out in the UNFCCC decisions. This should limit excessive expectations.

But how might keeping to the essentials look, especially for Article 6?

From my point of view, this comes down to the question of reaching a mutual understanding of what is essential for whom. This was not discussed at COP24 in Katowice nor at the Chilean COP25 in Madrid. Interests became clear outside the expert level of policy negotiators for the first time in Madrid. This is perhaps a good starting point in answering the question of which negotiation points should be brought to the fore.

¹ Details on the San José Principles can be found at <https://cambioclimatico.go.cr/press-release-leading-countries-set-benchmark-for-carbon-markets-with-san-jose-principles/>



Source: Photo by IISD/Kiara Worth (enb.iisd.org/climate/cop25/enb/10dec.html)

Seeking compromise – SBSTA Chair Watkinson with Wael Aboulmagd, Egypt

Clarifying politically sensitive issues

So where are the big contrasts? Can we solve them? Or is an agreement unlikely in the end?

Looking back at Madrid, there were three issues that could not be politically agreed:

1. The question of financing of the adaptation fund
2. The transition phase of the CDM
3. The accounting complex of Article 6.4.

Other aspects that play into these three topics are the expiry of the CDM and the revision of additionality and baseline for their alignment with the Paris Agreement (see article ‘Bridging the Ambition Gap’ elsewhere in this issue).

Unfortunately, the three main contrasts are very different in nature and maturity. Even after passing through several years of negotiations, technical solutions, which decision makers could have dealt with, are lacking. They are in need of solutions for compromise-oriented technical options. For this reason, it was not a question of the political will of the Parties, but only that a decision could be taken in Madrid. A solution put forward at the negotiating table needs to be prepared by experts who have received the green light from their respective Parties.

Financing the adaptation fund

Markets must make a substantial contribution to climate protection generally. This can only materialize through the rules of market mechanisms.

It is not enough to look for emissions reduction in an isolated manner. Mitigation activities must consider how they affect sustainable development and how they might optimize their co-benefits. Moreover, cross-financing has been a critical issue since the establishment of the Kyoto

Protocol, with the Share of Proceeds (SoP) to be paid upon issuance of CERs.

Under the Paris Agreement it remains a difficult relationship. The SoPs are only intended for use with Article 6.4. They are not to be paid under Article 6.2, under which comparable cooperative mitigation measures can be implemented. This would make most of the Article 6 pilot projects and especially cross-border linking of the emissions trading system exempt from such a fee. This differentiation creates nothing but a loophole and may be seen as a failed provision of the Paris Agreement.

But then this could, perhaps, be a negotiated solution – one which Parties accepted in Paris 2015. If negotiations end in compromises, where interests are balanced, results must be respected. However, recent negotiations show some movement in the direction of a more advanced solution.

While the defence against general payment of SoPs remains fundamental for a number of Parties, a voluntary payment could well find its way into the negotiated solution. Whether such a solution would have an actual effect on the buyer states of ITMOs would depend on the voluntary commitment of the buyer states. Such statements by potential buyer countries could help here in that the voluntary solution for paying SOPs is perceived as a serious negotiation offer.

But in Madrid it was at least noted that a possible settlement of the controversy surrounding the SoPs is unfortunately not a reliable financing solution for the Adaptation Fund. On the one hand, with a view to the CDM, you can see that the market mechanisms were used very discontinuously and therefore have only led to discontinuous income. But on the other, the amount of income may also be insufficient for the replenishment of the Adaptation Fund. An overall financing solution for the Adaptation Fund that is fed from multiple sources is urgently needed. In this regard, the SoPs are not solely a matter of the Article 6 negotiations, but also of climate finance. And in the event that financing of the Adaptation Fund can be achieved with different sources and the request for mandatory

SOPs under Article 6.2, it would be a shame to see Article 6 failing on that point alone.

The SoPs are therefore almost exclusively a matter of the political will to reach an agreement. But then, the next topic, the question of the transition of the CDM, needs more than just political will. In Madrid, there were high expectations on the part of the seller countries regarding the value of old certificates and registered projects, even those in which investments have not been made. Conversely, some potential buyer countries feared that the transfer of such a large number of certificates would undermine the ambition of the NDCs. An agreement on the question of transition was also not possible because Parties questioned the reliability of the existing data. This is, however, only one aspect of the transition.

Can the CDM expire without the launch of its successor?

Old against new - if the old is too strong, the new cannot transpire

The agreement to introduce new market mechanisms goes back to the climate conference (COP13) in Bali in 2007. In retrospect, this is interesting timing when all Parties, including the strong “CDM” countries, have agreed. They did this while the CDM was in its infancy. Against the historical background, it is surprising that some countries are still very much attached to the CDM. Why some states are currently blocking the termination of the CDM, which has no legal basis for generating new CERs after December 31, 2020, calls their underlying motives into question. Pursuing this question may lead to clarification as to which motives are internationally acceptable.

An important aspect involves the reciprocal side, which would like to see an early end to the CDM. Ultimately, the motives and interests of both sides must match. There is currently little sign of that. There is also a big gap between an abandoned CDM and the availability of his successor, Article 6.4. Something is needed to build reliability and trust. The stated goal of introducing new market mechanisms is missing a convincing signal concerning their intended use. In reality, only a few countries are commit-



Catching the Sun by Nic Bothma / UNFCCC Photo Contest / CDM 0079

Transitioning: The CDM's methodologies and tools are valuable achievements and must not be reinvented.

ted to acquiring ITMOs and in consequence CDM countries are protecting the stock.

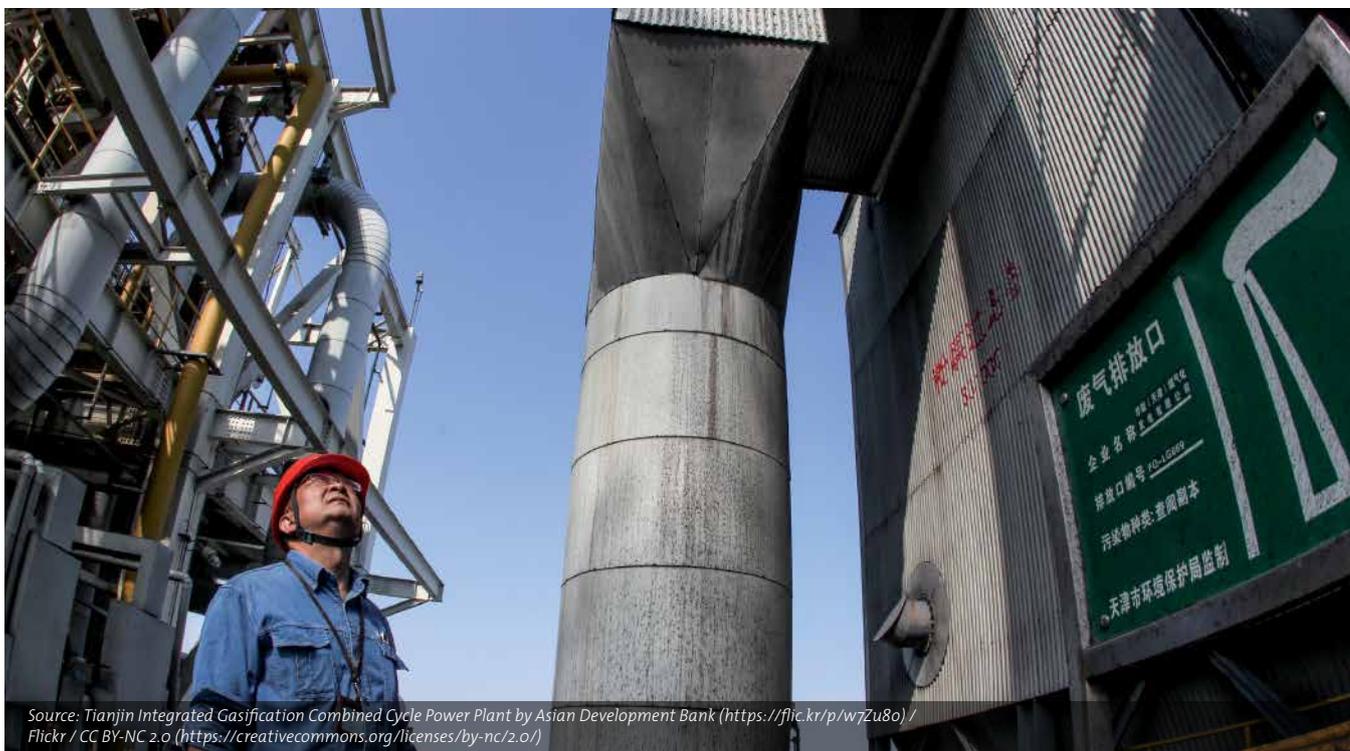
The spectrum of transition questions is all-encompassing. It ranges from old certificates and registered projects, whose implementation has never reached the investment phase, the continuation of ongoing activities, the adoption of methodologies and CDM tools, and the continued existence of the EB. The conflict of interests is clear. Obviously, a heavy burden on the Paris Agreement would be lifted if old certificates could be used to meet insufficient NDCs; however, this would put us on a 3.5°C pathway. It would be just as questionable as to allow the so-called “dormant” CDM projects to start on the historical CDM basis and generate compliance certificates for the Paris Agreement.

A further transition element: The methodologies and tools are valuable achievements under the CDM and must not be reinvented. However, they cannot be transferred automatically, they need upgrades in order to correspond to the architecture of the Paris Agreement. The long-hint-

ed-at reference to the NDCs is completely missing. For example, the standardized baselines and the de facto used sectoral parameters in some methodologies already show the path that the methodologies have to follow to achieve Paris compatibility.

The various aspects of transition must be considered separately:

- The adoption of old certificates for compliance under the Paris Agreement undermines the ambitions. The question is whether this applies equally to seller and buyer countries. The fact that buyer countries do less than promised in their NDCs, and that with certificates from the past, will double the damage in terms of climate policy. The fact that potential seller countries want to count the old certificates as a kind of “early action” may limit the damage, but is still a failure in terms of climate policy. And in addition, it would delay the start of new emission reduction activities under the Paris Agreement.



Source: Tianjin Integrated Gasification Combined Cycle Power Plant by Asian Development Bank (<https://flic.kr/p/w7Zu8o/>) / Flickr / CC BY-NC 2.0 (<https://creativecommons.org/licenses/by-nc/2.0/>)

Inside or out – should action taken inside the NDC be prioritized?

- The situation is different again if no old certificates may be used at all, but if ongoing projects are allowed to continue in the future under the terms of the Paris Agreement. With the Pilot Auction Facility (PAF), the World Bank has launched a model that has ensured continued operation for CDM projects, i.e. payments for future emission reductions (see article ‘Innovation in Finance’ elsewhere in this issue). This model is entirely suitable for giving current CDM projects a Paris perspective. At the same time, appropriate CDM projects could form the basis of a project pipeline under Article 6.4: Not all projects would be transferred – only those that meet the transition conditions would receive a strong incentive to continue with this model. The PAF model shows that competition for scarce resources in auctioning leads to acceptable prices per certificate.

The reasoning for a potential agreement boils down to both limiting certificates as regards their use in climate policy terms and in ongoing projects to capture the future effects of climate action.

Narrowing down the transition issue to the interest of strong CDM countries is politically inadequate. Many countries have taken some time to prepare for the CDM and could only benefit to a small extent from the CDM’s short-term boom. Of course, it is true that this was in the hands of those countries themselves. The question here, however, is why the imbalanced regional distribution of CDM activities under the Kyoto Protocol should be carried over to the Paris Agreement and bring huge disadvantages for those Parties when it comes to accessing the future carbon market. It would thus seem more than legitimate that if these countries have access to such auctions, it will incentivize new projects. Only addressing countries with a high number of CDM activities and probably also a high number of old CERs available would continue the regional disadvantage for many Parties. Limiting this effect is a legitimate interest that also needs more consideration.

Accounting remains the key challenge

Achieving more comparability between Articles 6.2 and 6.4 would build trust and should not weaken Article 6.4 accounting.

The third sensible issue, accounting of Article 6.4 activities, remains the main challenge in getting Article 6.4 up and running. It is conceptionally inconvenient that the spectrum of NDC types requires specific accounting rules to ensure the environmental integrity of the NDC mitigation balance at the end of the NDC period.

Claiming transferred certificates for NDC compliance is a political risk, which – as is well known – could be only avoided by corresponding adjustments (CA). The double claiming challenge goes hand in hand with two mayor topics: The single year targets issue and the argument in favour of prioritising action taken inside the NDC. With application of corresponding adjustments to the emission balance, the single year target problem will not find an appropriate and adequate solution, while the mitigation activities outside NDC coverage does.

The arguments beyond these assessments are simple: Full accounting of all transferred certificates will not allow the host country to present a proper balance at the end of the NDC period. There are two ways out: Decide on one of the negotiated methods, which may lead to fair sharing of CA between transferring and acquiring Parties, but phase it out during the first NDC period. The second way out is to forget these artificial accounting methods and have corresponding adjustments for each transfer, which show up completely under the transparency framework. This should also be phased out during the first NDC period. It should be clear that this is a compromise on a given dilemma with the implication of a trade-off between Article 6 and the NDC evaluation.

For the other element, it is simpler and clearer: Corresponding adjustments for mitigation activities outside the actual NDC coverage protects against the risk of policy lock-in and remain neutral to allow expansion of NDC scopes and policies. Corresponding adjustments applied outside NDC activities will operationalize the Paris Agreement’s formula of going “beyond NDCs” under

Article 6. The Paris Agreement provides a strong lever for higher ambition in Article 6.1, where Article 6 is dedicated to higher ambition of voluntary cooperation in the implementation of NDCs. If use of Article 6 was not aimed at higher ambition and it was used instead to implement the existing mitigation level contained in the current NDCs, there would be no need for UNFCCC rules. In this case, progress in mitigation achievements has only to be considered from the global stocktake until the submission of subsequent NDCs.

Both core elements must be decided at COP26, if Article 6.4 is to have a chance of starting early. Many Parties think that the recent COP25 presidency text, often called the 3rd iteration, would provide a good basis. If Parties manage to continue negotiations on this basis, a lot of remaining technical work could be mandated to the Supervisory Body (SB) and/or slated for consideration at later SBSTA sessions, depending on the political relevance.

Glasgow Outlook

For a well-balanced compromise instead of heavy loads emerging from Kyoto mechanisms

For the politically sensitive issues left over in Madrid, a good solution could be found ahead of implementation of the first NDC period of the Paris Agreement. Cooperative approaches under Article 6 could play a big role in accelerating emission reductions against a pathway, which Parties can achieve in isolation. Markets have demonstrated their capacity to deliver emission reductions quickly, once the political framework has been put in place.

However, there is a political dilemma which could block decision making at and beyond the COP26 in Glasgow. Having stressed the rational of the key controversial issues, albeit in a rather compact manner, it is evident that reaching a compromise on these issues still needs technical work at expert level, but there is a need to continue coordination at heads of delegation level and for political backing. No more is needed, but to do less would amount to a self-imposed setback.

Bridging the Ambition Gap

The Situation-Ambition Approach for Crediting Baselines under Article 6.4

by Lukas Hermwille



Business as usual? Considering national policies in baseline setting and determining additionality has been controversial ever since the CDM was launched.

International carbon markets may help countries to leap onto a transformative, low greenhouse gas development pathway, a pathway that would otherwise be unaccessible without the support of meaningful and transformative mitigation activities stimulated by international carbon markets. But this can only be achieved if the modalities and procedures are robust and ensure credibility and legitimacy. Will the modalities and procedures of the new Article 6.4 mechanism be designed in a way that avoids locking in an inappropriate level of ambition? And will they ensure that the activities implemented under the

mechanism contribute to transformative change in a facilitative and constructive manner?

Two elements will be crucial in this regard: (1) The way in which the additionality of activities under Article 6.4 is being determined and (2) the way in which crediting baselines is established. The former has already been the subject of debate. To address the question regarding transformative change, the author recently published a Policy Paper titled “Reconciling Pretensions and Reality – The Situation-Ambition Approach for Dynamic Base-

- 1 See for example Michaelowa, Axel, Lukas Hermwille, Wolfgang Obergassel, and Sonja Butzengeiger. 2019. ‘Additionality Revisited: Guarding the Integrity of Market Mechanisms under the Paris Agreement’. *Climate Policy* 19 (10): 1211–24. <https://doi.org/10.1080/14693062.2019.1628695>; Spalding-Fecher, Randall, Francois Sammut, Derik Broekhoff, and Jörg Füssler. 2017. ‘Environmental Integrity and Additionality in the New Context of the Paris Agreement Crediting Mechanisms’. Oslo: Carbon Limits. <http://www.energimyndigheten.se/contentassets/2600659ecfa54ec995b835a4c99d75fb/environmental-integrity----final-report-2017.01.24.pdf>; and Schneider, Lambert, Jörg Füssler, Stephanie La Hoz Theuer, Anik Kohli, Jakob Graichen, Sean Healy, and Derik Broekhoff. 2017. ‘Environmental Integrity under Article 6 of the Paris Agreement’. DEHSt Discussion Paper. Berlin: German Emissions Trading Authority (DEHSt). https://www.dehst.de/SharedDocs/downloads/EN/project-mechanisms/Discussion-Paper_Environmental_integrity.pdf.
- 2 This idea was inspired by the methodological tool to calculate the emission factor for an electricity system under the CDM. In this tool a “combined margin” is developed as a weighted average of the “operating margin” representing the emission factor of the existing fleet of power plants and the “build margin” representing the hypothetical power plant that would be affected by the proposed activity.

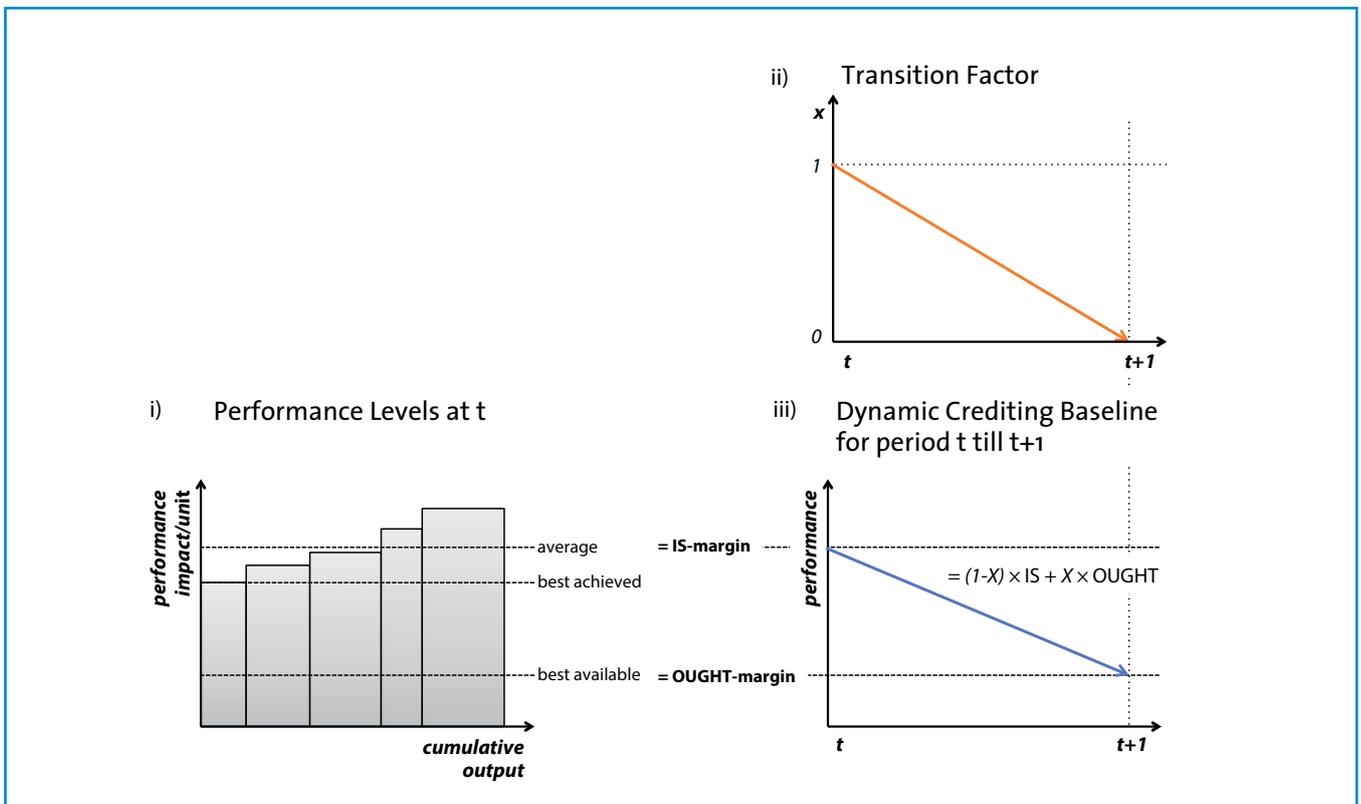


Figure 1 Schematic illustration of the Situation-Ambition Approach. In this example, the OUGHT margin is determined by an ambitious best-available technology benchmark (see panel i on the left). The relative weight of the IS vs. the OUGHT margin is determined by a dynamic transition factor (panel ii, upper right). The crediting baseline is determined by the weighted average of the IS and OUGHT margins and decreases over time in correspondence with the transition factor (panel iii, lower right).

lines under Article 6.4”. The core concept of this approach is presented in this article.

What is a Crediting Baseline?

The crediting baseline is a reference scenario to determine the amount of emission reductions or avoided emissions achieved through a specific activity. It quantifies emissions occurring in all likelihood in the absence of a proposed activity. The actual emission reductions are then calculated as the difference between the baseline emission scenario and the actual measured emissions of the implemented activity.

Transformative ambition vs. desperate climate policy realities

In the context of current NDCs, a fundamental dilemma lies at the heart of designing market-based mechanisms: On the one hand, the mechanism needs to take account of the ambitious objectives and the obligation of each party to develop and maintain ever more ambitious climate policies towards these objectives. On the other hand, any mechanism can unfold its full potential only if it also recognizes the current deficits in climate policy as evident in the currently insufficient level of ambition in nearly all nationally determined contributions (NDCs). An Article 6.4 mechanism can only meet its purpose “to allow for higher ambition (...) and to promote sustainable development

and environmental integrity” if it helps countries to (over-)achieve their NDCs and provide a leg-up onto a transformative development pathway.

Historically, under the CDM and in many voluntary carbon crediting schemes, crediting baselines were calculated by means of a hypothetical business as usual emission scenario. But what is “business as usual” under the Paris Agreement? After all, Parties are obliged to present increasingly more progressive NDCs and each NDC is supposed to represent the “highest possible ambition” (Art. 4.3, Paris Agreement). Hence one could argue, that maximum climate protection ambition is the new business as usual. Alas, it clearly isn’t.

However, ignoring the transformative ambition of the Paris Agreement and taking the insufficient and inappropriate reality of climate protection ambition as a point of reference for determining the crediting baseline could risk cementing the status quo. If the credits are then (partly) used as offsets to compensate for a lack of effective mitigation elsewhere, the situation could become even worse. Consequently, we need to find a way to determine crediting baselines for Article 6.4 activities in a way that aims to bridge the gap between the imperfect and insufficient reality of climate action (the Situation) and the transformational pretensions of the Paris Agreement and its 1.5°C goal (Ambition).

Introducing the Situation-Ambition Approach

To bridge this gap, it is proposed to dynamically determine crediting baselines by combining two perspectives in a “combined margin”. This combined margin is calculated as the weighted average of a representation of the status quo of emissions/performance in a given field of application – the IS margin. This representation would also reflect the lack of ambition both in terms of targets as well as implementation thereof. This perspective is complemented with a representa-

tion of the transformative ambition and ambitious mitigation objectives enshrined in the Paris Agreement, what is called the OUGHT margin in the following. The relative weight of the IS versus the OUGHT margin can be adjusted dynamically over the crediting period of a proposed Article 6.4 activity.

The IS margin is defined by the average performance of the sector. It can be developed using the same set of methodologies and tools developed for the CDM, including the principle of conservative estimates. The OUGHT margin can be defined in different ways. In sectors and areas of activity where it is appropriate, the OUGHT margin can be determined by an ambitious best available technology benchmark. Alternatively, the OUGHT margin could, for example, be determined as a sector-specific breakdown of the NDC. The bottom line for the OUGHT margin would be just zero emissions as all sectors will have to be fully decarbonized eventually.

The dynamic element is introduced via a dynamic transition factor that determines the relative weight of the IS margin and OUGHT margin respectively. The idea is that the crediting baselines gradually shifts emphasis from the IS margin to the OUGHT margin over a predetermined period.

The length of the transitioning period should be chosen in a way that corresponds to the determination of the OUGHT margin. If the OUGHT margin is determined by an ambitious technology benchmark, the length of the transition period should reflect how quickly the technology used in the proposed activity ought to become common practice in the host country taking into account the average technical lifetime of the corresponding technologies. If the OUGHT margin is determined as a sectoral breakdown of an ambitious NDC, the transitioning period should be aligned with the implementation period of the NDC. And if the OUGHT margin is set at zero, as proposed above, the length of the transitioning period

Webinar: Reflecting the Dynamics – Baseline Setting under a Future Art. 6.4 Mechanism

On May 2020, 14.00-15.30 hrs, Wuppertal Institute on behalf of BMU is going to conduct the webinar "Reflecting the Dynamics – Baseline Setting under a Future Art. 6.4 Mechanism". The event is going to discuss latest research to design approaches to determine crediting baselines for Art. 6.4 in order to make them „Paris-proof“, i.e. to account for the dynamic nature of the national climate policies as mirrored in the NDCs. Speakers include Aglaja Espelage, perspectives; Stephanie La Hoz-Theuer, adelphi (tbc); Lukas Hermwille, Wuppertal Institute; Luca Lo Re, CCXG/IEA; Axel Michaelowa, perspectives; Konrad Raeschke-Kessler, German Environment Agency.

Please register online at <https://attendee.gotowebinar.com/register/4353023015896568336>

should be determined by the date at which the host country should achieve climate neutrality taking into account its common but differentiated responsibilities and respective capability.

Meeting normative objectives while maintaining predictability for investors

The Situation-Ambition Approach for dynamic crediting baselines introduces a normative component into what has so far been a purely technical process: While this is certainly politically challenging, the proposed approach is perhaps a pragmatic compromise to resolve a conundrum that may otherwise threaten the legitimacy and credibility of international carbon trading under the Paris Agreement.

But what are the consequences for prospective project developers? First and most obvious, the dynamic approach would likely yield fewer mitigation credits than the previous static approach which only considered the status quo. But essentially this outcome is a corollary of the universal mitigation obligations specified in the Paris Agreement, namely to formulate and implement increasingly ambitious NDCs. While the approach limits the volume of cred-

its generated, its effect on revenues for project developers is uncertainty as it is also determined by prices. And with less credit supply, prices may actually be higher, at least partially compensating for the lower volume of credits. Perhaps even more important than the overall volume of the revenue stream is predictability. A predictable stream will make or break the financing of the project. The Situation-Ambition approach offers a high degree of predictability. Including the normative component of the OUGHT margin might even increase certainty and predictability as it explicates and quantifies anticipated future developments in the sector, making it more transparent for investors and lenders.

Conclusion

The Situation-Ambition Approach takes inspiration from existing concepts and hence may be easily understood, thus avoiding further complication in an increasingly complex field. Moreover, it bridges negotiation positions by bringing together those who hold up the transformative ambition of the Paris Agreement and those who want to ensure continuity from and exploit the trove of experiences from existing mechanisms, particularly the CDM. It remains to be seen whether it resonates with negotiators and stakeholders, and whether it has the potential to help resolve an issue that has significantly stifled international negotiations on Article 6 of the Paris Agreement.

Further information:

The underlying policy paper Hermwille, L. – Reconciling Pretensions and Reality - The Situation-Ambition Approach for Dynamic Baselines under Article 6.4 can be downloaded from www.carbon-mechanisms.de/en/dyn_baselines



Innovation in Finance

The Pilot Auction Facility as a Model for Future Climate Financing

by Stephanie Rogers and Tanguy de Bienassis, The World Bank Group

While the rules for the transition of Kyoto-era carbon projects into the Paris era are still being decided, many mitigation projects continue to need public support in lieu of attractive market prices for carbon credits. The World Bank's Pilot Auction Facility for Methane and Climate Change Mitigation (PAF), having completed most of its first-phase activities, presents a unique model and case study for the efficient allocation of public climate finance to private sector projects that can produce results at the lowest cost.¹

The PAF was established in 2014 in order to incentivize methane abatement projects in the landfill, animal waste, and wastewater treatment sectors. The PAF's founding was supported by a report from the Methane Finance Study Group, convened at the request of the G8.² The Study Group's report found that a large number of abatement opportunities existed in developing countries but in many cases were not implemented or were at risk of discontinuing due to lack of financial return. The Study Group recommended the establishment of a pay-for-performance facility to incentivize methane abatement projects' emission reductions. In response, the World Bank developed the Pilot Auction Facility concept and the governments of Germany, Sweden, Switzerland, and the United States contributed funds to test the first phase of activities, cp. CMR 03-2015.

To date, the PAF has held four internet-based auctions to allocate funding to eligible activities that reduce methane emissions in the waste sector and nitrous oxide emissions from nitric acid (not adipic acid) production.

The PAF's most recent auction, described below, was held on March 3, 2020.

How Climate Auctions Incentivize Climate Action

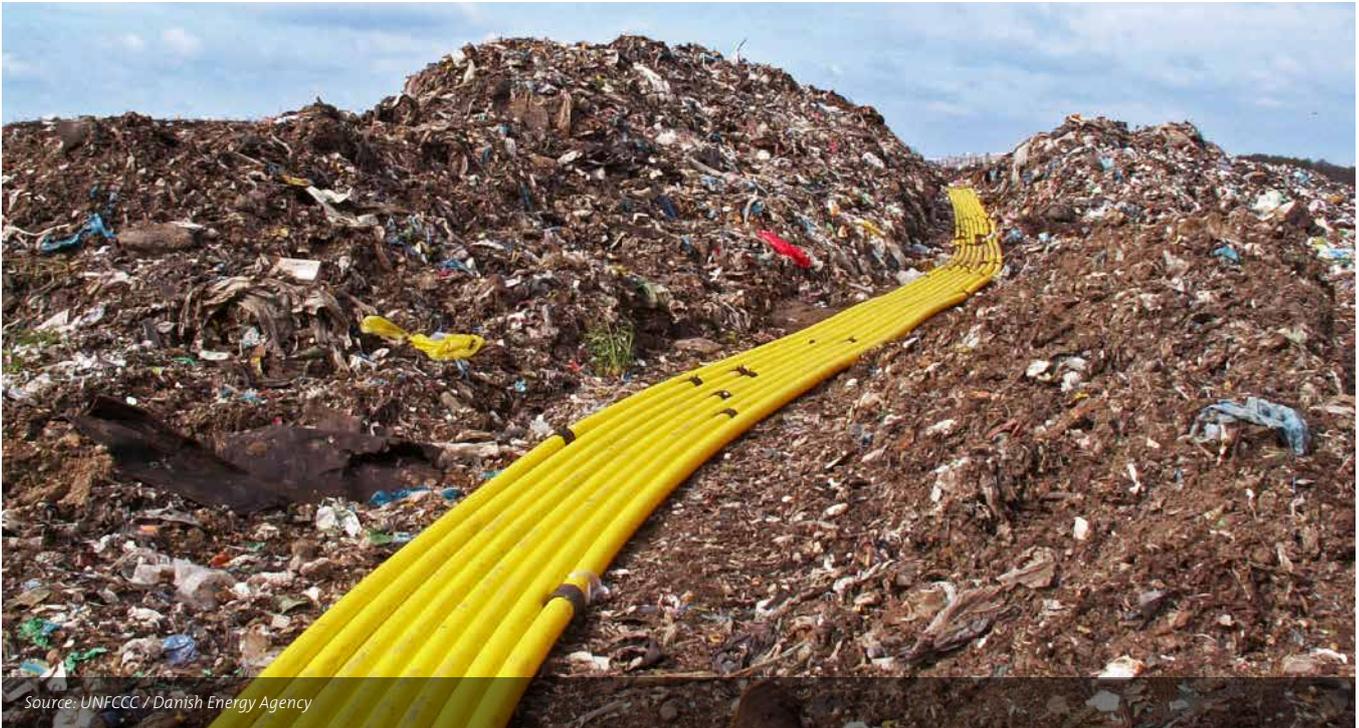
Building on the success of auctions used in other sectors as well as the efficacy of price guarantees and results-based payments, the PAF developed and implemented the concept of "climate auctions". The goal of climate auctions is simple: by bringing companies together to compete on the price at which they are willing to generate and deliver eligible climate results in the future, companies reveal the lowest incremental cost that they need to fund those activities and subsequently self-identify and deliver eligible results.

Here's how the auctions work:

1. The contributors fund the facility so that the PAF can buy eligible climate results. In the pilot phase, the contributors agreed to purchase carbon credits and provided US \$50 million for that purpose.
2. The PAF defines what type of results will be eligible before the auctions are held. The PAF's four auctions set forth eligibility criteria on the eligible carbon standards, methodologies, generation and issuance periods pertaining to carbon credits (all before the end of 2020), and countries in which activities could occur. The PAF's first auction included Clean Development Mechanism credits while the later auctions included credits from the Gold Standard and the Verified Carbon Standard, as applicable.

¹ The PAF's website is available at: www.pilotauctionfacility.org

² World Bank, Methane Finance Study Group Report: Using Pay-for-Performance Mechanisms to Finance Methane Abatement (2013), available at: <http://documents.worldbank.org/curated/en/600031468148163877/Methane-finance-study-group-report-using-pay-for-performance-mechanisms-to-finance-methane-abatement>



Source: UNFCCC / Danish Energy Agency

Safeguarding climate protection: The PAF was founded to incentivize emission reductions in methane abatement projects

- In addition, the PAF defined environmental, health, safety, and social criteria that abatement projects would have to meet in order for their credits to be eligible for sale to the PAF.
3. The PAF qualifies companies to participate in an auction. The companies pay a refundable deposit to the PAF to participate in the auction and the PAF undertakes integrity due diligence research on the potential bidders.
 4. Qualified companies convene, via the internet, to bid in a live auction held on a specific date. Each PAF auction has a specific amount of budget that the PAF's funders set aside to purchase eligible carbon credits, summarized in Table 1 below. During the auction, the companies compete on the price at which they would be willing to generate and deliver future carbon credits from eligible activities that reduce greenhouse gas emissions. The PAF offers the companies a guaranteed price for the companies' carbon credits, while not obligating them to sell credits to the facility. The companies that require the lowest guaranteed price for carbon credits win the auction.
 5. The PAF's price guarantees are offered to auction winners as World Bank bonds and function as a contract between the companies and public funders. The companies pay to the PAF an upfront cost to purchase the bonds (the "premium price" in Table 1). The bonds may be sold by the auction winners to other companies. Companies might be interested in trading the bonds if they can find a buyer who offers a higher price for their carbon credits (in which case the public funders are buyers of last resort) or if they cannot generate or source eligible carbon credits. The tradability of the PAF's bonds allows companies to continue to make business decisions regarding their activities during the life of the bonds. Regardless of whether the companies deliver, the PAF retains the upfront premium that the companies paid to the facility and can redirect the funds to other climate auction activities.
 6. Each year following the auctions, the PAF makes payments to bondholders who deliver eligible carbon credits. Bondholders are responsible for making sure that carbon credits are third-party verified and that the underlying projects have a passing score on the environmental, health, safety, and social audit required by the PAF. The redemption results are summarized below.

Table 1: The PAF's auction results

	Auction 1 (Methane, July 2015)	Auction 2 (Methane, May 2016)	Auction 3 (Nitrous Oxide, January 2017)	Auction 4 (Methane, March 2020)	Cumulative Results
Price guaranteed in future for eligible carbon credits	\$2.40	\$3.50	\$2.10	\$1.98	
Premium price paid upfront by auction winners	\$0.30	\$1.41	\$0.30	\$0.30	
Net benefit (price guaranteed minus premium paid)	\$2.10	\$2.09	\$1.80	\$1.68	
Auction Budget (USD million)	\$25 million	\$20 million	\$13 million	\$7 million	
Premium Funds Raised (USD million)	\$2.6	\$8.0	\$1.9	\$1.25	\$13.75
Climate Finance Allocated (USD million)	\$20.9	\$20	\$13	\$8.25	\$62.15
Future Emission Reductions (million tCO _{2e})	8.7	5.7	6.2	4.2	24.8

7. The PAF's funders agreed at the outset of the first phase that the carbon credits purchased by the PAF would not be used for compliance obligations. Rather, the carbon credits are cancelled. In this way, the PAF has provided climate finance for activities that are verified as carbon markets-eligible results.

The PAF's Fourth Auction

The PAF's recent fourth auction serves as an example of how climate auctions work.³ First, the PAF publicized the auction's parameters and eligibility criteria. With an auction date of March 3, 2020 in mind, the PAF committed a budget of at least US \$7 million to fund the price guarantees that would be offered to companies through the auction. The PAF posted eligibility criteria for carbon credits on its public website and in draft bond terms that were accessed by auction applicants. The eligibility criteria for the auction included that credits could be generated

from the Clean Development Mechanism, Gold Standard, and Verified Carbon Standard and listed the eligible methane mitigation methodologies under those standards pertaining to landfill waste, animal waste, and wastewater treatment projects. The eligibility criteria also included the generation period (between March 3 and December 31, 2020) and issuance period for carbon credits (after July 1, 2020). The PAF also published a list of eligible countries from which credits may originate and the environmental, health, safety, and social criteria that will need to be met in onsite project audits before carbon credits are delivered for payment.⁴

The auction parameters for the fourth auction included a starting price of US \$5 per ton of carbon dioxide equivalent. When the auction commenced, twenty-one auction bidders from nine countries indicated how many tons they would be willing to deliver to the PAF at that price. The PAF's auction manager lowered the price offered per ton

³ World Bank Press Release, "Pilot Auction to Help Reduce 4.2 Million Tons of Emissions in 2020" (March 4, 2020), available at: <https://www.worldbank.org/en/news/press-release/2020/03/04/pilot-auction-to-help-reduce-42-tons-of-emissions-in-2020>

⁴ See Pilot Auction Facility Website, Fourth Auction - Eligibility Criteria, available at: www.pilotauctionfacility.org/content/fourth-auction-eligibility-criteria (last updated December 19, 2019)

through nine rounds of bidding, and companies revised the number of tons they would be willing to offer at each price or dropped out of the auction. The auction closed after the ninth round at a price of US \$1.98 per tCO_{2e} because the PAF's budget could purchase all of the tons offered at that price. Before the auction, the companies had paid the PAF a deposit of US \$0.30 per ton that they were bidding on and the PAF reallocated that money to the auction budget during the auction. Ultimately, the auction allocated US \$8.25 million to future price guarantees to companies that will deliver up to 4.2 million tCO_{2e} of eligible carbon credits (from 2020) to the PAF in 2021.

Redemption Results

The PAF has offered four payment opportunities for bondholders (in 2016, 2017, 2018, and 2019) and will continue to make payments for bonds issued after the first three auctions through 2020. To date, US \$37.3 million have been paid to investors in exchange for carbon credits representing 14.1 million tons of CO₂. The PAF has upcoming redemption opportunities for bondholders in 2020 (for auctions 1, 2, and 3) and 2021 (auction 4).

Beyond the Piloting Phase

Looking past 2020, the PAF's climate auctions model could be applied by countries that are financing climate actions toward their NDC targets and by international funders that have committed to mobilize increasing amounts of climate finance. The PAF Secretariat has published lessons learned reports on the implementation of the first auction and a comparison of the auction designs and results from the first and second auctions.⁵ In addition, an external

team carried out an independent evaluation of the formative stage of the facility, finding that PAF's model has been well-received by market participants, expert stakeholders, and donors and that the concept has proved to be an effective mechanism to allocate scarce funding to reduce GHG emissions and mitigate climate change.⁶ The PAF has also published studies reviewing potential sectoral applications of the climate auction model (applying to CO₂ and non-CO₂ greenhouse gases), a deep dive on the green buildings sector, and how the model can be used as a financing mechanism for NDC implementation.⁷

Building on the pilot phase, the World Bank's activities have expanded into a broader Climate Auctions Program, which includes a separate Nitric Acid Climate Auctions Program and an in-depth exploration of the potential for climate auctions in the green building sector. Going forward, the PAF's approach of efficiently allocating public funds to the private sector for critical climate actions can be replicated by countries or via other financial institutions and has the potential for significant scale up. Public funders on the international and domestic levels should look to the PAF's work as a blueprint for maximizing the value of their money, sharing the risk of climate investments with the private sector, and achieving climate results quickly.

- 5 See World Bank Group, *Lessons Learned: the First Auction of the Pilot Auction Facility* (2015), available at: www.pilotauctionfacility.org/Lessons-Learned; and Benjamin Chee and Chantale LaCasse, NERA Economic Consulting, *Lessons Learned from Auctions 1 & 2: Pilot Auction Facility for Methane and Climate Change Mitigation* (2017), available at: <http://www.pilotauctionfacility.org/content/report-lessons-learned-auctions-1-2>;
- 6 IPSOS Mori and SQ Consult, *Evaluation of the Pilot Auction Facility for Methane and Climate Change Mitigation* (2019), available at: www.pilotauctionfacility.org/content/evaluation-pilot-auction-facility-methane-and-climate-change-mitigation
- 7 See World Bank, *Opportunities Beyond the Piloting Phase* (2016), available at: www.pilotauctionfacility.org/content/report-opportunities-beyond-piloting-phase; World Bank, *Study on Using the Climate Auction Model to Catalyse Energy, and Resource Efficient Buildings* (2018), available at: <https://openknowledge.worldbank.org/handle/10986/32643>; World Bank, *Climate Auctions: A Market-Based Approach to National Climate Action* (2019), available at: <https://openknowledge.worldbank.org/handle/10986/31322>; and World Bank, *The Potential for Climate Auctions as a Mechanism for NDC Implementation* (2019), available at: <http://documents.worldbank.org/curated/en/578381544469838606/pdf/The-Potential-for-Climate-Auctions-as-a-Mechanism-for-NDC-Implementation.pdf>.

Slowing Emission Growth

Towards carbon pricing in Pakistan

by Nicolas Muller, UNFCCC Secretariat

Syeda Hadika Jamshaid, Country Facilitator, Federal Ministry of Climate Change, Pakistan

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In June 2019, the first phase of the project “Collaborative Instruments for Ambitious Climate Action” (CI-ACA) was successfully wrapped up. The project is implemented through the network of UNFCCC Regional Collaboration Centres (RCCs) and aims to “assist Parties in the development of carbon pricing approaches for implementing their NDCs”, cp. CMR 02-2019. Building on the successes and lessons learned from the first phase, a second phase of the project has now been launched which is set to run until the end of 2021. The project directly echoes the call by UN Secretary General Antonio Guterres to “put a price on carbon” as one of the top priorities for addressing the climate crisis. In this context, a much-noted accomplishment of the projects’ first phase is the collaboration with Pakistan to support the consideration of domestic carbon pricing.



Arguing the point: Mushahid Ullah Khan, former Pakistani Minister for Climate Change (2017-2018), current Member of the Senate of Pakistan

CI-ACA at a glance

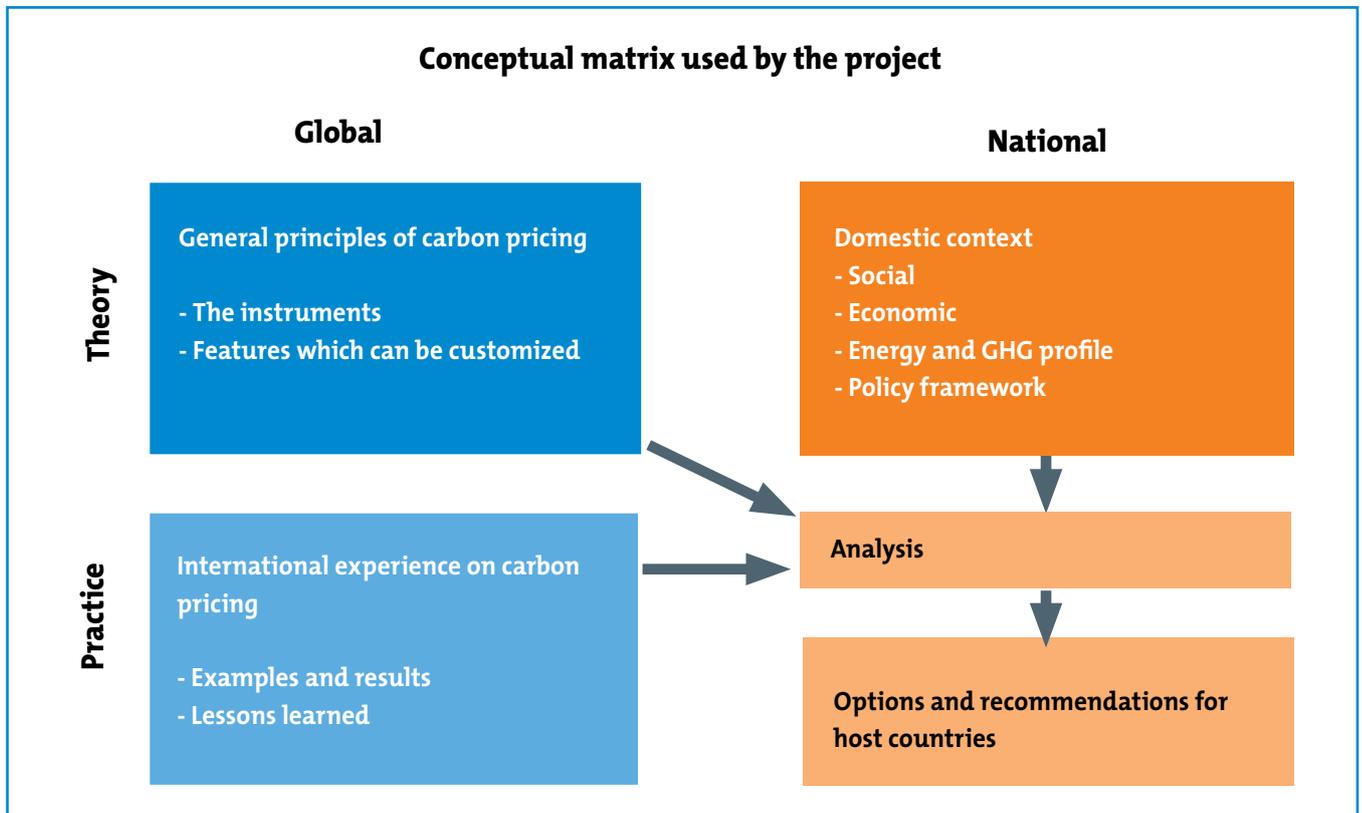
The project Collaborative Instruments for Ambitious Climate Action was launched at the end of 2016 as an immediate response to the growing need to support Parties in the consideration and adoption of carbon pricing to achieve ambitious NDCs under the Paris Agreement.

During its first phase between December 2016 and June 2019, CI-ACA targeted 18 jurisdictions (both national and regional), providing capacity building, awareness raising, stakeholder engagement and technical sup-

port to Parties. Most of the activities are conducted via the UNFCCC Regional Collaboration Centres and their partner organizations. The second project phase began in September 2019 and is currently focusing on building on the momentum created in the first phase as well as expanding to new jurisdictions.

Further information:

<https://unfccc.int/about-us/regional-collaboration-centres/the-collaborative-instruments-for-ambitious-climate-action-ci-aca-initiative>



CI-ACA is a voluntary initiative, enabled by the voluntary support of contributors (Germany and Quebec being the main donors in the second phase).

The case for considering carbon pricing in Pakistan

Pakistan is a developing country with volatile gross domestic product (GDP) growth in recent years. As per the statistics of 2016, the GHG emissions of Pakistan stood at just 2 tCO₂e per capita per year. Therefore, one may wonder about exploring the opportunity to introduce a carbon pricing mechanism. Though the contribution of Pakistan to global greenhouse gases emissions (GHG) is still low, being an emerging economy, with a large population and a strong dependence on fossil fuel, major growth in the GHG emissions is forecasted. The nationally determined contribution (NDC) submitted by Pakistan to the UNFCCC in 2016 indicates that under business as usual (BAU), the GHG emissions are expected to increase from 405 MtCO₂e in 2014-2015 to 898 MtCO₂e in 2030, equivalent to an

annual growth rate of 9.6%. In this context, carbon pricing should not be viewed as an instrument to reduce emissions from current levels; instead, it should be understood as a cost-effective instrument for curbing the expected future growth in emissions and fostering low carbon development.

Another key point is that the introduction of carbon pricing instruments takes time. The World Bank Partnership for Market Readiness (PMR) showed that this process, starting with the initial consideration of carbon pricing, moving to the design of an instrument, its adoption in national legislation and finally its concrete implementation, can easily take five years or more. But once in place, carbon pricing can serve in achieving successive and increasingly ambitious NDCs in an effective manner, and also support a long-term low carbon development strategy. Therefore, it seems ideal that countries who want to use carbon pricing in the future should start taking steps towards doing so as soon as possible.



Weighing the options: Participants at the first National Consultative Workshop on Carbon Pricing, Islamabad, 21 December 2017 (Photos: UNFCCC)

Start of support to Pakistan

In this spirit of looking at the long-term picture, the CI-ACA project team started engaging with Pakistan's Federal Ministry of Climate Change as early as August 2017, providing a first capacity building workshop on the topic. As a next step, it was agreed to organize a National Consultative Workshop on Carbon Pricing in December 2017. The event, which took place in Islamabad, brought together over 60 key national stakeholders representing various branches of public and private sectors to gather their views on the challenges of and opportunities for introducing carbon pricing in the country. The rich feedback collected made it clear that any carbon pricing approach for Pakistan should strongly consider national priorities:

economic development, poverty reduction, addressing energy poverty and power shortages. The workshop successfully concluded with the decision to explore the possibility of domestic carbon pricing, in line with national priorities.

To deliver on the outcome of the workshop, a team was assembled to carry out a study on the opportunity for introducing domestic carbon pricing in Pakistan. The team included Pakistani nationals placed directly within the Ministry of Climate Change to achieve the following objectives: (i) ensuring strong coordination with the Ministry, (ii) maximizing domestic anchorage and buy-in, and (iii) developing Pakistan's own domestic capacity and nurtur-

ing national “champion(s)” who can potentially sustain the outcomes beyond the project’s duration.

Study on the introduction of carbon pricing in Pakistan

The first part of the study looked at the general theory of carbon pricing and the instruments available. But given Pakistan’s very specific domestic circumstances, a strong emphasis was put on how instruments can be customized to fit domestic conditions or needs. To build on internationally available experiences, the study looked at how concrete examples of carbon pricing have played out in practice. A next crucial part of the study assessed the domestic context in Pakistan.

Some of the key challenges identified in this section include the large trade deficit (which includes energy imports), the circular debt and power outages in the electricity sector, as well as sustainable development challenges. At the same time, the domestic context was also found to offer major strength and opportunities: very strong potential for energy efficiency, huge potential for almost all major types of renewable energy, a push to liberalize energy markets, and robust climate change policy framework at the federal level.

Based on this, design options which could fit Pakistan’s domestic circumstances were explored and evaluated (these will be elaborated below). Finally, recommendations on pathways for potential implementation were proposed. For good reasons, the study deliberately took a forward-looking approach, considering what the potential domestic context is likely to be in 2023 as the earliest point in time for potential implementation.

An important decision for the study was not to overly focus on aspects related to ambition levels and corresponding carbon prices, since these can be dealt with later. Thus, priority was given to elaborating an adequate carbon pricing architecture which is seen as more time critical. And after all, carbon pricing approaches are meant as a durable infrastructure which can accommodate increased levels of ambition over time. And ambition levels are not cast in stone but are required to evolve over time. By the

time a carbon pricing instrument is implemented, a lot can have changed: domestic capabilities, levels of available international support, level of action by peers, domestic and international levels of climate ambition, etc.

Which type of carbon pricing could work?

When considering which carbon pricing approaches could work, both the technical feasibility as well as the political feasibility should be considered. Building on the extensive consultations conducted, the study found that an economy-wide carbon tax could not only be rejected by key economic sectors, but could also negatively impact the most vulnerable fringes of the population. Consultations indicated a clear preference by the industry and energy sector for an emissions trading system (ETS). At the same time, it was found that a petroleum development levy (PDL) was already levied to the transportation sector. One suggested way forward was to transform the PDL into a GHG-based carbon tax while a separate instrument, perhaps in the form of an ETS, could apply to the industry and electricity sector. But would an ETS make sense?

Considering this option called for a specific sub-study on the feasibility of an ETS. The sub-study estimated that by 2023, Pakistan would have around 121 large-scale emitters, corresponding to an emissions volume of 168 MtCO_{2e}. This is certainly a good start: in comparison, the Regional Greenhouse Gases Initiative (RGGI) in the US covers 165 entities representing around 53 MtCO_{2e}. Overall, the sub-study revealed that a domestic ETS could have enough participants, be relevant in terms of coverage and be sufficiently liquid for an effective carbon price to form. Interestingly, just the power generation and cement sector would together account for 89% of GHG emissions from large facilities. Hence, as a first step, a domestic ETS could focus on these two main sectors and later be extended to others.

As Pakistan is still strongly developing with output levels rising, setting a fixed-cap may not be feasible for the near future. Instead, a flexible cap based on output levels and allocation benchmarks appears more appropriate in the context of Pakistan. Overall, the combination of a transformed PDL to cover the transportation sector and an ETS



Source: United Nations Climate Change Secretariat

Pros and Cons: Exchange with stakeholders during the first National Consultative Workshop on Carbon Pricing, Islamabad, 21 December 2017

for the energy and industry sector could cover 10% and 26% of Pakistan's GHG emissions by 2023 respectively.

The study also revealed many positive elements which could facilitate the implementation of the carbon pricing architecture. For example, the existing output-based tax on cement (a simple production tax which applies to each tonne of cement produced) could be amended if GHG-based pricing is introduced. Similarly, for the power sector, Pakistan already has a progressive tariff structure which could serve as a basis for returning some of the proceeds to customers. Interestingly, Pakistan also has economic mechanisms for supporting the most vulnerable fringes of the population and these could be used as well. Furthermore, Pakistan is working on a potential domestic climate fund which could process the revenues generated from a carbon pricing instrument. Pakistan also has effective renewable support schemes, in the form of soft loans and renewable energy auctions which could be highly complementary to carbon pricing. Finally, Pakistan has an active stock exchange which could support the operation of a carbon market.

Nevertheless, one element to keep in mind is that carbon pricing can only be successful if climate finance is avail-

able in parallel, to enable the economy to respond to the price signal on GHGs. In short, while carbon pricing sets the economic signal, climate finance provides the means. In the context of strong constraints on public finances, this aspect should not be underestimated, and further work may be needed in this area.

Benefitting from an ETS, including through Article 6 participation

The potential for carbon pricing in Pakistan is two-fold. At the domestic level, carbon pricing could contribute to important national objectives: increasing energy security, reducing the bill for imported fuels and cutting pollution. As such, to a certain extent, it can be considered a no-regret option. And Pakistan, for example with its 10 billion tree initiative, has already started putting domestic resources into mitigation action. In addition, while applying an MRV for carbon pricing is a challenge, it is also an opportunity for improving data collection for managing GHG emissions.

Beyond that, one of the key reasons for considering a national ETS for Pakistan is that such an instrument could directly generate mitigation units in the form of allow-



Source: United Nations Climate Change Secretariat

Tapping the potential: Malik Amin Aslam, Pakistani Federal Minister and Adviser to the Prime Minister of Pakistan for Climate Change; during a press conference on the launch of the National Committee on Establishing Carbon Markets (NCEC), Madrid, December 2019

ances expressed in tCO₂e. This would in turn enable the country to actively participate in cooperative approaches as foreseen under Article 6 of the Paris Agreement and to do so at a very large scale (which is anyway the scale for achieving the Paris Agreement). Certainly, an ETS in Pakistan would have the scale to deliver large-scale emission reductions, in the context of a strong unmobilized potential for mitigation action.

Then the next question is, of course, where demand could stem from to support ramped-up mitigation action in Pakistan and nurture increased ambition in a potential domestic ETS. Indeed, considering its domestic circumstances, Pakistan's first NDC foresees that it would need external support to implement mitigation. Several avenues could be considered. The first could be a permanent linking with another market, for example with China. This could be a win-win since the net buyer of units would achieve its climate target at a lower cost, while the net seller would benefit from decarbonization and its co-benefits. Another avenue to consider could be to sell mitigation units to the various sources of demand: potential compliance buyers, carbon funds, CORSIA, and last but not

least voluntary demand given the unprecedented number of corporates pledging to become carbon neutral.

How could this work in practice? An emission credit could be issued in exchange for the cancellation of an emission allowance in the ETS. This would however require a thoroughly designed ETS which can, among other things, demonstrate that it is not over-supplied. To date, the overwhelming majority of Article 6 pilots have focused on project and programme-based approaches. But, there is certainly strong merit for emission credits issued against the cancellation of allowances from an ETS. And certainly, potential buyers will be aware of the broad coverage and transformational nature an ETS can provide.

While using an ETS to supply credits to traditional offset buyers is a novel and promising approach, some technical work remains. In particular, the interaction between the removal of emission allowances and price stability mechanisms needs to be explored. For example, there may be a legitimate risk if units removed to satisfy an external demand trigger the release of more allowances from a cost-containment reserve.

Results of the first phase

A clear result of the first phase of CI-ACA support to Pakistan is the study which was not only successfully carried out, but also positively received and subsequently endorsed by the Ministry of Climate Change. What greatly facilitated the study was the clear mutual understanding that it was undertaken for the sole purpose of informing policy makers about their options, and that it would not create any formal obligation to move towards implementation.

The mutual trust and high-level technical support provided resulted in the COP25 declaration by His Excellency Malik Amin Aslam, Adviser to the Prime Minister of Pakistan on Climate Change, during a press conference on the launch of the National Committee on Establishing Carbon Markets (NCEC). Among other significant announcements, the adviser stated that the NCEC will assess the scope and potential for the carbon market in Pakistan, assess the data needs and suggest a way forward on how to overcome gaps. In a very supportive speech, Mr. Aslam concluded that carbon markets “need to be understood, not feared”, and highlighted how Pakistan could also harvest the strong co-benefits of a carbon market for its own sake.

The CI-ACA project has already pledged to support Pakistan in its second phase and will work in close collaboration with the NCEC. From the constitution of the NCEC as approved by the Government of Pakistan, it can be seen that NCEC is represented by the government institutions, public and private sector entities and sectoral players, including representatives of the power sector, industries and commercial lending institutions. This is encouraging and it is right to involve all stakeholders in the decision-making process for establishing the ETS from the outset. The NCEC is required to review national and regional carbon market mechanisms, weigh up options for creating a carbon market in Pakistan, develop national consensus, create awareness, craft ownership among key players, identify and articulate linkages with international carbon markets, and produce a report for government consideration. The NCEC can also establish sub-committees and engage consulting services to deliver specific work packages.

The way ahead

The role and responsibility of the NCEC is very broad and challenging given that Pakistan is, for the first time, entering into this exhaustive exercise of establishing a carbon market. To serve its purpose, it is important that the NCEC be operated via a permanent secretariat with sufficient capacity to provide administrative support and technical expertise, and be able to hire consulting services, as needed.

To advance the establishment of a domestic market, resources would need to be found for use in achieving many critical goals and performing vital functions. For example, an MRV infrastructure and an emission registry would need to be established. To enable transaction, an interface or a platform similar to a digital carbon stock exchange, linking interested parties for sale/purchase of units and/or offsets needs to be established. Furthermore, the detailed rules which apply to the carbon market would need to be refined to achieve important objectives. A healthy balance between supply and demand would need to be ensured. Ideally, a price slab for offsets would be ensured. Double counting in the system would need to be avoided. And last, but not the least, the system would prevent disruptions caused both by the demand-supply gap and price volatility in countries like Pakistan.

Undoubtedly, certain financial support would be required that is to be arranged either internally or through donors' contributions. To do so, Pakistan is actively mapping the different needs, and identifying priorities in order to ensure a maximum of synergies and impact in the support that can be received. The next steps this year will therefore focus on drafting policies and pursuing stakeholder consultations, while taking the first concrete steps towards establishing the capacity needed for implementation.

Further information

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Improving Trust and Efficiency

The potential of digitisation and technology for the carbon markets

by Owen Hewlett, The Gold Standard Foundation; Jürg Füssler, infras AG; Sven Braden, Climate Ledger Initiative

The carbon markets face unprecedented change due to new policy and compliance regimes, and general fragmentation. This is coupled with renewed demand and corresponding scrutiny and critique. Like all markets, they also face the risks and opportunities that digitisation and disruptive technology bring.

With the exception of sectoral or national-level allowance transfers, carbon markets rely on the monitoring, reporting and verification (MRV) of project-level activities, according to fungible standards and methodological requirements. Strong MRV requirements are the bedrock of credibility and integrity, coupled with transparency of issuance and tracking of units. But it is an imperfect system, with significant scope for improvements in 'trust' (credibility, accuracy, integrity of MRV) and 'efficiency' (time, cost and practicality of MRV). MRV includes:

- Data collection
- Impact quantification and reporting
- Verification
- Carbon credit issuance

Digitisation and technology have great potential to improve the trust and efficiency of all aspects of the MRV process, particularly where complementary technologies are applied across the process. The ultimate result of these improvements can be summarised as follows:

- **Automation & credibility:** The application of digital technology to automate data collection and assurance to reduce the cost and time

associated with MRV whilst also improving the credibility, accuracy and transparency of key parameters through reduced manual error of fraud.

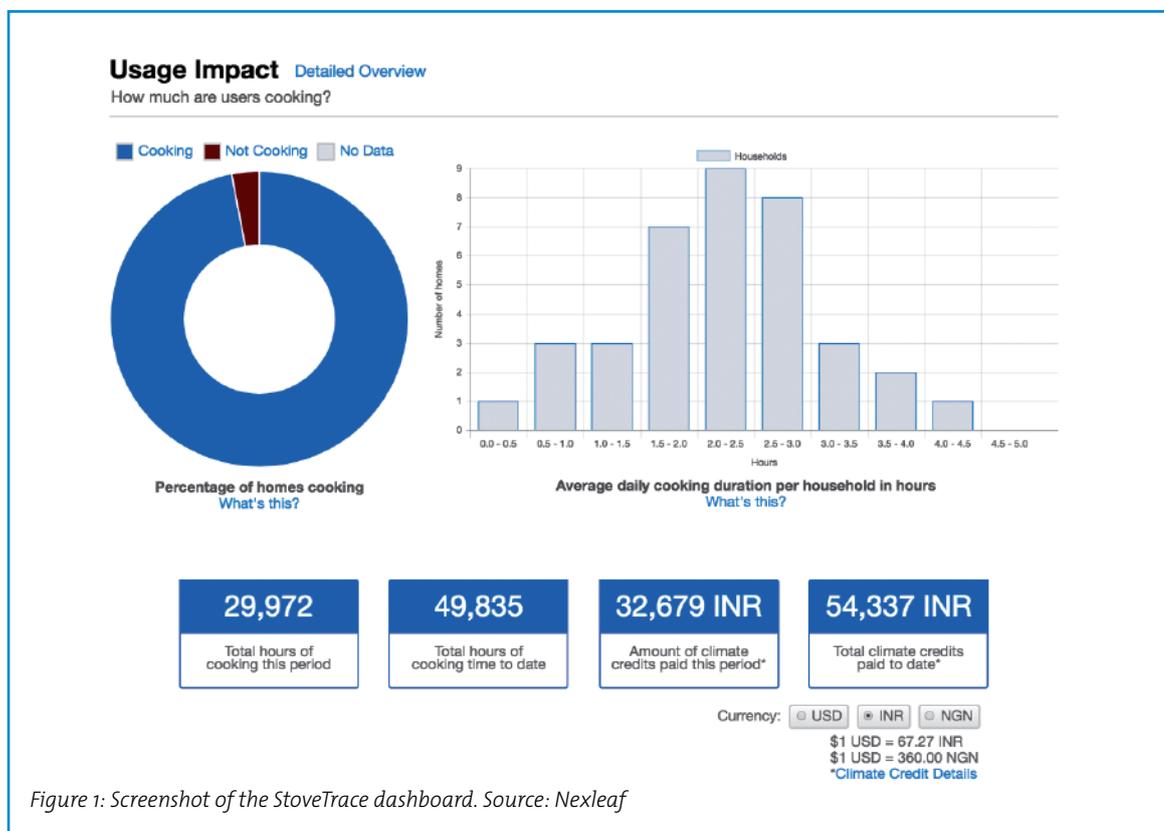
- **Open data & interoperability:** Allowing data to be used for different purposes, to be aggregated and enhanced through standardisation of data principles and accessibility. Enhanced flexibility for proponents to decide which markets and customers to serve and for registries to seamlessly cooperate for maximum transparency and integrity.

These inter-related areas will be discussed, along with examples, before concluding with recommended ways forward and consideration of the risks involved.

Automation and credibility

The collection, reporting and assurance of data for MRV can be expensive and impractical, not to mention prone to error or gaming. For example, many project types include a manual data collection element, such as monitoring deforestation in forestry or usage/uptake rates for domestic technologies. In both cases the time and expense of data collection is high and there is the potential for manual error and survey bias which may result in credibility issues.

The following examples demonstrate how new technologies can create 'win-win' scenarios for improving the trust and efficiency of MRV while at the same time adding value to the quality



of project design and implementation through enhanced analytics.

Example 1

Nexleaf 'Stairway to Scale' (<https://nexleaf.org/>): Nexleaf Analytics advocate for, develop, test and implement data-drive solutions to global development challenges such as access to 'clean cooking technologies'. In many rural households in developing countries, household cooking takes place on 'three stone' open fires, releasing greenhouse gases and other short lived climate pollutants. Providing clean cooking solutions to households reduces indoor air pollution and mitigates both climate and health impacts.

Two of the biggest challenges in clean cooking are driving adoption (specific clean cooking technol-

ogies either may not be durable or may not be well suited to a family's typical usage or cultural context, or continued fuel consumption might be financially prohibitive) and the monitoring of key parameters related to usage (which can be expensive and unreliable due to their distributed nature). When these two challenges combine it can be difficult to accurately assess true adoption rates.

Nexleaf seeks to design and implement clean cooking solutions that are methodically and responsibly scaled by ensuring the chosen technology is fit for the intended purpose, hence driving up adoption rates. This includes the testing of clean cooking solutions in small groups – beginning with a cohort of 10 households – and incrementally increasing scale once the equipment and/or fuels have met an agreed standard of adoption. Working so methodically brings



Source: RPBajao/shutterstock

increased transparency on the affordability of household energy being distributed to the rural poor.

‘Stairway to Scale’ is Nexleaf’s methodological approach to resolving these issues:

- A StoveTrace sensor is placed on an improved cookstove and continuously uploads cooking event data to Nexleaf’s servers in near real time.
- The data is immediately viewable on the StoveTrace dashboard, which offers several useful visualization options. This visualization shows a single day of cooking for a single household.
- The web-based StoveTrace dashboard (cp. screenshot on page 27) lets improved cookstove stakeholders understand adoption rates, real-time cooking behavior, and comparisons broken down by household and region. With the incremental, data-led analysis approach, Nexleaf can identify the obstacles to clean cooking adoption, such as design flaws, supply chain inefficiencies, or improper after-sales service.

Further information:

<https://nexleaf.org/impact/>

Example 2

Wood Tracking Protocol (<https://wtp-project.com/problem.php>): With more than half of its territory covered by forests, Peru continues to face significant deforestation, estimated at 143’000 hectares in 2017 for the Amazon region. Wood extraction through illegal logging is an important driver in the degradation of Peruvian forests. Corruption plays a central role in the sector, which often influences the granting of concessions and titles of property, as well as illegal logging. Collusion between public and private actors along the wood processing chain often leads to the counterfeiting of forest inventories or the creation of false data.

The Wood Tracking Protocol (WTP) features a proof of concept and an IT prototype to demonstrate how features provided by mobile devices and blockchain technology can combine to support traceability of wood in the Peruvian Amazon region. WTP includes an application to gather relevant forest data (user information) and a platform to manage and process that data.

WTP user (for example legal logging companies, purchasers, etc.) information may include geographical parameters of logging licences, data on the species or size of a tree to be logged and a picture embedded with timestamp and GPS data showing an operation along the wood processing chain. Users of the application connect to the WTP Platform where ID validation via phone number verification takes place (a switch to more secure means of ID verification such as fingerprint or face recognition is planned). Once users are validated by WTP, they gain access to the blockchain gateway where user information is sent to the blockchain network in a sequenced and tamper-proofed manner. The project complements real world tracking by associating a unique digital history, in particular GPS route and time, to one tree or to one load of wood. In this way, WTP lowers the risk that the same tree or load of wood is double counted along the paper trail.

Ultimately, the data is secured through application of blockchain technology (immutable and irreversible records). The app is currently under development and is expected to enter demonstration mid-2020. WTP has been developed under the Climate Ledger Initiative and is financially supported by the Swiss Development Cooperation.

These examples point the way forward for the next generation of MRV, but it should be noted that there are barriers and risks to consider. These include access and capacity, particularly for marginalised and vulnerable project types, start up costs, and scaling uptake for new technologies, building capacity and new business models in

the verification community. Likewise, standards will need to consider adopting more flexible approaches to approving methodologies that incorporate digital technology; this should be done in a flexible way, based on core principles and guarding against technology exclusivity.

Open data and interoperability

One of the key building blocks towards applying new technology to MRV and to dealing with the increased complexity and fragmentation of markets is to make data accessible and interoperable. In short, this means market standards conforming to a standardised and open data approach, allowing the aggregation of data and easy tracking of units in different registry systems. Like technologies applied at the project level, new data approaches also have the potential to contribute to the overall impact of markets by using shared data sets to improve quality and make better decisions.

Example 3

World Bank Climate Warehouse: The World Bank's Carbon Markets and Innovation team (CMI) is exploring a Climate Warehouse ecosystem to demonstrate a decentralized information technology approach. It is envisioned that this Climate Warehouse information system would connect to country, regional and institutional databases and registries to surface publicly-available information on mitigation outcomes (MOs) and record status changes to provide information on how MOs are used. The objective is to enhance transparency and trust among market participants and enable tracking of MOs across jurisdictions and test blockchain technology for this purpose. The internal testing demonstrated that blockchain enables an open data approach and facilitates the interoperability of markets by simplifying data sharing amongst diverse registries. Consequently,

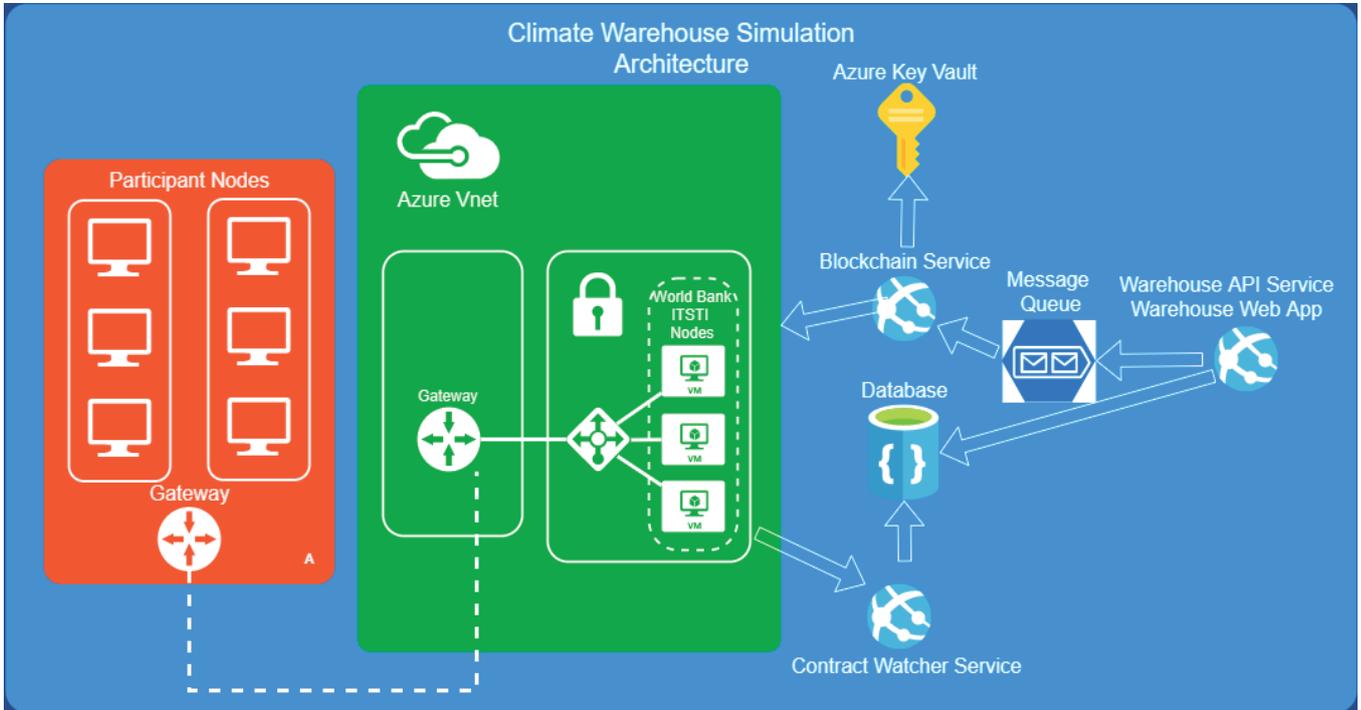


Figure 2: Architectural components of the Climate warehouse meta-registry. Source: World Bank

all participants could account for their MOs in an immutable structure. The decentralized and immutable nature of the system provides resilience against attacks and confidence that asset information has not been tampered with. Since each participant can hold their own decentralized node, the node architecture and access rights can be determined by each participating entity according to the regulations of each country. Blockchain also ensures that MOs can be traceable from their origin to their eventual retirement.

However, blockchain is not a suitable repository for storing large amounts of attribute information about climate actions and MOs. The MRV processes needed to verify project and MO information currently rely on extensive use of audit reports, detailed project information, and imagery. Therefore, more extensive information and attributes of the mitigation outcomes should reside within conventional data storage component.

Further information:

Click here to learn more about the Climate Warehouse simulation <http://documents.worldbank.org/curated/en/128121575306092470/Summary-Report-Simulation-on-Connecting-Climate-Market-Systems>

It is clear that the future for standards operating in carbon markets is to create and apply standardised data approaches, towards the goals of inter-operability. To enable this, common principles and participation by standards will be needed. This will also need to translate into registry functionality to ensure the integrity of international accounting and guard against issues such as double counting or mis-matched accounting approaches.

Conclusions

The goal of carbon markets is to direct finance towards 'additional' emission reduction and removal activities and should be underpinned by robust environmental and sustainable development integrity. Standards are focused on maximising and optimising the impacts of projects supported through markets while reducing the burdens of cost, time and practicality. Markets are also rightly scrutinised due to concerns about green-washing, with increasing attention now focused post-Paris.

Disruptive technology and inter-operability of data offer a way forward in improving in these areas, in a way that can be consistent and optimised in a global effort. Technology can improve on the twin aims of trust/efficiency and impact by turning powerful analytics to the goal of maximising impact.

To move to this new market paradigm, several barriers and risks must be overcome:

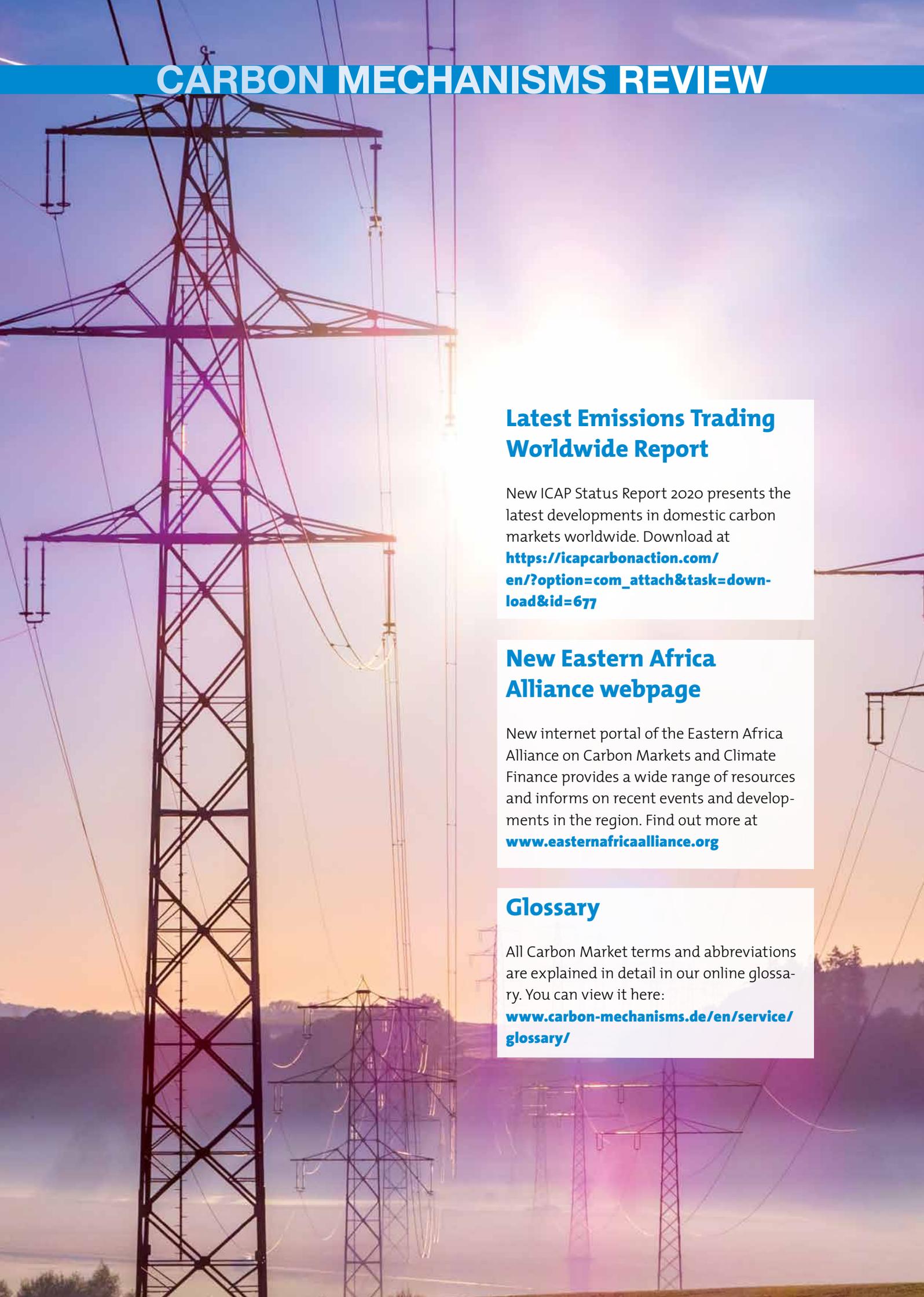
- Common principles and approaches to data should be aligned across markets and climate policy, in line with the goals of the Paris Agreement
- Standards should make efforts to align their methodological and tracking processes with these principles
- 'Traditional' MRV methods should be maintained, alongside efforts to increase capacity and access to those groups that may otherwise be left behind by change

- Increased engagement with the verification community is necessary to address capacity and concerns over the viability of verification business models
- Inter-operable climate warehousing efforts will be required to ensure the inter-operability of registry systems and unit tracking

These building blocks are large and likely beyond the scope of any one stakeholder. Hence, for the greater good, it is critical that efforts seek to align and share knowledge and capacity in an open way.

Finally, to underpin these efforts, strong governance and regulation will be required.

CARBON MECHANISMS REVIEW



Latest Emissions Trading Worldwide Report

New ICAP Status Report 2020 presents the latest developments in domestic carbon markets worldwide. Download at https://icapcarbonaction.com/en/?option=com_attach&task=download&id=677

New Eastern Africa Alliance webpage

New internet portal of the Eastern Africa Alliance on Carbon Markets and Climate Finance provides a wide range of resources and informs on recent events and developments in the region. Find out more at www.easternafricaalliance.org

Glossary

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