

Transition pathways for the Clean Development Mechanism under Article 6 of the Paris Agreement. Options and implications for international negotiators

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Freiburg, Germany 14.06.2019



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Abbreviations

A6.4ERs	Article 6.4 emission reduction
AILAC	Independent Alliance of Latin America and the Caribbean
AOSIS	Alliance of Small Island States
BMU	The German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety
BR	Biennial Reports
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
Ci-Dev	Carbon Initiative for Development
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CH ₄	Methane
CO _{2e}	CO ₂ equivalent
COP	Conference of the Parties
CP	Crediting Period
CPA	Component Project Activity
DIAN	The National Directorate of Taxes of Colombia (Dirección de Impuestos y Aduanas Nacionales)
DNAs	Designated National Authorities
DOEs	Designated Operational Entities
EE	Energy
ERU	Emission Reduction Unit
ETF	Enhanced Transparency Framework
ETS	Emission Trading Scheme
EU	European Union
GHG	Greenhouse gas
GoK	Government of South Korea
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
I4C	Innovate for Climate
ITL	International Transaction Log
ITMO	Internationally Transferred Mitigation Outcome
JI	Joint Implementation
KAU	Korean Allowance Units
KCU	Korean Credit Unit
KETS	Korean Emission Trading Scheme
KOC	Korean Offset Credit
KP	Kyoto Protocol
LDCs	Least Developed Countries
LPG	Liquefied petroleum gas

LULUCF	Land use, land-use change, and forestry.
MRV	Monitoring, reporting and Verification
MW	Megawatts
N ₂ O	Nitrous Oxide
NACAG	Nitric Acid Climate Action Group
NDC	Nationally Determined Contribution
NEFCO	The Nordic Environment Finance Corporation
NGO	Non-Governmental Organization
ONAC	National Accreditation Body of Colombia (Organismo Nacional de Acreditación de Colombia)
PA	Paris Agreement
PAF	Pilot Auction Facility
PFCs	Perfluorinated compounds
PoAs	Programme of Activities
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SB	Standardized baseline
SBSTA	Subsidiary Body for Scientific and Technological Advice
SD	Sustainable development
SDGs	Sustainable Development Goals
SDM	Sustainable Development Mechanism
SF ₆	Sulfur hexafluoride
SIDS	Small Island Developing State
SISCLIM	National system of climate change
UN	United Nations
UNEP	United Nations Environment Programme
UNEP DTU	UNEP Partnership with the Technical University of Denmark
UNFCCC	United Nations Framework Convention on Climate Change
UN-OHRLLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States
VCM	Voluntary carbon market
WB	World Bank

Acknowledgments

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This study has been supported by Ecoeye Co. Ltd. and benefitted from valuable comments provided by Sangsun Ha and Anna Cho.

Executive summary

The ambitious targets under the Paris Agreement (PA) to keep global warming below 2°C and achieve a balance of emissions and sinks in the second half of the century require significant mitigation investments, already in the short term. However, the current willingness of governments to use low-cost options such as international carbon markets remains limited, and negotiations on the rules for the market mechanisms under Article 6 of the PA are dragging on. This is surprising given that the Clean Development Mechanism under the Kyoto Protocol functioned very well during the 2000s, mobilizing hundreds of billion USD for thousands of greenhouse gas mitigation projects in over 100 developing countries. Private investors in the CDM market feel “let down” by the sudden reduction of government demand for credits after 2011 which led to a fall of credit (CER) prices by 95%. While carbon pricing mechanisms (such as emission trading schemes or carbon taxes) are being implemented (or planned) in a large number of countries, in only a few of them these mechanisms are generating demand for CERs, as for instance Colombia, South Africa and South Korea. This CER demand is, however, lower than in the past, and subject to many restrictions regarding host countries, project types and eligible project developers.

The CDM is the only currently available market mechanism under the UNFCCC that could be immediately used for NDC implementation and that is already operational while the new market mechanisms introduced by Article 6 will need several years to be fully operationalized. Thus, it is necessary to ensure a swift transition of the CDM to the PA in the short term, ideally already at COP 25 in Chile.

Without some criteria for the transition, billions of CERs could flood the market in the near future, with very negative effects in terms of price and credibility. We therefore define a set of criteria for possible restriction of this transition, building on the key elements under discussion by international negotiators. Criteria include cutoff of the eligible CER vintage, according to the registration date of the activity, and exclusion of certain activity types or certain types of host countries. Through differentiated application of these criteria, we develop three pathways, ranging from full CDM transition to strict limitation. Under full transition, total CER volume could reach 15.6 billion until 2030. A 2013 registration cut-off date, coupled with exclusion of industrial gas and large hydro projects, would limit CER volume to 0.89 billion. A November 2016 registration cut-off and limitation to least developed countries (LDCs) and small island developing states (SIDS) would reduce the projected CER volume to just 0.13 billion. In case of a formal termination of the CDM, Article 6.2 would allow bilateral approaches that are based on existing CDM activities. Further qualitative criteria that could be considered are the eligibility of activities outside the NDC coverage, activities that are part of the unconditional part of the NDC, the applicability of standardized methodologies, the need to pass a new additionality test, and the contribution to sustainable development.

We also shed light on possible key administrative requirements, such as a new letter of approval or the need for activity deregistration for the transition in order to assess the potential negative impacts these may have on the transition.

The pathways' impacts are tested on 4 specific case studies - two cookstove PoAs, one renewable energy project in an LDC and a coal power project - and provide useful insights into how specific activities can be affected by the different criteria in place. Particularly the treatment of registration cut-off for PoAs or the related CPAs would make a strong difference.

Ideally, governments of large countries would start an initiative to acquire the accumulated CER surplus to allow an ambition increase of their second NDC to reduce the gap to a pathway consistent with the long-term ambition of the PA. This would require funding comparable to the first round of financing for the Green Climate Fund. Building on the successes of South Korea and Colombia, at the domestic level, governments should introduce carbon pricing mechanisms to incentivize mitigation investments, while allowing for offsetting through emission credits from international market mechanisms to reduce costs for the ambition increase.

1 Introduction

1.1 Background

Article 6 of the Paris Agreement (PA) lays the foundation for a new generation of market mechanisms that can provide cost-efficient solutions for countries reaching their mitigation targets as identified in the Nationally Determined Contributions (NDCs). This new generation of market mechanisms builds upon the experiences and lessons learned from the first generation of market-based mechanisms under the Kyoto Protocol (KP): Joint Implementation (JI) and the Clean Development Mechanism (CDM). In particular the latter achieved an impressive mobilization of the private sector for activities in developing countries that are usually seen as risky and facing many barriers. CDM and JI credits were traded at prices between 15 and 20 USD/tCO_{2e} for the largest part of the period from 2005 to 2011.

However, since the late 2000s the CDM lost international support due to criticisms regarding the additionality of registered activities, lacking sustainable development (SD) co-benefits, inequitable regional distribution and transaction costs being too high, and regulation overly complex. In reaction to these developments, the CDM has undergone a lengthy reform process, where transaction costs were reduced substantially, especially through programmatic activities (PoAs). Also, the level of standardization in the methodological toolkit was increased. These reforms led to tangible results, for instance, by enabling access to the CDM for household and community level activities with high SD impacts, and, as a result, a stronger participation by least developed countries (LDCs) and African countries. Regardless of these reform efforts, the CDM suffered from a massive downturn of demand, mainly linked to the reaching of the maximum import level into the EU in 2011-2012 and a concurrent crash of Certified Emission Reduction (CER) prices after 2012 to below 1 USD per t CO_{2e}. However, several public carbon procurement initiatives emerged to sustain high-quality CDM activities that paid 3.5-8 USD/CER for specific types of activities, mainly PoAs with high perceived SD co-benefits. Also, carbon credits originating from voluntary carbon markets (VCM) projects registered under high-quality voluntary standards have achieved considerably higher prices than secondary market CERs. For example, some projects, including energy efficient household devices, achieved average prices of around 5 USD/tCO_{2e} in 2016. In comparison, the average price of CERs in 2016 was at 1.6 USD/CER (Hamrick and Gallant 2017), with CERs sold on the secondary market with prices mostly at around 0.3 USD/CER.

The future of registered CDM activities is being negotiated in the context of the rules, modalities, procedures and guidelines for Article 6 under the PA. Transitioning from CDM and JI to the new Article 6 mechanisms is under discussion regarding three forms of transition of (a) units (CERs and/or emission reduction units (ERUs)) to be used for NDC compliance purposes under Article 6; (b) registered CDM and/or JI activities to become Article 6.4 activities, and (c) methodologies and accreditation standards from CDM and JI to the new Article 6.4 mechanism. With regard to the

substantive mobilization of the private sector in the CDM, a decision to not allow for a transition would severely reduce trust in the long-term stability of the Paris mechanisms, given that private sector players were told that projects could generate CERs for up to 21 years, and PoAs for up to 28 years¹. Ensuring some form of continuity for CDM projects and programs after 2020 would enable a quick-start of the new mechanisms and scale-up greenhouse gas (GHG) abatement (see also EBRD 2017).

International guidance on the transition of the CDM is required due to key differences between the KP and PA regimes. Under the PA, all countries have their own NDCs and therefore trading of mitigation outcomes will take place in a “capped environment”. This is somewhat similar to the situation under JI, where industrialized (“KP Annex 1”) countries had to account for their trading against their quantified emission reduction targets. Parties to the PA will have to “correspondingly adjust” their emission levels and targets upon transfer of mitigation outcomes to avoid double counting. However, in contrast to the Kyoto regime, the PA relies on bottom-up commitments where the NDCs widely differ in coverage and ambition and also in methodologies, metrics and indicators used. If crediting was to be allowed for mitigation activities implemented in sectors or regarding GHG not covered by the NDC without a corresponding adjustment to emission levels, the situation would resemble the CDM. In this bottom-up regime, safeguarding the environmental integrity of international market-based mechanisms is key and even more complicated than under the KP. The CDM transition must therefore be carefully designed to be in line with the new policy context of international carbon markets.

Unfortunately, COP 24, held in Katowice in December 2018, did not reach an agreement on the rules for Article 6 mechanisms, with the transition question being among the key contentious issues where no progress could be achieved. A number of industrialized countries want to terminate the CDM, while many developing countries want it to continue. COP 25 in Chile in December 2019 is tasked to reach an international agreement on the rules for Article 6 in general, which includes the role of the CDM under the PA. In the run-up to COP 25, the identification of potential pathways for the CDM transition will help negotiators to identify preferred options and associated risks, and to understand the impacts that the different transition pathways will have on private CDM investments.

Currently, investors face great uncertainty regarding their existing investments in CDM activities: many hope that government demand to reach the NDC targets would emerge and drive prices upwards. According to the Climate Action Tracker (2018), the Parties to the UNFCCC face a significant emissions gap between the pledges made in the NDCs and the temperature goals of the PA, as well as between the currently implemented policies and the achievement of their pledges.

¹ For afforestation/reforestation activities the length is up to 60 years

Overall, the gaps between the pathway defined by current policies and the path required to reach the 2°C temperature goal amount to 16-17 billion t CO₂ eq. in 2025 and 24-27 billion t CO₂ eq. in 2030. If policymakers were serious about closing these gaps, market mechanisms would have to play an important role and prices would multiply. But CDM investors could only sustain this hope if their activities and credits would remain eligible.

The current uncertainty in the negotiations has given rise to a number of initiatives that aim to prepare for the Article 6 mechanisms and to test and pilot the potential underlying rules. As negotiators continue to work on the technical subtleties of the rules, pilot initiatives can offer vital insights and experiment with the concepts of international market mechanisms emerging from the climate negotiations and, in turn, usefully inform negotiators with experiences made and lessons learned.

Article 6 piloting is already beginning to move towards operationalization. Buyer countries (e.g. Sweden, Switzerland, and Canada) and multilateral development banks (e.g. World Bank) are beginning to support bilateral cooperation seeking to generate practical experience for Article 6 activities and carbon credit transfers (Greiner et al. 2019). While these remain small, this trend can be expected to grow significantly once UNFCCC rules for Article 6 are clarified and the NDC implementation period starting in 2021 approaches. Countries should actively reach out to active bi- and multilateral Article 6 champions and develop concepts and test potential Article 6 elements and procedures.

Article 6 pilots should ideally be built on existing activities that have a certain level of maturity (in terms of existing processes, institutional capacities available, level implementation). This is especially important if one wants to use the experience from these pilots for shaping the Article 6 mechanisms. In many countries CDM activities can represent an ideal starting point to test Article 6 elements. The lessons learnt from such pilots (e.g. on aspects like additionality, MRV, accounting, avoiding double-counting, environmental integrity, scaling up mitigation and level of international oversight) can help to reduce the time for the operationalization of the new market mechanisms under the PA.

Conducting pilot activities that build on the CDM elements and that achieve fast implementation can also demonstrate how a CDM transition could work in practice and what implication certain rules may have. It can further harness transactional experience, allowing countries (and stakeholders) to better understand the underlying GHG emissions and economic implications of their own targets and how these can be optimally achieved. Several ongoing pilot initiatives are already building on the CDM as they, for instance, make use of CDM methodologies and project cycle as a starting point.

More specifically, pilots can contribute to building up capacity for tracking and accounting for ITMOs, which is the basis for sound NDC accounting. Current pilot initiatives often work towards national-level tracking, MRV, capacity and infrastructure through different approaches, including registries and proposed methodologies for corresponding adjustments. The move towards sector specific, nationally (co)-determined positive lists of technologies pursued by pilots could relieve project developers of

cumbersome project-by-project additionality tests common under the CDM and fits the bottom-up nature of the PA, in which countries define their contributions based on national contexts.

1.2 Key objectives and structure of the report

The main objective of this study is to provide an assessment of possible pathways for the CDM transition under Article 6 of the PA, describing their practical implications and impacts on the global CDM portfolio and its potential eligibility under the PA. The findings of the study will inform international negotiators, as well as private stakeholders, on the main elements for the transition currently under negotiation and that will have impacts on the markets for CDM credits at a global level.

Chapter 2 provides an overview on the current status of the CDM globally and in the context of the Korean Emission Trading Scheme (KETS). This comprises an analysis of the number of currently registered CDM activities, the volume of CERs issued so far, CER prices in various markets, as well as an overview of those domestic markets that drive demand for CERs. This global overview will be complemented by the assessment of the current status and future trends in the Korean carbon market and an overview of the KETS. Based on the largely quantitative assessment of the status of the CDM, the pros and cons of transitioning CERs into the PA regime will be discussed in further detail.

The role of market-based cooperation in the PA and the current status of rule development in this regard is the main focus of Chapter 3. After a short introduction into the mechanisms laid out in Article 6 of the PA, the key issues currently under negotiation and impacting the modalities of a CDM transition are discussed.

Taking into account the current status of negotiations but also the ongoing expert debate on transition modalities, the report develops and discusses three potential pathways in Chapter 4: (1) a full transition of the CDM activities, units and methodologies; (2) a transition under certain limitations and (3) a transition under strict limitations. Also, the “no transition” option is described. For each of the three pathways a set of transition criteria will be discussed, with an increased stringency in the combination of criteria and threshold levels from pathway 1 to 3. Based on an analysis of the UNEP DTU CDM pipeline (UNEP DTU 2019a) and PoA pipeline (UNEP DTU 2019b), the quantitative impacts of the limitation criteria under the different pathways on the volume of CERs eligible under Article 6 will be estimated.

In addition to the quantitative assessment, a qualitative discussion of general rules for mitigation activities under Article 6 that can impact CDM transition is presented in 5. More specifically, the impacts of the decisions related to crediting for mitigation outcomes outside of the host Parties’ NDC or covered by conditional and unconditional NDC targets will be discussed, together with rules on the

standardization of methodologies, rules of baseline setting, additionality and conservativeness of crediting as well as eligibility criteria based on contributions of mitigation activities to SD.

A range of practical implications of the CDM transition is addressed in Chapter 6. Firstly, the likely administrative requirements that will have an impact on the CDM transition will be presented. Secondly, the implications of the lack of agreement on the transition and possibilities how CDM activities could be reframed in the PA context in this case, for instance, through bilateral cooperative approaches, will be discussed. Thirdly, the practical implications of the different pathways will be illustrated on the basis of specific case studies. Finally, the potential role of using CDM activities for piloting Article 6 activities to test specific elements and enable a fast-start of the Article 6.4 mechanism is outlined.

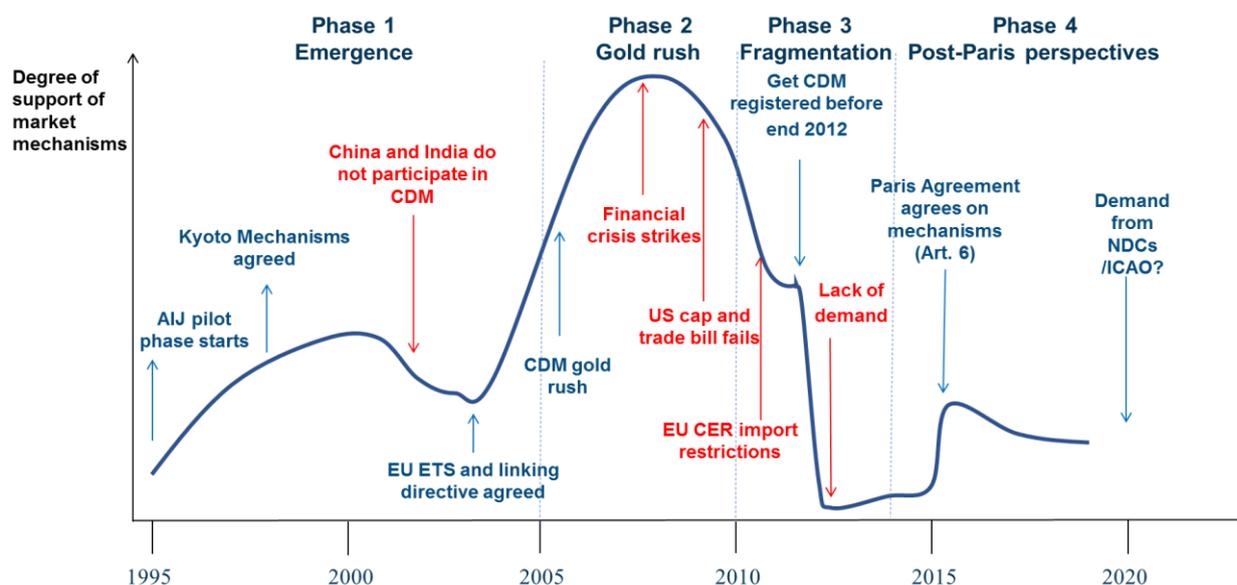
Chapter 7 discusses practical case studies of CDM activities to illustrate the impacts of the different transition pathways. Chapter 8 concludes.

2 Overview of current status of the CDM at global and domestic level

2.1 The Paris Agreement and carbon markets

Since its emergence in the early 1990s, the international carbon market has been a key element of the international climate regime defined by the KP. However, the degree of support it received and its fortunes over time have been varying substantially over time, as presented in Figure 1. In 2015 the PA gave a new strong role to market mechanisms within the new climate regime. While the negotiation on the detailed rules for the implementation of the new generation of market mechanisms (i.e. under Article 6) are still ongoing, carbon markets are increasingly seen as a key element for achieving the ambitious mitigation target of limiting global temperature increase well below 2° C.

Figure 1: Differing fortunes of carbon market mechanisms over time



Note: Blue colors denote positive influence on the markets, red ones negative influences.

Source: authors' elaboration

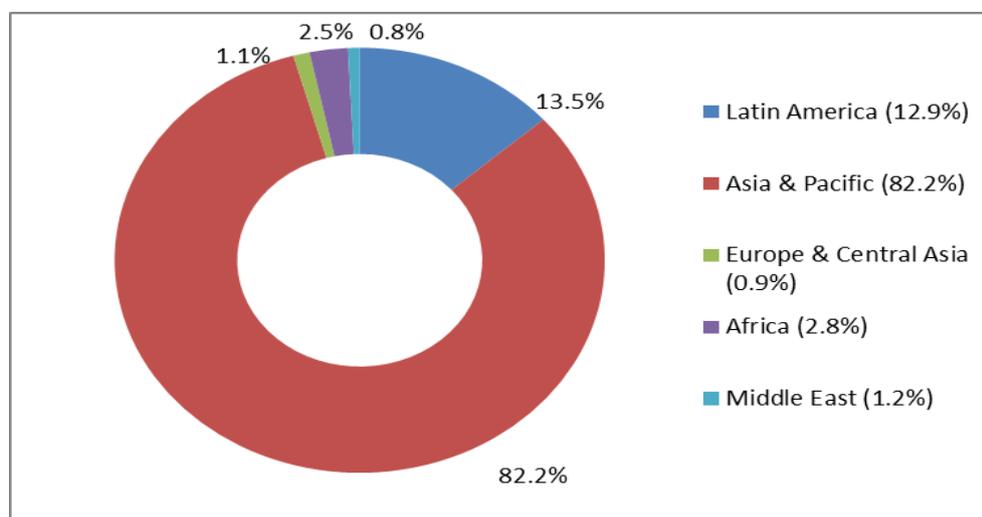
The CDM has been successfully attracting private investment in mitigation actions in many developing countries, mobilizing over 420 billion USD for a total of 7805 projects registered (UNEP DTU 2019a). While it is true that some countries dominated the market, for instance, China and India alone account for the large majority of the total registered projects, almost 100 countries successfully achieved registration of at least one CDM project. Continuation of the CDM under the PA is therefore a key step to strengthen credibility in carbon markets and to support existing investment in mitigation that was made in the past years under more attractive market conditions. It is important to note that

the CDM remains the sole operational UNFCCC-backed market mechanism until 2020, when the PA is due to enter into force.

2.2 Status of the CDM at a global level

Countries of the Asia-Pacific region host the highest number of CDM projects (around 82%), followed by Latin America with 13%, Africa 3% and Middle East and Europe & Central Asia with 1% each. A similar distribution is seen when considering CER issuance. A total of 1.96 billion CERs have been issued from 3179 projects (or 41% of the total) (see Figure 2 for share of projects and of issued CERs). 517 projects are at validation and 10 projects have been deregistered (UNEP DTU 2019a).

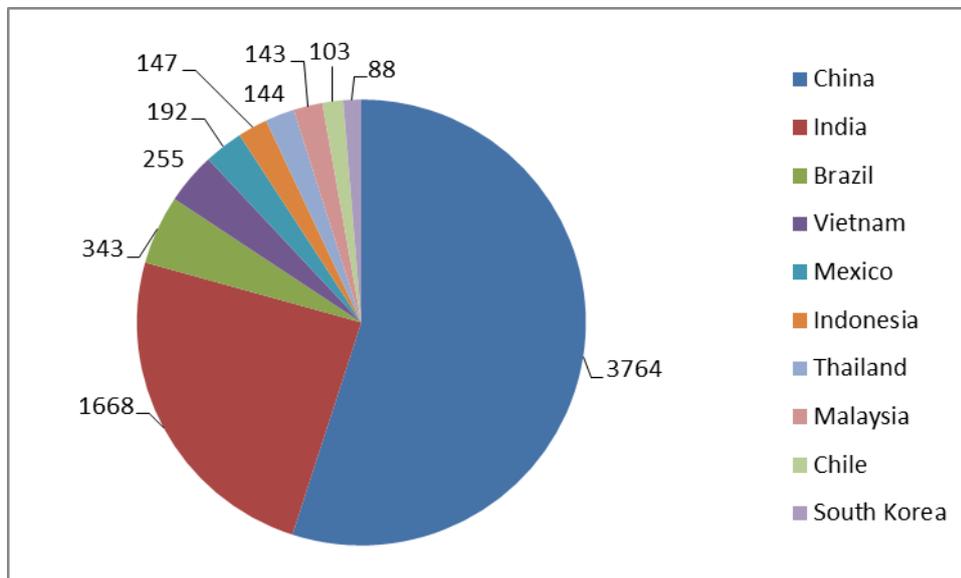
Figure 2: Share of issued CERs by regions (figure in brackets shows the share of projects)



Source: authors' elaboration based on UNEP DTU 2019a

Figure 3 shows project numbers for the ten leading countries.

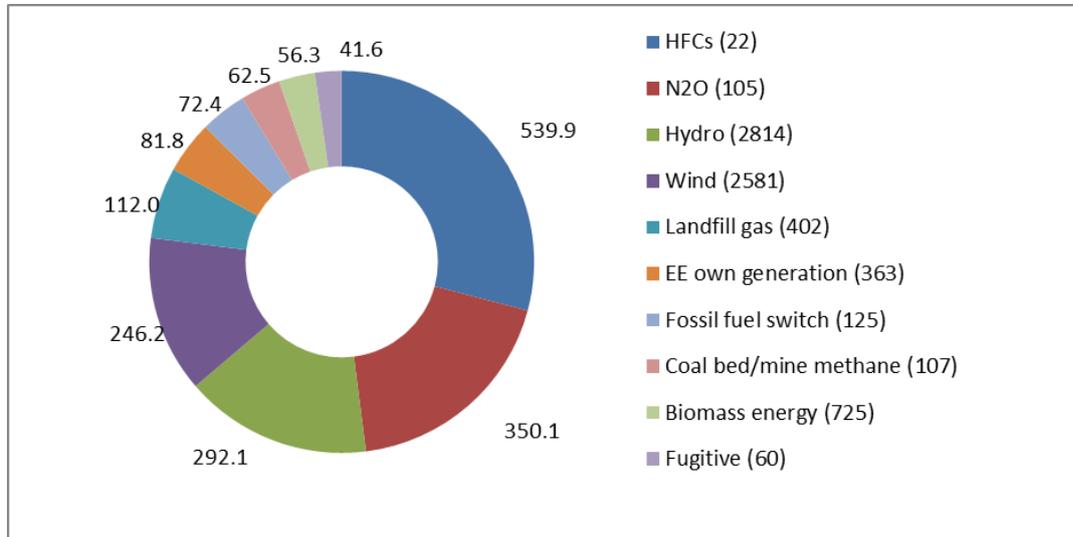
Figure 3: Top ten countries by number of single projects hosted



Source: authors' elaboration based on UNEP DTU 2019a

The most represented sectors are renewables (solar, hydro, biomass, geothermal and wind) totaling 5998 projects, while energy efficiency (EE) (i.e. own generation, households, industry, supply side, service) reaches 707 projects, followed by methane avoidance and landfill gas (taking into account also project at validation stage). Despite hydrofluorocarbon (HFC) representing less than 0.5% of number of projects (22 projects), its share of issued CERs is 27.5% of the total. N₂O projects represent 1.3% of the total project number, but they account for almost 18% of the total CERs. Regarding renewable energies, hydro accounts for almost 15% of total issuance, followed by wind with 12.5%. Biomass energy accounts for only 2.9%. Altogether renewables (including wind, hydro, biomass, solar, geothermal, tidal and mixed renewables) cover over 31% of the total volume of CERs issued. Other key project types are: EE own generation (4.2% of total issuances), landfill gas (5.6%), fuel switch (3.7%) and coal bed methane (3.2%). When considering all types of EE projects, the total issuance increases to 5%. The following figure shows the total issuances by project type for the top ten types. They account for 80% of the total number of registered projects, and for over 94% of the CERs issued.

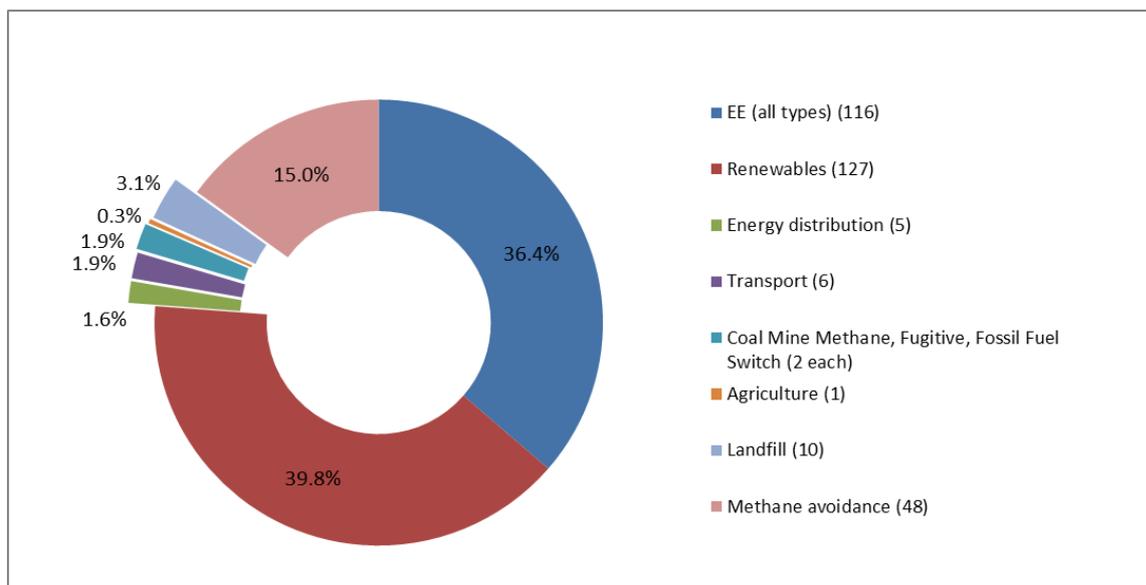
Figure 4: Top ten project types by volume of CERs, million CERs (figure in brackets shows the number of projects)



Source: authors' elaboration based on UNEP DTU 2019a

A total of 319 PoAs have been successfully registered and 1197 CPAs have been included so far. Renewables account for 127 PoAs, or almost 40% of the total, followed by EE, methane avoidance, landfill and transport (both 3%). Details are shown in Figure 5.

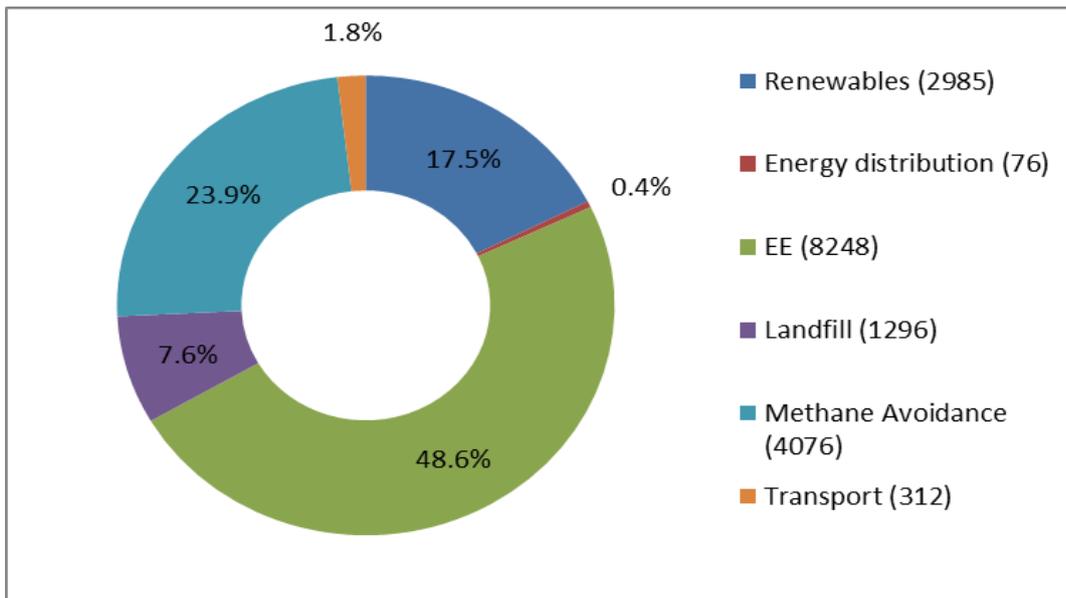
Figure 5: Project type shares in PoA (figure in brackets indicates the number of activities)



Source: authors' elaboration based on UNEP DTU 2019b

Only 57 PoAs issued CERs so far, for a total of over 17 million CERs (UNEP DTU 2019b). The biggest sector issuing CERs is by far the EE for households, with 47.5% of total issued CERs, followed by methane avoidance, solar, landfill gas, hydro and transport, as shown in Figure 6.

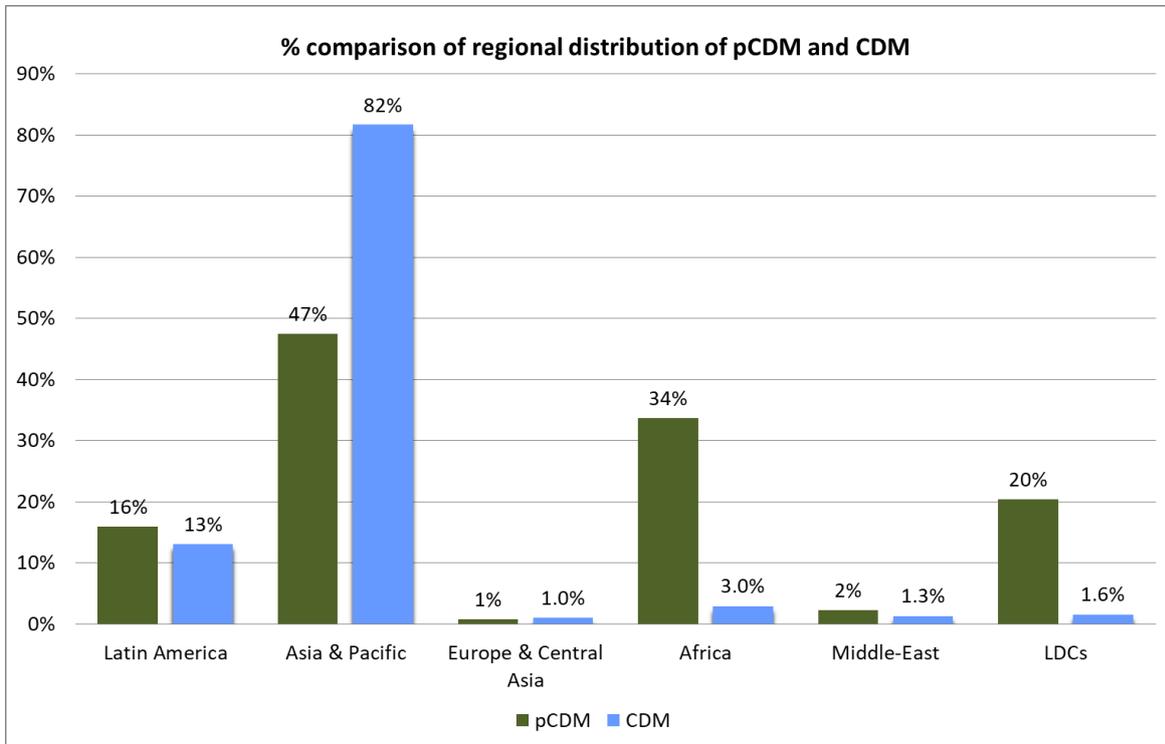
Figure 6: Share of total CERs issued, by PoA type (figure in brackets shows the volume of CERs issued, kCERs)



Source: authors' elaboration based on UNEP DTU, 2019b

The introduction of the programmatic approach and simplified methodologies has played a crucial role in the recent CDM uptake in developing countries that otherwise would have been underrepresented in the global CDM portfolio, such as African countries and LDCs (see Figure 7).

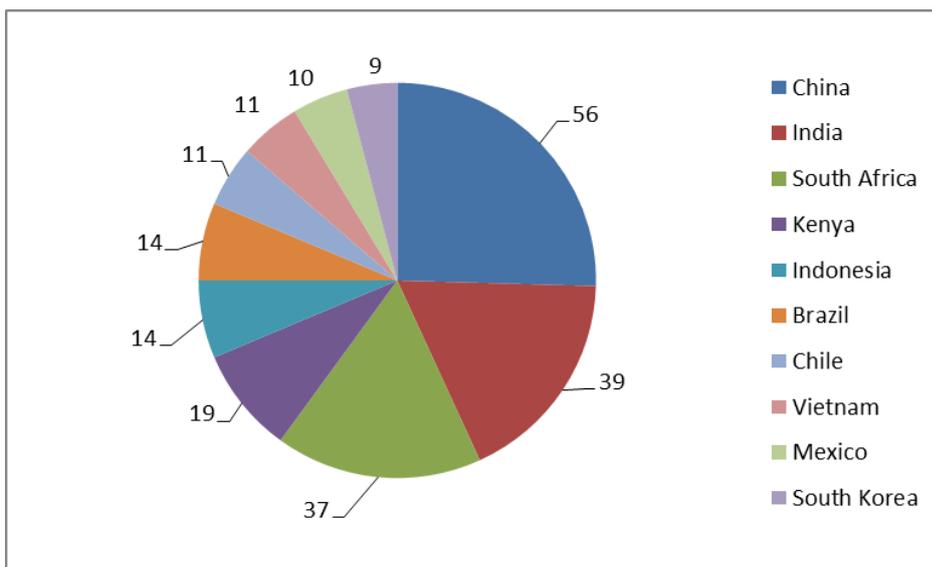
Figure 7: Distribution of CDM projects versus PoAs



Source: UNEP DTU 2019b

The following figure presents the top 10 countries by number of PoAs.

Figure 8: Top ten countries by number of PoAs hosted



Source: UNEP DTU 2019b

An option for cancelling the CERs is available in the CDM registry: a list of available CERs for cancellation is presented and any stakeholder can engage with the project participants to purchase and then cancel the CERs. This allows the credits to be used for other purposes - for instance, under a carbon pricing mechanism (as in the case of Colombia and Korea), or for offsetting the carbon footprint of a company - avoiding the risk of double counting. The voluntary cancellation enabled the CDM to move away from a pure offsetting instrument (as initially conceived) towards the possibility of contributing to global mitigation efforts. Over 19.2 million CERs from projects hosted in South Korea were cancelled and are to be used under the KETS, while around 3.5 million CERs from activities hosted in Colombia have been used for offsetting the domestic carbon tax (UNEP DTU 2019a). Over 39.8 million CERs have been voluntarily cancelled globally.

While there are still new CDM activities being registered, the global market for CERs has been suffering from very low prices since 2011. In many cases, project activities are at risk of being discontinued or cease to issue CERs as the price of CERs is too low. Since the lack of demand is severely affecting the carbon market, different initiatives have emerged for stimulating demand for CERs. Examples include the World Bank's Carbon Initiative for Development (Ci-Dev), the Pilot Auction Facility for Methane and Climate Change Mitigation (PAF), the Nitric Acid Climate Action Group (NACAG), and also domestic procurement programs (Norway and Sweden).

The 'Carbon Initiative for Development' of the World Bank (Ci-Dev) has budgeted 76 million USD to purchase carbon credits from 12 energy access projects in Sub-Saharan Africa (Ci-Dev n.d.) and the CDM will be used as framework for the validation and verification of the emission reductions.

The PAF is a competitive auctioning mechanism piloted by the World Bank. It supports stranded CDM activities providing a higher price than those available in the markets. During the previous three rounds of auctions held so far, the price reached 2.40 USD/tCO_{2e} in 2015, 3.5 USD/tCO_{2e} in 2016 and 2.1 USD/tCO_{2e} in 2017 (PAF n.d.).

Norway has committed to reduce its GHG emissions by 30% relative to 1990 levels. The Ministry of Climate and Environment is therefore mandated to secure carbon credits through the Norwegian Carbon Credit Procurement Program. The program aims to procure carbon credits from vulnerable projects, e.g. at risk of suspending operations due to the current low market prices. Around 46 million CERs have been contracted under the bilateral procurement program and through carbon funds under NEFCO and the World Bank (Government of Norway 2018).

The Swedish governmental program for International Climate Change Mitigation targets to buy up to 40 million tCO_{2e} emission reductions as part of Sweden's national target for 2020. The program is managed by the Swedish Energy Agency and will be implemented until 2022. It is the 6th largest buyer in the CDM market and the 10th largest buyer in the JI market. The program is focusing on up-scaled or sector-based approaches, as well as approaches to result-based climate finance, in collaboration with initiatives by the World Bank, such as the Carbon Initiative for Development and the Transformative Carbon Asset Facility.

The German Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (BMU) launched the Nitric Acid Climate Action Group (NACAG) as part of the global efforts for reducing Nitrous oxide (N₂O) emissions. The NACAG initiative aims to assure global abatement of N₂O emissions from nitric acid production by supporting pre-2020 mitigation efforts and encouraging the regulation of the sector in partner countries after 2020, incentivizing the installation of effective N₂O abatement technologies in all nitric acid production plants worldwide and offering partner countries technical and financial assistance. Eligible countries must demonstrate their commitment in reducing N₂O after 2023. The NACAG will host an auction in which companies will have the opportunity to participate with the possibility to sell their emission reductions NACAG. The auction price will be between 8 USD to 15 USD per carbon credit. All credits must be CDM CERs, or Verified Carbon Standard Units (WB 2019).

Climate Neutral Now is an initiative launched during the 2015 UN Summit in New York with the aim of involving all level of stakeholders including individuals, governments, companies, and organizations to achieve a climate neutral world by mid-century. Climate Neutral Now encourages different parties to be conscious of their GHG emissions and provides CERs to offset them (UNFCCC n.d.).

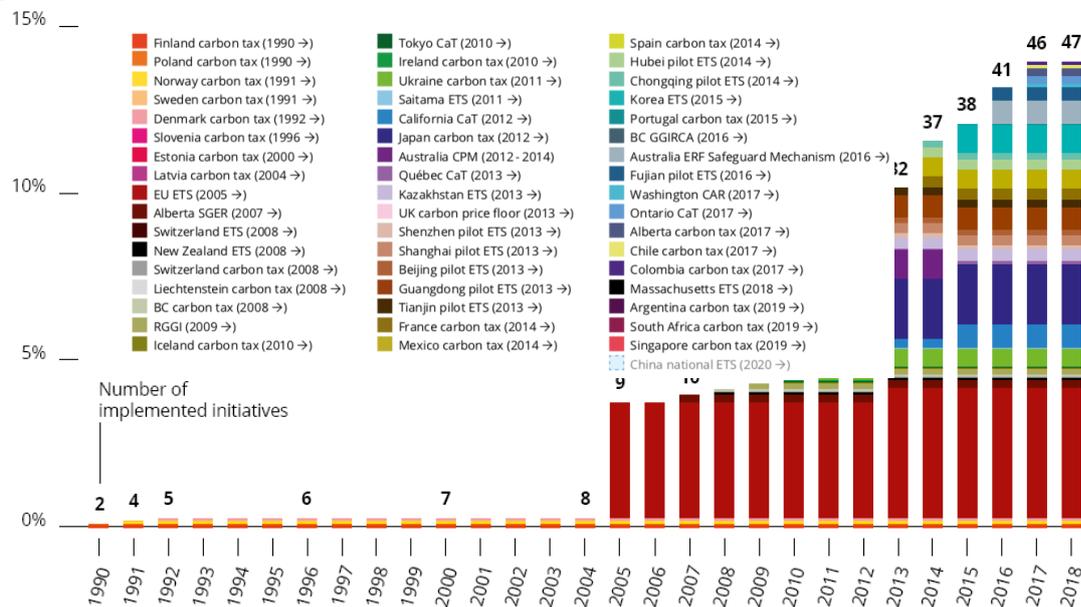
The Voluntary Market is represented by those transactions between stakeholders that generate and trade emission reductions certified by a voluntary standard. These credits are not used to meet compliance obligations under international or domestic schemes. A broader range of prices is available in the voluntary market: as reported by Hamrick and Gallant (2018), in the first quarter of 2018 credits have been exchanged at average price of 2.4 USD/tCO₂e with actual prices ranging from as low as 0.1 USD to 70 USD /tCO₂e. Cumulative issuances have exceeded 438 million tCO₂e from over 2000 projects in a wide range of sectors.

2.3 Carbon pricing mechanisms and the role of offsetting in stimulating CER demand

Carbon pricing instruments are becoming prominent elements in the climate policies implemented by both developed and developing countries to reduce GHG emissions. Carbon pricing through emissions trading systems (ETS) or carbon taxes is a cornerstone of mitigation policies, as in a distortion-free economy it is the most efficient way of mobilizing GHG mitigation activities. Some countries such as Finland, Norway and Sweden have taxed carbon for over 25 years. A number of emerging economies have recently introduced carbon taxes and several more are in the process of doing so. Globally, the number of carbon pricing instruments is continuously increasing. As of 2018, 47 jurisdictions have put in place some form of explicit carbon pricing covering about 15% of global GHG emissions, up from less than 5% in 2005

Figure 9). The popularity of carbon pricing instruments is due to the fact that they are seen as effective and efficient tools to facilitate least-cost compliance with environmental targets.

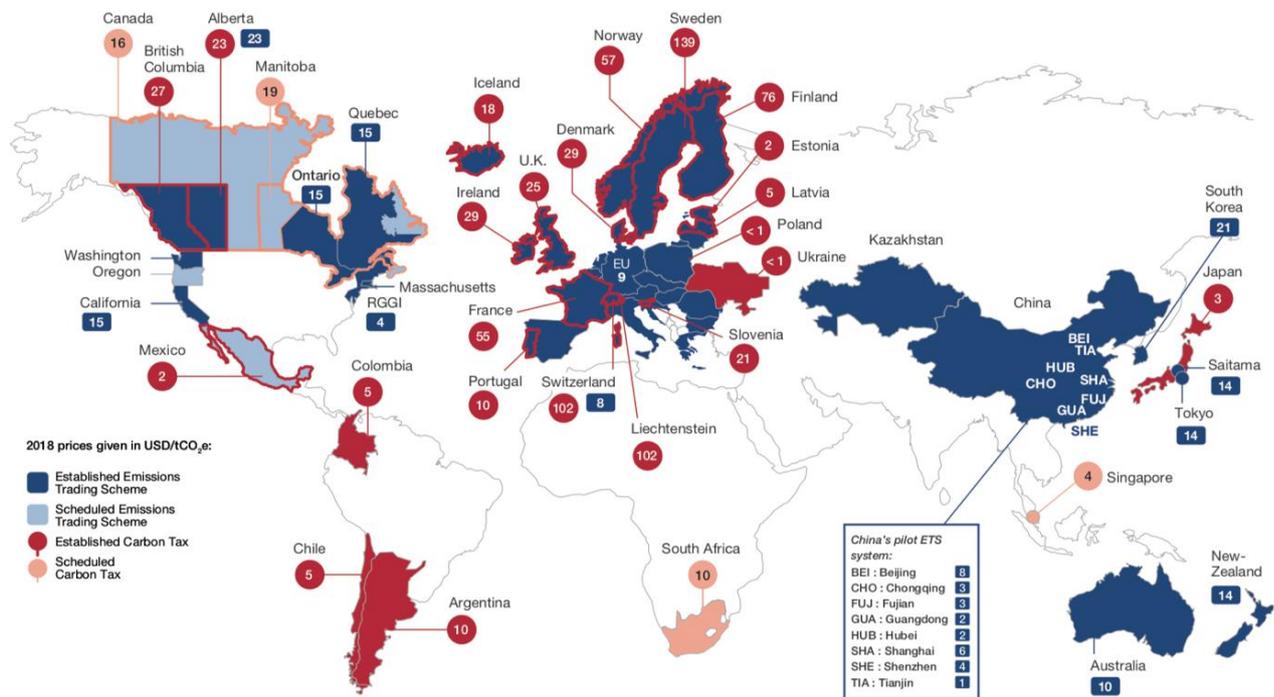
Figure 9: Growth of carbon pricing schemes around the world



Source: World Bank and Ecofys (2018)

Carbon pricing around the world can be expected to grow further as 88 countries, representing more than 50% of global GHG emissions, explicitly stated the intent to utilize carbon pricing as a tool to meet their commitments under the PA (World Bank and Ecofys, 2018). According to the High-Level Commission on Carbon Prices (2017), carbon prices of at least 40–80 USD /tCO₂e by 2020 and 50–100 USD /tCO₂e by 2030 will be necessary to reach the objectives of the PA.

Figure 10: Landscape of carbon pricing around the world as of 2018



Source: IACE (2018)

Most of the carbon pricing initiatives allow offsetting: entities can reduce their exposure to a carbon tax or under an ETS by surrendering emission reduction units. Allowing offsetting using CERs from CDM activities can trigger demand at domestic level. Economic viability for offsetting depends on the cost of the CERs and the cost imposed by the carbon pricing mechanism. Different design options are possible for offsetting: from limitations on the total volume eligible under the carbon pricing mechanism, to eligible credits, eligibility of domestic activities or of activities implemented abroad etc. The following section presents the case of Colombia, where a carbon tax (with offsetting) is in place and an ETS is also planned for implementation.

2.4 Carbon pricing in Colombia

Colombia has declared its intention to reduce GHG emissions by 20%, i.e. 224 million tCO₂e, against the 2010 Business-as-Usual scenario by 2030 (Government of Colombia, 2015). In order to achieve its commitments, the government of Colombia approved the National System of Climate Change (SISCLIM, from the Spanish acronym) with the Decree 298 in 2015. The SISCLIM introduces a common platform for stakeholders (state actors, private sector organizations, and NGOs) to cooperate for the implementation mitigation activities (Carbon Trust et. al., 2018). In 2016 Colombia

passed a national carbon tax which is levied on sales and imports of fossil fuels, excluding coal. The National Directorate of Taxes of Colombia (Dirección de Impuestos y Aduanas Nacionales, DIAN) is responsible for collecting revenues and administration related tasks. The Ministry of Environment and Sustainable Development manages the emissions reporting and the accredited entities. The tax came into force in 2017 and covers 16% of Colombia's total emissions and 50% of the emissions generated from fossil fuels (Carbon Trust et al., 2018). Colombia's carbon tax rate was fixed at 15,000 COP/ tCO_{2e} (approx. 5 USD/tCO_{2e}), with a plan to increase annually by 1% (plus inflation) until a level of 10 USD/tCO_{2e} is reached.

The tax is imposed on all fossil fuel uses for energy and for combustion and includes sales made within the national territory, fuel extraction for self-consumption, and import fuels. Gasoline, kerosene and jet fuel, diesel and fuel oil are taxed independently from their final use. Natural gas is subject to the carbon tax when it is only used by industries, while LPG is taxed when it sold to industrial users (MADS 2017; Carbon Trust et al, 2018). A fine is imposed on companies that fail to comply with the tax obligations, which can reach up to two times the value of the emission generated under the tax scheme (Carbon Trust et al, 2018).

Decree 926 gives entities the possibility to achieve partial and total carbon tax exception (Government of Colombia 2017). It allows entities to compensate for their emissions by investing in domestic mitigation activities. An entity can be certified as "carbon neutral" if it compensates the full amount of emissions that are covered by the carbon tax through domestic mitigation activities implemented after 2010. Emission reductions from domestic mitigation projects must be verified by DIAN before they are used as carbon offset under the tax. Projects are required to comply either with CDM methodologies or be certified under a carbon standard that includes the verification from a third party accredited by the UNFCCC or by the National Normalization Body; or meet the REDD+ requirements (Carbon Trust, et. al., 2018). Participating entities applying for carbon offset should submit "Voluntary Cancellation Certificates" and a "Declaration of Verification" before the tax compliance deadline. A Voluntary Cancellation Certificate is issued when one credit is cancelled in its own certification program. This ensures that there is no double counting as the Cancellation Certificate is issued before the credits enter the National Emission Register. Verifications issued by CDM-certified bodies (i.e. the Designated Operational Entities) are accepted only until 31 December 2018. After that date, only Declarations of Verification issued by an authorized verification body accredited under the National Accreditation Body of Colombia (Organismo Nacional de Acreditación de Colombia ONAC) will be accepted (Carbon Trust, et. al., 2018). Around 3.6 million CERs have been cancelled for offsetting the carbon tax liability.

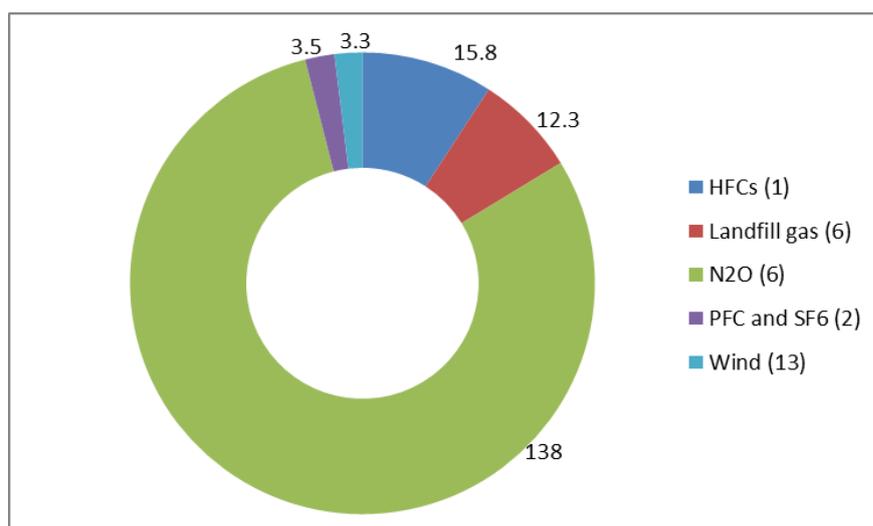
2.5 Status of the Korean carbon market

2.5.1 Carbon market in South Korea

South Korea, given its rapid economic growth from the 1990s, is among the world's top ten emitters with overall greenhouse gas emissions in 2016 at 694 million tCO₂e (excluding land use, land-use change, and forestry (LULUCF)). The energy sector is responsible for the largest share of GHG emissions, with 604.8 million tCO₂e emitted in 2016, accounting for 87% of the total emissions.

South Korea has been strongly involved in the implementation of CDM activities. A total of 88 projects hosted in South Korea have been registered as of April 2019. 59 projects issued over 174.5 million CERs so far. 4 SF₆ projects have been deregistered (UNEP DTU, 2019a). The top 5 project types, in terms of CERs issued, are shown in the following figure.

Figure 11: Top five sectors of Korean CDM by volume of CERs issued, million CERs (the figure in brackets shows the number of projects)



Source: authors' elaboration based on UNEP DTU 2019a

There are 7 PoAs registered in South Korea, however none issued CERs yet. In terms of sectors, 4 PoAs are targeting solar energy; methane avoidance, hybrid renewables and EE service sectors are represented as well (1 PoA each).

The Government of South Korea (GoK) ratified the PA in November 2016. The NDC of South Korea established the country's commitment to reduce GHG emissions by 37% from the BAU scenario which estimates emission at 851 million tCO₂e in 2030 (GoK, 2015). The target includes 25.7% GHG reductions to be achieved through domestic measures and 11.3% to be achieved through the use of

international carbon markets and emission reduction credits. The GoK developed a Roadmap 2030 to define the detailed implementation plan of the domestic measures, and a revised version in 2018 (GoK, 2016). The Roadmap reduced the use of international credits to only 4.5% while the domestic interventions account now for the remaining 32.5%. The target of 4.5% can be reached by a combination of international credits (under Article 6) (i.e. 16.2 million tCO₂e) and LULUCF (i.e. 22.1 million tCO₂e).

2.5.2 The Korean Emission Trading Scheme

The Korean ETS (KETS) was launched in 2015 covering 524 companies, now increased to 591, accounting for around 67% of national emissions. South Korea became the second nation in Asia to introduce a nationwide cap-and-trade program and became the world's second largest carbon market after the EU ETS. The KETS covers companies that emit 125,000 tCO₂e/year or more and individual installations that emit 25,000 tCO₂e/year or more. It covers CO₂, CH₄, N₂O, PFCs, HFCs, and SF₆ from energy, industry, building, transportation, waste and aviation. Voluntary participation is also allowed.

Flexibility measures have been introduced in the KETS, such as borrowing, banking and offsetting through emission reduction credits as well as market stabilization measures (such as allowance reserves, allowances for new entrants,) to ensure market liquidity and to control price trends. Borrowing is allowed but was initially limited to 10%. It has since been increased to 20% (during Phase I) and it is, from 2019, set at 15% and future banking will be limited based on the formula: *[Borrowing limit of previous year – (“borrowing ratio” in previous year x 50%)] / entity’s emission volume* (ADB, 2018). Banking is allowed but limited across Phase I and Phase II: covered installations are allowed to carry over 20,000 Korean Allowance Units (KAUs) plus 10% of the annual average allocation. Banking will be further limited in Phase III applying the higher limit between the net amount of allowances sold per year in Phase II and the company limits of 250,000 KAUs (or 5000 KAUs for each facility).

During Phase I, allowances were freely allocated to minimize the economic burden and to avoid negative impacts on the international industrial competitiveness. The cap was set 1685.5 million tCO₂e. Phase I of the KETS suffered low liquidity given the risk-adverse attitude of covered companies which led to accumulation of surplus KAUs and policy uncertainties. The market experienced several price increases (see following section) due to shortage of allowances and the GoK had to activate the supply of stabilization reserves on two occasions.

Auctioning was introduced during Phase II in 2019, with companies receiving 97% of their allocation while the remaining share will be allocated. The share of allocated allowances will increase up to 10% in the following Phase III. However, both energy-intensive and trade-exposed sectors will

receive free allowances in all Phases. Allocation of allowances is moving away from systems based on historical emissions towards a benchmark approach to consider the carbon intensity of different sectors. Already during Phase I, the benchmark approach for the allowance allocation was introduced for three sub-sectors (grey clinker, oil refinery, and aviation). During Phase II, a total of 28 sub-sectors will follow the auctioning process for the KAU allocation. Phase I ended in August 2018 with a surplus of 1.62 million tCO_{2e}. During Phase II, total allowance allocation has reached 1796 million tCO_{2e}. 1777 million KAUs will be allocated to emitting entities, 134 million KAUs are allocated to reserves for new entrants, and 19 million KAUs to market stability measures.

Offsetting is permitted as well: during Phase I, however, only CERs from CDM activities hosted in South Korea (or credits from domestically certified projects) were eligible under the KETS. From 2018 the GoK also allowed the possibility to utilize CERs from activities implemented abroad with investment by Korean entities, up to 5% of an entity's compliance obligations. Some observers estimate the potential for CERs under the KETS at around 30 million tCO_{2e}. The reasons for allowing the use of CERs from activities implemented abroad, anticipated by the GoK to occur from 2021, are multiple: high price of the mitigation measures at domestic level; low liquidity in the KETS; and generation of internal expertise by Korean companies on the implementation of overseas mitigation activities under international mechanisms such as the CDM. The GoK has introduced the Korean Offset Program to allow for domestic carbon offsets credits, the so-called Korean Offset Credits (KOC). KOC are generated from domestic activities not covered under the KETS, and can be used either for compliance or trading within the KETS only after conversion, on a one-to-one basis, to Korean Credit Units (KCU). Similarly, CERs must be cancelled in exchange for KOCs before use under the KETS.

As of March 2019, over 19 million CERs have been cancelled to be used under the KETS. Cancellation in exchange of KOC occurred in several sectors: renewables (wind, tidal, solar, hydro), SF₆, N₂O (both adipic and nitric acid), and landfill gas. 15.4 million tCO_{2e} (68.5% of the total KOC issued) have been traded or used.

Learning from experiences generated during Phase I, when a limited number of players was active in the carbon market due to the fact that only participants in the KETS can have holding trading accounts, the GoK decided to allow also other entities, the so called "market makers" to participate in the trading to stimulate the market and increase liquidity. The market makers are three banks: the Korea Development Bank, the Export–Import Bank of Korea, and the Industrial Bank of Korea (ADB, 2018). These players will receive 5 million KAUs (out of the 19 million for market stability).

2.5.3 Evolution of the KETS

The KETS has shown the capacity to adapt itself to both internal and external factors that affected its functioning. The regulator is constantly seeking increased efficiency and the economic incentive for mitigation, as well as allowing flexibility with the use of domestic and international credits. The limitation on banking is one measure that will incentivize trading and will force companies to seek cost efficient solutions in the market to comply. The possibility for non-covered entities (the three “market makers”) to trade as third party agencies goes in the same direction. The phased introduction of the auctioning process in a broader number of subsectors is another measure that aims at increasing efficiency and can drive demand for CERs, provided that the differential between the price of KAUs auctioned and price of CERs is sufficiently large. So far no KOC from the conversion of CERs has been used under the ETS.

The decision to grant eligibility to CERs from CDM activities hosted abroad opens new market opportunities for investments in activities that go beyond those registered in South Korea, opening the door to investment in CDM activities in foreign countries, with the possibility of targeting high quality CDM activities. Emission reduction units from activities implemented abroad can be used to contribute to the NDC mitigation target, however, the CDM is the only operational mechanism accepted.

Regarding prices, KAUs are traded at a relatively high value. Since mid-2017, KAU’s price reached around 17 USD (21,000 KRW) and since then it has increased to around 25 USD (30,000 KRW), as shown in Figure 12.

Figure 12: Prices and trading volumes in the KETS (Source: Ecoeye, 2019)



In this context, investment in new overseas CDM projects with lower mitigation cost (compared to domestic measures) is an attractive option for investors. Even if transition rules for the CDM are not yet agreed, many Korean investors are focusing on projects in LDCs delivering strong benefits in terms of SD with a view on their potential use under Article 6.4 mechanism. The GoK has set a limit of 4.5% on the use of international credits to comply with the national mitigation targets under the NDC. While this limit can be revised for a less stringent one, it already provides some incentive for investors to utilize credits from overseas project. As mentioned, several measures are in place for stimulating trading and provide economic incentive for mitigation activities (i.e. reduced surplus of KAUs and controlled price increases). These conditions will also favor investments in offset activities as demand for offset credits could be naturally satisfied by existing stranded CDM activities.

Stronger demand is, however, linked to the possibility of using CERs, also within the PA, hence the importance of ensuring that this option is available and the CDM is transitioned under the PA. Further details on the pros and cons of the CDM transition are discussed in the following section.

2.6 Arguments for transitioning the CDM

This section will describe the key arguments in favor of transitioning the CDM under the PA including: trust building, preserving existing knowledge, providing a stimulus for new mitigation activities.

2.6.1 Trust building - Providing certainty for existing investments and safeguarding the long-term horizon

One prominent argument in favor of the CDM transition is the need to preserve existing mitigation investments and their mitigation contribution. The CDM successfully contributed to the creation of a functioning carbon market by attracting private investors at scale and catalyzing resources in a broad number of sectors and countries (see above). The CER price crash in many cases prevented the issuance of CERs from registered activities. Transition to the PA would create new CER demand over the next years reviving these revenue streams that otherwise would not be available to investors.

Overall, the transition of the CDM into the PA would send a strong signal to the private sector regarding efforts made at international level to support demand for existing mitigation investments (in CDM), despite the difficulties and lengthy processes of the transition (negotiations, setting the detailed rules); it would therefore be a crucial trust enhancing measure.

2.6.2 Preserving knowledge

Many investors are already familiar with the methodologies and MRV requirements applied under the CDM. Utilizing these existing elements can limit the associated transaction costs resulting from completely new requirements. This would prevent the need for large scale capacity building exercises and reduce unnecessary outlays for consultancies.

2.6.3 Stimulus for new mitigation activities in the short term in the context of PoAs

A transition of CDM activities (not considering potential eligibility based on registration date) would allow the inclusion of new CPAs under existing PoAs also in the future. This would enable private investors to continue investing in new mitigation activities (CPAs) that can generate emission credits eligible under the PA (only limited by the lifetime of the underlying PoA and the crediting period of the CPA). CPAs could be included with limited investment in time and resources, given the lower transaction costs associated compared to projects. This would provide an alley for early movers to combine mitigation investments with credit generation under the PA. Currently, CDM is the only operational tool under the UNFCCC that is available for the generation of credits under an international climate agreement. Eligible PoAs may therefore stimulate new investments in CPAs well before the actual rules and procedures for the new market mechanisms will be agreed, as the negotiation process is likely to take 2 to 5 years before achieving an agreement on the implementation rules for new market mechanisms. Ensuring the transition of CDM activities would grant the possibility of new investments in mitigation within the CDM framework, considering also the

limited transaction costs associated with the inclusion of a new CPA, which is significantly simplified and less resource-consuming compared to the registration of a brand-new activity.

2.7 Potential drawbacks of a CDM transition

This section discusses arguments against a CDM transition, i.e. mainly negative effects on price levels and potential lack of credibility.

2.7.1 Negative effects on price levels

The CDM transition, depending on the volume of eligible CDM activities and CERs, could result in a large volume of CERs being available in the market. Considering the current CDM portfolio (see Section 4), if unrestricted transition is allowed, it would result in several billion CERs that could be used under the PA for the achievement of the NDC targets. Unless governments would ramp up demand significantly, this would result in an excessive supply of credits which would keep CER prices low, potentially for years, and would very likely prevent new investments in mitigation actions. Criteria that will govern the CDM transition should take this issue into account and prevent the flooding of the markets with an excessive volume of CERs.

2.7.2 Potential lack of credibility of CERs

Another challenge of a CDM transition relates to the level of credibility that needs to be ensured for emission reductions from existing CDM activities. Many CDM activity types have been contested on social and environmental grounds or for their limited contribution to SD beyond emission reductions. This is the case, for instance, for large hydropower plants, industrial gases (i.e. HFCs and N₂O from adipic acid production), or large coal-based power projects.

Negotiators should be addressing these issues carefully, to avoid undermining the environmental integrity of a CDM transition, and ultimately negatively affecting the credibility of market mechanisms under the PA. Environmental integrity, although explicitly mentioned, is not clearly defined either in the Kyoto Protocol or in the PA. Hence different interpretations are possible. For the purpose of this report, we understand environmental integrity to relate to the stringency of the baselines, to avoid use of “hot air”, and to the additionality check to ensure that only activities that would not be implemented without the support provided by the instrument under Article 6 are generating emission reduction units.

3 The Paris Agreement and the role of its market mechanisms for the CDM

3.1 The market mechanisms under Article 6 of the Paris Agreement and their key design elements

The PA which entered into force in November 2016 is the successor of the KP. With its aim of keeping global warming below 2°C, and its specific target to achieve a balance of sinks and greenhouse gas (GHG) emissions in the second half of the century, it is very ambitious. However, it builds on a “bottom up” structure and specifies that each country shall communicate a Nationally Determined Contribution (NDC) for greenhouse gas (GHG) mitigation. NDCs are to become more stringent over time through a “ratcheting up” process. NDCs will kick in from 2020, and are to be updated every five years. The detailed rules underpinning the PA were scheduled to be agreed before the end of 2018.

Article 6 of the PA provides three modalities for voluntary cooperation between Parties with regard to mitigation:

- ◆ Bilateral so-called “cooperative approaches”, under Article 6.2. Parties agree on the specific modalities of activities to generate internationally transferred mitigation outcomes (ITMOs). The modalities of transfer and accounting for these ITMOs will have to be consistent with the guidance on cooperative approaches. The key pillar of this guidance is the reporting and review process with regard to the “corresponding adjustments” that selling and buying Parties will be required to apply to the emissions inventories and/or NDCs to ensure there will be no double counting of mitigation outcomes.
- ◆ A centralized baseline-and-crediting mechanism under the auspices of the UNFCCC specified in Article 6.4. This so-called “Article 6.4 mechanism” will lead to the certification of Article 6.4 emission reductions (A6.4ERs). The mechanism will be governed by a Supervisory Body and in its activity cycle it shares many similarities with the CDM.
- ◆ A framework for non-market based approaches under Article 6.8. This is intended to be a federative instrument to enhance synergies and promote implementation of approaches that do not involve the transfer of emission credits. Its exact role and relation to different climate finance institutions and programs remain unclear. We will not discuss it further in this study.

For the last three years, negotiations have tried to develop a detailed set of rules for the Article 6 mechanisms but have failed to date. We discuss the key aspects of these negotiations in the following section.

3.2 Status of negotiations on Article 6.2 and Article 6.4 with regard to CDM transition

3.2.1 Article 6 as the glaring gap of the PA rulebook

COP24 in Katowice 2018 adopted a large part of the “rulebook” of the PA with the enhanced transparency framework (ETF) as its centerpiece. Despite substantial progress in the first week of negotiations, no agreement could be found on the guidance under Article 6.2 or the mechanism under Article 6.4. Therefore, Article 6 can be seen as the “glaring gap” of the Paris rulebook. Finalizing the rules, modalities, procedures and guidance on Article 6 at COP25 in 2019 is a precondition to operationalize cooperative approaches and the Article 6.4 market-based mechanism in the first NDC implementation period.

In the general reflections on COP24, the failure of the Article 6 negotiations is mainly attributed to the Brazilian determination to not apply a corresponding adjustment for the initial transfer from the Article 6.4 registry, and calling for full CDM transition. In reality, however, the inability of Parties to reach consensus must be seen in the context of diverging interests between upper middle-income countries and emerging economies on one side, and Least Developed Countries (LDCs) on the other. The African Group and LDCs for instance stressed the importance of facilitating broad Article 6 participation and signalled the risk of overburdening developing countries. Their concerns can be understood from the CDM-era, where many LDCs and African countries were on the side-line of CDM markets when the markets thrived.

The first week of COP24, negotiations were held under the Subsidiary Body for Scientific and Technological Advice (SBSTA). At the end of the week, Parties concluded negotiations on draft versions (hereinafter called: SBSTA text) they submitted to the Conference of the Parties serving as the meeting of the Parties to the PA (CMA) for the supposedly final round of negotiations (SBSTA 2018a,b). In the second week of negotiations, the COP Presidency produced iterations of text in close coordination with co-facilitating ministers and the SBSTA chair. A first “Presidency text” was published on December 13th. On December, 14th two draft negotiation texts were produced for Article 6.2 and Article 6.4 nominated “FCCC/CP/2018/L.24” and “FCCC/CP/2018/L.25” (UNFCCC 2018c, d). These texts faced stiff opposition from several Parties and were deleted from the online document repository of the UNFCCC. The final iteration of text on Article 6.2 and Article 6.4 was presented as part of the “Katowice texts” on 14 December at 10:00 (UNFCCC 2018e).

The first session of the CMA concluded with a purely procedural decision on Article 6 of the PA. In this decision, SBSTA is mandated to continue negotiations in order to forward its recommendations to the second session of the CMA for adoption by COP25 in December 2019. Both, the SBSTA text and the Presidency text, are referenced as basis for the upcoming negotiations (UNFCCC 2018a).

3.3 Key negotiation issues regarding CDM transition

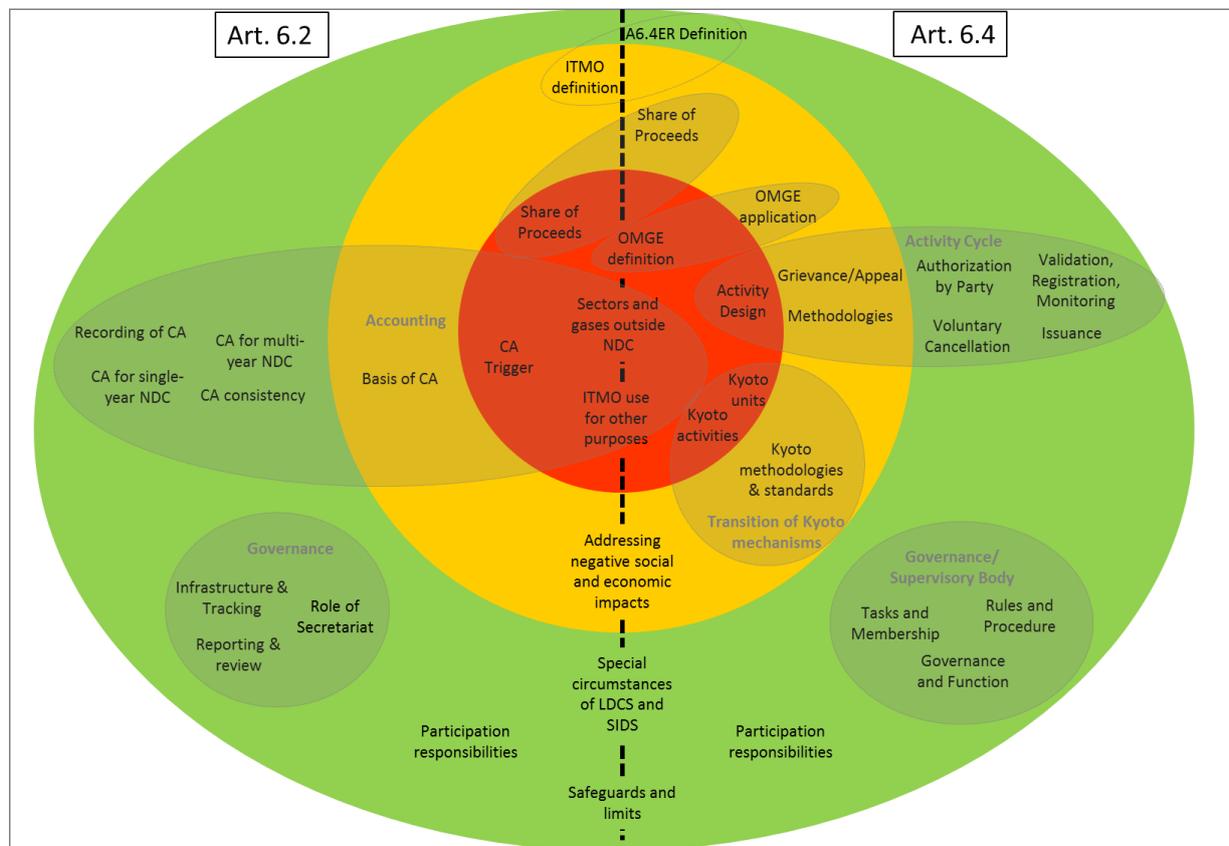
Even if the principle “nothing is agreed until everything is agreed” applies to the negotiation texts, key features of cooperative approaches and the Article 6.4 mechanism emerge, that will impact the conceptualization of potential CDM transition pathways:

- ◆ Article 6.2 governance will be assured through a reporting and review process and a centralized Article 6 database. Corresponding adjustments will be recorded and must be done on the basis of both, NDC and GHG inventory, or a reference value expressed in a non-CO₂e metric. Parties will have to demonstrate their capabilities to conform to the reporting requirements to be eligible to participate in cooperative approaches (SBSTA 2018a, UNFCCC 2018e).
- ◆ Article 6.4 governance will be executed by the Supervisory Board. Any activity will require host country approval and undergo an activity cycle from project design, validation, registration, monitoring and issuance (SBSTA 2018b, UNFCCC 2018e).

There were also several contentious issues under negotiation whose operationalization will have an impact on the conceptualization of CDM transition pathways:

- ◆ the modalities regarding the transition of units, activities and methodologies and standards from the CDM and JI;
- ◆ the eligibility criteria for activities, in particular with regard to the coverage of the sectors and/or gases in the NDC;
- ◆ the triggers of corresponding adjustments; and
- ◆ the principles for baseline setting and additionality testing under the Article 6.4 mechanism.

Figure 13: Status of negotiations on Article 6.2 and Article 6.4 of the PA



Green: Areas of advanced status of negotiations

Yellow: Areas of potential agreement

Red: Key contentious issues

Source: Perspectives Climate Group, 2019

The current negotiation status with regard to these issues will be presented in the following section.

3.4 Current negotiation status regarding items that are critical for the CDM transition

The transition of the Kyoto mechanisms to the Article 6.4 mechanism is one of the key contentious issues of negotiations and concerns the transition of activities, units, methodologies and accreditation standards of both CDM and JI. The negotiation options in the current versions of negotiation texts are linked to four fundamental scenarios:

Table 1: Negotiation options on transition of Kyoto mechanisms

Transition scenario	Transition of:			
	CDM and/or JI activities	Transition of Certified Emission Reductions (CERs) and/or Emission reduction Units (ERUs)	CDM/JI baseline and monitoring methodologies	CDM accreditation standards and procedures
Full transition	Registration activities under Article 6.4 in an expedited registration process (not having to undergo full examination). Registration of CDM and/or JI activities without further criteria.	ERUs/CERs to be used by a Party towards NDC. Automatic transfer of CERs in CDM issuance account to Art.6.4 mechanism registry. Issuance of Art.6.4 ERs for activities registered under CDM and/or JI.	Validity of CDM and/or JI baseline and monitoring methodologies for Art.6.4 activities.	Accreditation standards and procedures should serve as basis for the standards and procedures for accreditation under the Art.6.4 mechanism.
Transition under certain circumstances	Registration of activities under Article 6.4 upon condition of host country approval.			
Deferral of transition	No text	No text	No text	No text
No transition	Activities not allowed to be registered under Article 6.4.	ERUs/CERs not to be used by a Party towards its NDC. No transfer of CERs in Art.6.4 mechanism registry. No issuance of Article 6.4 ERs for activities registered under the CDM and/or JI.		

Source: authors' elaboration

The negotiation texts furthermore foresee a mandate for SBSTA to further develop the potential transition requirements. Annex 1 contains a comparison of the SBSTA and the Presidency negotiation text with regard to Kyoto transition. However, as the issue did not advance in the two weeks of negotiations at COP24, the changes are marginal.

The EU on the one side and Brazil, supported by India and the Arab Group, on the other side, have diametrically opposed positions on the Kyoto mechanisms transition. While the former opposes any

transition modalities in the rulebook, the latter call for the full and unrestricted transition. Other Parties take a middle-ground position. The opposition for a full transition of all units issued under the CDM and JI is highest, as it is also unacceptable for Switzerland, Norway and the Independent Alliance of Latin America and the Caribbean (AILAC) countries. However, these Parties support the transition of activities after eligibility checks. The transition of baseline and monitoring methodologies as well as accreditation standards incites the lowest resistance by Parties.

Figure 14: UNFCCC Parties' positions on CDM transition in negotiations²



Source: authors' elaboration

3.4.1 Setting baselines and assessing additionality of activities

If CDM activities were permitted to be re-registered under Article 6.4 mechanism, they could be subject to an adjustment of the baseline calculations and a renewed additionality assessment. In the Presidency text, a bridging proposal combining different approaches to setting baselines has been introduced. It first outlines a performance-based approach to baseline setting, and, in case this is not considered "appropriate" under certain national circumstances, it sets out the option to calculate baselines based on business-as-usual scenarios and historic emissions. The choice of baselines will have to be justified, but it remains unclear who assesses the justification (UNFCCC 2018e).

According to the Presidency text, additionality will have to be assessed against the policies and measures implemented and planned for NDC implementation (UNFCCC 2018e). As CDM activities were developed in the absence of host country NDCs, their additionality could be re-assessed in the case of transition.

² Representation of Parties' positions based on observations made during COP24, as negotiations evolve, positions might change.

3.4.2 Eligibility of units and activities in sectors not covered by the NDC

The discussion whether crediting will be allowed for emission reductions in sectors and gases not covered by the NDC is one of the most contentious issues in the negotiations and also closely linked to the question of applicability of corresponding adjustments. The key concern of some Parties (in particular EU and the Alliance of Small Island States (AOSIS)), of allowing for crediting of activities in sectors not accounted for by the host country, is that this would set perverse incentives to not increase coverage of NDCs which could lead to the transfer of hot air. In case corresponding adjustments would apply, this would mean a de-facto inclusion of the sector in the countries' commitments under a business-as-usual scenario. This would be acceptable to China, Norway and others.

The African Group highlights that the scope of NDCs is often limited due to capacity constraints and that the crediting for activities not covered by the NDC should be possible under the Article 6.4 mechanism, where a general additionality test will take place. To treat this issue differently under Article 6.2 and Article 6.4 is also supported by Costa Rica. Switzerland proposes a cut-off date to allow for outside crediting in the first NDC implementation period only. The transition of CDM units and activities could therefore depend on a case by case basis of the relationship this activity has with the NDC of the host country.

3.4.3 Applying corresponding adjustment upon transfer of mitigation outcomes

The overarching purpose of corresponding adjustments is to avoid double counting/double claiming of emission reductions. Both the transferring as well as the acquiring country must record the transaction of mitigation outcomes and correspondingly adjust their emission levels in their inventories (in case of units expressed in CO₂e) and NDCs. For units expressed in CO₂e, as it would be the case for CERs, some key requirements of corresponding adjustments were adopted in the context of Article 13 ETF, in paragraph 77d of Decision 18/CMA.1 (UNFCCC 2018b):

Box 1: Paragraph 77d of the transparency decision 18/CMA.1

Each Party that participates in cooperative approaches that involve the use of internationally transferred mitigation outcomes towards its NDC under Article 4, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of its NDC, shall also provide the following information in the structured summary:

- a. The annual level of anthropogenic emissions by sources and removals by sinks covered by the NDC on an annual basis reported biennially;
- b. An emissions balance reflecting the level of anthropogenic emissions by sources and removals by sinks covered by its NDC adjusted on the basis of corresponding adjustments undertaken by effecting an addition for internationally transferred mitigation outcomes first-transferred/transferred and a subtraction for internationally transferred mitigation outcomes used/acquired, consistent with guidance developed related to Article 6;
- c. Any other information consistent with guidance developed related to Article 6, if relevant;
- d. Information on how each cooperative approach promotes SD; ensures environmental integrity and transparency, including in governance; and applies robust accounting to ensure, inter alia, the avoidance of double counting, consistent with guidance developed related to Article 6.

Corresponding adjustments will be made to an emissions balance that reflects annual levels of emissions by sources and removals by sinks (a GHG inventory) for all sectors and gases covered by the NDC. The adjusted emissions balance will be reported biennially in the context of the biennial reports (BR) of the Parties to the PA.

The fact that corresponding adjustments will have to be undertaken by the host country (at least if the activity is in a sector covered by the host country's NDC, see above), the host country approval for an activity could prove to be more difficult to obtain. The host country will have to assess if it risks own NDC achievement when transferring the mitigation outcomes, but also if the approval would require it to undertake further work, such as quantifying NDC targets in order to comply with the Article 6.2 guidance. This would not be a barrier to transition of activities, if, as Brazil requests, Article 6.4 transfers would be exempt from corresponding adjustments. However, this has been a deal-breaker at the COP24 negotiations.

3.5 Outlook on the negotiation process in the run-up to COP25

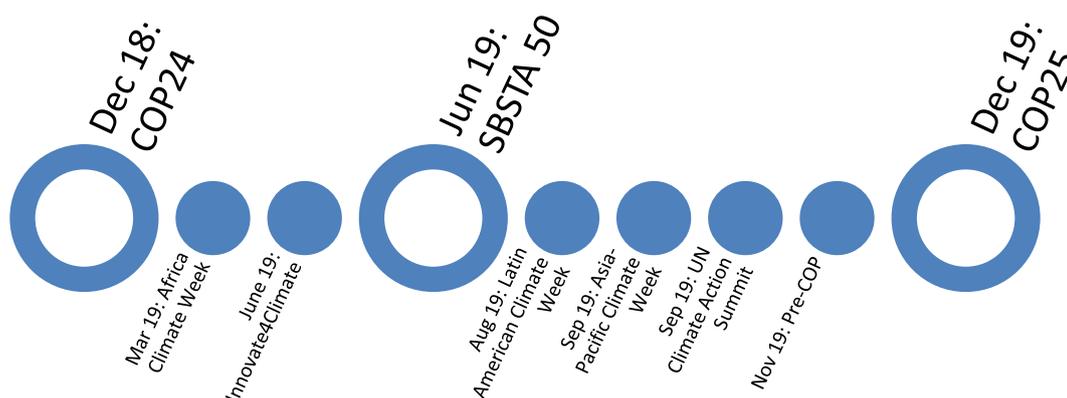
2019 is be a crucial year for Article 6 negotiations, as the rules are now expected to be adopted at COP25 in December 2019. Two official UNFCCC meetings will be of particular importance to advance the negotiation texts before the COP: the 50th meeting of SBSTA in June 2019 in Bonn and the meeting of the heads of delegations in the preparatory meetings to COP25 in Costa Rica end of

November. During the meetings of the subsidiary bodies and the COP itself, stakeholders can act as observers to the UNFCCC and share their inputs and perspectives in so-called “side events”.

In addition to the meetings of the subsidiary bodies and the Conferences of the Parties, the global conference “Innovate4Climate” (I4C, formerly “Carbon Expo”) organized by the World Bank since 2004 and the related regional “climate weeks”³, can act as platform for various stakeholders to interact with negotiators. In 2019, the Africa Climate Week took place in March in Ghana, I4C was held in Singapore in June⁴, the Latin-American Climate Week will be hosted in Brazil in August and the Asia-Pacific Climate Week will take place in September in China⁵.

The Climate Action Summit hosted by the UN General Secretary in September 2019 in New York aims to provide a general push to the negotiations⁶.

Figure 15: Calendar of relevant international climate conferences in 2019



Source: authors' elaboration

³ The events' global partners are the UNFCCC, World Bank, UN Development Programme, UN Environment Programme, UNEP Partnership with the Technical University of Denmark, Climate Technology Centre and Network and the International Emissions Trading Association. Regional partners include the African Development Bank, the Inter-American Development Bank and the Asian Development Bank as well as the UN Economic and Social Commission for Asia and the Pacific.

⁴ For more information, please visit: <https://www.cvent.com/events/innovate4climate/event-summary-decee7fe0cf94765af069f3e7c52ff47.aspx>

⁵ For more information, please visit: <https://www.regionalclimateweeks.org/>

⁶ For more information, please visit: <https://www.un.org/en/climatechange/un-climate-summit-2019.shtml>

4 Pathways for the transition of the CDM under the PA

4.1 Description of potential pathways and key criteria to be considered

Due to the remaining uncertainty within international negotiations about the design of Article 6 mechanisms and the extent of CDM eligibility post 2020, many scenarios are possible, spanning from full transition to complete abolition of the CDM (i.e. no emission reductions resulting from CDM are eligible under the PA).

We therefore describe potential options for a CDM transition that are realistic and their repercussions on the global CDM portfolio as well as that of specific host countries. Limitation of CDM transition is proposed by various stakeholders for several reasons. There is an interest to drive investment towards high-quality mitigation activities. More advanced developing countries shall embark on more ambitious mitigation contributions and not focus on generating offsets. Only mitigation actions with high environmental integrity should be promoted. Transformational change is to be triggered.

We develop the following three potential transition pathways:

Pathway A - Full CDM transition;

Pathway B - Transition with certain limitations;

Pathway C - Transition with stricter limitations.

A fourth Pathway D - No transition, is also discussed. We identify a set of criteria that are part of the negotiations for potentially limiting the scope of eligible CDM activities (projects and PoAs) and CERs after 2020. They are derived from the key elements currently under negotiation, discussed above, as well as secondary elements currently being discussed at international level and (tertiary) elements currently not included in the draft text. They can be structured as follows:

- eligibility of host countries;
- project type characteristics (technology/sector, registration date, SD impacts);
- experience in the negotiations; and
- previous limitations of CDM access to national climate policy systems.

For defining the three transition pathways, different levels of stringency were applied to these eligibility criteria.

For Pathway A, a full CDM transition is considered, where all CDM activities and resulting CERs will be eligible also after 2020 with no limitations. Pathway B considers criteria related to the registration date and project type, while Pathway C has a high stringency level for the three criteria applied (host country, registration date and technology/sectors).

A brief explanation on the relevance for each criterion is provided below.

Cut-off based on CDM activity registration date

Only projects/PoAs registered after a certain date would be eligible. A date that is linked to a specific event under the UNFCCC could be chosen, like 1 January 2013 (start date of the second commitment period under the Kyoto Protocol) or 5 November 2016 (the day after the PA entered into force). The 1st January 2013 is proposed as cut-off date under Pathway B, and the 5 November 2016 for the more stringent Pathway C. The crash of the CER price since 2011 had a negative effect on investors in CDM activities. For this reason, the cut-off date under Pathway B (31 December 2012) is selected, because eligibility of such activities would be a reward for those investors that continued to channel resources into new activities despite the negative market outlook and the simultaneous lack of mitigation ambition at international level and lack of certainty on future climate regimes. The entry into force of the PA (cut-off date under Pathway C) marked the dawn of a new climate agreement, however, definition of detailed implementation rules for the new market mechanisms will take a few years. This creates a continuing problematic situation on the international carbon market with no immediate stimulus for investments in mitigation activities. While more stringent than under Pathway B, this criterion aims at rewarding those investors that have had a long term view and believed in the implementation of Article 6 from the start.

Limitation of project type, technology

Specific technologies could be excluded from the CDM transition. We consider the potential exclusion of the following project types:

- Industrial gases (HFC-23 and N₂O from adipic acid), as practiced in the EU Emission Trading Scheme (ETS) since 2013.
- Large hydro energy plants (above 15 MW), given that the EU ETS limited access for large hydro projects and potential negative impacts of large scale hydro plants.
- Projects involving clean coal/EE on coal for industrial applications given that a transition away from coal is necessary for reaching the PA targets.
- Afforestation and reforestation, given the risk of non-permanence of such activities.

Limitation of host countries

Only projects and CERs from certain country groups are eligible. For example, after 2012, the EU limited access under the EU ETS to projects in LDCs. The limitation proposed here, applies only in the stringent pathway, where only projects implemented in LDCs and Small Island Developing States (SIDS) are eligible for the transition.

For each of the three pathways, a specific set of limitation criteria was selected. The text boxes below describe how the pathways have been set up, which criteria were applied and what CDM activities would be generally excluded under such pathways.

Pathway A: “Full CDM transition”

Brief description: This pathway describes a CDM transition without limitations, meaning that all existing CDM activities would be fully eligible post 2020 under the Paris Agreement.

Eligibility criteria and thresholds:

Cut-off on Registration date	Limitation on project type/ technology	Limitation of Host Countries
No cut-off date	All types eligible	All countries eligible

Under this pathway no limitations are expected and all registered projects and generated CERs would be eligible under PA.

Pathway B: “CDM transition with certain limitations”

Brief description: This pathway describes a CDM transition with some limitations. It can be understood as a lenient scenario.

Eligibility criteria and thresholds:

Cut-off on Registration date	Limitation on project type/ technology	Limitation of Host Countries
Only CDM activities with registration date on or after 1 January 2013	Exclusions of: - Industrial gases -(HFC and N ₂ O adipic acid) - Large hydro (above 15 MW)	All countries eligible

Under Pathway B it is assumed that CDM activities would be not eligible if they were registered prior to the start of the 2nd commitment period of the KP. Only activities including industrial gases (HFC and N₂O adipic acid) and large hydro (above 15 MW) are excluded. On host countries no limitations are applied.

Pathway C: “CDM transition with strict limitations”

Brief description: This pathway describes a CDM transition pathway with strict limitations.

Eligibility criteria and thresholds:

Cut-off on Registration date	Limitation on project type/ technology	Limitation of Host Countries
Only CDM activities with registration date on or after 5 November 2016	Exclusions of: - Industrial gases (HFC and N ₂ O adipic acid) - Large hydro (above 15 MW) - Projects involving clean coal/EE on coal for industrial applications - Reforestation and afforestation	Only LDCs and SIDS eligible

Under this strict scenario, Pathway C it is assumed that only projects are eligible that were registered after the PA entered into force (4 November 2016) and only CERs generated on or after 1st January 2020 (start date of the operation of the PA) would be eligible. In addition to the project types not eligible under Pathway B, also projects involving clean coal and energy efficiency on coal for industrial applications as well as afforestation and reforestation projects would be excluded⁷. Eligible host countries would be limited only to LDCs and SIDS (status at the time of project registration). In the following sections the impacts of the different Pathways A, B and C on the global CDM portfolio are discussed.

4.2 Impacts of the eligibility restrictions as per transition pathways on the volume of Article 6 eligible CERs

This section presents the volume of eligible CERs, as well as number and type of activities and their geographic location for each of the three pathways. We utilize the UNEP DTU CDM pipeline and PoA pipeline (UNEP DTU 2019a,b)⁸ as a basis for our calculations. We only consider registered activities in our estimations, as those still in validation may not reach registration, or the timeline for the registration is rather uncertain. Estimations do not take into account the issuance success rate of the

⁷ Also transition of Carbon Capture and Storage activities could be limited due to controversial issues related to this technology, such as permanence of the sequestration and long-term risks. While the activity type is allowed under the CDM methodology has been approved to date. Hence this category is not explicitly considered in this report.

⁸ Both have been downloaded on 26 March 2019. We did not assess the data quality of the pipelines given the huge number of entries and as they are a commonly recognized reliable tool, hence we are not responsible for potential errors in the pipelines that could affect the estimations.

underlying activities. Estimates on the accumulated potential for projects are provided by the UNEP DTU pipeline which also considers the potential contribution until 2030 for projects with renewable crediting period that could be extended until then. In case of non-renewal, the potential CER volume would be reduced. Regarding PoAs, UNEP DTU provides only information on the potential issuance for one crediting period. In this report it is assumed that existing PoAs would continue generating CERs until 2030. This is an assumption that may be conservative, as it does not consider that new Component Project Activities (CPAs) could be potentially added anytime, which could also increase supply significantly beyond the current estimates. On the other hand, it is also reasonable to expect that some of the activities will not be continued, or will be substituted by other PoAs.

4.2.1 Pathway A: Full transition

This pathway assumes that there is no restriction to the transition of the CDM under the PA.

Table 2: Summary of transition impacts, Pathway A

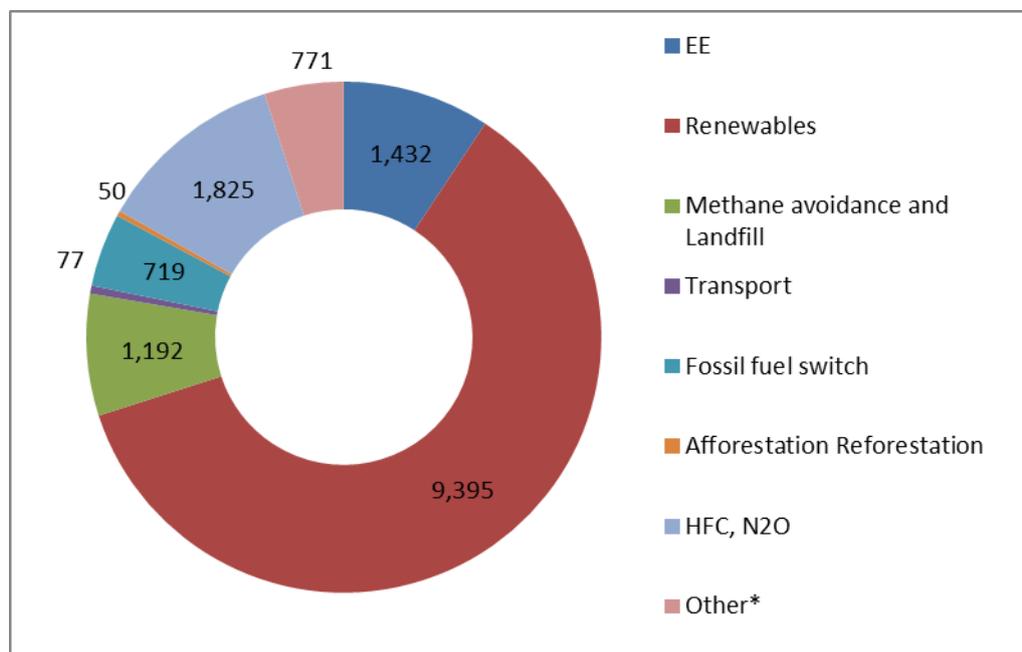
Full transition (Pathway A)⁹	
Number of projects	7805
CERs already issued (million CERs)	1963
Potential CER generation from projects pre and post 2020 (million CERs)	14,485
Potential CER generation from projects post 2020 (million CERs)	6912
Number of PoAs	319
Number of CPAs	1197
CERs already issued - PoAs (million CERs)	17.2
Potential CER generation from PoAs pre and post 2020 (million CERs)	975
Potential CER generation from PoAs post 2020 (million CERs)	630
Total potential CER generation pre and post 2020 (PoAs and projects) (million CERs)	15,445
Total potential CER generation post 2020 (PoAs and projects) (million CERs)	7543

Source: author's elaboration based on UNEP DTU (2019 a,b)

Total CER volumes reach 15.4 billion, which means that commensurate demand for Article 6 credits would have to materialize in order to equilibrate the market. The following figure shows the potential for CERs issuance until 2030 by activity type.

⁹ Rounded figures

Figure 16: Potential CER volume, by activity type (million CERs)



Source: authors' elaboration based on UNEP DTU (2019a,b)

4.2.2 Pathway B: transition with certain limitations

Table 3 below presents the criteria applied under the Pathway B with its eligibility restrictions.

Table 3: Summary of transition Pathway B

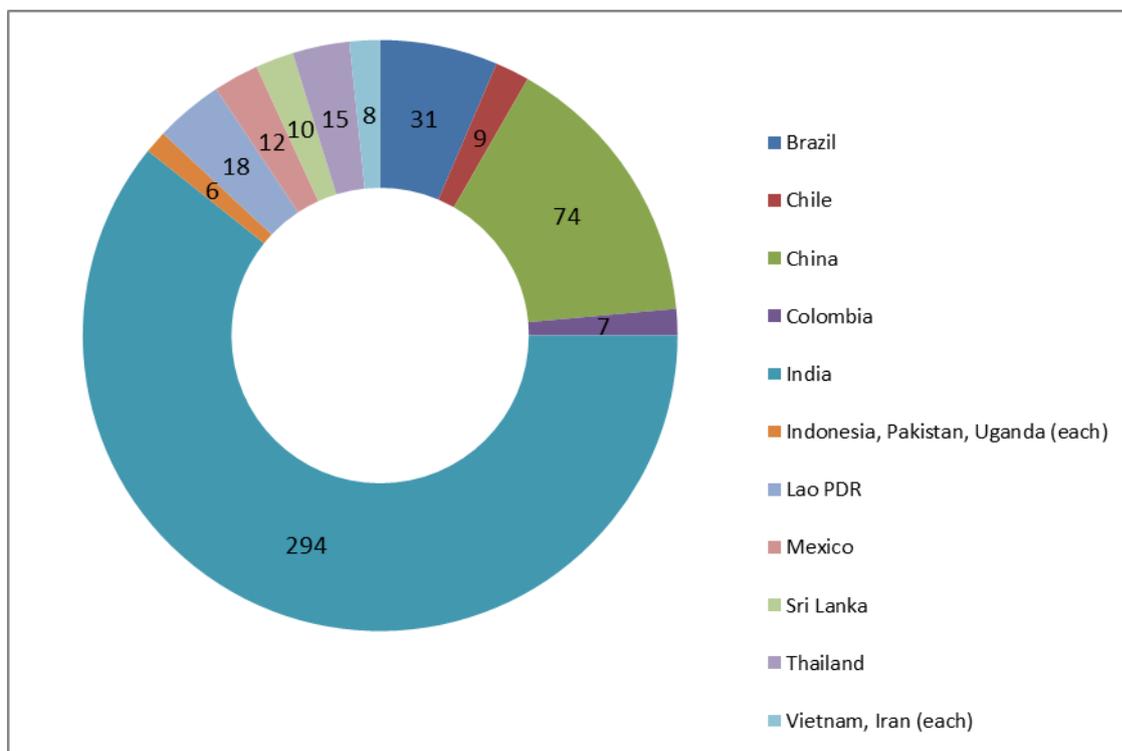
Transition with certain limitations (Pathway B)	
Registration date (cut-off date)	1 January 2013
Technology/sector eligibility (excluded types)	- Industrial gases (HFC-23 and N ₂ O from adipic acid) - Large hydro (above 15 MW)
Host country (eligible host countries)	All countries eligible

Source: authors' elaboration

Figure 17 shows the country-wise number of CDM projects for the countries hosting most activities (showing countries hosting at least 6 projects), where India dominates followed by China and Brazil, while Figure 18 shows the countries hosting PoAs (countries with at least 3 PoAs), where the

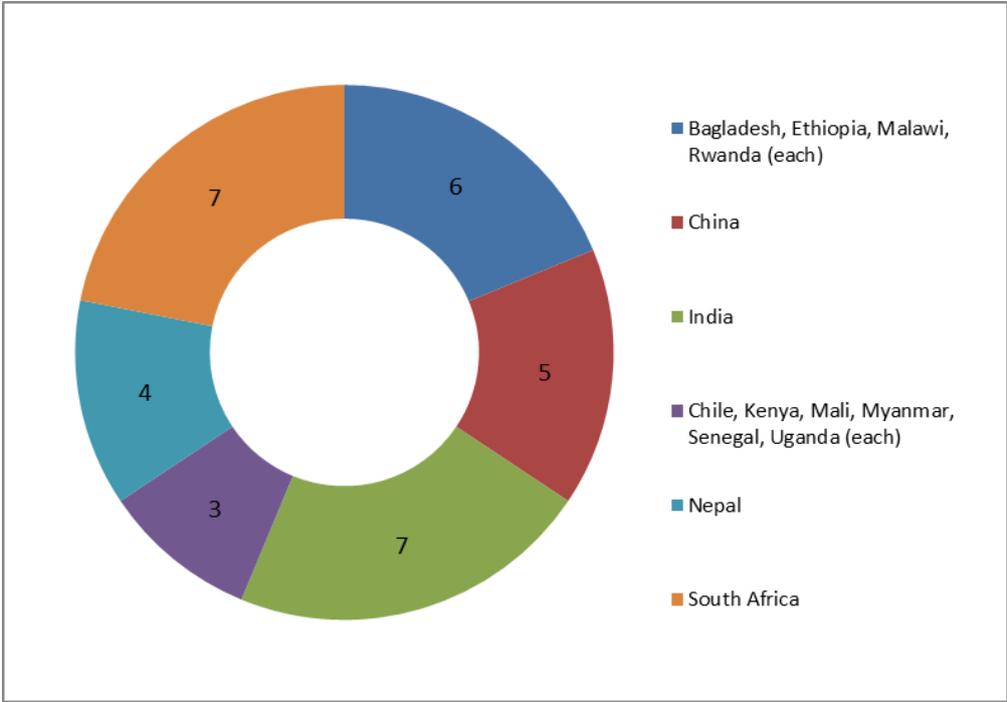
distribution is much more equitable. Africa would still host 55 PoAs, i.e. half of the eligible ones, followed by Asia with 37 PoAs.

Figure 17: Top countries hosting eligible projects, Pathway B



Source: authors' elaboration based on UNEP DTU (2019a)

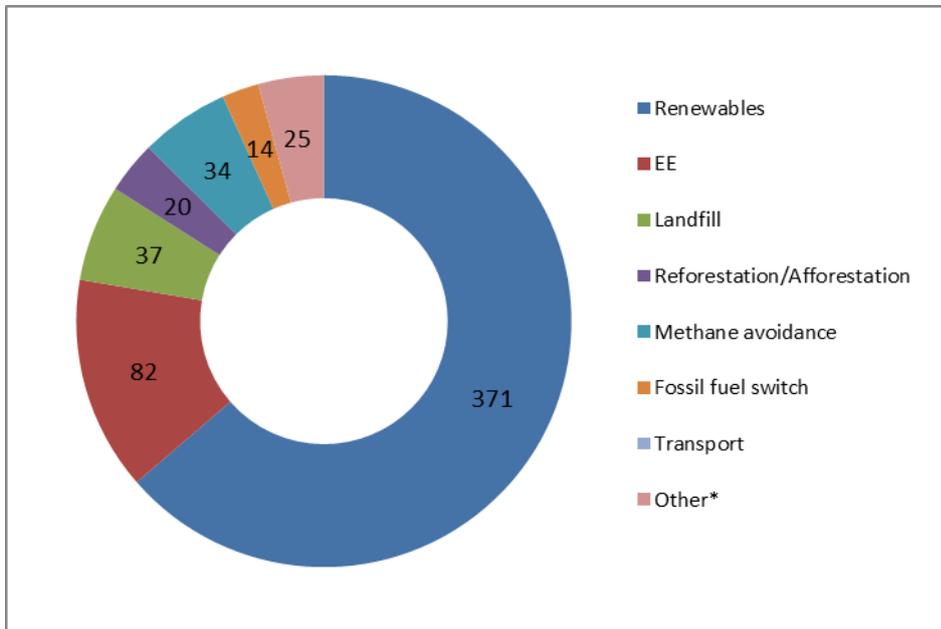
Figure 18: Countries hosting eligible PoAs, Pathway B



Source: authors' elaboration based on UNEP DTU (2019b)

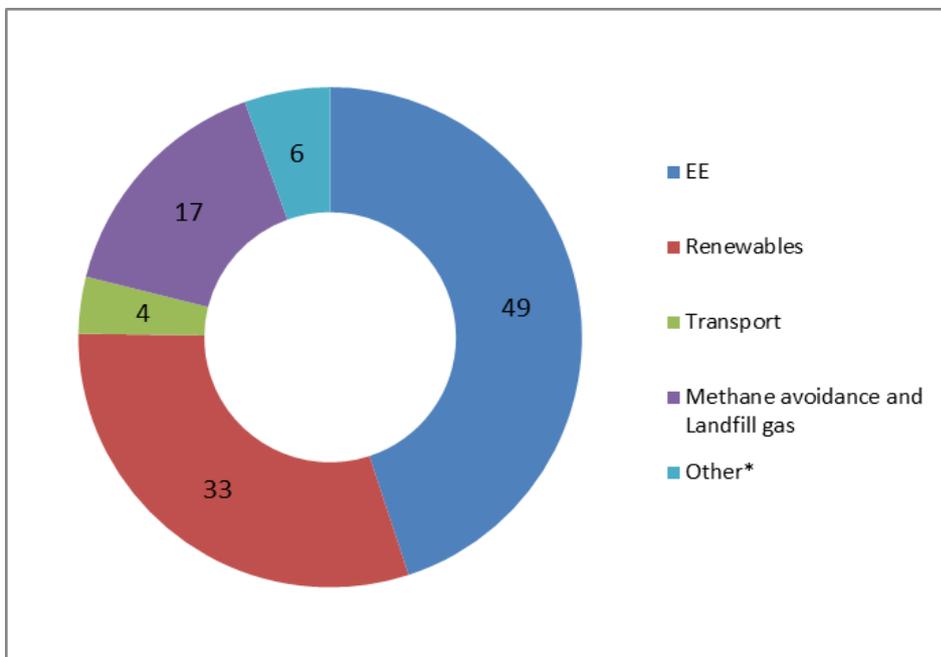
Figure 19 shows the project types, which are dominated by renewable energy. For PoAs, energy efficiency is leading, see Figure 20.

Figure 19: Eligible project types, Pathway B



* Cement, Energy distribution, Fugitive, Coal bed/mine methane, N₂O, PFCs and SF₆, Transport
Source: authors' elaboration based on UNEP DTU (2019a)

Figure 20: Eligible PoA types, Pathway B



*Coal bed/mine methane, Agriculture, Energy distribution,
Source: authors' elaboration based on UNEP DTU (2019b)

Table 4 presents the summary of the application of the eligibility restrictions and the impacts on the CDM portfolio in terms of eligible activities and volume of CERs. Total CER volume would reach almost 0.89 billion which could be taken up by the Article 6 market relatively easily.

Table 4: Summary of transition impacts, Pathway B

Transition with certain limitations (Pathway B)¹⁰	
Number of projects	583
CERs already issued (million CERs)	5.2
Potential CER generation from projects pre and post 2020 (million CERs)	554
Potential CER generation from projects post 2020 (million CERs)	255
Number of PoAs	109 ¹¹
Number of CPAs	307
CERs already issued from PoAs (million CERs)	3.4
Potential CER generation from PoAs pre and post 2020 (million CERs)	332
Potential CER generation from PoAs post 2020 (million CERs)	250
Total potential CER generation pre and post 2020 (PoAs and projects) (million CERs)	885
Total potential CER generation post 2020 (PoAs and projects) (million CERs)	505

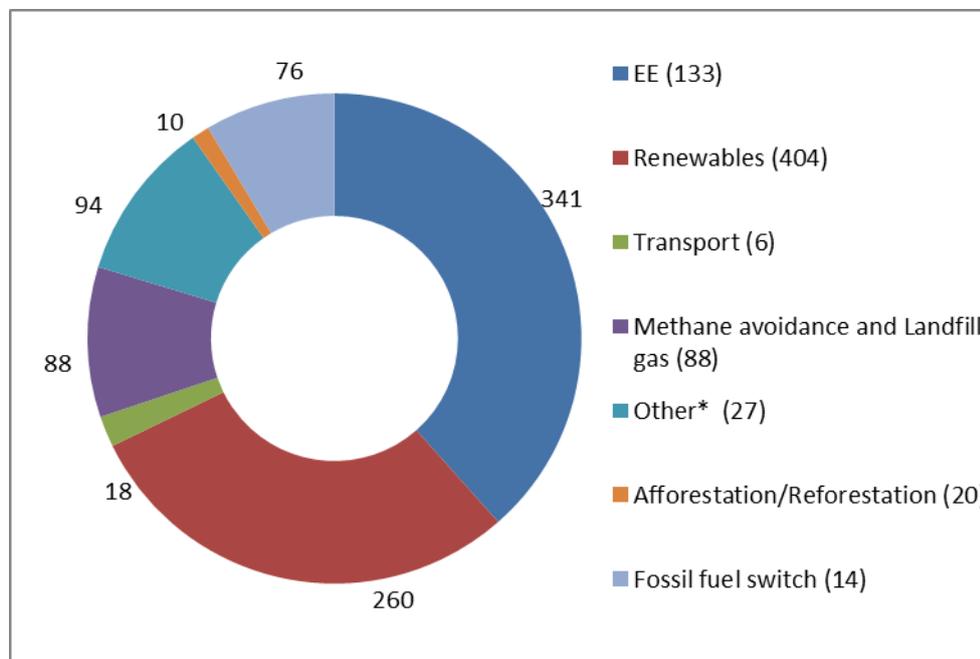
Source: author's elaboration based on UNEP DTU (2019a,b)

The following figure shows the volume of potential CERs (pre and post 2020) for all eligible actives (both PoAs and projects) by activity type.

¹⁰ Rounded figures

¹¹ Two PoAs potentially include also large hydro: one is however allowing only activities up to 20 MW (#9797) while another one can allow all types, micro, small and large (#9847) however initial hydro CPA are all micro scale. Both PoAs are thus included.

Figure 21: Potential CER volume, by activity type (million CERs) (figure in brackets shows the total number of activities)



*Other: Coal bed/mine methane, Agriculture, Energy distribution, N₂O, Fugitive, PFCs and SF₆, CO₂ usage

Source: authors' elaboration based on UNEP DTU (2019a,b)

4.2.3 Pathway C: transition with stricter limitations

The strict pathway C is summarized in Table 5 below.

Table 5: Summary of transition Pathway C

Transition with strict limitations (Pathway C)	
Registration date (cut-off date)	4 November 2016
Technology/sector eligibility (excluded types)	Industrial gases (HFC and N ₂ O adipic acid) - Large hydro (above 15 MW) - Projects involving clean coal/EE on coal for industrial applications - Reforestation and afforestation
Host country (eligible host countries)	Only LDCs and SIDS

Source: author's elaboration

When applying the strict limitation described above, both the number of eligible CDM activities and associated CERs generation are very small. Once all eligibility criteria are applied, 76 countries would be eligible (i.e. all LDCs and SIDS), but the number of eligible CDM activities would be very limited, i.e. only 7 projects and 11 PoAs. The total supply of CERs, including pre and post 2020 volumes, would reach 128 million CERs, with PoAs accounting for the majority (i.e. approx. 94% of the total). The overall volume is rather small and would not lead to significant changes in the market in the short term, except for specific cases that would be eligible under this pathway, while the majority of activities would not be eligible for the transition.

Host countries would be limited to 12 LDCs and SIDS, with a maximum of two activities per country (Bangladesh, Madagascar, Mali, Myanmar, Lao PDR and Senegal); Burkina Faso, Cape Verde, Ethiopia, Mozambique, Rwanda and Uganda would host one activity each.

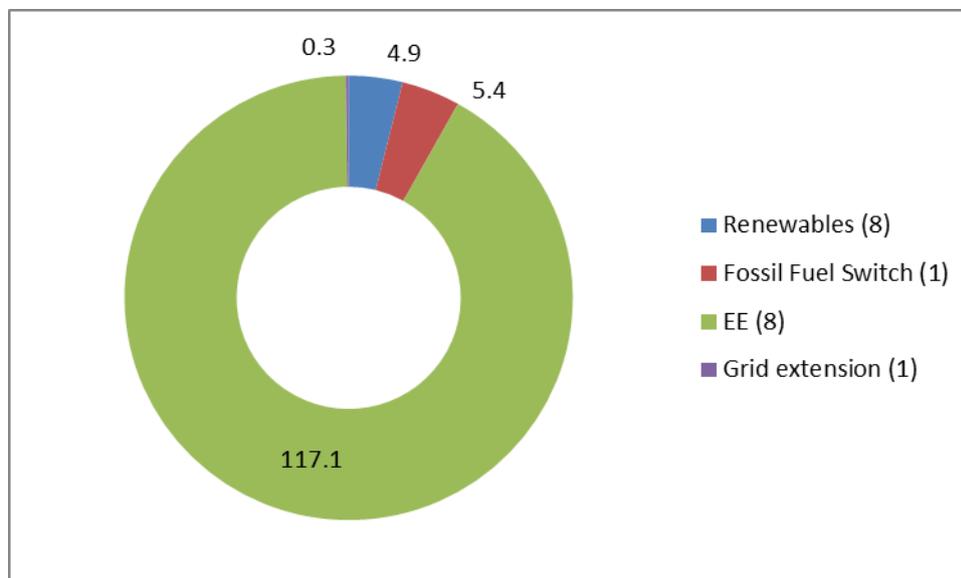
Table 6: Summary of transition impacts, Pathway C

Transition with strict limitations (Pathway C)¹²	
Number of projects	7
CERs already issued (million CERs)	0.25
Potential CER generation from projects pre and post 2020 (million CERs)	8.2
Potential CER generation from projects post 2020 (million CERs)	5.1
Number of PoAs	11
Number of CPAs	18
CERs already issued from PoAs (million CERs)	0.02
Potential CER generation from PoAs pre and post 2020 (million CERs)	119
Potential CER generation from PoAs post 2020 (million CERs)	101
Total potential CER generation pre and post 2020 (PoAs and projects) (million CERs)	128
Total potential CER generation post 2020 (PoAs and projects) (million CERs)	106

Source: authors' elaboration based on UNEP DTU (2019a, b)

¹² Rounded figures

Figure 22: Eligible CERs, by activity type (million CERs) (figure in brackets shows the total number of activities)



Source: authors' elaboration based on UNEP DTU (2019a,b)

4.2.4 Pathway D: no transition - possibility for reframing activities?

Some parties completely oppose the transition and, also in light of the existence of controversial issues being negotiated, a “no transition” pathway could still materialize. This would not be the most advisable outcome of the negotiations, but it is, however, possible.

There are several options that could be explored under the “no transition” pathway. One is the possibility of deregistering activities from the CDM and to register them under the SDM. It would require investors in CDM activities to undergo a new registration process, including associated costs and uncertainties. Depending on the final requirements under Article 6, this additional cost may vary but could be significant. The probability of successful registration is also uncertain. However, provided that underlying CDM activities are aligned to the new requirements, this option can provide a way forward for investors to generate continuity of their investments and ability to generate emission reductions also under the PA. It should be noted, that this option of a new registration could materialize also if the transition for CDM activities is allowed, as they may be required to be formally registered under Article 6.4, following the new procedures and requirements.

Given the similarities of the SDM and the CDM, Article 6.4 would be the most practical option for the CDM transition. However, under a “no transition” scenario, options for utilizing also the Article 6.2 mechanism should be considered. Cooperative approaches are based on bilateral cooperation

between countries. Hence, there is room for designing tailor-made alternatives for the transfer and use of CERs from existing activities. Here, a strong role of the buyer country is envisaged, while for the seller country the incentive is clear (provided that transfer of units does not jeopardize the country's ability to meet its NDC targets); buyers can seek partner countries that can supply units to identify market options. The level of oversight under Article 6.2 is not yet defined, but it is likely to be limited. Important buyers may want to ensure that only good quality emission reduction units that have a robust environmental integrity are transferred. It can be argued that CERs, being generated by UNFCCC-approved activities, have a certain quality level, while it remains to be seen how environmental integrity of ITMOs transferred through bilateral agreements under Article 6 will be assured. Specific agreements for bilateral transfers of CERs under Article 6.2 will be required, thus buyer countries can cooperate with selected host countries to identify CDM activities of interest (for instance prioritizing activities delivering strong SD benefits) and negotiate the bilateral transfers. Such transfers would provide a new market for CERs that otherwise would not be eligible under the PA and will provide a leeway for investors to generate revenues in a more predictable manner. As transfers can be structured with volumes, prices and timelines, project owners would benefit from this certainty in the long term, as transfers can potentially occur along the lifetime of the CDM activity. Developing bilateral partnerships with potential buyer countries will be necessary to implement this option. While supply of CERs is going to be available, demand is also likely to exist. However, the demand would depend on the specific circumstances and needs of the buyer countries.

5 Additional qualitative criteria for the pathways

Beyond the criteria listed above and applied to the pathway scenarios, there are additional aspects that can influence the negotiations for the CDM transition. These additional criteria are described below, together with a short explanation why they may become relevant in the negotiations. We will apply these additional criteria for a qualitative description of the impacts they would have on the transition pathways.

5.1 Eligibility for mitigation measures in sectors covered or not covered in the NDC

As discussed in section 2, the eligibility of emission reductions generated from activities in sectors (or gases) covered or not covered in the NDC under Article 6 is rather contentious. Article 4 of the PA requires increasing mitigation ambition by Parties and it aims at the introduction of economy-wide targets with progressive inclusion of sectors initially excluded from the NDCs. Exclusion of sectors in the initial NDCs can be a result of different factors, such as lack of quality data, existence of barriers limiting the implementation of mitigation activities, and national focus on certain priority sectors only (e.g. energy sector). The main opposition to the crediting of non-NDC sectors is due to the potential creation of an incentive for not expanding sectoral coverage of NDCs if CERs from activities implemented in non-NDC sectors are eligible under the PA. This perverse incentive to ambition increase could be addressed by the requirement that sectors from which CERs are generated must be included in the subsequent NDC revision. This provision would need to consider a sufficiently long crediting period for the underlying activities to avoid jeopardizing the capacity of generating revenues from CERs of the underlying activities. Furthermore, it can be argued that allowing crediting of non-NDC sectors would contribute to enhancing the data collection and Measurement, Reporting and Verification (MRV) capabilities, by applying methodologies and procedures for MRV for certain activities in the sector. The CDM would provide a ready-to-use set of MRV methodologies covering a large number of sectors.

It is important to ensure that no transfer of non-additional emission reduction units occurs. As non-NDC sectors will have no requirement for corresponding adjustments when units are being transferred, there is a risk of the environmental integrity of the units being transferred between Parties. The CDM has already experienced a similar situation when host countries had an incentive to allow generation and transfers also of low-quality CERs. However, this would pose a serious risk to the capacity of Article 6 mechanisms to contribute to the global mitigation efforts. This risk could be avoided by robust testing of additionality to rule out all units that could be generated from non-additional activities. Existing CDM activities have already passed an additionality test to reach registration and thus, it can be argued, they should not undergo a new test (see also section 5.5). Alternatively, for project types that are deemed to have had additionality problems in the past, a revalidation could be required.

An assessment of the impacts of the two options, i.e. allowing the transition of CDM activities implemented in non-NDC sectors or excluding their eligibility under the PA and limit it only to the sectors covered in the NDCs, requires a detailed screening of the NDCs submitted by Parties and of their specific CDM portfolio. NDCs vary significantly in their coverage, targets and formulation and thus the impact of current NDCs on existing CDM activities should be evaluated on a case-by-case basis. Given the broad differences in coverage of the NDCs, there will be activity types that are generally eligible, such as renewable power generation, as the energy sector is almost always covered by the NDCs. Other activity types may be covered or not, resulting in potential different eligibility for the same type of CDM activities. For instance a multi country PoA could be affected with non-eligibility for certain CPAs if implemented in a country where the sector is not covered by the NDC, while other CPAs would be fully eligible as implemented in a country where the same sector is covered under the NDC.

5.2 Eligibility for mitigation measures under conditional or unconditional pledges

Most developing country NDCs consist of conditional and unconditional pledges. The term “conditional” indicates mitigation interventions that will be implemented only if the Party received international support in the form of technology transfer, capacity building and/or finance. On the other hand, the “unconditional” element indicates the mitigation contributions will be implemented through domestic means, without international support. There is no generally accepted interpretation on what “conditional” and “unconditional” means and how this would have to be reflected in the implementation of the Article 6 mechanisms. Some interpretations restrict Article 6 mechanisms to conditional components of the NDCs which should be seen as the baseline for the mitigation interventions, while other Parties would instead allow crediting also for contributing to the unconditional elements and targets of the NDCs (Schneider et al., 2017). Another layer of complexity is added by those cases where an unconditional target is provided, for instance, reduction of emission by a certain percentage, and the conditional pledge is providing a more ambitious target. This would increase the difficulties in clearly differentiating the activities that fall under the unconditional and those covered under the conditional component. To evaluate potential implications for eligibility of mitigation actions under a CDM transition, a detailed assessment of the NDC and the unconditional and conditional targets would be required. As a basic requirement, however, it should first be agreed how unconditional and conditional elements are exactly defined. This would enhance the comparability of the NDCs and also clarify the role that CDM activities, implemented in a sector covered by the conditional/unconditional pledges, could play under the transition pathways.

5.3 Eligibility based on the level of standardization of methodologies

Standardization has emerged as one of the most important components of CDM reform in the last five years. It intends to simplify key elements of CDM methodologies, thereby lowering transaction

costs and lowering the entry barrier for project participants. Standardization can mean developing a standardized baseline (SB) or other standardized approaches (e.g. a nationally applicable default value for an important parameter). This may reduce transaction costs for project developers significantly, as key elements of the required project documentation, such as default factors for baselines or project emissions, are made readily available, and therefore eliminate the problem of data availability and the need for surveys and/or sampling of data. It is possible that under PA, an even higher level of standardization will be applied, particularly under Article 6.4. This will not only reduce transaction costs for project participants and make emission reductions from similar projects better comparable, but will often lead to an improved data basis in the host country. However, these simplifications require upfront investment for ensuring their broad applicability. Moreover, an overly strong standardization can also have negative repercussions on environmental integrity. For example, positive lists for RE technologies under the CDM have been kept unchanged despite massive cost reductions of certain technologies such as photovoltaics, which is now the lowest cost electricity source under many circumstances.

5.4 Baseline setting, additionality testing and conservativeness

CDM baseline and monitoring methodologies have been based on three possible approaches regarding baseline setting (UNFCCC, 2002):

- existing actual or historical emissions, as applicable;
- emissions from a technology that represents an economically attractive course of action, considering barriers to investment; and
- average emissions of similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20% of their category.

The current options being negotiated for Article 6 mechanisms at international level focus on the introduction of a performance-based approach with the option of utilizing the business-as-usual scenarios and historic emissions if the former approach is not applicable. This keeps the methodological approaches wide open.

Article 6 may also allow the introduction of up-scaled and sectoral or policy instrument level crediting, which may require a set of new or revised methodologies. However, regarding the CDM transition towards the PA, the existing baseline methodologies can principally be transitioned very easily. This criterion is more relevant for new activities while existing ones, already applying a methodology approved by the UNFCCC, should be eligible for the transition, even if a final assessment will depend on the final rules that will be agreed. Conservativeness of baselines and their linking to the NDC baselines and targets is still an open topic for negotiation. Key features, such as eligibility of existing methodologies, identification of the body responsible at international level for the assessment and

approval of existing and new methodologies, frequency of the baseline revision to ensure stringency and a potential process to increase stringency over time, are not yet agreed.

There is the possibility that existing CDM activities have to undergo a new additionality test and prove the conservativeness of baselines. This option would generate an extra cost to the CDM activities seeking transition under the PA.

5.5 Eligibility based on the contribution to Sustainable Development (SD)

The most important document related to SD at the global level is the 2030 Agenda for SD, which incorporates 17 Sustainable Development Goals (SDGs) and 169 targets (UN, 2015).

The text of the PA makes several explicit references to the concept of SD including in the text of Article 6, most importantly:

- Article 6.1: “Parties recognize that some Parties choose to pursue voluntary cooperation in the implementation of their nationally determined contributions to allow for higher ambition in their mitigation and adaptation actions and to promote Sustainable Development and environmental integrity”.
- Article 6.2: “Parties shall [...] promote Sustainable Development and ensure environmental integrity and transparency [...]”.
- Article 6.4: “A mechanism to contribute to the mitigation of greenhouse gas emissions and support Sustainable Development is hereby established [...]”.
- Article 6.4 (a): “To promote the mitigation of greenhouse gas emissions while fostering Sustainable Development”

SD is thus an important and explicit component of Article 6 but the detailed rules are unlikely to require a mandatory SD check due to the same sovereignty concerns that prevented such a decision under the CDM. Favoring mitigation activities based on high SD impacts by buyers is a likely scenario for a CDM transition, even if no formal universal SD criteria are likely to be adopted in the negotiations.

6 Practical implications of the CDM transition

Several items being discussed at international level are related to the administrative requirements that will have to be in place for Article 6 activities. It is likely that a transition of the CDM would fall under Article 6.4, thus potential requirements under Article 6.4 would need to be applied for CDM activities that will be granted eligibility under the PA. This could have direct implications resulting in additional administrative hurdles and leading to additional transaction costs that need to be considered. Potential elements in this regard will be discussed in this section and include:

- level of approval;
- responsible authority for the approval;
- requirements on registration/deregistration;
- role of existing entities and bodies;
- potential new requirements for CDM activities;
- implications of the corresponding adjustments; and
- functions of the registries and tracking system.

6.1 Level of approval

Under the CDM, all activities had to obtain a Letter of Approval from both the host country and the buyer's country before registration by the UNFCCC. This allowed some form of control by national institutions and served to confirm alignment to the country's SD. Under Article 6.4, a certain level of international supervision is envisaged, and thus it is reasonable to expect that, similar to the CDM, two layers of approvals will be required:

1. approval by host country and purchasing country, and by an international entity (similarly to the CDM EB) for activities implementation; and
2. approval by transferring and purchasing country for transfers of units.

For the purpose of this report, we focus here on the Letter of Approval for the actual implementation of the activities, rather than the approval of the transfers of CERs/ITMOs.

The Letter of Approval under the CDM proved to be, especially in the early days, a bottleneck for project implementers due to long and complex inter-ministerial processes for the issuance. As more activities came on line, countries, especially host countries, streamlined the process and reduce associated costs. Building on this existing expertise developed within the Designated National Authorities (DNAs) and maintaining the process similar to the CDM, would be beneficial for speeding up the transition process and avoiding creating a new burden for institutions and private companies. On the other hand, new requirements under Article 6.4 of the responsible entity for issuing the approval, or different criteria for granting the approval, may result in a new barrier for investors resulting in additional time required before effectively being able to issue units that can be used under the PA. This situation would discourage investors from transitioning their activities under the PA, given the current lack of trust and the expected opposition of private investors to undergo a new full approval cycle. Especially developing countries may have capacity and resource constraints to establish entirely new structures and rebuild the required expertise to evaluate and approve mitigation activities.

At international level, it is reasonable to expect that also under Article 6.4 a CDM-style oversight will be agreed, with an entity in charge of approving (i.e. registering under the CDM) the activities that will

be newly implemented under Article 6.4 and also to approve the transition of existing CDM activities. While some type of formal approval will be needed for the transitioning activities, and given that the CDM activities have already passed a third party validation and the entire registration process at UNFCCC level, a “fast-track” channel should be provided for the CDM activities to avoid long and inefficient new approval processes (e.g. the new body supervising the Article 6 mechanism could issue a simple approval letter instead of having the activity entering into a fully new approval process). While the rules and requirements at international level could be defined in a straightforward manner, the host countries’ requirements and procedures must be considered as they can represent a barrier for the transition.

6.2 Requirements on registration/deregistration and/or voluntary cancellation

Under several offsetting schemes related to carbon pricing instruments, there are certain requirements that must be met before the emission reduction units from an eligible activity can be effectively used. This refers for instance to the requirement of several countries with an ETS (e.g. South Korea, China, etc.) that imposes CDM activities to be de-registered from the CDM or to have the CERs cancelled voluntarily. This avoids the risk of double counting, i.e. if the CERs from a CDM activity are used under the PA and also in another context (e.g. voluntary market). Proof of deregistration or proof of voluntary cancellation ensures that no double counting can occur.

For CDM activities transitioning under the PA, similar requirements can be set. CDM activities may be required to deregister and register under the PA, following Article 6.4 requirements and procedures. The process could be designed in an efficient manner, e.g. by utilizing IT based-tools to facilitate the procedure and reduce delays and errors.

6.3 Role of existing entities and bodies

This element is strictly related to the level of approval discussed above. The level of experience and capacities build through the CDM inside institutions in almost all countries where CDM activities have been taken place is huge. If new institutions are designed under the PA, it will be necessary for countries, especially developing ones, including LDCs and SIDS, to ensure this expertise is not lost and existing units (capacities) are not disbanded. Existing bodies/entities should still be left responsible for the supervision of Article 6.4 to ensure continuity with the efforts put under the KP to build a functioning supervising system at national level for the CDM activities to be implemented. Furthermore, duplication of entities in one country may result in unclear priorities, low coordination, inefficient use of resources, lack of common view and approach. Setting up of new entities is also a time and resource consuming process that can become politically sensitive. The institutional set up is also very important for transitioning CDM activities. It is clear that the need to create new entities or a

full reallocation of responsibilities between ministries may require long processes for the institutionalization of the new entity, resulting in delays in the transition of the CDM.

At international level there will be the need to agree on the institutional set up for the bodies that will have to supervise Article 6.4 implementation. While over time an effective structure has been built under the CDM comprising several bodies (i.e. the CDM EB, Methodology Panel, Accreditation Panel, Afforestation and Reforestation Working Group, Registration and Issuance Team), this structure still needs to be defined for the new mechanism. If existing structures can be reused under the PA, this would allow a smooth and fast transition for the CDM and reduce the burden for countries, and allow for speeding up the process for private investors getting involved.

Entities in charge of validating and verifying the mitigation impacts (and potentially also the SD contributions) of Article 6 activities shall be identified. Under the CDM, Designated Operational Entities (DOEs) have this function. Due to the fast increase of CDM activities requiring validation and verification services, a strong market emerged and many companies have been carrying out these services on a routine basis. DOEs are also relevant under Article 6.4. These entities, with existing UNFCCC accreditation, would be available for performing such services also under Article 6 without the need of a new accreditation process. If a new accreditation is required as a result of the negotiations, DOEs should be granted a fast-track channel, potentially having to demonstrate meeting new requirements that may arise from the negotiations for Article 6.4 activities (e.g. the MRV of SD contribution, see following paragraph).

6.4 Registries and tracking system

A system of registries has been created under the CDM to ensure transparent tracking of CERs to avoid double counting. The International Transaction Log (ITL) serves to keep a record of all transactions, including the unique serial numbers that allow the identification of each CER. A CDM registry grants access to different users and is linked to the national registries. The registry and tracking system, including the responsible entity (in case of a national or international entity) under Article 6, are not yet defined. The ITL and CDM registry could be directly reused. As “second best”, a similar system to the CDM could be established, with responsibilities at both national and international level. When considering the transition of CDM activities, it would be necessary to ensure compatibility of the systems, i.e. registries must be able to record the relevant information from both CERs generated by transitioned CDM activities and from A6.4ER. This refers to the need of also tracking the use of units against the NDCs.

The system should ensure the tracking of the first issuance and subsequent transfers between Parties. This information is relevant for the corresponding adjustments (see below) as these could be triggered at different points in time.

6.5 Corresponding adjustments

As discussed in Section 3, corresponding adjustments are still a contentious topic at negotiation level. The requirements for CDM activities transitioning under Article 6.4 can vary significantly. One scenario could be the lack of requirements, for instance if the CERs are not used against NDC targets. Another element to be considered is the relationship of the CDM activity with the NDC of the host country. Inclusion of the project type under one sector covered by the NDC, as well as the conditionality (or unconditionally) of the mitigation target covering a certain project type will be relevant for understanding whether CDM activities, and the CERs generated, will be subject to the corresponding adjustments and at which point in time this would be triggered (e.g. at first issuance, or upon utilization against the NDC target). Corresponding adjustments are not going to affect the transition of the CDM in terms of reducing (or expanding) eligibility of activities. However, to ensure compatibility between units generated under both Article 6.2 and 6.4 (therefore including also transitioned CDM activities) it is important to facilitate robust accounting procedures and avoid double counting.

7 Practical implications of the CDM transition: case studies

This section describes practical implications of the transition pathways for specific existing CDM activities. We will assess whether certain CDM activities and resulting CERs would be eligible under the different transition pathways and discuss what potential implications this may have on the CDM activities. The selected case studies represent a variety of CDM activities (different project types, host countries and registration dates) to demonstrate different implications when applying the pathways. The following table summarizes the four case studies that were selected.

Table 7: Key information on selected case studies

	Case Study 1	Case Study 2	Case Study 3	Case Study 4
CDM activity type	PoA	PoA	Single Project (LSC)	Single Project (LSC)
Project type(s)	Improved cookstove	Improved cookstove	Wind Power (grid connected)	Supercritical Coal
CDM Methodology	AMS-II.G. ver. 8	AMS-I.E. ver. 4	ACM0002 ver. 13	ACM0013 ver. 3
Host Country(ies)	Myanmar (LDC)	Kenya	Sudan (LDC)	India
Registration date	28/08/2018	30/11/2012	14/05/2013	22/07/2011
Crediting Period	Start date: 10/01/2019; End date: 09/01/2029	Start date: 01/11/2017; End date: 31/10/2024	Start date: 01/01/14; End date: 31/12/2023	Start date: 24/11/14; End date: 23/11/2024

CERs Issuance until date	-	0.12 M tCO ₂ e	-	-
Expected CERs until 2020	0.25 M tCO ₂ e	0.04 M tCO ₂ e	0,6 M tCO ₂ e	13 M tCO ₂ e
Expected CERs post 2020	5 M tCO ₂ e	0.11 M tCO ₂ e	0,3 M tCO ₂ e	8 M tCO ₂ e

Source: UNFCCC website, UNEP DTU (2019a,b)

The following sub-sections will show for each CDM transition pathway, what implications the application of the different criteria (registration date, project type and host country) will have for the eligibility of each CDM activity¹³. In addition to verifying the eligibility, additional implications for the case studies are described, if considered relevant in the context of a CDM transition and for negotiations on Article 6. As outlined in section 6.1, it is likely that CDM transition rules would require certain administrative procedures, that need to be followed and that may have implications for CDM activities and involved project participants. Despite the general eligibility of CDM activities, based on the criteria applied under the pathways, these requirements may lead to significant transaction costs or cause significant delays which may cause project participants to discontinue the activities.

7.1 Implications under the Pathway A “Full transition”

Under the “Full transition” pathway, all CDM activities would be eligible for transition. Therefore, all four CDM activities described under the case studies would be eligible post 2020.

Table 8: Eligibility of Case Studies under Pathway A

	Criteria	Case Study 1 "Cookstove PoA Myanmar"	Case Study 2 "Cookstove PoA Kenya"	Case Study 3 "Wind Project Sudan"	Case Study 4 "Coal Project India"
Pathway A "Full Transition"	Registration date	ok	ok	ok	ok
	Project type	ok	ok	ok	ok
	Host Country	ok	ok	ok	ok
	Eligibility	YES	YES	YES	YES

¹³ See section 4 for further information on the definition of criteria and the set of criteria and thresholds for the CDM Pathways

7.2 Implications under the Pathway B “Transition with certain limitations”

CDM activities are considered eligible if they are registered on or after 31 December 2012 and if they are not industrial gas (HFC and N₂O adipic acid) or large hydro projects (above 15 MW). Applying these criteria to the case studies would mean that only case studies 1 and 3 would be eligible.

Table 9: Eligibility of Case Studies under Pathway B¹⁴

Pathway B "Transition with certain limitations"	Criteria	Case Study 1 "Cookstove PoA Myanmar"	Case Study 2 "Cookstove PoA Kenya"	Case Study 3 "Wind Project Sudan"	Case Study 4 "Coal Project India"
	Registration date	ok	no	ok	no
	Project type	ok	ok	ok	ok
	Host Country	ok	ok	ok	ok
	Eligibility	YES	No	YES	No

Even though the project type and host country criteria would be met for the other two CDM activities, they would be ruled out due to the registration date.

Applying the criteria registration date for PoAs may lead to controversial discussions on whether this cut-off date should be applied to the PoA or to the component projects (CPAs) that are included in the PoA and that actually lead to emission reductions. When applied to the PoA, there would be two potential dates, the date of PoA registration or the start date of the PoA (which can be after the date of registration)¹⁵. The PoA concept was developed to build the framework for the inclusion of CDM activities in the future (by adding CPAs) and hence enables scaling up mitigation over time.

For the PoA in Kenya (Case Study 2) the actual start date (first inclusion of CPAs) was in 2017. For the CDM transition in this study we consider the registration date of the PoA (30 November 2012), and therefore the PoA and all CPAs would not be eligible. However, when considering the start date of the PoA instead (19 May 2017), or the date of CPA inclusion (first CPA included 1 November

¹⁴ Under this pathway, the PoA hosted by Kenya would be eligible in the case of a criterion for eligibility based on the inclusion date of the CPA instead than the registration date of the PoA.

¹⁵ The duration of a PoA, or the period in which the CPAs under the PoA can generate carbon credits, can be up to 28 years from the start date of the PoA (which can be the date of registration or any later date). The duration is defined by the project participants in the PoA-Design Document.

2017), then the situation would be different and any CPAs included and the generated CERs would be eligible.

7.3 Implications under the Pathway C “Transition with strict limitations”

This pathway applies stricter criteria on all three criteria, the registration date (registered on or after 5 November 2016), the project types (additionally CCS, clean coal or energy efficiency for coal for industrial applications and reforestation and afforestation) and the host country (only LDCs and SIDS are eligible).

Table 10: Eligibility of Case Studies under Pathway C

	Criteria	Case Study 1 "Cookstove PoA Myanmar"	Case Study 2 "Cookstove PoA Kenya"	Case Study 3 "Wind Project Sudan"	Case Study 4 "Coal Project India"
Pathway C "Transition with strict limitations"	Registration date	ok	no	no	no
	Project type	ok	ok	ok	no
	Host Country	ok	no	ok	no
	Eligibility	YES	No	No	No

Applying these criteria to the case studies would mean that only the Cookstove PoA in Myanmar (Case Study 1) would be eligible as all eligibility criteria would be fulfilled. In contrast to Pathway B, the PoA in Kenya would be non-eligible not only because of the registration date, but also due to its country status (as Kenya is listed as non-LDC). If the PoA has multiple host countries, the CPAs in other countries may still remain eligible.

Despite fulfilling two out of three eligibility criteria (project type and host country - LDC status) under the strict scenario, the Sudan wind project (Case Study 3) would not be considered eligible under Pathway C. This is only due to the registration date, which is after 1 January 2013, but prior to 5 November 2016). The Indian coal project (Case Study 4) would not match any of the applied eligibility criteria and would not be considered eligible for a CDM transition under Pathway C.

8 Conclusions

The CDM is the only operational tool under the UNFCCC currently available for private companies, willing to invest in mitigation activities in developing countries. Its transition to Article 6 under the PA is a key precondition to generate trust of private investors that engagement in international carbon markets makes sense. Many CDM activities have been supported through private investments over extended periods of low CER prices and lack of certainty on the existence of a future international climate agreement and thus, the private sector rightly asks not to be “cut out” once demand for credits from international market mechanisms picks up again. However, CDM transition to the Article 6 mechanisms is highly contested on the international level, with important countries trying to prevent it. This situation generates massive uncertainty for CDM investors and also for the institutions that will have to manage and supervise Article 6 mechanisms at the domestic level. There is now a short window of opportunity for those who oppose “expropriation” of CDM investments to influence the negotiation outcome scheduled for COP25 in Chile in December 2019. Piloting Article 6 activities on the basis of upscaling existing CDM activities is one option to test implications, gain experience and build up capacity for fast tracking Article 6 mechanisms and a successful CDM transition. Pilots can inform the negotiators and other relevant stakeholders on the real implications of different rules and procedures for both, Article 6 as a whole and the CDM transition.

Our assessment of three potential CDM transition pathways shows that stringent eligibility criteria, particularly regarding the characteristics of host countries or a cut-off date for registration, would result in very limited supply of CERs and eligible activities. It is important to carefully select the criterion (or combination of) that will be applied, to avoid sending a negative signal to potential investors in Article 6 activities. One example is the selection of the registration date for eligibility under the transition; other options are also possible and would lead to different outcomes. As shown by the case studies, utilization of the inclusion date of the CPAs can lead to some high quality PoAs not being eligible under the PA. There are several PoAs that have been registered and have only one CPA included, but still have the potential to contribute significantly to the global mitigation efforts through the inclusion of new CPAs as soon as the market conditions are more stable and favorable for new investments.

Limiting the possibility of renewing the crediting period under the PA, i.e. no renewal is allowed, would significantly limit the volume of CERs that would be eligible under the PA. On the other hand, this would again punish those investors that had a particularly long-term perspective. This issue would be less relevant in the case of a stringent transition with only a limited number of activities to be transitioned and consequently, a limited volume of CERs eligible under Article 6. Another potential option to limit the volume of eligible CERs is to define cut-off dates based on the vintages of the CERs, granting eligibility only to credits generated after a certain date. Different dates can be selected, similarly to the cut off dates based on the registration date. In this case the more lenient

option would be 31 December 2012, with limited effects on the volume of CERs; an intermediate date would be 4 November 2016 (entry into force of the PA), while the most stringent one would be 31 December 2020, i.e. the starting point of the NDC implementation period under the PA.

A full transition can potentially flood the market with many billions of CERs hence, keeping prices down for many years, and also undermine the environmental integrity of the new mechanism under which CDM could be transitioned. This challenge could be reduced if governments of large countries were willing to buy the accumulated CER surplus to allow a fresh start for the Article 6 market. Buying the currently accumulated (not used and not yet issued) CER volume of 8 billion at a price of 1 USD per CER would require roughly the same volume of money as the first allocation to the Green Climate Fund. Ideally the same countries would set up domestic carbon pricing systems and allow private sector players to submit Article 6 credits instead of paying the carbon price. If linked to a commensurate increase in ambition of NDCs of buyer countries, e.g. by the volume of CERs generated annually on average, this would bring the world closer to the long-term ambition of the PA.

Annex 1: Comparison of negotiation texts on Kyoto transition

Issue	SBSTA text 08.12.2018	Katowice text 14.12.2018
Transition from Kyoto Protocol- Activities	<p>Option A</p> <p>72. [Projects and programmes of activities registered under joint implementation under Article 6 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities.]</p> <p>73. [Project activities and programmes of activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities.]</p> <p>Option B</p> <p>74. [Projects and programmes of activities registered under joint implementation under Article 6 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities subject to the authorization for such registration by the relevant host Party.]</p> <p>75. [Project activities and programmes of activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities subject to the authorization for such registration by the relevant host Party.]</p> <p>Option C</p> <p>76. Project activities and programmes of activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol may be registered. Such registration shall undergo an expedited registration process.</p> <p>Option D</p> <p>77. [No activities registered under joint implementation under Article 6 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities.]</p> <p>78. [No activities under the clean development mechanism under Article 12 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities.]</p> <p>Option E</p> <p>{no text required, as deal with transition in the work plan}</p>	<p>Option A</p> <p>66. [[Projects and programmes of activities registered under joint implementation under Article 6 of the Kyoto Protocol] [Project activities and programmes of activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol] may be registered as Article 6, paragraph 4, activities.]</p> <p>Option B</p> <p>67. [[Projects and programmes of activities registered under joint implementation under Article 6 of the Kyoto Protocol] [Project activities and programmes of activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol] may be registered as Article 6, paragraph 4, activities subject to the authorization for such registration by the relevant host Party.]</p> <p>Option C</p> <p>68. [Project activities and programmes of activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities. Such registration shall undergo an expedited registration process.]</p> <p>Option D</p> <p>69. [No activities registered under joint implementation under Article 6 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities.]</p> <p>70. [No activities under the clean development mechanism under Article 12 of the Kyoto Protocol may be registered as Article 6, paragraph 4, activities.]</p>
Transition from JI units	<p>79. In relation to ERUs:</p> <p>Option A</p>	<p>71. [Emission reduction units that are issued for emission reductions that were achieved [prior to] [after] 1 January [2020] [2021] may be used by a</p>

	<p>(a) ERUs may be used by a Party towards its NDC; Option B (b) ERUs that are issued for emission reductions that were achieved prior to 1 January [2020] [2021] may be used by a Party towards its NDC; Option C (c) ERUs that are issued for emission reductions that are achieved after 1 January [2020] [2021] may be used by a Party towards its NDC; Option D (d) ERUs may not be used by a Party towards its NDC. Option E {no text required, as deal with transition in the work plan} {end of Option E} Option A 80. A6.4ERs may be issued for activities registered under joint implementation under Article 6 of the Kyoto Protocol. Option B {no text required, as no issuance of A6.4ERs for JI activities}</p>	<p>Party towards its NDC;] 72. [Emission reduction units may not be used by a Party towards its NDC.] 73. [A6.4ERs may be issued for activities registered under joint implementation under Article 6 of the Kyoto Protocol.]</p>
<p>Transition of CDM units</p>	<p>81. In relation to CERs: Option A (a) CERs may be used by any Party towards its NDC [or for purposes other than towards NDCs]; Option B (b) CERs that are issued for emission reductions that were achieved prior to 1 January [2020] [2021] may be used by a Party towards its NDC; Option C (c) CERs that are issued in relation to emission reductions that are achieved after 1 January [2020] [2021] may be used by any Party towards its NDC and for purposes other than its NDCs; Option D (d) CERs may not be used by a Party towards its NDC. Option E {no text required, as deal with transition in the work plan}</p>	<p>74. [Certified emission reductions that are issued for emission reductions that were achieved [prior to] [after] 1 January [2020] [2021] may be used by a Party towards its NDC.] 75. [Certified emission reductions may not be used by a Party towards its NDC.] 76. [A6.4ERs may be issued for activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol.] 77. [Certified emission reductions that have not been cancelled or retired under the Kyoto Protocol may be transferred to the mechanism registry.]</p>

	<p>Option F {no text required, as deal with this under guidance for cooperative approaches} {end of Option F}</p> <p>Option A 82. A6.4ERs may be issued for activities registered under the clean development mechanism under Article 12 of the Kyoto Protocol.</p> <p>Option B {no text required, as no issuance of A6.4ERs for CDM activities} {end of Option B}</p> <p>Option A 83. CERs that have not been cancelled or retired under the Kyoto Protocol may be transferred to the mechanism registry.</p> <p>Option B {no text required}</p>	
<p>Transition of Kyoto methodologies</p>	<p>Option A 84. Baseline and monitoring methodologies under Article 6 of the Kyoto Protocol shall be valid for Article 6, paragraph 4 activities,</p> <p>Option B {no text required, as no use of JI methodologies by Article 6, paragraph 4, activities} {end of Option B}</p> <p>Option A 85. Baseline and monitoring methodologies under the clean development mechanism under Article 12 of the Kyoto Protocol shall be valid for Article 6, paragraph 4 activities.</p> <p>Option B {no text required, as no use of CDM methodologies by Article 6, paragraph 4, activities}</p> <p>Option C {no text required, as deal with transition in the work plan}</p>	<p>78. [Baseline and monitoring methodologies under Article 6 of the Kyoto Protocol shall be valid for Article 6, paragraph 4 activities.]</p> <p>79. [Baseline and monitoring methodologies under the clean development mechanism under Article 12 of the Kyoto Protocol shall be valid for Article 6, paragraph 4 activities.]</p>
<p>Transition of Kyoto accreditation standards</p>	<p>Option A 86. The accreditation standards and procedures of the clean development mechanism under Article 12 of the Kyoto Protocol should serve as the basis for the standards and procedures for accreditation under the mechanism.</p>	<p>80. [The accreditation standards and procedures of the clean development mechanism under Article 12 of the Kyoto Protocol should serve as the basis for the standards and procedures for accreditation under the mechanism.]</p>

	<p>Option B {no text required, as no transition of the accreditation system}</p> <p>Option C {no text required, as deal with transition in the work plan}}</p>	
<p>Transition of Kyoto mechanisms- SBSTA mandate</p>	<p>Mandate given to SBSTA to elaborate:</p> <p>(r) Further provisions on the transition of activities from the Kyoto Protocol to Article 6, paragraph 4, that may be required in addition to those set out in section XIII (Transition from the Kyoto Protocol to Article 6, paragraph 4) of the annex, including on:</p> <p>(i) Having the same requirements for joint implementation and clean development mechanism activities as for Article 6, paragraph 4, activities;</p> <p>(ii) Conditions that may be necessary for the transition of activities, in addition to those set out in section XIII.A (Activities under the Kyoto Protocol) of the annex and/or in subparagraph (i) above;</p> <p>(iii) Necessary steps for the implementation of such transition;</p> <p>(s) Further provisions on the transition of units issued under the Kyoto Protocol that may be required in addition to those set out in section XIII.B (Transition of joint implementation emission reduction units) and section XIII.C (Transition of clean development mechanism certified emission reductions) of the annex;</p> <p>(t) Potential provisions on the transition from the Kyoto Protocol to Article 6, paragraph 4, that may be required pursuant to section XIII (Transition from the Kyoto Protocol to Article 6, paragraph 4) of the annex;</p>	<p>Mandate given to SBSTA to elaborate</p> <p>(h) [Further provisions on the transition of activities from the Kyoto Protocol to Article 6, paragraph 4, that may be required in addition to those set out in section X (Transition from the Kyoto Protocol to Article 6, paragraph 4) of the annex, including on:</p> <p>(i) Having the same requirements for joint implementation and clean development mechanism activities as for Article 6, paragraph 4, activities;</p> <p>(ii) Conditions that may be necessary for the transition of activities, in addition to those set out in section X.A (Transition of activities under the Kyoto Protocol) of the annex and in paragraph 7(h)(i) above;</p> <p>(iii) Necessary steps for the implementation of such transition;]</p> <p>(i) [Further provisions on the transition of units issued under the Kyoto Protocol that may be required in addition to those set out in section X.B (Transition of joint implementation emission reduction units) and section X.C (Transition of clean development mechanism certified emission reductions) of the annex;]</p> <p>(j) [Potential provisions on the transition of methodologies and accreditation standards from the Kyoto Protocol to Article 6, paragraph 4, that may be required pursuant to section X.D (Transition of methodologies) and section X.E (Transition of accreditation standards) of the annex;]</p>

Annex 2: List of LDCs and SIDS

N.	Country	LDCs	SIDS
1	Afghanistan	x	
2	Angola	x	
3	Antigua and Barbuda		x
4	Bahamas		x
5	Bahrain		x
6	Bangladesh	x	
7	Benin	x	
8	Bhutan	x	
9	Burkina Faso	x	
10	Burundi	x	
11	Cabo Verde	x	x
12	Cambodia	x	
13	Central African Republic	x	
14	Chad	x	
15	Comoros	x	x
16	Congo, Dem. Rep	x	
17	Cuba		x
18	Djibouti	x	
19	Dominica		x
20	Dominican Republic		x
21	Eritrea	x	
22	Ethiopia	x	
23	Federated States of Micronesia		x
24	Fiji		x
25	Gambia	x	
26	Grenada		x
27	Guinea	x	
28	Guinea-Bissau	x	x
29	Guyana		x
30	Haiti	x	x
31	Jamaica		x
32	Kiribati	x	x
33	Lao PDR	x	
34	Lesotho	x	
35	Liberia	x	
36	Madagascar	x	
37	Malawi	x	

38	Maldives		x
39	Mali	x	
40	Marshall Islands		x
41	Mauritania	x	
42	Mauritius		x
43	Mozambique	x	
44	Myanmar	x	
45	Nauru		x
46	Nepal	x	
47	Niger	x	
48	Palau		x
49	Rwanda	x	
50	Samoa		x
51	São Tomé and Príncipe	x	x
52	Senegal	x	
53	Seychelles		x
54	Sierra Leone	x	
55	Singapore		x
56	Solomon Islands		x
57	Somalia	x	
58	South Sudan	x	
59	St. Kitts and Nevis		x
60	St. Lucia		x
61	St. Vincent and the Grenadines		x
62	Sudan	x	
63	Suriname		x
64	Timor-Leste	x	x
65	Togo	x	
66	Tonga		x
67	Trinidad and Tobago		x
68	Tuvalu	x	x
69	Uganda	x	
70	Vanuatu	x	x
71	West Bank and Gaza	x	
72	Yemen, Rep.	x	
73	Zambia	x	

Source: UNOHRLLS (n.d. a, b)

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