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Towards sector-wide market-based
climate action

System Change

Transformative design of
Article 6 programmes

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November



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Dear Reader!

Ever since the negotiations on market-based climate action beyond Kyoto began, there has been the desire to move away from the project-by-project approach and instead allow for policy-based and sectoral crediting. Many expect that such a step will not only exceed existing interventions in terms of scale, but that it will help drive entire sectors or even economies towards low-carbon sustainable development. In this “upscaling” issue of CMR, we thus present an in-depth analysis of a sectoral initiative of this kind – the Nitric Acid Climate Action Group, portrayed in both an article and an interview. We also look at the connection with the transformational change debate and feature views from Article 6 pilot programme managers.

The move towards sector-based action is encouraged in a number of Asian countries that recently committed to net zero emissions targets or, in the case of the Philippines, declared a moratorium on new coal-fired power plants. It is developments like these that contribute to keeping up momentum at a time when Covid-19 rightfully takes most of the attention. Together with the UNFCCC climate dialogues in November and December this year, they are a reminder that multilateral and cooperative action are key prerequisites in making global climate action a success.

On behalf of the editorial team, I wish you an informative 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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Towards Sectoral Transformation

Nitric Acid Climate Action Group (NACAG) aims at mitigating emissions in nitric acid production worldwide

by Malte Plewa (GIZ), Volker Schmidt (GIZ), Daniel Ávila (GIZ), Enrico Rubertus (GIZ), Dr. Silke Karcher (BMU)

Nitric acid is a nitrogen compound used throughout the world as a raw material in fertiliser manufacturing. Nitrous oxide (N₂O) is an unwanted by-product of the production process and a potent ozone-depleting greenhouse gas (GHG) with a global warming potential 265 times that of CO₂. Even though extensive abatement is neither technically difficult nor expensive, this harmful greenhouse gas is released into the atmosphere unabated by most production facilities around the world. Respective abatement technology is currently applied consequently in the European Union (EU), where its operation is highly incentivised by the European Emissions Trading System (EU-ETS). Outside the EU, only a few countries or regions have implemented similar incentive systems, however often with a limited reach. In addition, there is a small number of nitric acid plants that continue to operate N₂O abatement technology as they still hold valid contracts for selling emission reduction certificates through the Clean Development Mechanism (CDM), either through individual purchase agreements or option rights from the last auction of the Pilot Auction Facility (PAF).

Based on the available information, it is estimated that the operation of dedicated N₂O abatement technology is limited to around 25% of the approximately 580 nitric acid plants that exist worldwide. This is especially alarming as N₂O abatement in nitric acid production has been

rather successful under the CDM. To date project activities in nitric acid production facilities have generated emission reduction certificates worth more than 92 million tonnes of CO₂ equivalent. In total almost 100 CDM projects have been registered. However, due to the drastic drop in certificate prices at the end of 2012, approximately 40 of these projects never actually reached technical implementation and most of the rest were decommissioned in the years that followed.

There are two main types of catalyst-based N₂O abatement technology used in nitric acid plants. 'Secondary' abatement technology is installed directly in the reactor where the primary reaction of the production process takes place. The catalyst material destroys the N₂O as soon as it is formed during the ammonia oxidation over a platinum gauze (primary reaction). 'Tertiary' abatement technology involves an end-of-pipe solution which decomposes the N₂O in the tail gas before it is released into the atmosphere.

One advantage of tertiary solutions is that it is possible to combine N₂O abatement with destroying NO_x, another unwanted by-product, in the tail gas, thus generating possible synergy effects. For newly built nitric acid plants certain measures for process optimisation can already be considered during the planning and construction, resulting in a reduction in nitrous oxide during the production process. In existing plants the installation



Source: Abrahams/UNFCCC 1441/Tianji Group Line 3 N₂O Abatement Project

Beyond the project-by-project approach: CDM N₂O project in China

of either secondary or tertiary N₂O abatement technology is usually unavoidable when aiming to reduce N₂O emissions.

While GHG mitigation can be challenging or expensive in many sectors, proven N₂O abatement technology for nitric acid installations is readily available and mitigation is possible at a comparatively low cost of approximately 1 to 5 dollars per tonne of CO₂ equivalent. Moreover, the technology can be installed in existing plants relatively easily and can reach very high abatement efficiencies of up to 98 per cent. Estimates suggest that there is a theoretical additional abatement potential of up to 180 million tonnes of CO₂eq per year globally.

Given the ongoing challenges of climate change, we are duty bound to exploit this cost-effective mitigation potential.

NACAG's launch and offer

Driven by this rationale the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) launched the Nitric Acid Climate Action Group at UNFCCC's 21st Conference of the Parties in Paris (COP 21). This global action group's ambitious vision is for all nitric acid production plants worldwide to implement and permanently operate effective N₂O abatement



Source: Fertiliser Loaders by Doug Beekers (<https://flic.kr/p/8GXkFr>)/Flickr/CC BY-SA 2.0 (<https://creativecommons.org/licenses/by-sa/2.0/>)

measures; in other words, transform the entire industry sector towards climate-friendly production.

To achieve this goal, NACAG supports its partner countries in the technical aspects as well as in designing effective policies to ensure the permanent abatement of these emissions. For example, NACAG conducts technical studies at plant level on the most suitable mitigation technology; it also provides policy advisory services by analysing potential options for regulation of N₂O abatement in its partner countries.

In addition, NACAG offers financial support for N₂O abatement measures to plant operators in countries which do not have sufficient resources to implement these activities. There are approximately 95 nitric acid plants located in countries eligible to receive official development assistance, with a total annual abatement potential of roughly 45 million tonnes CO₂eq.

The financial support is provided through two different mechanisms. For plant operators which have not operated N₂O abatement technology in recent years, NACAG provides direct grants to purchase and install nitrous oxide abatement technology and emission monitoring equipment.

For plant operators which have recently mitigated production-related N₂O emissions, usually incentivised by the CDM, NACAG offers participation in a climate auction for price guarantees on emission reduction certificates. This second financing programme is based on the World Bank's Pilot Auction Facility and operates under the Nitric Acid Climate Auctions Programme (NACAP).

Support linked to partner country commitment

All countries worldwide are invited to join the NACAG by signing the NACAG Declaration, a non-binding expression of support for the action

group's goals. To qualify for NACAG funding the partner countries need to formally commit to implementing effective policy measures that guarantee a commitment to N₂O abatement in nitric acid production after 2023. This strategy is in line with the spirit of the Paris Agreement as it not only ensures the lasting effectiveness of the measures but also invites all countries to count this easily tapped potential towards their own Nationally Determined Contributions (NDCs) to the Paris Agreement, thus contributing to raising the ambition. From the perspective of the partner countries, it makes sense to use these 'low-hanging fruit' emission reductions for their own climate commitments, rather than for any form of international trading of mitigation outcomes through existing schemes or possible future set-ups under Article 6 of the Paris Agreement.

This firm commitment is expressed by the government of the partner country signing a unilateral Statement of Undertaking (SoU), which ensures that a one-time investment is turned into permanent mitigation. Since this requires an official agreement from the partner countries' governments, it can entail a lengthy political process.

The initiative has been in close discussions with more than 30 countries to offer technical and financial support. So far, 14 countries have joined by signing the Declaration, thereby expressing support for the initiative's goals. Moreover, four countries (Georgia, Mexico, Tunisia and Zimbabwe) have already signed the formal political commitment (SoU) and thus qualify for financial support. NACAG is currently setting up grant agreements with the local nitric acid producers in these countries. It is expected that more countries will sign the SoU in the coming months.

A regulatory deficit

Despite the availability of proven and cost-effective N₂O abatement technology, only a few coun-

tries have implemented policies on the abatement of N₂O emissions in nitric acid production.

There are several reasons for this regulatory deficit. In developing countries in particular, fertiliser producers are often considered to be of strategic importance for food security, the regulators therefore hesitate to enforce stricter environmental regulations. Furthermore, in most countries, there are only a very small number of these facilities; creating a separate regulation aimed solely at this sector may therefore appear somewhat arbitrary.

However, in working towards the Paris Agreement's goals to keep global warming well below 2 °C, it is now impossible to ignore a sector that generates considerable amounts of GHG emissions when they can easily be mitigated at a comparatively low cost. There are positive signs from a variety of partner countries worldwide that production-related N₂O emissions from the nitric acid sector will be considered in the current updating process of the NDCs, due at the end of 2020. Once included in the NDC, these emissions will need to be covered by some sort of policy to ensure that they are permanently abated.

Regulating N₂O emissions from nitric acid production: an overview

There is a variety of approaches governments can use to ensure mitigation of nitrous oxide emissions from nitric acid production on a national level. These approaches include market-based instruments, such as a carbon tax or an emissions trading system, and command-and-control approaches such as mandatory emission limits.

Taxing N₂O emissions from nitric acid production generally results in increased production costs. When the tax level is sufficiently high, plant operators are incentivised to install N₂O abatement

technology in order to avoid paying the tax. As the mitigation costs per emission unit for nitric acid production are usually quite low, a relatively low tax level should be sufficient to incentivise the installation of abatement technology. However, in some countries carbon taxes include exemptions or free allowances for critical industries such as fertiliser production. In some countries, while the actual tax level would generally be sufficient to incentivise the installation of N₂O abatement technology in nitric acid production plants, its effectiveness is impeded by the availability of free allowances resulting in a situation where it is more economically viable for plant operators to pay the tax rather than reduce emissions.

After carbon taxes a cap-and-trade emissions trading system is the second option available to policy makers to reduce emissions as cost effectively as possible. Such a scheme is in place for example in the European Union, where the current price is around EUR 25 per tonne of CO₂ equivalent. In California and Switzerland, the emissions trading systems cover N₂O emissions from nitric acid production.

To be effective, the price of emission allowances in an ETS must, like the carbon tax, reach a certain level in order to incentivise the installation of abatement technology. It is furthermore essential for an ETS explicitly to cover N₂O emissions, either directly or indirectly, through a national off-setting mechanism enabling a transfer of CO₂ equivalent emission reductions to the ETS. A stand-alone ETS only for the nitric acid production sector does not make sense due to the limited number of participants. Both market-based instruments described above can only be effective if the plant operators are required to monitor and report the emissions appropriately.

Command-and-control policies, such as mandatory emission limits for local pollutants such as NO_x emissions, are in place in many countries, where they have been proven to be efficient regulato-

ry tools. These emissions are nowadays widely regulated as they have a direct negative impact on human health in the areas surrounding the emitting facilities. Yet, as with most GHG emissions, emission limits have not been applied much in the context of N₂O abatement in the nitric acid industry.

As the installation and operation of N₂O abatement technology leads to additional costs without generating any economic benefit, it cannot be assumed that plant operators will install this technology without being provided with the respective incentives either through regulation or economic policies. Furthermore, these measures and activities have a high risk of being discontinued if the incentive is phased out, as was observed when the prices for certificates under the CDM dropped considerably. It is therefore crucial that any regulation or incentive system is designed so as to ensure the mitigation technology remains in operation.

NACAG's global approach contributes to reducing the comparative disadvantages that early adopters face in applying N₂O abatement technology when their competitors have not done so. NACAG's vision that all nitric acid plants worldwide operate effective N₂O abatement technology supports the creation of a global level playing field in which climate-friendly nitric acid production is the new global standard.

Outlook

While discussions about the future of the CDM and the rules of any mechanism under Article 6 of the Paris Agreement are still under way, there is no doubt that emission reduction activities such as those in the nitric acid sector will play an essential role in reaching the Paris Agreement goals. In this context, NACAG can be a facilitator in the transfer of these emission reduction activities into a post-Kyoto world and speed up the



Source: Fredes/UNFCCC 1229/Catalytic N₂O Destruction Project

Towards sectoral transformation: N₂O abatement in Chile

implementation of abatement activities. Mitigating N₂O emissions in this sector is cheap and technically easy, these projects therefore present attractive options and opportunities for countries to fulfil commitments under their NDCs. Countries should carefully consider whether to use this abatement potential for international transfers under any form of future Article 6 mechanism, including the possible transfer of internationally transferred mitigation outcomes (ITMOs). From an economic perspective, the transfer of this ‘low-hanging fruit’ is questionable as it can be used to fulfil national commitments in a cost-effective manner.

While countries are preparing their successive NDCs to the Paris Agreement, for many countries the inclusion of the nitric acid production sector will present an opportunity to raise their climate ambitions. The NACAG initiative offers technical and financial support, linked to a firm partner country commitment, to incentivise the early

realisation of this substantial global mitigation potential.

With 14 member states (as at July 2020) already the NACAG initiative has proven to be of interest to governments and plant operators around the world. Other countries are invited to join the action group to show their support for the initiative’s goal to phase out N₂O emissions from nitric acid production globally. Plant operators interested in climate action are also welcome to contact the NACAG Secretariat. As the NACAG approach has been well received internationally, it would be interesting to see whether this approach can be expanded to other sectors besides nitric acid production.

Further information:

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“Creating a Level Playing Field on a Global Scale”

State Secretary Jochen Flasbarth on NACAG as a global sectoral initiative and its relation to the NDC process in the implementing countries

CMR: Mr. Flasbarth, could you please explain the rationale behind the launch of the Nitric Acid Climate Action Group and its link to the Paris Agreement?

Jochen Flasbarth: The Paris Agreement marks a major paradigm shift in international climate policy. For the first time all member states committed to set their own emissions targets and regularly review them to be more ambitious. With the Nitric Acid Climate Action Group, BMU launched an initiative which follows the spirit of the Paris Agreement providing climate finance and technical support to developing countries for realising the cost-effective mitigation potential of the nitric acid sector. The Action Group therefore contributes to raising ambitions by encouraging the partner countries to include the nitric acid sector in their Nationally Determined Contributions (NDCs) to the Paris Agreement.

A key element of NACAG is that the partner countries need to commit to ensure that the emissions from the sector will be mitigated permanently. NACAG only provides financial support to countries which have made this firm commitment.

CMR: Why does the initiative target the nitric acid sector globally?

Jochen Flasbarth: The intention was to pick a sector where the abatement of emissions is particularly cost-effective, and for which widely proven mitigation technologies are available. The global

mitigation potential in this sector is substantial as nitrous oxide has a global warming potential of 265 relative to CO₂ and, in some countries, emissions from nitric acid production account for a considerable share of total national emissions. Therefore, in working towards the Paris Agreement goals, this sector cannot be ignored. NACAG promotes the early achievement of this potential within national mitigation strategies, the raising of ambitions and the updating of NDCs.

Under the Clean Development Mechanism plant operators from developing countries were given an incentive to mitigate emissions and monetise the resulting emission reductions. However, when the price for these credits dropped, we observed that the mitigation activities in some countries stopped and that many plant operators uninstalled the technology to save on maintenance costs, leading to a rise in emissions. Through NACAG, we aim to revive these abatement activities on a global scale. We would also create an incentive for the plant operators which have not been active under the CDM to begin to address these emissions and to encourage governments to regulate emissions nationally and include them in the NDCs. Hence, the NACAG can serve as an example of how mitigation measures, which previously took place under the CDM, can be transferred into countries' NDCs and therefore be part of a long-term sustainable solution.



Source: © Hilgers/BMU

“Abatement activities on a global scale”: State Secretary Jochen Flasbarth

CMR: What are the innovative aspects and what made this approach unique when it was launched at the COP in Paris?

Jochen Flasbarth: To achieve the goals of the Paris Agreement any new initiative needs to have a strong focus on concrete implementation leading to measurable results. However, capacity building and the transfer of technology and knowledge are also important factors. The NACAG initiative combines all of these to reach its vision and goals.

Providing grant-based finance for companies to purchase mitigation and monitoring technology conditioned on a long-term political commitment was innovative. The initiative also offers a market and results-based financing option with the Nitric

Acid Climate Auction Program. NACAG’s aim is for all nitric acid plants worldwide to operate with effective N₂O abatement technology thus contributing towards transforming this industrial sector globally and creating a level playing field on a global scale.

CMR: From a pure business perspective, plant operators do not have an incentive to abate the N₂O emissions from nitric acid production. How can it be ensured that the emission reductions achieved through NACAG will be permanent?

Jochen Flasbarth: NACAG links direct financial support with the partner countries’ long-term political commitment to greenhouse gas mitigation in this sector. The key criterion for gaining access



Source: Hamhung Hungnam Fertiliser factory, DPRK, by Clay Gilliland (<https://flic.kr/p/qwRSJA>) / Flickr/CC BY-SA 2.0 (<https://creativecommons.org/licenses/by-sa/2.0/>)

Tapping the potential: The global mitigation potential of the nitric acid sector is substantial

to NACAG's financial support is that countries where the supported nitric acid plants are located must confirm that they will implement suitable measures to ensure that the emission reduction activities continue after the initiative's support has ended. This can for example be achieved through market-based approaches, such as an emissions trading scheme operating in the European Union but also through direct regulation via emission limits. We see different approaches being evaluated and implemented in a variety

of countries. We support partner governments in the design of instruments to measure N₂O emissions and regulate their abatement as well as on ways of including the nitric acid sector in the countries' NDCs.

CMR: How do the governments and the industry react to NACAG's offer?

Jochen Flasbarth: Since NACAG was launched in 2015 there have been discussions with around 30 countries, namely those which produce nitric acid

and are eligible to receive official development assistance. So far, thirteen countries have joined the action group by signing a Declaration of Support.

Throughout the work on NACAG we have received positive signals from both the industry and governments in many countries. The governments understand and embrace the opportunity to use NACAG's offer to raise their ambitions under the current NDC revision process and nitric acid producers often welcome the offer of technical and financial support. Several plant operators have proactively contacted NACAG to engage in emission reduction activities. We are also regularly invited to speak about NACAG at major industry events. These are signs that industrial companies are increasingly aware of their responsibility and the importance of addressing climate change.

CMR: Could you tell us a bit more about how NACAG operates and what has been achieved so far?

Jochen Flasbarth: In my opinion, a key success factor is the continuous dialogue between all relevant stakeholders, especially partner governments and plant operators. In addition to making financial resources available, NACAG advises its partners on a technical level. It is our goal to support the partner countries throughout the entire process of sustainably transforming the nitric acid sector.

We have conducted more than 30 workshops, performed numerous technical feasibility studies at plant level and advised partner countries on adequate policy instruments through country-specific studies. In some countries, for example Tunisia and Zimbabwe, we are in the final stages of a grant agreement for the implementation of N₂O abatement activity, and other countries such as Mexico and Georgia have made good progress towards the same goal.

CMR: NACAG started as a pilot initiative in the nitric acid sector. Would you say that the NACAG approach could be replicated in other sectors? If so, which sectors could these be?

Jochen Flasbarth: I would like to highlight that the nitric acid sector was selected as several characteristics make it particularly favourable for a global action group approach such as NACAG. The main aspects being that proven mitigation technology is readily available and easy to install resulting in a high yield of emission reductions per individual measure at comparatively low mitigation costs per tonne of CO₂ equivalent. Another important aspect is the limited number of stakeholders involved, which makes it possible to provide individual technical advice and financial support.

The NACAG approach combines financial and technological support with a long-term commitment from the participating countries. While it may be difficult to find a set-up as distinct as the nitric acid sector in any other industry, the NACAG approach, or a very similar approach, can generally be applied to sectors that also meet or come close to meet these characteristics. One example could possibly be seen in caprolactam production facilities which, like nitric acid plants, generate N₂O as a by-product and where the same abatement technologies could be applied. A similar approach could also be used in large municipal landfills that have poor or non-existent waste management systems and produce high levels of methane.

System Change

Transformative design of Article 6 programmes for net zero emissions by 2050

By Mathilde Kolenda and Karen Holm Olsen, UNEP DTU Partnership, Owen Hewlett, Gold Standard Foundation and Sven Braden, Independent Consultant

Sustainable development (SD) enables the fundamental societal and systems transformations required to limit global warming to 1.5°C above preindustrial levels (IPCC, 2018). Importantly, more synergies than trade-offs can be harnessed between mitigation options consistent with 1.5 degree pathways and sustainable development impacts. Despite the global goals for climate and sustainable development agreed in 2015 in the Paris Agreement and the 2030 Agenda (SDGs), five years have passed and the emissions gap is wider than ever (UNEP, 2019). Enhanced NDC ambition to reach net zero emissions by 2050 is still severely lacking (Hermwille and Obergassel, 2018), as only 15 countries have, for now, submitted their updated NDCs (UNFCCC, 2020). At such a critical time, cooperative mechanisms envisaged in Article 6 of the Paris Agreement to allow for NDC ambition raising represent an opportunity to make use of transformative, science-based pathways to achieve the global goals and ensure environmental integrity in carbon trading.

To understand the concept of transformational change and operationalize how to assess the transformational impact of policies and actions, the Initiative for Climate Action Transparency (ICAT) has developed the ICAT Transformational Change Methodology as part of a series of assessment guides for tracking progress in NDC implementation. The ICAT definition of transformational change is as follows:

“A fundamental, sustained change of a system that disrupts established high-carbon practices and contributes to a zero-carbon society, in line with the Paris Agreement goal to limit global warming to 1.5–2°C and the United Nations SDGs.” (ICAT, 2020b)

An example of how the transformational change concept and methodology is used by countries can be seen in the case of Costa Rica. The government of Costa Rica has adopted a national Decarbonisation Plan to achieve net zero carbon



Figure 1: Co-benefits for SD as a result of mitigation actions implemented: Potential for achieving transformational change. Derived from (Mora, 2020)

1 Net zero carbon implies that some remaining CO₂ emissions can be compensated for by the same amount of CO₂ uptake, provided that the net emissions to the atmosphere are zero.

The Sustainable Development Initiative (SDI)

The Sustainable Development Initiative (SDI) aims at promoting strong provisions on sustainable development for the rulebook of Article 6. The initiative is a collaboration of UNEP DTU Partnership and the Gold Standard Foundation supported by Belgium, Finland, Germany, Norway and Sweden. Views stated in the adjacent article those of the authors of this text and do not represent any consensus among the Parties involved.



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<https://unepdtu.org/project/sustainable-development-dialogue-on-the-implementation-of-article-6-of-the-paris-agreement-under-the-unfccc-process/>

emissions by 2050 (Government of Costa Rica, 2018). With the support of UNEP DTU Partnership as an ICAT implementing partner, Costa Rica is in the process of developing its enhanced transparency system to track progress in NDC implementation. Ten focus areas have been identified to achieve decarbonisation, for which respective transformational visions have been set out.

For example, by 2050, electric power from renewables such as solar and wind will be a primary source of energy for transport, residential, commercial and industrial services. The ICAT Transformational Change Methodology together with the ICAT Sustainable Development Methodology (ICAT, 2020a) will be adapted and integrated into SINAMECC, an open access digital metric system, to track progress in NDC implementation as shown in Figure 1.

In other words, if the implementation of climate mitigation actions leads to co-benefits for SD, with both outcomes sustained over time, this could trigger the transformational change potential of mitigation actions (policies, plans or projects) that is needed. This simple framing could also apply to the Article 6 context and

would strongly support the integration of sustainable development in carbon-market activities to trigger transformational change.

With the two historical international agreements in place, we (theoretically) have at our disposal the necessary collective action framework to embark on a sustainable path (IPCC, 2018). Such ambitious global goals for climate and sustainable development cannot happen without radical transformations at every scale of society, across all sectors of the economy and in all political and social spheres – all supported by technological and cultural innovations and changes in lifestyles (TWI2050, 2018).

Promoting sustainable development in Article 6 mechanisms and beyond

Article 6 of the Paris Agreement, with the overarching goal to incentivise voluntary cooperation between Parties to raise the ambition of their climate action over longer time scales, also explicitly calls for contributions to sustainable development as a central objective (Article 6.1). However, lessons learned from the Clean Development Mechanism (CDM) under the Kyoto Protocol show that adequately promoting and assessing

sustainable development impacts of climate actions was a challenge, particularly due to a lack of international guidance on and support for the use of voluntary SD tools and approaches (Olsen, Arens and Mersmann, 2018).



Source: Assembly: Canada Installs Solar Panels by DOE Solar Decathlon (<https://flic.kr/p/aom34B>)/Flickr/CC BY-NC ND (<https://creativecommons.org/licenses/by-nd/2.0/>)

Transformative design: Article 6 activities should make use of transformative, science-based pathways to achieve the global goals

To avoid a ‘race to the bottom’ for sustainable development as happened in the early days of the CDM (Sutter and Parreño, 2007), guidance on how to clearly and transparently assess and report on sustainable development is critical (Braden, Olsen and Verles, 2019). To bridge this gap, Gold Standard, founded in 2003, has pioneered robust SD principles and approaches, applied in both the voluntary and compliance markets. As of 2020, Gold Standard has committed to the release of ‘next generation’ SDG-oriented impact reporting tools that will standardise reporting of co-benefits.

Currently, fully integrating SD provisions in an Article 6 context remains a crunch issue. A recent analysis on ‘Views on Sustainable Development provisions in the Art. 6 rulebook draft from COP25 in Madrid’ shows that, since 2018, SD provisions in the current draft negotiation text for Article 6.2 appear weaker than laid out by the initial mandate of the Paris Agreement (Braden and Olsen, 2020). So far, sustainable development for Article 6 remains at the periphery of negotiations (Michaelowa et al., 2019). Nevertheless, as partners of the Sustainable Development Initiative (SDI), we argue that treating sustainable development as an equally important an outcome as GHG mitigation will support the transformative design of Article 6 activities. Article 6 mechanisms can indeed serve as a ‘leg-up’ to a transformational, well below 2 degree pathway (Hermwille and Obergassel, 2018).

The SDI earlier identified six issues relevant to promoting sustainable development based on Party submissions to the negotiations on the Article 6 ‘rulebook’, namely governance, safeguards, stakeholder inclusivity, SD indicators, SD assessment and transparency (the six Policy Briefs are available on the initiative’s website, see box). With regard to SD assessment, the SDI carried out a study to evaluate which tools and approaches would best fit the Article 6 SD provisions, including amongst others the ICAT Sustainable Development Methodology and the Gold Standard for the Global Goals (GS4GG). The alignment of both these approaches with the SDG framework may enable market players to comply with host Party and buyer requirements to promote sustainable development through Article 6. To promote synergies with national implementation of the 2030 Agenda, avoid fragmentation and high transaction costs for SD assessment, the SDI recommends the use of internationally agreed approaches based on the globally agreed indicator framework for the SDGs (Braden, Olsen and Verles, 2019).

As an example, the Gold Standard published in August 2020 a policy brief for future carbon markets, highlighting that a specific project may have access to a number of newly fragmented market opportunities (Gold Standard, 2020). Gold Standard VERs themselves could be adopted for use in Article 6 (either issued as 6.2 or labelling of 6.4) or for use in compliance schemes such as CORSIA. In all potential use cases, consistency of approaches and maximised flexibility is essential. Hence, if consistency can be created, the approaches to sustainable development and transformational change outlined in this paper have application beyond the Article 6 use cases envisaged in the Paris Agreement. Put differently, whether a project and its issuance is for Article 6, CORSIA, voluntary markets or domestic markets, the same principles can apply and in applying them we can maximise the opportunities for good mitigation actions to obtain appropriate funding and be used in the correct way.

Uptake of transformational change by carbon market funds and investors

The concept of transformational change has already been taken on by several international climate funds, such as the Green Climate Fund,

but also by several carbon market mechanisms and investors. Early movers in the piloting of 6.2 activities for cooperative approaches, such as Foundation for Climate Protection and Carbon Offset (KliK) and the Transformative Carbon Asset Facility (TCAF), have also embraced the concept. Yet, the way these institutions understand and operationalise transformational change differs.

For example, TCAF promotes the concept of transformational change from an economic theory perspective through clearly defined criteria for transformative operations, such as:

1. Size of the project,
2. Sustainability, through the different angles of technology (Paris alignment, no fossil fuel lock-in), policy (policy change), finance (reliable exit strategy), potential for replicability within the country on its own,
3. Leverage to increase domestic ambition, and
4. Carbon pricing, including implicit pricing (TCAF, 2018).

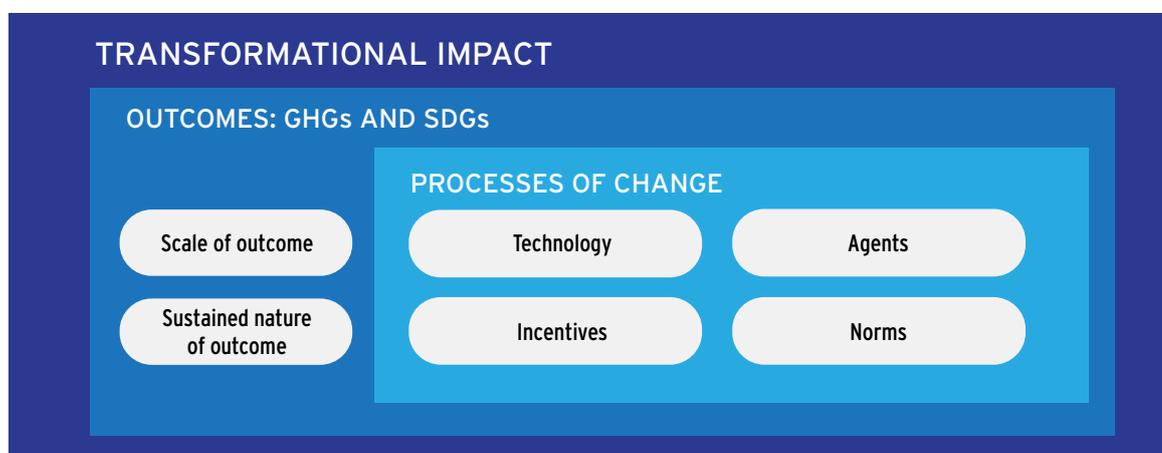


Figure 2: Layers of transformational impact assessment (ICAT, 2020b)

Despite its clear conceptualisation framework, TCAF has so far not been able to implement an active pipeline of Article 6 pilots.

The concept of transformation is not always central to the mandates of the institutions. In fact, KliK's primary mandate is to achieve mitigation while facilitating Article 6 activities for Switzerland. Its field of action is well delimited by the CO₂ Act of Switzerland and therefore the selection of the programme activities cannot primarily depend on the potential to trigger transformative change. Subsequently, within KliK, projects are neither selected nor benchmarked. Instead, windows of opportunity are identified to drive transformation, and transformation principles are to be included in the design of the activity. In terms of Article 6 piloting, KliK is, as of today, one of the most advanced institutions (cp. the interview "Long-term engagement" is key elsewhere in this issue)².

When it comes to defining what is considered transformational or what is sustainable development, carbon mechanisms and investors are cautious about their being normative, often positioning them as 'buyer preference' despite the demonstrable benefits of incorporating them. This runs along the lines of not infringing national prerogatives. For example, TCAF defines sustainable development separately from transformational change and it is always in the hands of the host countries to define SD objectives in their national context, often in agreement with buyers interested in safeguarding and promoting SD goals. In that regard, host governments have a key role to set SD objectives and put their achievement high

on the political agenda. The SDI fully acknowledges the national prerogative also respected in the context of the 2030 Agenda and, rather than seeing a conflict with Article 6 voluntary guidance and support to promote sustainable development, we see opportunities to promote synergies and interlinkages and avoid duplication of effort.

Towards an operational definition of transformational impact for Article 6

Arguably, assessing transformational impact could be a way to overcome some of the crunch, unresolved issues such as 'additionality', although further research is urgently needed (Hermwille and Obergassel, 2018). The ICAT Transformational Change Methodology presents a framework for operationalising the assessment of transformational impact, as depicted in Figure 2, which can be applied in an Article 6 context. In particular, outcomes of change are characterised based on their scale and sustained nature, both for GHG emissions and for SDGs. Overall, the ICAT suggested framework is well suited for application in an Article 6 context.³

Promoting transformational impacts for Article 6 approaches

Innovative ideas and options for the promotion of transformation characteristics in the design of Article 6 approaches can be suggested at the global level for the development and use of rules, modalities and procedures (Art. 6.4), guidance (Art. 6.2) and a work programme for non-market approaches (Art. 6.8) as shown in Table 1.

² The interview with the KliK foundation is part of a project funded by the German Environment Agency (UBA), entitled "Transformation & Article 6: Strengthening the transformative effect of market approaches under the Paris Convention", implemented by a consortium led by UNEP DTU Partnership. The first report is to be published in late 2020/early 2021.

³ Applying the ICAT transformational change framework in an Article 6 context comes within the scope of the project funded by the German Environment Agency (UBA), entitled "Transformation & Article 6: Strengthening the transformative effect of market approaches under the Paris Convention". The results will be presented in the first report, due to be published in late 2020/early 2021.

Table 1: Overview of ideas and options to promote transformative impacts of Article 6 activities at the global level

Outcomes characteristics	Global level
GHG mitigation outcomes at scale, sustained over time, aligned with the PA temperature goal of well below 2°C	<p>Article 6.2 Government driven, bilateral results-based finance mechanism for policy-based crediting aligned with NDC priorities</p> <p>Article 6.4 Bottom-up, market-driven price-discovery mechanism for projects and programmes to scale-up known technologies</p> <p>Article 6 activities additional to both NDC and economic business as usual, with crediting periods shorter than operational life and financially self-sustaining thereafter</p>
SDGs outcomes at scale, sustained over time, aligned with the 2030 Agenda global goals and the Paris Agreement	<p>Guidance and tools to support developers in assessing, monitoring and reporting SD impacts of Article 6 activities to meet host government SD priorities (based on SDI recommendations)</p> <p>Text provisions in the Article 6 ‘rulebook’ to ensure safeguards against negative impacts, including stakeholder consultation.</p>

Outlook

After three rounds of negotiations for Article 6, the COP26 in Glasgow likely represents the last chance to finalise the Article 6 rulebook, articulating strong and compelling SD provisions in the official texts, which so far remain on the periphery of the negotiations. Hence, there is a risk of there being no clear mandate on how to promote sustainable development under Article 6, which could lead to ‘a race to the bottom for SD’, known from the CDM. However, and as the COP26 has been postponed to 2021, a whole year still lies ahead of us. This situation could cut both ways, but on the bright side, this could mean more time for promoting the importance of SD provisions in the Article 6 rulebook. Further, this window of opportunity may incentivise the transformative design of Article 6 activities and promote SD provisions in the texts.

If nothing is agreed in the next round of negotiations, cooperative approaches as framed in Article 6.2 are likely to move forward outside the official process and at an increased rate, as piloting has already started and priority is on achieving ambitious mitigation. Contrary to 6.2, the mech-

anism in 6.4 may be stuck and not agreed upon until a later date, compromising international governance and high standards for Article 6. This would increase the risk of not being able to use this tool to promote long-term ambition raising in NDCs, as initially planned in the Paris Agreement mandate.

In the meantime, the SDI continues its collaboration with early movers in the Article 6 community of practice, including private companies and national governments, to include SD assessment in Article 6.2 pilots. Hopefully, it will generate further knowledge prior to COP26 on how nationally determined SD priorities can be promoted and implemented as an effective means to trigger transformative action and NDC ambition raising.

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“Long-term Engagement is Key”

Piloting Article 6 activities in a challenging environment

While the rulebook for Article 6 activities is still in the making, several institutions have embarked on pilot activities in order to gain early experience and to test new concepts. Compared to the situation under the Kyoto Protocol, the Paris Agreement (PA) requires not only new answers to technical questions like baseline setting, additionality determination, and accounting of the transferred mitigation outcomes. It also puts cooperative implementation into a new context, given the all-encompassing nature of the PA with mitigation targets for all Parties and the need to factor in the dynamic nature of the host country climate policies. Many hope that the feedback from the real-world test runs of the pilot programmes can in turn inform UNFCCC negotiations on operationalizing Article 6.

Against this background, Carbon Mechanisms Review interviewed three representatives of different pilot initiatives about their experiences so far and the challenges ahead: Malin Ahlberg is Deputy Head of the Division “European Climate and Energy Policy, European Climate Initiative, Carbon Markets” at the German Environment Ministry (BMU); Mischa Classen, Director Carbon Procurement with the KliK Foundation, Switzerland; and Nils Westling, Programme Manager, International Climate Cooperation, at the Swedish Energy Agency. The questions were asked by Christof Arens.

CMR: Mischa, Switzerland issued a call for pilot activities as early as 2016 – what are your experiences with activity implementation?

Mischa Classen: The Swiss Climate Cent Foundation (CFF) earmarked 20 million Swiss Francs for the purpose of developing and supporting suited pilot activities with a view to acquiring internationally transferred mitigation outcomes. This is a unique starting position, as the CCF can offer a relevant amount of funding. The pilot activities are developed with the support of the CCF by private entities that are well connected in the respective countries. The support of the development is essential, as the current imponderability regarding the generation of a carbon commodity under Article 6 effectively prevents private sector actors from taking stakes.

The challenge for private entities, however, is to connect competent government bodies to the process to receive guidance. For that government level, therefore, the respective Swiss office is liaising with the authorities. This way the activities are concretized stepwise in close coordination between developer, the governments and the KliK Foundation.

All the activities develop differently. While in Peru the pilot programme Tuki Wasi initiated the operation in 2019 with a “test drive”, the other activities depend to a greater degree on overarching questions about the domestic climate change policy and are consequently less advanced.



Malin Ahlberg is Deputy Head of the Division "European Climate and Energy Policy, European Climate Initiative, Carbon Markets" at the German Environment Ministry (BMU) and director of the German Foundation "Future of the Carbon Market"

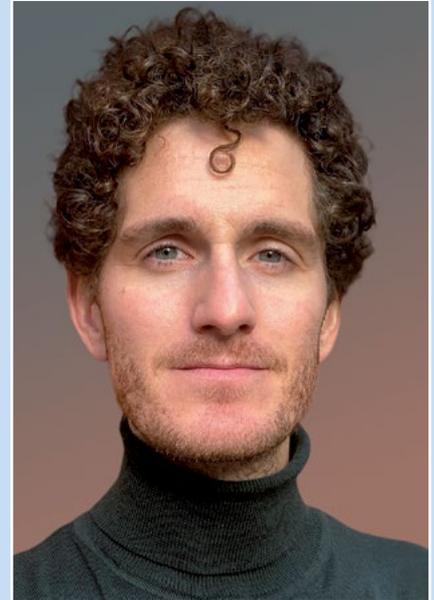
Further information:

www.carbon-mechanisms.de/en/NACAG
www.carbon-mechanisms.de/en/Africa



Misha Classen is Director Carbon Procurement with the Swiss KliK Foundation

Details on the latest Peru/Swiss Agreement on ITMO Transfer can be found at https://www.international.klik.ch/news/publications?publication_id=145



Nils Westling is Programme Manager, International Climate Cooperation, at the Swedish Energy Agency (SEA)

The press release on the activity proposals mentioned in the interview can be found here: <https://gggi.org/gggi-and-sea-to-develop-four-mitigation-activities-generating-itmos-in-energy-waste-and-manufacturing/>

The KliK foundation follows the same process in the seven activities cleared so far for development support. With the conclusion of the first bilateral agreements and the authorization of activities under them, we expect to see more momentum.

CMR: Nils, Sweden was quite an early mover in the pilots market as well with your virtual pilots programme. What are your most important take-aways from these pilots?

Nils Westling: One of several important learnings for us was that Article 6 requires a lot from host countries, thus cooperation should be characterized by long-term engagement with the host country rather than just a transaction of ITMOs. This thinking lies behind our cooperation programme with the GGGI.

Other important learnings include the need for conservative baselines and for financial attribution analysis, due to the often large-scale and combined efforts that we foresee under Article 6. In connection with this, we believe it is very important for host countries to have clear road maps for NDC implementation – to ensure mutual benefits and to avoid over-selling.

CMR: Together with GGGI, Sweden launched the Mobilizing Article 6 Trading Structures programme last year. What is the idea behind the initiative and what activities will be carried out?

Nils Westling: As previously mentioned, it has become increasingly clear to us that cooperative approaches under Article 6 must be characterized by long-term and trust-based engagement with



Source: Beneficiary Happy about Earthquake-Resistant Structures by USAID/Koutnik (<https://flic.kr/p/owAqhm>)/Flickr/CC BY-NC-ND 2.0 (<https://creativecommons.org/licenses/by-nc-nd/2.0/>)

Reaping the benefits: The Peruvian pilot supported by Switzerland aims to scale up the market for improved cook stoves

the host country. They will most likely need to build up internal governance infrastructure and capacity to be able to make the right decisions to deliver on its NDC, avoid over-selling, handle reporting requirements, etc. We want to contribute to this and in GGGI we found a partner well positioned to help us out. We are just about to start the development of four activity proposals, two that will target the energy sector in Ethiopia, one focused on the waste sector in Nepal, and one on the manufacturing sector in Cambodia. We look forward to communicating the specifics in due time.

Malin, Germany does not have a purchase programme for Article 6. Nevertheless, Germany is preparing for Article 6 pilots in Sub-Saharan Africa. What are your most important take-aways from those pilots?

Malin Ahlberg: Right, Germany has not decided on a purchase programme. It is our understanding that the UNFCCC rule book is the key for any deliberation on the use of carbon markets including voluntary compensation. Since the start of the CP2 we invested in the development of the programmatic approach (PoAs), which still could build the bridge to new market mechanisms. There have been investments in a few PoAs. And now with regard to the Paris Agreement we proceed similarly. We identified several opportunities for pilots, addressing renewable energy, cooling and energy

efficiency, resulting in three concrete project concepts.

“Involving all stakeholders in the implementing country is crucial”

Malin Ahlberg

As a first step, we financed the technical elaboration of the activity and considered the economic challenges by developing the financing schemes. Of course, we also considered the host countries' NDCs and the potential generation of ITMOs. One of these projects could have the character of a programme based on cross-country cooperation. We must say, it is a challenge to elaborate such cooperation activities, as they are based on vague rules anticipating a UNFCCC decision. We still expect that this activity will be implemented with climate finance money. The second project is still under development, but the third project might run in the beginning of the first NDC period and could be replicated in several countries.

One of several important learnings for us was that the involvement of all stakeholders in the implementing country is crucial for success and that Article 6 requires expertise on both sides of the table. Furthermore, we also learned on a very practical level that market activities can be designed to provide incentives for implementing countries to enhance their national climate policy.

CMR: Germany has launched the NACAG, the Nitric Acid Climate Action Group, which we also portray in this issue. I understand that this is a well-financed programme. Could it be seen as an early A6-piloting activity?

Malin Ahlberg: The NACAG could be characterized as a hybrid concept. Fertilizers have been addressed by CDM projects ahead of EU wide regulations in this sector. However, under the

Paris Agreement, we want “low hanging fruit” activities to be covered by the unconditional part of the host country's NDC. Therefore, we have used the CDM as a proper framework, including the methodology, but will cancel all generated CERs. This is one side of the coin, but the other is that we expect that the host country will take this emission reduction potential under its NDC and account the entire reduction towards their NDC. The overall aim is that the incentive set by the programme convinces host countries to find regulations in their capacity.

Therefore, NACAG is an example for climate finance using market frameworks to raise domestic ambition that is visible in an enhanced NDC. This way of enhancing NDCs should be possible for any sector with Article 6.4 in the future and Article 6.2 from 2021 onwards. What has to be discussed is the use of the mitigation outcome. With NACAG, the international transfer of the mitigation outcome would lack environmental integrity because it would challenge the host country's ability to achieve and/or enhance its NDC. In other sectors, the use of a cooperative approach would be appropriate because this will be the only way to accelerate mitigation policies in third countries. In these cases, the classical functioning of carbon market eligible assets will work for setting incentives for buyers and sellers.

Mischa, how do you balance Article 6.2 versus Article 6.4 in your programme? And what are your views regarding the actual transfers of emission reductions?

Mischa Classen: In the absence of the mechanism according to Article 6.4, Switzerland is prioritizing collaborative approaches under Article 6.2. If at some point units will be issued under Article 6.4, the KliK foundation would consider sourcing those as well. However, it remains unclear by when the A6.4 mechanism will be operational. Article 6.2 will be the forerunner with first units expected to be issued in 2022.



Source: *Installing the solar panels by BudapestBamako* (<https://flic.kr/p/rpAWgI>)/Flickr/CC BY-SA 2.0 (<https://creativecommons.org/licenses/by-sa/2.0/>)

Building domestic capacity: Installing solar panels in Bamako, Mali

As per the architecture of the bilateral agreements established by Switzerland, there will be no transfer of ITMO units from any country into Switzerland. Rather, upon request to transfer, the seller surrenders the respective domestic units to the transferring country registry administrator for cancellation. Simultaneously, the cancelled units are re-issued as “international attestations” in the Swiss registry into the account of the acquiring entity. There will be no joint body under the agreement, but instead parallel sovereign decisions under respective domestic law to authorize an activity and to accept a transfer of mitigation outcomes to Switzerland.

Consequently, the CDM could retain under Article 6.2 part of its role as a provider of certified emission reductions that would have to be translated into ITMOs by means of surrendering. The CERs

as such – as well as the units of other standards – will be of no use for ITMO buyers.

CMR: Germany announced at one of the recent ERCST meetings on Article 6 negotiations that a new capacity building programme to be launched under the BMU’s International Climate Initiative is close to its start. The host countries’ NDCs will be taken into focus. Malin, how do you think this capacity building programme will affect the evolvement of a new carbon market?

Malin Ahlberg: The Paris Agreement calls for a completely different framework for carbon markets. Article 6 mechanisms are defined as an ambition raising undertaking, which is calculated and determined based on the NDC and the underlying strategies and policies. Therefore, Article 6 activities must be defined as supplemental to those NDCs. For us, the formulation in the Paris

Agreement is crystal clear. We read Article 6.1, Article 6.3 and Article 6.5 in a unique context. Our new activity will allow a few countries to develop a clear strategy including the use of quantified and quantifiable parameters to determine the potential for cooperative approaches and the A6.4 mechanism.

This will bring host countries into an active role in building the supply strategy for carbon markets. Such a strategy will transform the carbon market from project-based thinking to sectoral and sub-sectoral approaches. If host countries adopt this kind of top-down strategy it will open emission reduction potential for the private sector and for international facilities because preparing the ground for the host country's carbon market would overburden the capacity of buyers. Providing such a domestic framing for the international carbon market access would, as a side effect, lower the transaction cost. The programme will start at the beginning of 2021. We understand this activity as a contribution to domestic capacity building and global knowledge sharing. The project will be based on the capacity built in the identification of Article 6 pilots, so a dry run is not our intention.

CMR: What in your view is the most important hurdle that piloting activities are facing currently and how might it be overcome?

Nils Westling: In the current situation, without a rulebook for Article 6, and with COP26 being delayed, there is of course a magnitude of uncertainties and unanswered questions. The one thing that would reduce hurdles is certainly an agreement at COP26 that safeguards conservativeness, high ambition and adherence to the San José principles.

To be more concrete, the major hurdles that we have focused on lately relate to NDC alignment in relation to baselines and additionality, payment-on-delivery transaction structures in relation to reporting cycles and the general risk of

overselling. We are currently evaluating various strategies to handle these issues.

“Governments need to take ownership in ITMO activities”

Mischa Classen

Mischa Classen: In our view, the most important hurdle pertains to the still poor political decision-making capacity that falls short of what is needed to make mitigation programmes happen. Unlike under the CDM, the development of activities under the Paris Agreement requires decisions from government bodies about various elements, such as the baseline, the scope of the activity – to avoid overselling – and authorization. Without politically sound decisions, the development of activities runs in circles. A government is required to take a certain degree of ownership in ITMO activities.

Countries should be encouraged to establish bodies that are vested with a political mandate to govern questions related to climate change regulations, adopt respective laws and authorize mitigation activities under Article 6. Such cross-ministerial bodies are also essential in developing a low emission strategy and respective policies and measures under the “NDC package” that are carried by the whole administration and all political parties. If a country has clarity about its NDC package, it will be easy to design and authorize ITMO activities that complement the package, thereby effectively limiting the risk of overselling.

CMR: Thank you all for your time and the inspiring discussion.

New: Enhanced Carbon Market Information Hub

www.carbon-mechanisms.de is the BMU's information hub on global carbon markets.

The revamped website features a number of new functionalities:

- Enhanced publication database with advanced search function
- Detailed presentation of BMU-funded carbon market support activities both in list view and map view
- Up-to-date news sections covering international and national / regional carbon market developments
- A newly-added events section announcing the essential Article 6-related events
- Updated introductory section providing up-to-date background information on market-based instruments

Explore all the new features at

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The screenshot displays the website's layout. At the top left is the logo of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. To the right, the site title 'Carbon Mechanisms' is followed by the subtitle 'Market-based climate policy instruments'. A teal navigation bar contains five items: 'Introduction', 'BMU Activities', 'Publications', 'Events', and a search icon labeled 'Search'. The main content area is dominated by a large blue-tinted image of an industrial facility. Overlaid on this image is the text 'CLIMATE CHANGE MITIGATION AND OFFSETTING' and 'Study examines climate change mitigation targets of European Companies', with a 'More' button below. Below the banner is a row of five small circles, with the third one filled. A blue button labeled 'All news' is positioned below the banner. The 'Latest Publications' section features four publication covers: 1. 'JIKO POLICY PAPER' with the title 'Caught in between: Credibility and Feasibility of the Voluntary Carbon Market post-2020'. 2. 'Libérer le marché du carbone en Afrique' with a globe image. 3. 'CARBON MECHANISMS REVIEW' with the title 'The Transition Controversy: How much CDM should be in the 2015 Agreement world?'. 4. 'JIKO WEBINAR DOCU' with the title 'Reflecting the Dynamics: Baseline setting under a future 1.5°C scenario'. A blue button labeled 'All publications' is located at the bottom of the page.

CARBON MECHANISMS REVIEW



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Nature-Based solutions in China

AHK Greater China held a networking meeting in Beijing to discuss recent developments, challenges and opportunities in the field of Nature-Based Solutions (NBS) in China. The documentation of the event is now available at:

www.carbon-mechanisms.de/en/NBS

Glossary

All Carbon Market terms and abbreviations are explained in detail in our online glossary. View it here:

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