CARBON MECHANISMS REVIEW

VOL. 11 | NO. 4 WINTER 2023

Will Dubai Deliver?

Reports and analyses ahead of the crucial UN summit in the United Arab Emirates

Innovative Policymaking

Zambia's approach to building a carbon market framework

content

Winter


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editorial

Dear Reader!

It's COP time again. While the UN summit takes place against the background of rising geopolitical tensions and increasing protectionism, negotiators are eager to deliver on the Global Stocktake, the loss and damage fund, phasing out fossil fuels, tripling renewables, and a global goal on adaption. Geopolitical crises will feature prominently in the heads of state gatherings right at the beginning of the conference – what the consequences this will have on the COP remains to be seen.

For this Carbon Mechanisms Review, we invited a number of seasoned Carbon Market experts to share their expectations towards COP 28 and the carbon markets in general – more on this in our cover feature. We also report on an innovative policymaking approach in Zambia to setting up the country's carbon market framework.

We then present the current status of the Swiss KliK foundation's work and their programmatic focus and depict a recent initiative targeting SF6 mitigation in the electricity sector, including the use of Article 6. Last not least, the concept behind the World Bank's Climate Action Data Trust is outlined.

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

Enjoy the read!

Christof Arens, Editor-in-Chief

Wuppertal Institut

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

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Great Expectations

Five carbon market experts lay out their expectations for COP28 and the prospects for international carbon markets in general

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"Converging high integrity compliance and voluntary markets"

by Fenella Aouane, Head of Carbon Pricing, Global Green Growth Institute

The Paris Agreement opens the door to a more effective and robust international carbon market. Article 6 is gradually coming to fruition and is expected to shift carbon markets from a pure cost-effectiveness tool to one that fills the 'action gap' of NDC goals and targets the higher hanging fruit, above and beyond national actions. The flexibility offered by Article 6 also allows innovation into scaled up approaches to induce the transformational change needed to reach the global goals. It is hoped that COP28 will see the last outstanding matters of Article 6.2 agreed up as well as the introduction of the Article 6.4 mechanism.

Particularly, the issue of authorization revocation under Article 6, it is hoped the Parties negotiating are made fully aware of the repercussions, in a traded market, of the various options available to them on revocation. For the Article 6.4 mechanism, further details on the design of the international registry would allow many countries to move forward with their overall governance frameworks for Article 6. Stronger guidance around methodologies, baseline setting and additionality testing for example, will help a much wider audience, such as those looking at Article 6.2 trades.

If done right, Article 6 can and should become the convergence point for high integrity compliance and voluntary markets, helping developing countries tap into urgently needed public and private finance for their green growth pathways. If we get agreements and clear guidance from COP28 I think we can head into 2024 with clear confidence that the carbon markets will grow, substantially. It won't suddenly explode – there is still so much work that needs to be done on the ground to support host countries prepare for participating in such markets. Every incremental step we make such as publishing a policy, a framework, strategies, fee structures or initial trades helps building knowledge and confidence. I think by the end of 2024 we'll have a good body of early activities, and the funding in place to share this knowledge widely. The combination of which will see the accelerated market activity.

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"Counting ITMOs matters"

by Lambert Schneider, Research Coordinator for International Climate Policy, Oeko-Institut

The detailed rules on tracking and accounting for international carbon markets cooperation will be a focus of Article 6 negotiations at COP28. The discussions at two technical workshops and the intersessional negotiations in June 2023 in Bonn showed that countries still have different interpretations of what the rules adopted in Glasgow mean and what further decisions are necessary to have a robust accounting system in place. How these issues will be resolved will have major implications on the functioning and robustness of international carbon markets.

Article 6 authorizations seem to be the most contentious issue. This relates to *what* should be authorized – the cooperative approach, internationally transferred mitigation outcomes (ITMOs) and/or entities –, what information should be provided in authorizations, and whether and when any changes or revocations to authorizations can be made. If authorizations do not contain the necessary information, such as for what purposes ITMOs may be used, registries would not be able to ensure that ITMOs are used for authorized purposes. If host countries could any time revoke or change their authorizations, this would create major uncer-

tainty for the market and might lead to double counting: at the time of revocation, buyers may already have used the ITMOs, while sellers may no longer consider these ITMOs to exist. To ensure a robust accounting system, it will be important to provide sufficiently detailed information on all type of authorizations and to ensure that any changes or revocations to authorizations only affect ITMOs that have not yet been transferred.

There are also different understandings of what an ITMO registry is: whether it tracks units or only sums up accounting information. A reasonable way forward could be that both models could be implemented, depending on the Party's preference. This would mean that the international registry – which can be used by countries instead of building up their own registry – should also accommodate both models and allow for the transaction of units with national registries and the Article 6.4 mechanism registry.

Lastly, many accounting details will be clarified through the agreed electronic format (AEF) through which countries will report information on ITMOs. Complete, timely and consistent reporting will be essential to identify any inconsistencies in the claims made by countries on ITMOs. Here, basic questions still need to be resolved, including what transaction types should be reported and what exact transactions are a "first transfer" and thus constitute an obligation for the host country to apply a corresponding adjustment. The various flexibilities provided in the decisions in Glasgow make it complex to define a consistent reporting framework for all Parties. This will however be crucial to effectively avoid double counting.

"Ensuring international carbon markets do truly mobilize mitigation ambition"

© Perspectives

by Axel Michaelowa, Senior Founding Partner, Perspectives

International carbon markets will be measured against their ability to spur ambition of national mitigation targets. This they will only achieve if they do not generate spurious credits. Unfortunately, in 2023 we saw the meltdown of the voluntary carbon market when demand for REDD+ credits evaporated as media exposed unscrupulous actors and overcrediting by the largest private voluntary programme. This reminded me of the collapse of the CDM market just a decade earlier. It took the better part of that decade to painstakingly rebuild trust in international carbon markets.

We cannot afford losing another decade. We urgently need carbon markets to catalyze large-scale private investments into coal power plant replacement by renewable electricity generation in the Just Energy Transition Partnerships in key emerging economies.

Will Article 6 of the Paris Agreement suffer from a similar fate as the CDM and the VCM? Not if governments are willing to operationalize the stringent principles enshrined in the Glasgow Rulebook for Article 6.4 in a credible manner. Unfortunately, we are seeing fights that were thought to be long over reemerge in the meetings of the Article 6.4 Supervisory Body. Fights about what additionality means. Attempts to circumvent the clear wording that a baseline needs to be below business as usual. Attempts to dodge alignment of baselines with the long-term goal of the Paris Agreement by fluffily referring to "transformative" technologies. Likewise, under Article 6.2 we see the US and Singapore push for rules that mean that private carbon market registries would fulfil regulatory tasks. I would not like to see Verra credit issuances rubberstamped by overstretched governments in the global South diluting the ITMO market. The solidity and integrity of the carbon markets of the Paris Agreement hang in the balance.

I hope to see good voluntary carbon markets working hand in hand with compliance markets but currently see more of a risk that the former destroy the latter. COP28 has it in its hand to come up with an Article 6.4 methodological guidance that can make Article 6.4 the true "gold standard" of international carbon markets. COP28 can make a difference by requiring activities that generate removals to really work towards permanence. If this is achieved, ITMOs from Article 6 would help the voluntary carbon market to overcome its trust crisis, and rebuild confidence.

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"Robust Article 6 rules to guide voluntary markets"

© Wuppertal Institute

by Nicolas Kreibich, Senior Researcher, Wuppertal Institute for Climate, Energy and Environment

With COP28, a year is coming to an end that showed the full spectrum of potential flaws of carbon crediting in the voluntary carbon market (VCM): doubts about the actual mitigation impact of forestry projects and other market activities, lawsuits against companies making dubious claims about the alleged carbon neutrality of their products as well as scams in trading of carbon credits. The scandals have not only renewed the interest in international carbon markets and the role public governance can play therein to ensure integrity. They have also shown what can go wrong if rules are not sufficiently robust and transparency is not ensured.

Therefore, in order for the Article 6.4 mechanism to become the global benchmark of carbon crediting many stakeholders are looking for, it will be key to get the rules right and develop a robust framework. The (hard) lessons learned by the VCM over the past months and years can inform the process by showcasing potential pitfalls, while the use of the VCM's infrastructure should be limited. Article 6.4 should serve as a North Star for the VCM, not the other way round.

Parties in Dubai will further have to make sure that the Article 6.2 framework provides the transparency on which the very functioning of the Paris Agreement is built. Therefore, the confidentiality in Article 6.2 reports should be kept to a justified minimum, in order to allow for public scrutiny of Parties' cooperative approaches. Similarly, the Article 6 technical expert review reports should be made publicly available, while more clarity is needed regarding how Parties must take the underlying findings into account in the process.

Parties in Dubai should further provide more clarity in terms of market interaction: In Glasgow, the authorization for "other purposes" was agreed, allowing the voluntary carbon market to make use of the Article 6.2 accounting and reporting framework. This must be considered an important move towards the avoidance of double claiming in the context of voluntary offsetting. There is, however, some unclarity regarding the reporting elements that must be taken into account in this regard. Providing more clarity will allow the VCM to move towards Paris-alignment and increase overall robustness.

"Exclusive club mechanism or powerful climate action tool? "

© Climate Focus

by Adriaan Korthuis, Managing Partner, Climate Focus

The deliberations by the Article 6.4 SB and the ongoing talks on loose ends of Article 6 take place reassuringly far away from the ongoing turmoil in global carbon markets. The contrast between the conversations at the COP premises in Dubai and the action in the rest of the world is remarkable. While technical experts are discussing emissions accounting protocols, the markets outside run from one scandal into another. The diligent work by the experts and negotiators in Dubai may however contribute to restoring trust in carbon markets, by closing loopholes in accounting methodologies and setting the standard for robust carbon market practices.

Still, I wonder if all this investment in time and capacity of so many will pay off, and will pay back. Demand for Article 6 units is meagre. We can only praise Sweden, Switzerland and Singapore and a handful of other countries to exercise at least some demand, but buyers of large volumes are yet to make their appearance on the scene. And why would they? The quest for accuracy and book keeping excellence is resulting in unprecedented amounts of red tape. Transaction costs will be prohibitive for any typical carbon project producing volumes of up to 100,000 t CO_2e per year. And taking the viewpoint of a potential host country: would scarce capacity in governmental departments not be better spent on designing renewable energy policies, forest protection schemes and sustainable food production programmes, and have these eventually supported by public climate finance?

The beauty of carbon markets lies in that they can unleash a sizeable amount of finance from the private sector, additional to climate finance provided by countries. In the current design, Article 6 remains the exclusive domain of a few buying governments, whose climate finance is to an increasing extent used to sustain bureaucracy at the expense of supporting climate action. Negotiators would do well in discussing what they really want with Article 6: an admirable mechanism with few fans, or a carbon market that leverages finance and speeds up climate action.

Cracking the Code

The development of a carbon market framework in Zambia as innovative and inclusive policymaking approach

by Lakshmi Bhamidipati, UNEP Copenhagen Climate Centre; Joachim Schnurr, GFA Consulting, and Marshall Brown, GGGI

Nearly 70% of the world's nations are planning on using carbon markets under Article 6 of the Paris Agreement to meet their Nationally Determined Contributions (NDCs). They are all at different stages of preparedness, participation, and operationalization of the international carbon markets under Article 6 of the Paris Agreement. While a centralized UNFCCC mechanism for Article 6.4 is still being finalized, many nations are already undertaking readiness activities and developing frameworks that offer opportunities under Article 6.2 (which deals with bilateral cooperation). To this end, nations such as Ghana and Kenya have formulated new guidelines, while Ghana and Thailand have already entered into agreements with the Swiss KliK Foundation. Other African countries such as Rwanda, Zimbabwe, Senegal, Uganda, South Africa and Morocco have all begun to prepare for Article 6 cooperation. Zambia is now among the regional and global forerunners.

Source: © GGGI Zambia

The German Federal Ministry for Economic Affairs and Climate Action (BMWK) is supporting Colombia, Zambia, Pakistan and Thailand to engage in international markets through the Supporting Preparedness for Article 6 Cooperation (SPAR6C) programme. SPAR6C is led by the Global Green Growth Institute in collaboration with consortium partners Carbon Limits, GFA Consulting Group, Kommunalkredit Public Consulting, and UNEP Copenhagen Climate Centre.

The SPAR6C programme supports countries in several key areas of readiness:

- Medium and long-term emissions planning. This could include technical assistance for implementation and action planning of a country's Nationally Determined Contribution (NDC), Long-term Strategy (LTS) development, updates to the NDC, or other technical studies that might inform sectoral mitigation action identification and/or baseline and target setting.

- Governance framework development. This could include technical assistance to develop criteria for approval and authorization of mitigation activities for Article 6 transactions, recommendations for how to avoid over-selling and maximize co-benefits, and support to shape institutions and develop standard operating procedures for government and private sector stakeholders involved in international carbon transactions.

- Mitigation activity development. This could include the development of pilot mitigation activities across the project, programme or policy scales.

SPAR6C incorporates outcome-focused capacity building into all its technical assistance workstreams in a country, including for private sector stakeholders. The activities also extend to the academic and research sectors, incentivizing professors and students to undertake research that would link their areas of study or expertise to their country's international carbon market engagement through the Community of Practice for Article 6 Implementing Countries (CoP-ASIC), see also CMR issue Autumn 2022 (Vol 10. No. 3).

Zambia's innovative approach to building a carbon market framework

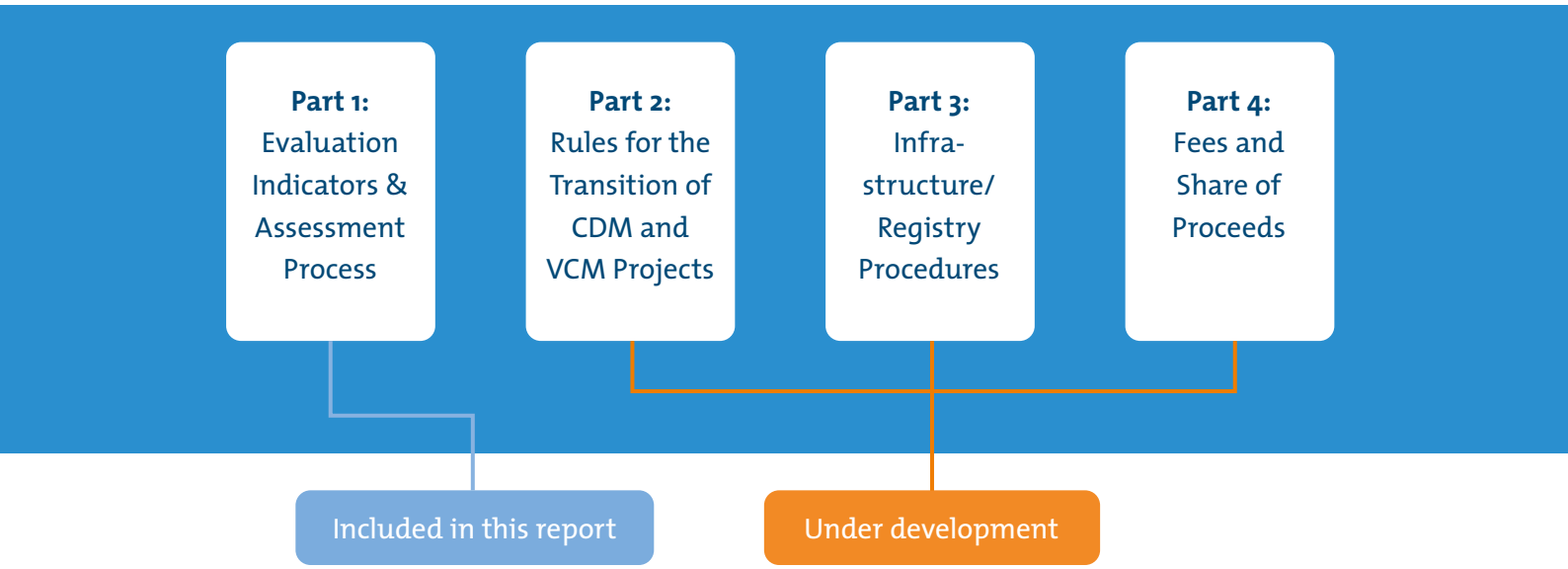
The Paris Rulebook does not provide detailed guidance on how to create institutional structures or strategies for Article 6 engagement, but does require that "domestic arrangements" are in place as a basic rule for participation in cooperative approaches under Article 6.2. There is no "perfect" way to create a carbon market framework, but the experience of Zambia emphasizes the importance of training and capacity building to inform decision making on the framework. Without the necessary education and an iterative feedback process, the government will not be able to make use of even the most comprehensive frameworks.

Zambia launched its *Guidelines for the Submission and Evaluation of Proposed Mitigation Activities under Article 6 of the Paris Agreement* (see box) on 17 October 2023 as Part 1 of its larger Carbon Market Framework – the first country in the SPAR6C programme to do so. The guidelines comprise of Article 6 eligibility criteria along with

- means of verification,
- options for tools and benchmarked standards, including non-permanence risk tools, or tools for assessing SD impacts ex-ante
- an institutional approval process stipulating the roles of key stakeholders including the private sector, the various ministries, technical working groups, and ZEMA (the environmental management authority responsible for MRV and registry).

The governance structure setup for Article 6 in Zambia includes institutional anchoring in an inter-ministerial working group titled the Technical Climate Change Committee for Mitigation (TCC-MIT). Chaired by the Ministry of Green Economy and Environment (MGEE), TCC-MIT takes key decisions on mitigation planning, NDC coordination and approval, and most importantly, decides on the approval and authorization of Article 6 activities.

Figure 1: Zambia's Carbon Market Framework



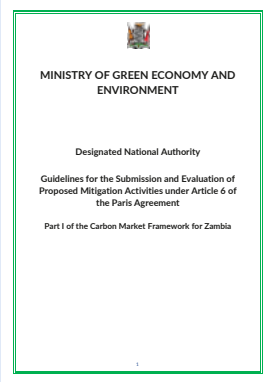
Source: Government of Zambia

Part 1 of the Carbon Market Framework development process included technical assistance and capacity building efforts by the SPAR6C programme spanning nearly one year. Subsequent parts of the framework currently under development are focusing on defining fees and Share of Proceeds (SOPs) for mitigation activities that are asking for a Corresponding Adjustment (CA), establishing procedures and guidelines for eligible CDM and VCM projects aiming at transitioning to Article 6, establishing a registry, and validating the MRV system to complement the support provided by UNDP previously. Once completed, the framework will govern Zambia's participation in the international carbon markets and may serve as a blueprint for other countries in the region.

SPAR6C's approach to developing Zambia's Carbon Market Framework has been nationally tailored. It entailed an iterative process to allow for local ownership, considering the uniqueness of the context and specific socio-economic and institutional structures, intentionally moving away from a one-size-fits-all approach, and offering a good model for others to emulate or build upon.

As the first product of Zambia's Carbon Market Framework, guidelines for submitting and evaluating activity proposals have been published.

Download the guidelines at https://www.mgee.gov.zm/?page_id=322


MINISTRY OF GREEN ECONOMY AND ENVIRONMENT

Designated National Authority

Guidelines for the Submission and Evaluation of Proposed Mitigation Activities under Article 6 of the Paris Agreement

Part I of the Carbon Market Framework for Zambia

Key tenets of Zambia's approach

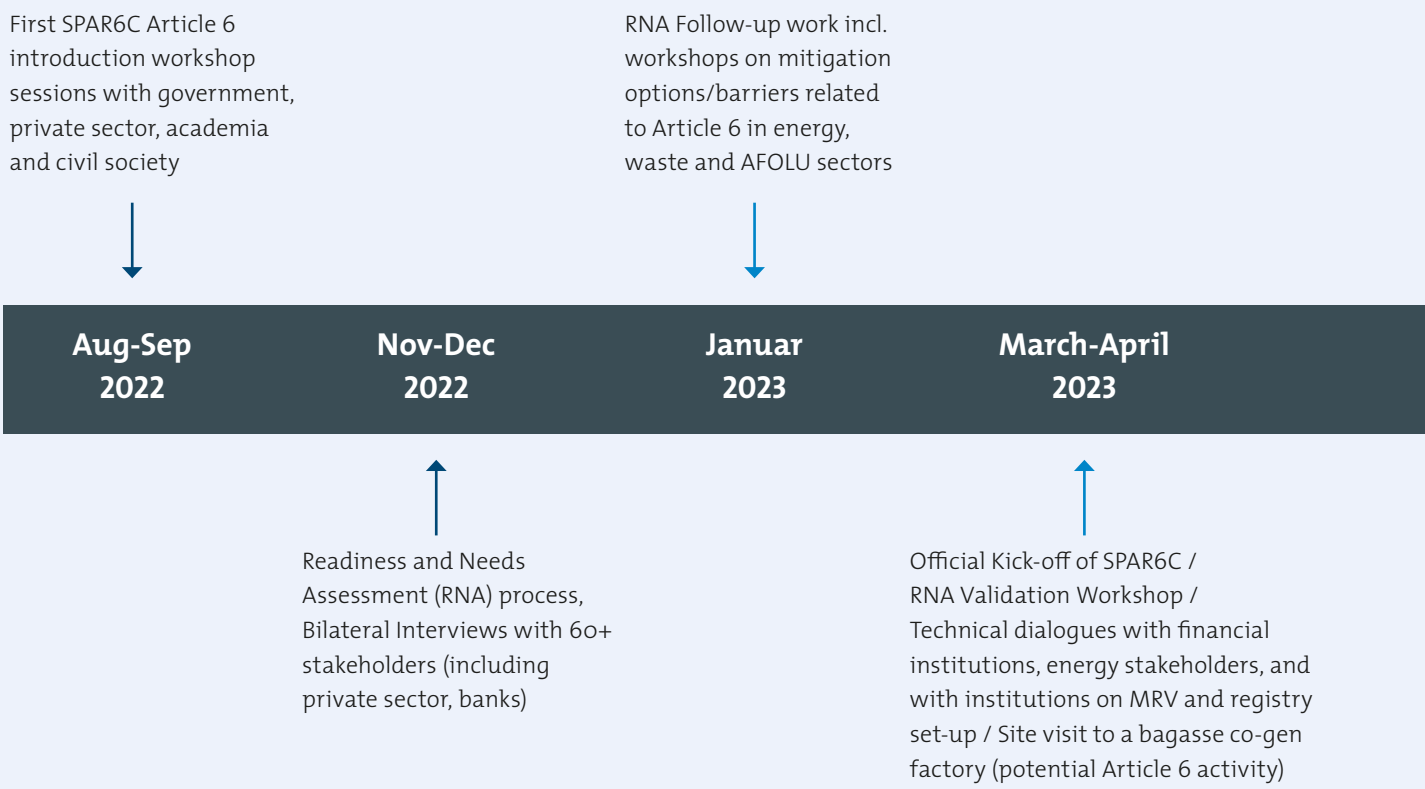
- **Early engagement with a wide range of stakeholder groups** including the government, private sector, academia, civil society and financial institutions to create awareness about the new framework being developed, to better understand the context and needs of stakeholders, and to assess their readiness regarding the many facets of Article 6. This also entailed analyzing past institutional arrangements during CDM, and accounting for the new structures that are still under formulation as part of Zambia's forthcoming climate bill. The process provided critical early feedback about capacities and gaps for stakeholders to engage in strategic decisions on the modalities for transacting ITMOs.

- **An iterative process to develop the guidelines,** which built on Zambia's Interim Guidelines for Handling Carbon Markets (December 2022) and involved several rounds of discussions, feedback, and amendments from officials of the Ministry of Green Economy and the Environment, and members of the TCC-MIT. This enabled fine-tuning and refinement of the framework, and familiarized TCC-MIT members with the indicators and process, thereby allowing for local ownership of the document. A demo application of the criteria and indicators was also carried out using the example of a mitigation project, a biomass to energy mitigation activity called the "Kafue Sugar Project", see box.

The "Kafue Sugar Project"
This project proposes to install a 40 MW boiler to produce electricity for own consumption and feeding surplus power to the grid. It uses bagasse, a residue from sugar production, that otherwise would be dumped in a landfill, a source of methane emissions. This first Article 6 demonstration project in Zambia would also address lead to a range of sustainable development co-benefits by implementing an out-grower scheme, i.e. small-scale farmers produce sugarcane on their land and deliver sugarcane to the factory, thus providing jobs and income for the rural population.

- Between March and October 2023, the SPAR6C consortium conducted a series of capacity building workshops with the TCC-MIT for them to gain familiarity with the eligibility criteria of the Framework and the principles of environmental integrity, sustainable development, and transformational change (which also included validation and feedback sessions). TCC-MIT members sought several clarifications to better understand the indicators and their means of verification, esp. additionality, leakage, monitoring of SD impacts and transformational change. Synergies were also identified with existing processes (for instance the environmental impact assessment conducted by ZEMA also alludes to the principles of social safeguards in line with the IFC Performance Standards).

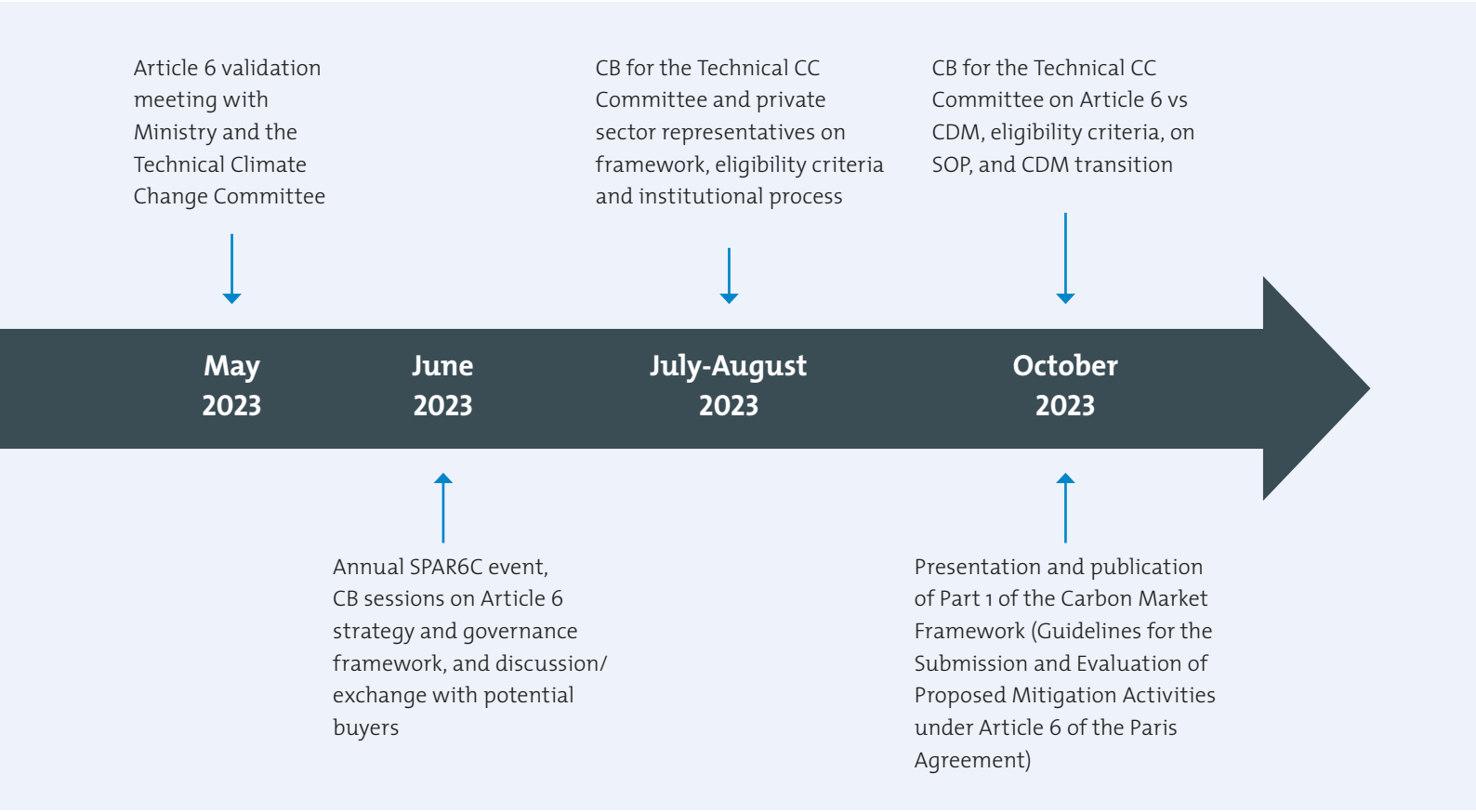
Figure 2: Key events and sessions leading up to the release of the carbon market framework for Zambia



Source: Authors

- Private sector engagement was crucial for fast-tracking the formulation of guidelines and creating favourable conditions for project implementation. Insights from private sector actors were obtained through bilateral meetings and targeted workshops, which also helped familiarize them with the structure and rules of Article 6, the risks, and opportunities of transacting in ITMOs, and clarify differences vis-à-vis CDM. The private sector readiness and interest in market participation has been significantly high in Zambia. Capacity building efforts through workshops were aimed at ensuring thatdevelopers are ready to engage in the market both in the short and long term, and to develop mitigation actions while being sensitive to sustainable development outcomes and maximizing transformational change potential.
- Transparency was a key focus area throughout. The findings of the readiness and needs assessment process – along with various stages of development of the guidelines and the governance requirements – were clearly communicated to the private sector, academia, and the civil society at large. A change log was maintained and included in the framework to indicate the feedback received and important changes made at different stages of the development and refinement of the document prior to its launch. Going forward, the same will be maintained as it is a living document, allowing for adjustments along the way.

Figure 2 highlights the key events and sessions leading up to the release of the carbon market framework for Zambia.




Source: © GGGI Zambia

As evident, a key aspect of the process has been constant engagement with relevant stakeholders, being open to their feedback and needs, and displaying flexibility in terms of effort, time and resources towards technical assistance and capacity building. Alongside, it has entailed working consistently towards raising collective awareness and understanding, not only of the Carbon Market Framework and its tenets but also of the broader Article 6 mechanism of the Paris Agreement. This in turn has equipped the stakeholders to take well-founded decisions with regard to strategic choices around Article 6 implementation and regulation, and to advance appropriate mitigation options.

SPAR6C Zambia scaling up readiness support

During the launch, Hon. Eng. Collins Nzovu MP, Minister of Green Economy and Environment, noted that "the implementation of the Article 6 framework is vital in advancing climate action, and Zambia has set an example in Africa by advancing article 6 governance with clear eligibility criteria and an efficient approval process – an inspiring model for regional climate action. The key is sustainable development that will not only protect and preserve our environment but also help to restore it by employing the resources, technology, and knowledge at our disposal through the various participating countries."

In parallel to the ongoing development of the carbon market framework, the programme is also carrying out sector-specific studies (e.g., forestry, livestock etc.) to close data gaps with respect to the GHG inventory, to inform the long-term emission planning and to provide sound data for baseline setting. Alongside, technical assistance will also be provided to the government in the first MADD preparation (potentially leading to a framework agreement) for the Kafue sugar project, while the TCC is assessing the eligibility of the long list of PIN submissions they received from the activity participants.

From this long list of Article 6 activity proposals, up to three will be selected by the national authorities in charge for receiving further support from SPAR6C, i.e. for taking them from the development of the MADD to implementation by identifying suitable financing instruments and opportunities.

Country experiences informing global best practice

The experiences in Zambia not only benefit from resources and expertise provided by the SPAR6C team of international experts, but the experiences have served to inspire other SPAR6C programme partners who are in the process of developing their carbon market frameworks. The experiences and the unique approach also have informed the guidance provided in the SPAR6C Article 6 Implementation Toolbox, which will be launched at COP28 in Dubai.

The Toolbox will include a range of guidance materials, decision making tools and templates that market practitioners can use to improve their readiness for Article 6 engagement. Six guides are on target to be completed by year-end, with the first three – "Developing and Article 6 Host Party Strategy", "Developing and Article 6 Host Party Institutional Framework" and "Screening and Developing Article 6 Activities" being released at the toolbox launch event (see box).

SPAR6C Toolbox Launch Event

At COP 28, the SPAR6C Article 6 Implementation Toolbox will be launched. The toolbox consists of guidance materials, decision making tools and templates for market practitioners, which can be used to improve readiness for Article 6 engagement.

"Launch of the SPAR6C Toolbox for Article 6 Implementation"

3 December, 17:30 – 19:00 hrs, (Local Dubai Time)
IETA Pavilion, COP 28, Dubai

Source: © pexels/daniel ponomarev

A Programmatic Approach

The KliK Foundation's strategy to procure around 20 million tonnes of emission reductions in the form of ITMOs

by Ursula Flossmann-Kraus and Andrea Reiter, KliK Foundation

The Swiss Foundation for Climate Protection and Carbon Offset KliK is a private organisation that finances international climate protection activities under Article 6 of the Paris Agreement by purchasing Internationally Transferred Mitigation Outcomes (ITMOs) on behalf of Switzerland. An ITMO is a specific type of carbon credit and corresponds to one tonne of CO_2 equivalent reduction. As Switzerland is one of the countries that started preparing early to implement Article 6 in order to meet its NDC, the KliK Foundation is also a pioneer of operationalizing cooperative action under the Paris Agreement. Under the framework of the Swiss CO_2 Act, which has been in force since 2000 and is currently being amended for the 2025-2030 period, Switzerland has institutionalised its international commitment to reduce its

Source: © Watchara Chaikornsakun

greenhouse gas emissions by at least 50% by 2030 compared to 1990 levels. This is to be achieved through a combination of measures, including reducing emissions and improving energy efficiency in four relevant sectors (transport, agriculture, industry, buildings) in Switzerland. Furthermore, Swiss law foresees part of the emission reductions being achieved through purchasing attestations from climate protection programmes outside of Switzerland in accordance with Article 6 of the Paris Agreement. This is where the KliK Foundation comes in.

Under the CO_2 Act of 2011, mineral oil companies are obliged to compensate for part of the CO_2 emissions caused by the Swiss transport sector. To this end, the Swiss Petroleum Association (now Avenergy Suisse) established KliK, the Swiss Foundation for Climate Protection and Carbon Offset, in 2012. Mandated by the Swiss CO_2 Act, the KliK Foundation fulfils the legal obligation of Swiss fuel importers and makes an important contribution to Switzerland's NDC. The Foundation therefore provides financial support for climate protection programmes in Switzerland. In 2021, it started working on also procuring carbon credits internationally. The KliK Foundation aims to procure approx. 20 million tonnes of eligible emission reductions in the form of Internationally Transferred Mitigation Outcomes (ITMOs) generated by emission reduction programmes by the end of 2030. The KliK Foundation's funds come from a surcharge on fuel sales levied at petrol stations. The price per ITMO is based on the actual cost.

In 2020, Switzerland started to conclude bilateral implementation agreements with partner countries that were interested in the cooperative approaches according to Article 6.2 of the Paris Agreement. So far, only a few buyer countries such as Sweden, Japan, Singapore, and South Korea have decided to follow this path. To date, Switzerland has signed eleven bilateral agreements with Dominica, Georgia, Ghana, Malawi, Morocco, Peru, Senegal, Thailand, Ukraine, Uruguay and Vanuatu; MoUs have been signed with Chile and Kenya. Several more are in the pipeline.

To achieve its goal, the KliK Foundation is working on a broad-based portfolio of programmes with the intention to acquire the resulting ITMOs.

Status of portfolio, programme development & contractual matters

The KliK Foundation's financial engagement is based on a twofold strategy: Development support and a long-term offtake contract for ITMO purchase. The KliK Foundation provides financial support for the conceptual development of programme ideas to mitigate GHG emissions, with funding of up to USD 150K. Based on the submission of a Mitigation Activity Idea Note (MAIN), the KliK Foundation decides whether or not to award a contract to carry out the following tasks: developing the necessary programme documentation (Mitigation Activity Design Document (MADD) and methodology) as well as establishing a robust business model.

The validated MADD is the basis for the request for authorisation by the host country and Switzerland under the bilateral cooperation agreement between Switzerland and its partner countries under Article 6.2 of the Paris Agreement. The authorisation is a sovereign decision and is granted by the two cooperating countries independently, as provided for in the bilateral cooperation agreement.

On the offtake contract, the KliK Foundation commits in a Mitigation Outcome Purchase Agreement (MOPA) to acquire Internationally Transferred Mitigation Outcomes (ITMOs) from a mitigation activity, subject to this being authorised by both partner countries. The KliK Foundation purchases the resulting emission reductions of the programme. This ensures the long-term financial viability of the programme.

KliK's Programmatic Approach

With very few exceptions, all of KliK Foundation's activities follow a programmatic approach. On the one hand, this is because of the technologies and the conditions for implementing; many of our activities use smaller unit size technologies such as household based cookstoves, farm level biodigesters, e-vehicles or decentralised solar PV etc. The KliK Foundation seeks programmes that grow quickly, ramp up over time and can potentially transform an entire sector or subsector. On the other hand, these programme types also offer significant benefits for the host country, such as the social and environmental benefits, or that they can target low-income populations and countries.

With regard to the project cycle, there is no real time or cost saving in the programmatic approach from the perspective of the KliK Foundation, as the process is always the same for every activity: it includes activity description (MADD) development, validation, authorisation by both the transferring country and Switzerland, and periodic verification. The MADD is written with an estimated number of participating units and emissions reductions that can be included based on clearly defined inclusion criteria. The units are onboarded through a contract or letter, not an additional MADD.

The transfer of Mitigation Outcomes (MO) from the seller to the buyer country implies corresponding adjustment in the form of cancellation of units in the transferring country's registry and issuance/crediting of the same number of MO as ITMOs in the Swiss registry.

In the following, we focus on three advanced programmes of which the KliK Foundation intends to buy the resulting emission reductions as ITMOs.

Ghana Green Cooling

With a growing population, increasing wealth, urbanisation and rising temperatures, the refrigeration and air conditioning (RAC) sector is a significant contributor to Ghana's current and future greenhouse gas (GHG) emissions. The Ghana Green Cooling programme by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH aims to bring about change through the introduction of climate friendly split air conditioners (ACs) that consist of two modules. One contains the compressor, outdoor heat exchanger and expansion device and is installed outside. The other module with the indoor heat exchanger (used as evaporator in cooling mode) is installed inside. The split AC sub-sector currently accounts for a large share of energy and GHG emissions from energy consumption and refrigerants, amounting to around 8% of national GHG emissions. The activity is a contribution to Ghana's NDC targets to reduce GHG emissions, both direct (refrigerant use) and indirect (energy consumption) emissions.

The introduction of highly energy efficient, low GHG emitting air conditioners will be supported by various financial and technical measures aimed at strengthening the adoption of this innovative and sustainable technology. The programme takes a holistic approach and aims at transforming the whole sector by fostering the market introduction of the green ACs, training of RAC-technicians to reduce cooling gas leakage and providing end-of-life treatment of the replaced air conditioners and the refrigerants contained therein.

Source: GIZ / Curllan Bhola

Bangkok E-Bus Programme

In February 2023, Switzerland and Thailand authorised the Bangkok E-Bus Programme, marking a milestone in cooperative climate action between two countries under the Paris Agreement. The Bangkok E-Bus Programme is additional to Thailand's NDC. It is the first programme hat has been authorised in Asia under Article 6.2 and the second in the world. The programme by Energy Absolute Public Company Limited (Energy Absolute) aims at converting 100% of its existing and expanding fleet of privately operated buses in the Bangkok metropolitan area to electric mobility. The introduction of electric vehicles in public transport will significantly reduce greenhouse gas emissions and air pollution in the region. Over 2,000 electric buses are expected to be in service by the end of 2023. The Bangkok E-Bus Programme will lead will lead to a cumulative reduction in CO_2 emissions of more than 500,000 tonnes by 2030. The KliK Foundation makes the activity financially viable through the contractual purchase of Internationally Transferred Mitigation Outcomes (ITMOs).

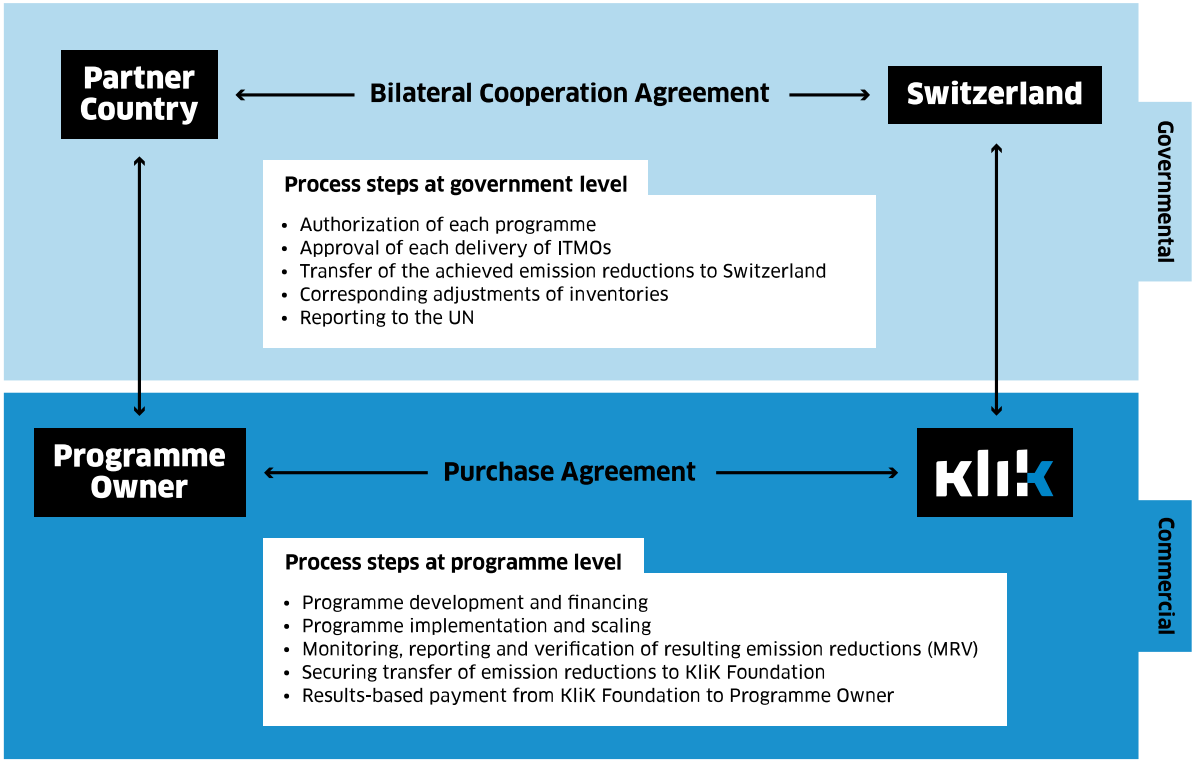
Source: © Watchara Chaikornsakun

Battery Energy Storage and Renewable Energy Programme

Senegal aims to increase its share of renewable energy. However, already today the country faces the challenge of having non-dispatchable renewable energy sources in its grid. The grid operator is struggling to balance the grid appropriately. To cope with this increasing share of renewables, the grid operator uses so-called spinning reserves, which can make up for any potential shortfalls in electricity production. Currently, these spinning reserves consist mainly of fossil fuel-based energy sources such as gas and heavy fuel oil. As more renewable energy production is added, additional, fossil-fuel based spinning reserves will have to be added to ensure smooth functioning. The goal of the Battery Energy Storage and Renewable Energy Programme by ACT Commodities and Ongresso Energy is to install both stand-alone Battery Energy Storage Systems (BESS) and BESS coupled with renewable energy. BESS avoids such fossil fuel-based spinning reserves having to be installed, thereby further reducing greenhouse gas emissions.

Source: © Africa REN

Figure 1: Public-private architecture and roles of cooperation



Source: KliK Foundation

Lessons learned, challenges & outlook

1. The challenges for buyers concern the novelty of developing programmes under Article 6.2. There is little to no experience. Building structures for the implementation of Article 6 as well as process development from programme idea to the implementation, approval, verification and transfer of ITMOs etc. is at the beginning. Many countries were initially cautious and wanted a sufficiently good understanding of the risks before committing to Article 6.

2. On the side of the transferring countries, the challenge is to define their unconditional NDC targets (and conditional pledges) and to build the necessary capacity in the public and private sectors. Furthermore, national frameworks are needed to successfully participate in Article 6, including institutional arrangements, structures for authorisation and ITMO transfer, as well as a registry. Ghana is taking a leading role here. Another challenge is working with different buyer countries, each with their own requirements for implementing the Article 6 programmes for the KliK Foundation are mainly.

3. The lessons learnt for the KliK Foundation are mainly in regard to how to approach programme design. Clusters are now being considered programmes.

The KliK Foundation is working intensively on country-specific calls for proposals in Switzerland's partner countries. Generally, the focus is on areas in which a high volume of ITMOs can be generated and where programmes can be designed and implemented in a straightforward manner.

Untapped Potential

SF6 mitigation in the electricity sector and Article 6 of the Paris Agreement

by Philippe Lempp, GIZ

The effects of global warming due to increased concentrations of greenhouse gases (GHG) in the atmosphere result in enormous environmental and economic burdens. In particular, poorer people in developing and emerging countries are affected most severely. Strangely, one GHG that has received little attention to date both in most countries and in international climate policy efforts is the most potent GHG known: sulphur hexafluoride (SF6). Its estimated global warming potential fluctuates as scientific knowledge grows. In the Kyoto Protocol, it was included as one of the six recorded greenhouse gases with a global warming potential (GWP) of 23,900. The IPCC's Sixth Assessment Report (AR6) puts its GWP at 24,300 over a 100-year period. In addition, SF6 is extremely durable; its atmospheric lifespan was stated in the AR6 to be approximately 1000 years. Therefore, a comparatively small amount of SF6 can have a significant impact on the climate.

SF6 in the power sector – relevance and challenge

SF6 is an industrially produced gas. Between 80 and 90 percent of the SF6 worldwide is used in electricity infrastructure, particularly in gas-insulated switchgear and transmission lines, where it serves as an insulating and switching gas. SF6 emissions are on an upward trajectory globally, as leaks occur during the production, maintenance and dismantling of SF6-containing equipment. Emissions will continue to increase if unchecked, as power grids are expanding – and indeed need to expand – especially in developing and emerging economies.

At the same time, many old systems built decades ago are approaching the end of their service life, so their SF6 needs to be either recycled responsibly or destroyed. SF6 is often poorly handled during the operation and dismantling of equipment due to a lack of awareness among key actors, a lack of regulation, a lack of oper-

Source: Dina Shinta Lestari on Unsplash

ating procedures and a shortage of trained technical staff at network operators. The return and emission-conscious disposal of SF6 and the use of better equipment are associated with additional costs. This can act as an incentive, particularly in economically weak countries and companies, to allow the gas to escape in an improper manner and to avoid shifting to alternative technology. A further fundamental problem is the incomplete monitoring and reporting of SF6 emissions.

What to build on

Over the past few decades, measures have been taken worldwide to reduce SF6 emissions from the power sector. Such measures include binding regulation, as well as voluntary commitments by industry actors, e.g., on tracking SF6-containing equipment and preventing leaks, including through closed circuits, technology improvements, monitoring systems, higher maintenance intervals and staff training. Research and industry actors are also developing alternative, SF6-free technologies. With the introduction of alternative insulating gases by individual manufacturers in selected applications, the discussion about the future use of SF6 has gained momentum in recent years.

In early October, the EU Council and the European Parliament reached a provisional political agreement on phasing out fluorinated gases (F-gases) and ozone-depleting substances. The text includes provisions concerning SF6, establishing a complete ban on F-gas-based switchgear in medium voltage environments as well as a gradual phase-out on the high-voltage level in the EU. But the proliferation of such regulation from highly industrialised countries to less-developed economies will not happen swiftly, let alone automatically. In the context of rapidly expanding grids and in view of upcoming replacements of old equipment, it is paramount that a worldwide shift be actively supported without delay, thus avoiding technology lock-in for decades to come.

The case for a dedicated international initiative

Against this backdrop, the German Federal Ministry for Economic Affairs and Climate Action intends to launch an international initiative on SF6 in the power sector. A global multi-stakeholder approach could help curb emissions swiftly by supporting countries in properly handling and ultimately phasing out SF6, as alternative technologies are becoming increasingly available. The initiative should:

- build a “coalition of the willing” with interested countries around this hitherto largely neglected topic and create awareness among policymakers and key actors in every country;
- establish overarching recommendations and institutional structures for international monitoring, verification, and reporting of SF6 emissions and tracking of progress towards a worldwide phase-out of SF6 in the power sector;
- study technology options and support information exchange between stakeholders and countries;
- support the introduction of appropriate regulation and/or industry commitments in every country;
- support technical training and the introduction of good practice with relevant actors on the ground to avoid emissions from existing systems without delay;
- incentivise the uptake of SF6-free technology in new infrastructure projects to avoid technology lock-in;
- help disseminate research and innovation;
- propose financing solutions and incentives for investing in alternative technologies.

Source: American Public Power Association on Unsplash

Outlook for SF6 mitigation in international carbon markets

In order to prevent short-sighted technology choices in favour of emission-intensive electricity transmission and distribution systems, the planned initiative will evaluate typical finance schemes under different stakeholder configurations, including all relevant actors in production, procurement, installation, application, maintenance, dismantling and recycling or disposal of SF6-containing equipment. It will identify possible incentives to encourage relevant stakeholders to implement SF6 emission reduction measures. The identification and presentation of possible international financing models according to country-specific requirements will be a focus of the initiative, possibly including options to employ Article 6 of the Paris Agreement and international carbon markets.

SF6 reduction in the electricity sector is a "medium-hanging fruit" in terms of GHG-emission prevention. It could become increasingly attractive for emerging economies to increase their ambition in terms of SF6 emission reduction. Some experience with the activity type for SF6 mitigation in the electricity sector already exists under the Clean Development Mechanism (CDM). This shows the opportunities and challenges presented by its use for international carbon markets. The global SF6 initiative on behalf of BMWK could work on methodological approaches to overcome the hurdles encountered in the CDM context and is especially directed towards countries that are willing to engage in SF6 mitigation in the electricity sector in the context of Article 6.

Transparency, Trust, and Integrity

Enhancing Carbon Markets with New Digital Infrastructure

by Yuvaraj Dinesh Babu, Executive Director, Climate Action Data Trust

Carbon markets play a crucial role in achieving global climate goals, especially as the world moves towards net-zero emissions. By promoting the trade of carbon credits – generated through measures such as the shift towards renewable energy or preservation of forests – carbon markets introduce a compelling incentive for impactful climate action. Carbon credit trading could significantly decrease the costs of realising countries' Nationally Determined Contributions (NDCs), potentially by as much as $250 billion by 2030, according to modelling by the University of Maryland and IETA in 2019.

This reduction facilitates an extra 50% emissions cut without additional expenditure. As we gravitate towards net-zero emissions globally, the demand for carbon trading may diminish over time. The post-2020 markets, under the Paris Agreement, will adopt a bottom-up blueprint, granting each participating country significant autonomy in monitoring and reporting its greenhouse gas (GHG) emissions reductions.

The need for a unified digital system to enhance transparency, trust and efficiency in carbon markets is evident. Such a system would gather and organise publicly available data on the lifecycle of carbon credits, increasing the efficiency and growth potential of these markets. It would offer a cohesive platform for real-time, auditable, and comparable emissions reduction data from various global registry systems, potentially spurring private sector innovation in market services like forecasting, ratings, compliance reports, and certifications.

Source: Dylan Calluy on Unsplash

The Climate Warehouse Ecosystem

The World Bank's Climate Warehouse Program is central to developing a digitally connected international carbon market. It focuses on using distributed ledger technology to secure and transparently manage data, crucial for preventing double counting of emission reductions. Integrating information from different countries and global registry systems into a common platform significantly reduces the risk of selling the same carbon credit twice.

This program also explores new technologies to address carbon market challenges like accuracy, robustness, and transaction costs. Digital monitoring, reporting, and verification (MRV) methods can drastically reduce the time and costs involved in generating and trading emission reductions, leading to more revenues being directed towards mitigation projects. This automation extends from the generation of emissions reduction credits to their transaction and final retirement, aiming for a digital system that enhances transparency, efficiency, and data accuracy in the carbon market.

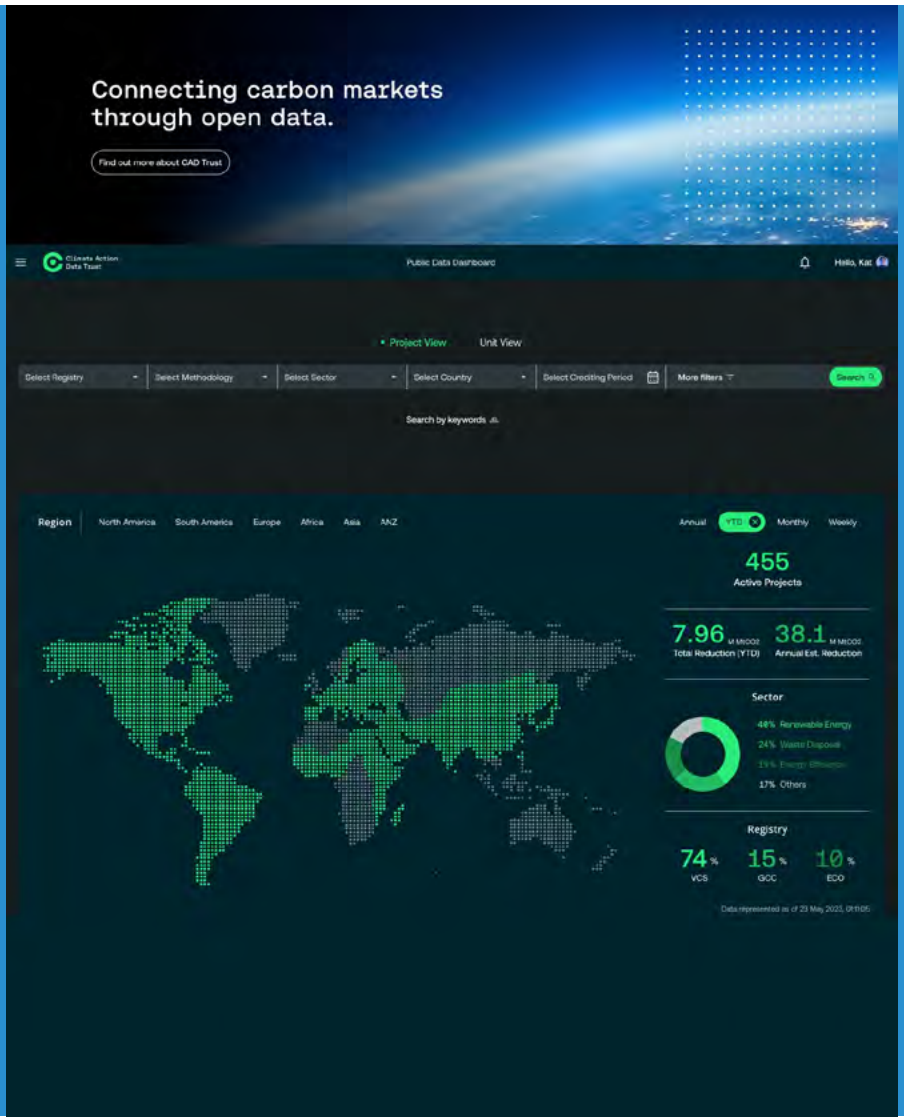
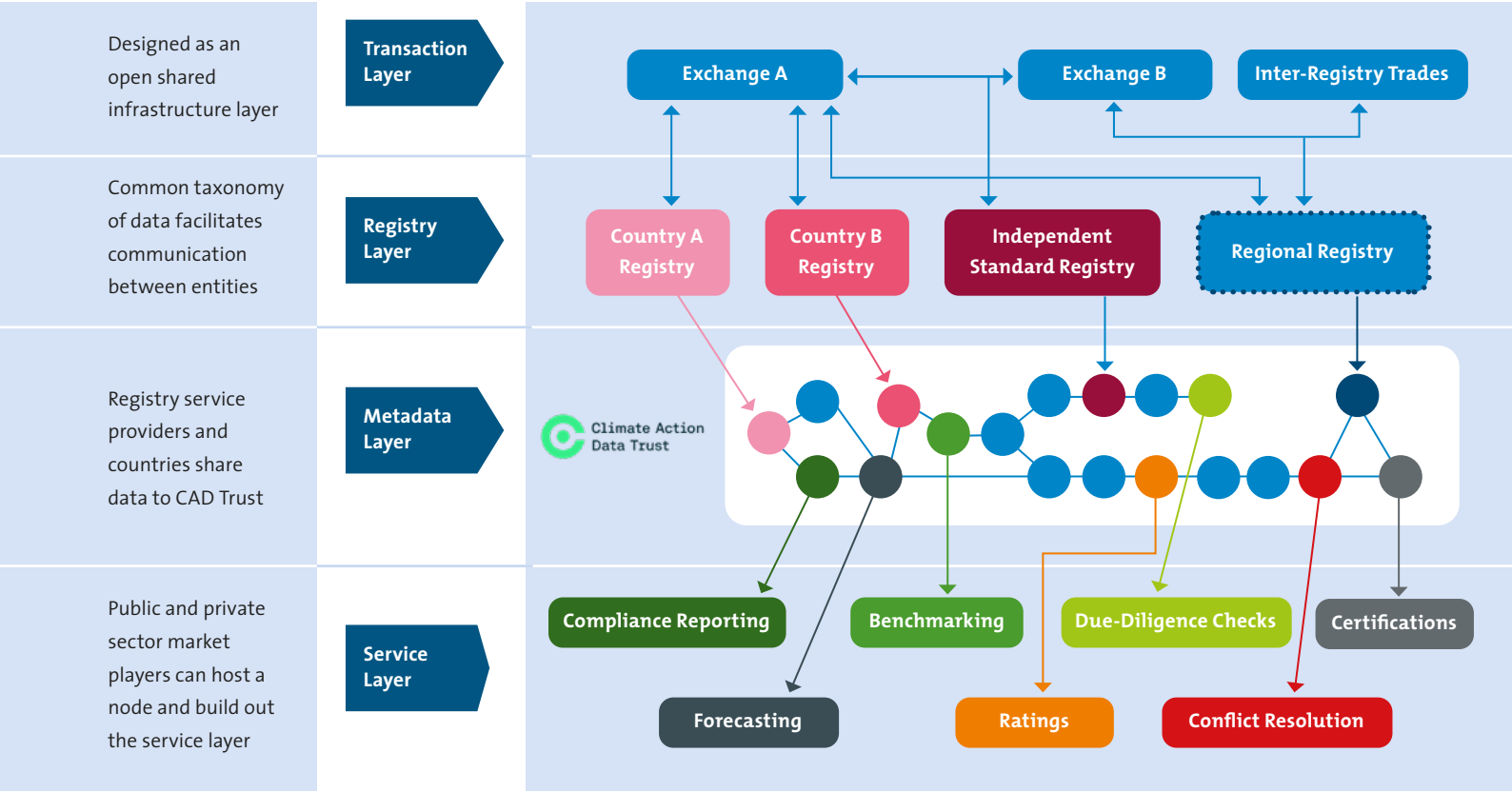


Figure 1: A global platform to link, aggregate and harmonise carbon credit data



Source: Climate Action Data Trust

The Climate Action Data Trust (CAD Trust)

The Climate Warehouse program is testing and developing digital infrastructure to foster greater transparency, trust, and integrity in the carbon market. Key developments include the Climate Action Data Trust (CAD Trust), a decentralised metadata platform linking, aggregating and harmonising major carbon credit registry data for transparent accounting aligned with Article 6 of the Paris Agreement.

The CAD Trust, an open-source solution for carbon markets, supports data sharing and serves as a foundational infrastructure for services developed by both public and private sectors. Tested by a wide range of carbon market stakeholders, including national governments and international organizations, this metadata layer has undergone extensive evaluation. The CAD Trust's open-source nature embodies transparency, collaboration, meritocracy, and community, with its immutable blockchain ensuring that data modifications are permanent, visible and verifiable.

The platform simplifies the aggregation of information from independent standards, enhancing trust and transparency between systems. It provides a reliable data source for buyers and traders, improves price discovery, and addresses market fragmentation by promoting standardization and easing the integration of diverse systems. For rating agencies, CAD Trust offers a harmonised data pool for accurate risk assessments and ratings, while project developers benefit from showcasing their projects and portfolios across standards.

Governments gain enhanced visibility and credibility for their climate activities through CAD Trust, which also helps research institutions in data mining for climate project analysis. It aligns national registry systems with the Paris Agreement, ensuring harmonious international reporting and potentially shaping Article 6 reporting requirements.

Facilitation of Article 6 Implementation

CAD Trust has the potential to significantly support the Article 6 of the Paris Agreement by facilitating compatible national registry systems. Its adoption of a unified data standard will streamline reporting of project activities, authorisations, and adjustments, enhancing the coherence between national and independent registries. This harmonisation is crucial for effective international reporting under the Paris Agreement.

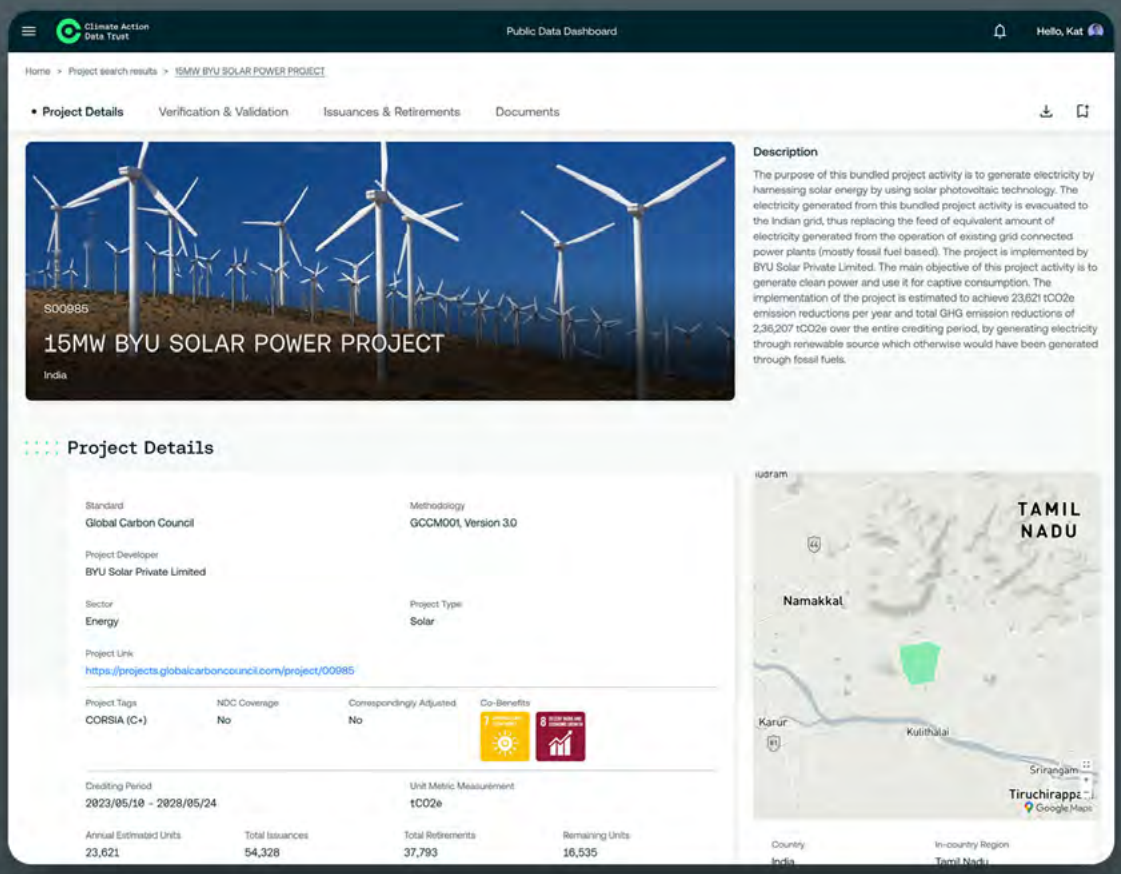
The consensus data model developed by CAD Trust participants could either shape or adapt to the evolving Article 6.2 and 6.4 reporting standards. Additionally, CAD Trust's potential to integrate with future systems could allow seamless data transfer to the Article 6 database or the UN's Centralised Accounting and Reporting Platform (CARP) via Application Programming Interfaces (APIs). This integration would prevent the need for duplicate data submissions by Parties using CAD Trust, further simplifying the reporting process.

The Technology: Benefits of blockchain in tackling double counting

Emerging digital technologies play an important role in creating a common data system that can collect and structure all openly available carbon credit data to improve transparency, trust, and integrity.

The Climate Action Data Trust (CAD Trust) adopts a public and permissionless blockchain technology to address the double counting problem. CAD Trust acts as a line of defence when registry data appearing at metadata layer of CAD Trust is double counted.

The open-source data system is designed to bring together real-time, comparable, and verifiable emissions reduction data from disparate registry systems around the world so that these registries can own and control their data on a central platform. By creating an immutable, auditable, and decentralised record of carbon market data, it facilitates data sharing in line with the Paris Agreement that can detect double counting.



The Open-Source Model

Open-source software is software with a source code that anyone can inspect, modify, and enhance. Developers can read, view, and change the software's code. This is in contrast to proprietary software, where only the original developers can legally alter the code.

The main principles of open source are:

- **Transparency:** The code (or design) is available for anyone to inspect.
- **Collaboration:** Because the code is public, a diverse group of people can collaborate, contribute, and improve upon it.
- **Meritocracy:** The best ideas or solutions rise to the top based on their merits, rather than who proposed them.
- **Community:** Open source often fosters a strong community of users and developers who can offer support, insights, and further development.

The Climate Action Data Trust is delivered as open-source software which means there are no fees associated to obtain the CAD Trust application apart from a very low XCH blockchain fee to submit transactions.

Conclusion

In summary, the digital revolution spearheaded by the World Bank's Climate Warehouse initiative and the Climate Action Data Trust (CAD Trust) is set to fundamentally transform the landscape of carbon markets. This transformation is pivotal in aligning with the global ambition towards net-zero emissions, demonstrating a seamless integration of technological advancements with environmental sustainability.

Looking ahead, the continued development and adoption of such digital solutions are essential in overcoming the complexities of global carbon trading. The Climate Warehouse and CAD Trust are not just technological solutions; they represent a collaborative, forward-thinking approach to tackling climate change. By embracing these innovations, the global community moves closer to a more sustainable, transparent, and effective carbon market, ultimately contributing to the broader goal of environmental preservation and climate action.

In embracing this digital transition, we not only enhance the operational aspects of carbon markets but also reinforce the global commitment to a sustainable and environmentally responsible future. The journey towards net-zero emissions is complex and challenging, but with the right tools and collaborative efforts, it is a goal well within our reach.

BMWK COP Side Events

Browse a selection of COP 28 side events with Article 6 focus at **https://www.carbon-mechanisms.de/en/service**

Successful West Africa Carbon Market Hub

More than 200 experts from 20+ countries participated in the first West Africa Carbon Market Hub in Abidjan / Côte d'Ivoire. Read a comprehensive report of the event at **http://www.carbon-mechanisms.de/en/west-african-hub**

Glossary

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