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NDC ACTION

DESIGNING THE ARTICLE 6.4 MECHANISM

Lessons Learned from the CDM

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KEY MESSAGES AND RECOMMENDATIONS

- The operational rules of Article 6.4 under the Paris Agreement would influence the supply of carbon credits on the market; however, the demand for credits cannot be controlled entirely by these rules. A realistic assessment of credit supply and demand should be used as the basis to determine the amount of Certified Emission Reductions (CERs) that are eligible for the use in Article 6.4, specifically since the NDCs are way below the required reduction to limit the increase in temperature well below 2 0C.
- The Clean Development Mechanism (CDM) under the Kyoto Protocol was successful in bringing new opportunities to reduce greenhouse gas emissions. However, the rules of Article 6.4 under the Paris Agreement should aim to address the challenges other opportunities faced from rules and procedures of, such as energy efficiency projects.
- It is important for climate negotiators and policymakers to strategically design the Article 6.4 mechanism to meet the needs of market participants, notably regarding how to ensure environmental integrity and incorporate sustainable development elements.
- Concrete solutions must be developed to incentivize the generation of sustainable development co-benefits from the projects contributing climate mitigation.

INTRODUCTION

The Clean Development Mechanism (CDM) was a key market mechanism included under Article 12 of the Kyoto Protocol (KP). It gave industrialized countries flexibility in meeting their emission reduction commitments by supporting climate change mitigation projects in developing countries. It was designed from the ground up in a context where little previous experience existed with the generation of carbon credits in international trading. Nevertheless, the CDM was successful in bringing opportunities for significant emission reductions.

At the same time, the CDM encountered various unanticipated challenges. Lessons from these valuable experiences can help in the improved design and operation of the market mechanisms under Article 6 of the Paris Agreement (PA) particularly Article 6.4 (see box 1). This policy brief focuses on these takeaways from the CDM to be considered by negotiators for the market mechanism under Article 6.4.

Box 1. Article 6.4 of the Paris Agreement

Article 6.4 adopts a centralized approach to emissions accounting and reporting, with emission reduction units, or mitigation outcomes, to be created under a supervisory body appointed by the Conference of the Parties to the Paris Agreement. This supervisory body is similar to the CDM's Executive Board and associated bodies. As under the CDM, it is expected that host country governments will take a role to approve the project and provide a certification for the project participants.

LESSON 1: THE OPERATIONAL RULES OF ARTICLE 6.4 WOULD INFLUENCE THE SUPPLY OF CARBON CREDITS; HOWEVER, THE DEMAND FOR CREDITS CANNOT BE CONTROLLED ENTIRELY BY THESE RULES.

Under the Paris Agreement, reduction in greenhouse gas emissions is driven through countries' pledges to climate action in their Nationally Determined Contributions (NDCs). Countries can set ambitious climate targets in anticipation of the use of carbon credits as a cost-effective emission reduction option. In other words, the demand for carbon credits can be driven through the level of ambition in NDCs. Linking NDC targets with the use of market mechanisms would be a starting point for countries to develop policies and measures for attracting private sector investment to engage in climate action projects through market mechanisms.

In reality, the Paris Agreement's ambition mechanism may bring some uncertainty and hesitancy from developing countries to use the Article 6.4 market mechanism. Private sector companies – not governments - in developed countries are expected to be a major buyer of Article 6.4 credits generated through climate mitigation projects in developing countries. However, in the Paris Agreement (unlike in the Kyoto Protocol), developing countries also commit to emission reduction targets in NDCs. If developing countries have highly ambitious commitments towards reducing emissions, they may not be willing to apply the Article 6.4 credit mechanism to mitigation projects in their country; rather, they may prefer to account for these emission reductions in their own NDCs rather than transferring these credits to another country.

In order for the Article 6.4 mechanism to scale up, there must be sufficient demand for credits to match the supply. The CDM faced a challenge in managing this supply/demand balance. The CDM credit supply and demand was determined not only through the CDM's governance framework but also through the European Union's Emission Trading System (EU ETS). In this case, the rules of the Kyoto Protocol affected the supply of CDM credits, whereas the demand for credits was driven mainly by the companies obligated to comply with emission reduction requirements in the EU ETS.

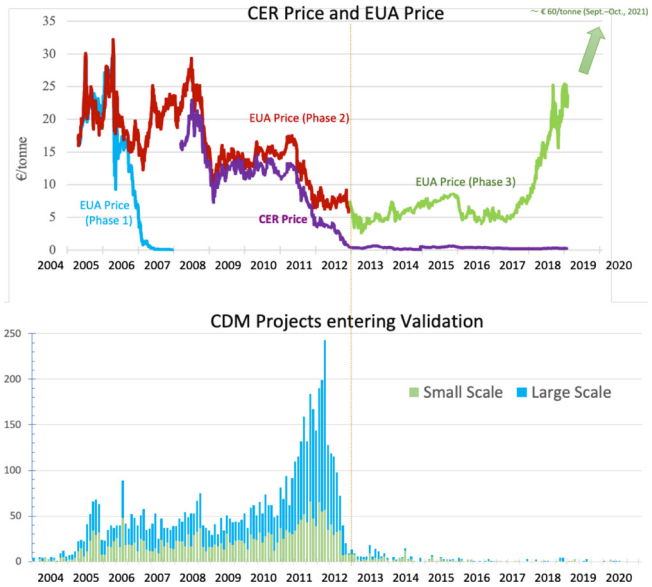
At COP26, climate negotiators and policy makers should build on the lessons from experiences with the CDM when negotiating and setting the rules for the Article 6.4 mechanism, as described below.

Credit demand

Under the Kyoto Protocol, the demand for Certified Emission Reductions (CERs) was driven mainly by private companies that had to comply with the mandatory regulatory requirements of developed country Parties to reduce their greenhouse gas emissions. A significant part of a country's reduction commitment was assigned to private and public entities. The government's need for CERs was low and hence the demand for CERs was low since it is not an active player in the market in its nature. In the first Kyoto Protocol commitment period, very few companies had adopted voluntary targets and thus there was limited CER demand by companies outside the regulatory requirements to reduce emissions.

Credit demand under the CDM was driven by the companies that had to comply with the regulations of the EU ETS. Companies initially relied on CDM credits to meet their compliance with the EU's regulation. However, the EU ETS is independent of the Kyoto Protocol and thus outside of the CDM mechanism under the Kyoto Protocol. Thus, the demand for CDM credits – CERs – was not controlled by the CDM rules themselves. When the EU no longer allowed companies to use CERs to meet their obligations from the beginning of the second Kyoto commitment period, the CER market collapsed and the development of CDM projects plummeted (figure 1).

Figure 1. Since the start of EU ETS Phase 3 in 2013, CERs have not been fungible with the European Union Allowances (EUAs). As a result, the demand for CERs stopped, the development of CDM projects plummeted, and CER prices crashed. Meanwhile, the EUA price continued to rise[1].



Similarly, the credits generated under the Paris Agreement can be dependent on demand from other existing carbon market mechanisms – including national, regional, sectoral and voluntary mechanisms. Each of these carbon market mechanisms will have a different approach, some of which may not permit the use of Article 6.4 credits to meet the requirement (as occurred with the use of CERs in the EU ETS). This risks leading to insufficient demand for the Article 6.4 credits.

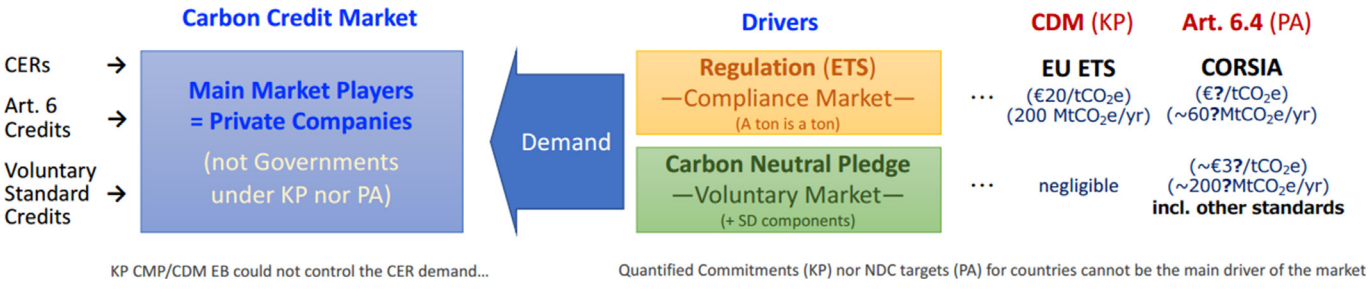
Consequent to the Paris Agreement, a number of countries are planning to establish, or have established, national carbon markets along the line of the EU ETS, to stimulate actions by economic actors to meet the NDC targets. This will impact the demand for credits generated from the Article 6.4 mechanism. Because these markets will be regulated by national governments and thus by the requirements of international offset credits that can be used within these markets, the demand generated will depend on country-driven regulations of these markets.

However, the regulations in these jurisdictions may not allow them to use the credits generated under the Article 6.4 mechanisms to meet their compliance, as was the case for second commitment period of the Kyoto Protocol in the EU. For example, according to the updated NDCs, the United States and the EU do not intend to use the Article 6 mechanisms to meet their NDC targets at this time. Moreover, many countries, such as Japan, do not have a regulatory compliance market. This makes it challenging to drive the private sector to engage in the Article 6.4 market mechanisms, as there are no obligations for companies to use the Article 6.4 credits to meet their targets.

At present, airline operators regulated under the International Civil Aviation Organization's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) that is outside the Paris Agreement is expected to create the largest demand for carbon credits in the Article 6.4[2].

Overall, as Figure 2 illustrates, the experience shows that the demand for carbon credits cannot be controlled entirely from the operational rules of the Article 6.4 mechanisms.

Figure 2. Carbon credit market overview[3]



1 *Source: European University Institute 2020 and data available at https://cdm.unfccc.int/Statistics/Public/CDMinsights/index.html*

2 *However, the ICAO Council's decision (ICAO n.d.), which was influenced by COVID-19, is estimated to reduce the demand for carbon credits even more than was originally assumed (230–1,700 $MtCO_2$ for 2021–2035, if the baseline remains 2019 level) (ICAO 2021). In addition, CORSIA-eligible credits include credits from mechanisms other than the Article 6 mechanisms.*

3 *Numbers are based on analysis in World Bank 2021 and Ecosystem Marketplace 2021.*

Credit supply

A number of factors determine the supply of carbon credits. This policy brief looks in particular at the transition of the Kyoto Protocol's CDM credits to the new Article 6.4 mechanism, as well as the related operational rules. There are two main issues at stake here:

a) **The risk of over-supply of credits.** Firstly, Paris Agreement rules can control the supply volume of the pre-2020 CERs carried over for use in the Article 6.4 mechanism. Depending on the volume of these carry-over credits and eligible projects, there could be a risk of over-supply of the credits in the market. If this over-supply were to keep the credit price too low, the private sector would lose its appetite to engage in the Article 6 mechanism.

   The use of Kyoto credits towards countries' NDCs and operational rules are part of the important agendas to be negotiated at COP26. It is necessary to make a rational political decision on this, as the negotiation outcomes would impact the success or failure of the Article 6.4 mechanism.

b) **Ensuring accurate crediting of reductions.** If the operational rules of Article 6.4 are too strict and complicated, project developers and operators will face challenges in participating, thus affecting the overall supply of mitigation projects. But the rules also need to ensure that only real and measurable reductions are credited, so as to maintain the environmental integrity of reduction efforts.

The operational rules were a barrier to developing projects under CDM, which indirectly affected the volume of CER supply. Developing CDM projects required various strict and complicated procedures to demonstrate environmental integrity. The principle of "conservativeness" is a concept to intentionally avoid over-estimation of the emission reduction. To ensure conservativeness and eliminate the risk of over-crediting when generating CDM credits, stringent monitoring, reporting and verification (MRV) was required (box 2). This included the development and use of a baseline and monitoring methodology, the development of a Project Design Document (PDD), monitoring of required parameters, and validation and verification.

These CDM requirements in some cases eventually resulted in the loss of emission reduction opportunities due to the lack of capacity of project developers and operators to meet all the requirements and the impact of the requirements on the project transaction costs and performance, leading to slow growth in credit supply. Complicated requirements disincentivized project development especially for small scale projects and resulted in lost opportunities to supply CDM credits.

In a similar manner, the operational rules of the Article 6 mechanisms would influence the volume of credit supply, either negatively or positively.

Box 2. Potential alternative approach to the principle of conservativeness: credit discounting

Instead of relying on stringent MRV requirement, there could be ways to estimate a conservative value of emission reduction. For example, 75% of the verified emission reductions can be credited, while the remaining 25% are cancelled. MRV methodologies may define this discounting approach. Alternatively, discounting can be applied at the credit issuance. In the Article 6 mechanism, cancelling a certain share of verified reductions is considered as a measure to ensure Overall Mitigation in Global Emissions (OMGE) (UNFCCC 2021). In addition, a project consortium can mitigate the operational burden to ensure conservativeness in the credited emission reductions.

Certain efforts were made, however, to mitigate the procedural burden in developing and implementing CDM projects. These included the creation of small-scale CDM as well as the Programme of Activities (PoA)[4] category with less stringent procedures, and the application of various methodology-related tools. The Article 6.4 mechanism should similarly introduce such measures to mitigate the operational burden for project developers without risking environmental integrity.

In sum, negotiators should be aware that the demand for carbon credits is largely determined by the regulations of governments and market mechanisms outside the Paris Agreement. A realistic assessment of credit demand and supply should be used as the basis for negotiators to decide the volume of Kyoto credits (especially CERs issued in the past) to be eligible in the Article 6.4 mechanism (New Climate Institute 2019; Carbon Mechanisms Review 2020; IGES et al. 2020).

4 *PoA simplifies several procedures and reduces the transaction cost and associated time to make them happen under the CDM. See https://cdm.unfccc.int/ProgrammeOfActivities.*

LESSON 2: THE CDM WAS SUCCESSFUL IN BRINGING NEW SOLUTIONS TO REDUCE EMISSIONS, BUT THE ARTICLE 6.4 RULES SHOULD ENSURE OPPORTUNITIES NOT TAPPED IN BY CDM TOO ARE MADE VIABLE, SUCH AS FOR ENERGY EFFICIENCY PROJECTS.

The essence of the carbon market mechanisms is that the market enables the discovery and implementation of lower-cost options to reduce emissions. In this respect, the CDM was successful in bringing new emission reductions opportunities such as HFC23 destruction projects, the destruction of industrial gases such as adipic acid and nitric acid, the recovery and combustion of methane from organic effluent water, etc. These discoveries of emission reduction options are among the key successes driven by the carbon market mechanisms.

However, the CDM also had challenges in scaling up some technology options that are key in bringing about a decarbonized economy – in particular, the option of energy efficiency. Energy efficiency projects not only reduce greenhouse gas emissions, but also decrease energy costs and improve economic efficiency. Although the CDM was initially expected to drive the deployment of energy efficiency technologies, this was not the case. The number of energy efficiency projects in the CDM has been limited because these projects tend to result in relatively low emission reductions if the scale of projects is not large enough.

For example, most energy efficiency and conservation projects on the demand side are small in scale, resulting in emission reductions of less than 10,000 tons of carbon dioxide (CO_2) per year. For CDM projects focused on energy efficiency, the cost/benefit analysis was not attractive: the revenue from CERs was likely to be small despite the high transaction costs required to develop CDM projects (as described earlier). It was also challenging to demonstrate the "additionality" requirements of energy efficiency CDM projects, as these projects showed high profitability on paper and it was difficult to determine if these projects would not have happened otherwise.

Although the CDM was not able to fully tap the potential of energy efficiency due to these challenges, the Article 6.4 mechanism should consider ways to remove these barriers to accelerate decarbonization.

LESSON 3: CONCRETE SOLUTIONS MUST BE DEVELOPED TO INCENTIVIZE SUSTAINABLE DEVELOPMENT CO-BENEFITS THROUGH THE ARTICLE 6.4 MECHANISM.

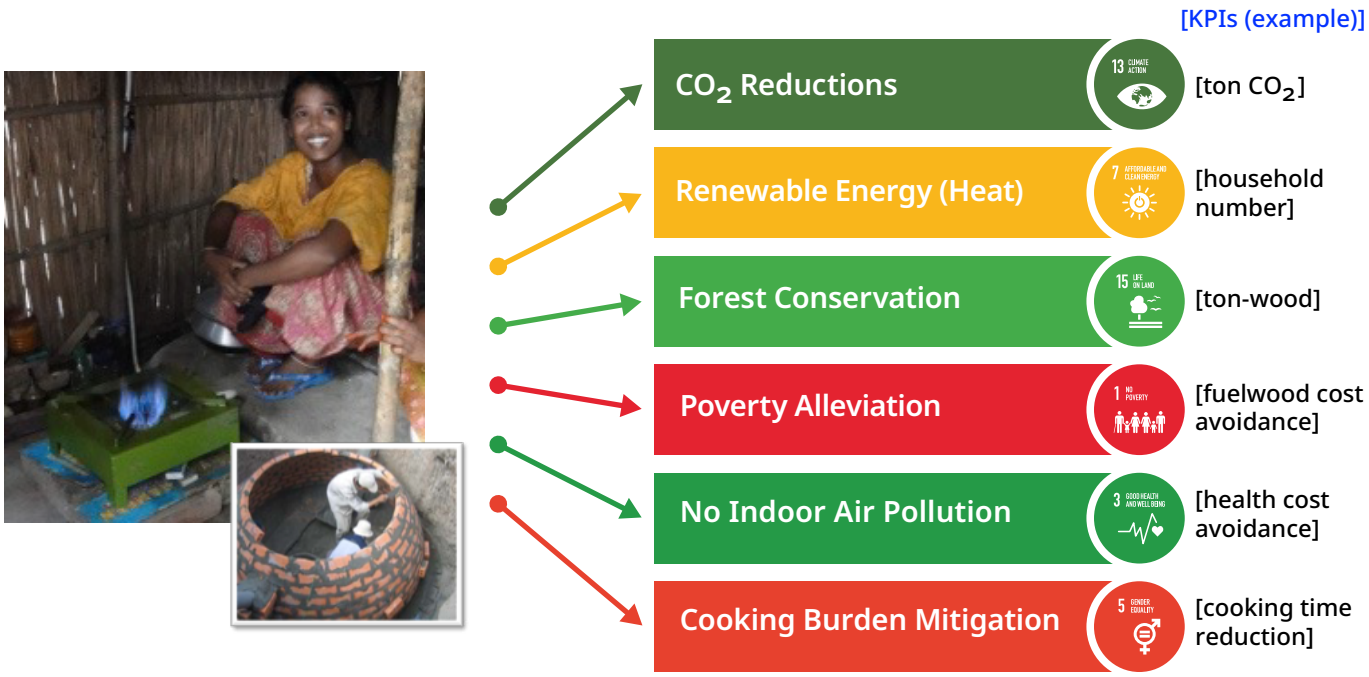
Multiple sustainable development co-benefits can be generated from climate action projects. For instance, domestic biogas digester programmes can contribute to forest conservation, poverty alleviation and other benefits beyond greenhouse gas emission reduction.

Although the CDM was not primarily designed as a mechanism to bring about sustainable development benefits other than reducing CO_2-equivalent emissions, efforts have been made to support these co-benefits through CDM projects, such as through the negative screening of non-sustainable development elements by host countries[5].

A related challenge is that most CDM projects with sustainable development co-benefits are decentralized and small in size, which, as with energy efficiency projects, implies that the cost of generating credits is high. The bundling of such projects through Programmes of Activities (PoAs) helped to ameliorate the cost of implementation and contributed to project development, often in rural areas. For instance, energy efficiency and domestic biogas projects were structured as PoAs, contributing to various sustainable development co-benefits in least-developed countries, such as pollution and poverty reduction in addition to emission reductions (Figure 3).

5 *The CDM also undertook efforts to address the unequitable geographic distribution of CDM project activities at the regional and sub-regional levels*

Figure 3. Sustainable development co-benefits from a domestic biogas digester programme



Public sector institutions generally brought more attention to such sustainable development co-benefits than did private sector companies[6]. Because the private sector was focused on complying with domestic emission regulations (as described earlier), there was a limitation in the CDM to engaging the private sector in creating sustainable development co-benefits beyond emission reductions. This challenge could also arise with the Article 6.4 mechanism, highlighting the need to develop concrete solutions to mainstream the incorporation of sustainable development co-benefits into climate action projects in the market mechanisms (box 3).

Box 3. An idea to incentivize sustainable development co-benefits

To incentivize sustainable development co-benefits in climate action projects, a potential solution would be to create a market system of sustainable development values independent of reductions in CO_2-equivalent emissions. Creating markets for sustainable development values would incentivize the private sector to prioritize developing climate action projects that can bring multiple sustainable development co-benefits. Multiple sustainable development values can be created through a single climate action project, as shown in figure 3 However, developing methodologies to quantify and measure such values would be a challenge.

6 *CDM project consortiums mainly consist of private sector companies in developed countries that were primarily interested in buying CERs. However, since they rarely invested in the project itself to avoid bearing the risk of the project, investment and financing of the project were rather made by the host country companies.*

TAKING STOCK AT COP26

Climate negotiators and policymakers should take a broader perspective in negotiating the design of the Article 6.4 market mechanism. The balance of supply and demand for carbon credits is one of the key determinants for the success or failure of the Article 6.4 market mechanism.

a) Negotiating the rules and modalities is critical. While the demand for credits is influenced by government regulations and market mechanisms outside the Paris Agreement, COP26 is an opportunity to negotiate the operational rules and modality related to the supply of credits – specifically, the carry-over of the Kyoto units towards the Article 6.4 mechanism. Since the negotiation agendas can impact the balance of carbon credit demand and supply, negotiators should be aware of the medium- and long-term impacts of the negotiation outcome on these.

b) There is a need to simultaneously address sustainable development goals. Considering the challenges that remain from the CDM, the Article 6.4 mechanism should address the opportunity to develop energy efficiency (and other) projects that can generate not only greenhouse gas emission reductions but also sustainable development co-benefits. Considering the lack of incentives for the private sector to bring sustainable development co-benefits through the carbon market, concrete solutions should be developed so that climate action projects benefit the other sustainable development goals.

c) In addition to the lessons highlighted in this policy brief, it is noticeable that voluntary markets have been emerging where companies purchase carbon credits to meet their voluntary carbon neutrality targets (World Bank 2021). Voluntary crediting standards have proliferated, and a number of cooperative approaches are also expected to emerge. In this context, buyers of carbon credits would be able to select one of many carbon markets to obtain emission reduction credits, depending on their preferences. These preferences may depend not only on the amount of CO_2-equivalent, but also on other factors such as specific sustainable development co-benefits associated with the projects.

d) Each mechanism needs to strategically define its unique rules and modalities and to design its own characteristics, based on which the buyers of credits will select the market. Currently there is no exception related to this in the Article 6.4 mechanism. In addition, if private sector companies prefer to rely on credits generated under the voluntary crediting initiatives for meeting their carbon neutrality targets, this will reduce the demand for Article 6.4 credits. To prevent such a situation, the Article 6.4 mechanism can differentiate itself from other carbon market mechanisms by integrating solutions for creating sustainable development -co-benefits.

Keeping these considerations in mind, negotiators at COP26 should bring their vision for what the Article 6 mechanism should aim for, and with what particular characteristics.

BIBLIOGRAPHY

Carbon Mechanisms Review (2020). Issue 2: The Transition Controversy – How much CDM should be in the Paris Agreement world? *https://ercst.org/wp-content/uploads/2021/03/20200707-CMR_2020_2_Transition_Controversy_bf.pdf*.

Ecosystem Marketplace (2021). State of the Voluntary Carbon Markets 2021. *https://www.ecosystemmarketplace.com/publications/state-of-the-voluntary-carbon-markets-2021/*.

European University Institute (2020). Informing the Carbon Market Policy Dialogue: The Emissions Trading Systems at a Glance. Brussels. *https://cadmus.eui.eu/bitstream/handle/1814/66753/QM-02-20-213-EN-N.pdf*.

Institute for Global Environmental Strategies, Mitsubishi UFJ Financial Group, New Climate Institute and Öko-Institut e.V. (2020). CDM Supply Potential for Emission Reductions up to the End of 2020. *https://www.iges.or.jp/jp/pub/cer-supply-potential/en*.

International Civil Aviation Organization (n.d.). CORSIA and COVID-19. *https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-and-Covid-19.aspx*.

International Civil Aviation Organization (2021). Update to Scenario Based Analyses of Potential Impacts of Covid19 on CORSIA (Presentation of Executive Summary). *https://www.icao.int/environmental-protection/CORSIA/Documents/CAEP_Update%20COVID-19%20impact%20analyses.pdf*.

New Climate Institute (2019). Offset Credit Supply Potential for CORSIA. *https://newclimate.org/wp-content/uploads/2019/11/Offset-credit-supply-potential-for-CORSIA.pdf*.

United Nations Framework Convention on Climate Change (2021). Article 6 of the Paris Agreement: Informal "Options Paper" by the SBSTA Chair. Bonn. *https://unfccc.int/sites/default/files/resource/SBSTA_Chair_options_paper_Article%206.pdf*.

World Bank (2021). State and Trends of Carbon Pricing 2021. Washington, D.C. *https://openknowledge.worldbank.org/bitstream/handle/10986/35620/9781464817281.pdf*.

EXPERT' BIO

Naoki Matsuo, Principal Researcher at the Institute for Global Environmental Strategies (IGES) and CEO of Climate Experts, Ltd. has been engaged in many Clean Development Mechanism (CDM) methodologies and project developments as well as reviews of National Communications and Biennial Reports / Biennial Update Reports. His first CDM methodology, AM0001, had a significant impact on what a CDM methodology should be. He likes Programme of Activities type decentralized projects, especially in rural least-developed countries.

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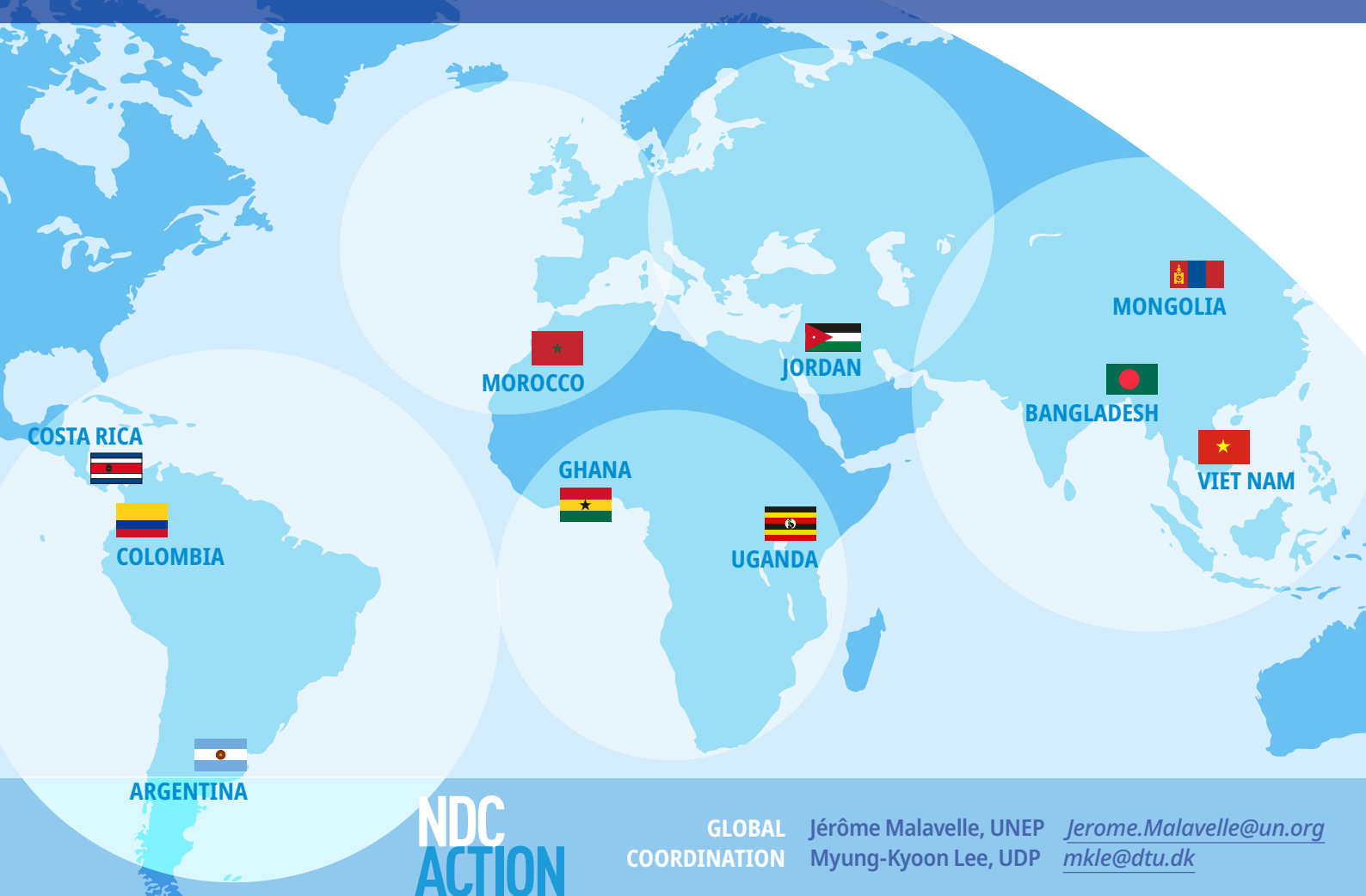
The "NDC Action" Project – jointly implemented by UNEP and the UNEP DTU Partnership (UDP) – supports ten partner countries to translate their Nationally Determined Contributions (NDCs) under the Paris Agreement into concrete strategies and actions ready for financing and implementation, and fosters accelerated public and private investments in sector specific NDC implementation. It builds on three core principles: country ownership, balanced focus between adaptation and mitigation, and integration with national development and climate change priorities.



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