CEEW THE COUNCIL | COP26

Advancing Article 6 Negotiations

A Proposal to Resolve the Certified Emissions Reductions (CERs) Transition Deadlock

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Executive summary

The 26th Conference of the Parties (COP26) of the United Nations Framework Convention on Climate Change (UNFCCC) is a significant checkpoint for global efforts to combat climate change. While much of the implementation guidelines of the Paris Agreement have been finalised, negotiators still need to resolve a few outstanding issues. One of these is devising the implementation guidelines for Article 6, which permits voluntary cooperation between Parties through cooperative approaches that involve the transfer of mitigation outcomes under paragraph 2, a market mechanism for mitigation under paragraph 4, and non-market approaches for mitigation, adaptation, and sustainable development under paragraphs 8 and 9.

Negotiations associated with the Article 6.4 mechanism include the issue of a possible transition of the Clean Development Mechanism (CDM) from the Kyoto Protocol regime to the Article 6.4 mechanism. A possible CDM transition encompasses the transfer of activities (projects and programmes of activities), carbon credits (known as certified emission reductions or CERs), methodologies for setting baselines and monitoring emissions, and infrastructure and institutional arrangements to the

Article 6.4 mechanism. Out of these four facets of a possible CDM transition, the transition of CERs remains the most contentious issue stemming from contrasting views among Parties on the path forward. This paper evaluates the issue of a possible CERs transition with the objective of proposing a solution that advances Article 6 negotiations.

On the one hand, CDM activities, set up primarily in large emerging economies, are left with a large stock of unutilised CERs as demand from Annex B countries (which made emissions reduction commitments under the Kyoto Protocol) dried up and prices fell by nearly 95 per cent after 2011 (Brescia et al. 2019). Some Parties, particularly Brazil, India, and China, support the full transition of CERs from the perspective of preserving the mitigation contribution of existing investments, thereby maintaining private sector confidence in UNFCCC market mechanisms. Other Parties, that include several developed countries, the Alliance of Small Island States (AOSIS), the Independent Alliance of Latin American and Caribbean States (AILAC), the Least Developed Countries (LDCs), and the African Group of Negotiators (AGN), have expressed concerns over a possible transition of CERs. These include:

i. Concerns that the transition of pre-2020 units (units associated with historical emissions reductions up to December 31, 2020) could disincentivise new emissions mitigation activities in the Nationally Determined Contributions (NDCs) implementation periods as Parties could opt to offset their emissions with pre-2020 units;

ii. Concerns over the environmental integrity of mitigation actions stemming from a possible double counting of emissions reductions: pre-2020 units being used for offsetting post-2020 emissions with the underlying emissions reductions already factored into host countries' progress towards their NDCs;

> **CDM activities, set up primarily in large emerging economies, are left with a large stock of unutilised CERs as demand from Annex B countries dried up and prices fell by nearly 95% after 2011.**

iii. Concerns over the additionality[1] and environmental integrity of some CDM activities; and

iv. Concerns that permitting the eligibility of pre-2020 CERs would flood the NDC-related compliance carbon markets and depress prices of carbon credits.

Taking cognisance of the positions of various Parties, this paper objectively evaluates the viability of a possible transition of pre-2020 units with a view to suggesting potential solutions to advance negotiations. In order to do so, the paper assesses the likely balance of demand and supply associated with this potential transition.

The analysis indicates that a total supply of 4.46 billion CERs could materialise in the event of a full transition of units. Out of these units, the total unsold CERs requesting transition could total 3.91 billion. The estimated total supply comprises two components:

- Latent CER issuance totalling 3.51 billion, which accounts for possible retrospective issuance by registered CDM activities which have monitored their emissions mitigation but have not been issued CERs.

- Available CERs totalling 0.95 billion, which represent the stock of unutilised CERs (those that have not been retired or cancelled)[2] out of those actually issued. Out of these units, only 0.40 billion CERs in the form of holdings in the CDM registry represent unsold CERs (for which no payment has been made to the developer).

The large stock of unutilised CERs and latent issuances stems from subdued demand (and consequently low CER prices) associated with existing sources in the pre-2020 regime. These include demand for offsets from carbon pricing initiatives such as emissions trading schemes and carbon taxes instituted by governments, demand from countries for compliance with Kyoto Protocol obligations (outside carbon pricing initiatives), demand for offsets from the International Civil Aviation Organisation's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) pilot phase, and demand from voluntary markets. Primary demand from these sources taken together stood at 13 million CERs in 2020, representing a sharp decline from 50 million in 2015. Demand for CERs has remained limited due to qualitative restrictions on eligibility based on vintage and geography imposed by these markets.

1 Additionality of a mitigation activity refers to evidence that the mitigation activity would not have happened in the absence of revenue from the sale of emissions reduction units from the market-based mechanism (CDM). Establishing additionality of an activity is an essential condition for its registration as a CDM activity.

2 Retirement refers to the utilisation of CERs by an Annex B country for compliance with its Kyoto Protocol commitments.

Stemming from a lack of demand visibility, a full transition of pre-2020 CERs seems to be an untenable proposition with sources of demand outside the Paris Agreement also inadequate to absorb the potential supply.

In the event of a CERs transition, pre-2020 units could be directly purchased by Parties towards the fulfilment of their NDC commitments, potentially opening up a large source of demand not available to CERs before 2020. A gap equivalent to 21.4 $GtCO_2$[3] over 2021-2030 exists between global current policy emissions trajectories and those corresponding to unconditional NDC commitments. However, as of July 2021, many Parties continue to express reservations about permitting the utilisation of pre-2020 CERs towards NDC commitments. If these positions remain unchanged, it is improbable that the consensus necessary for permitting the use of pre-2020 CERs towards NDCs would materialise at COP26.

If the CERs transition cannot be accomplished, CORSIA and voluntary markets represent possible sources of demand for pre-2020 units outside the Paris Agreement. Eligibility conditions for CORSIA first phase and second phase, which collectively represent demand for offsets equivalent to 2.59 $GtCO_2$ over 2024-2035 (contingent on a recovery in aviation traffic post the COVID-19 pandemic), have not yet been determined. However, if vintage-related eligibility restrictions similar to the pilot phase (2021-2023) are imposed[4], CORSIA is unlikely to represent a large source of demand for pre-2020 units. Further, the annual total demand for carbon credits from voluntary markets currently is 0.1 $GtCO_2$. Even without considering potential eligibility restrictions, the overall size of these markets seems inadequate from the perspective of absorbing pre-2020 units.

Thus, given the current lack of demand visibility, a full transition of pre-2020 CERs seems to be an untenable proposition and sources of demand outside the Paris Agreement also seem to be inadequate to absorb the potential supply. Various observers have suggested a limited transition of CERs based upon geographic, vintage, or sectoral restrictions as a compromise solution. However, such solutions appear arbitrary from the perspective of developers and could undermine private sector confidence in UNFCCC market mechanisms.

The Intergovernmental Panel on Climate Change's (IPCC's) *Sixth Assessment Report* clearly indicates that only prompt, accelerated, and large-scale decarbonisation can prevent global warming from exceeding 1.5 degrees (IPCC 2021). Thus, Parties must take decisive action to usher in the Article 6.4 mechanism to facilitate more ambitious mitigation action. In case a consensus on the CERs transition remains elusive, Parties should consider a compromise. In order to arrive at a compromise, Parties on both sides—those for as well as those opposing the CERs transition—would need to work together.

If Parties proposing the carry-over of CERs were to withdraw their proposal in exchange for compensation offered to the associated CDM activities, it could set the stage for the implementation of the Article 6.4 mechanism from a blank slate, that is, with a viable balance of demand and supply. Such a scenario would also address concerns associated with the environmental integrity of post-2020 mitigation action. In exchange for a compromise that results in no transition of CERs but achieves agreement on the Article 6.4 mechanism, this paper proposes that the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP), the highest decision-making body of the Kyoto Protocol, initiate deliberations on the constitution of a compensation fund for developers of CDM activities associated with pre-2020 CERs. In addition, this paper proposes that the Conference of Parties (COP) guarantee the constitution and capitalisation of the compensation fund by acknowledging proceedings associated with the fund in the outcome text of COP26. This would ensure that discussions may be taken up at future

In exchange for a compromise that results in no transition of CERs but achieves agreement on the Article 6.4 mechanism, this paper proposes the setting up of a compensation fund for developers of CDM activities associated with pre-2020 CERs.

3 $GtCO_2$ = 1 billion tonnes of CO_2 equivalents

4 The CORSIA pilot phase restricted eligible CERs to those generated by activities that commenced their crediting periods 2016 onwards and for emissions mitigation up to December 2020. The crediting period of a CDM activity is the period over which verified and certified emissions reductions attributable to a CDM project activity or programme of activity (PoA) can result in the issuance of CERs associated with that activity.

> **Either global weighted average prices of carbon offsets or a reverse auction mechanism may be used to determine compensation prices.**

climate summits in case an agreement on such a fund cannot be reached in Glasgow.

This paper proposes that the fund compensate developers of CDM activities that would otherwise remain uncompensated for their emissions mitigation achievements if CERs were to be excluded from the Article 6.4 mechanism. Such an exclusion would total 3.91 billion CERs, representing latent issuances and the unsold portion of issued CERs. In order to assuage any concerns over end use of proceeds from the fund, certain conditionalities could be applied on end use. For example, developers may be required to restrict deployment of proceeds towards either supporting existing CDM activities or investing in new mitigation activities. If proceeds are used for making new investments in mitigation activities, these should be consistent with the standards of environmental integrity to be determined for the Article 6.4 mechanism. Developers could also be required to monitor and report on the end use of proceeds.

Since current prices of USD 0.20-0.30 per CER are distorted due to the near absence of demand stemming from limited commitment to the Kyoto Protocol by developed countries, these do not reflect fair prices for determining the compensation amount. Developers should not be penalised for concerns over additionality or environmental integrity translating into low demand since the registration of these activities was approved by the CDM Executive Board (EB) itself. This paper proposes two alternatives to arrive at fair compensation.

The first option is using global weighted average prices of carbon offsets across voluntary crediting mechanisms to determine the compensation price. Based on market data sourced from the World Bank, these currently stand at around USD 3 per unit. At this level of pricing, the estimated size of the proposed compensation fund is USD 11.7 billion. The second option involves using a reverse auction mechanism for the discovery of compensation prices. In this mechanism, developers holding CERs can bid for a price from a compensation fund. Such a mechanism could potentially result in the rationalisation of the compensation price and the compensation amount needed.

While the paper recommends two alternative means of determining the compensation amount, it proposes that the fund be capitalised by developed countries (the COP in coordination with the CMA[5] and the CMP could designate to a subsidiary body the task of identifying the specific countries that capitalise the compensation fund) for the following reasons. A compromise requires parties on both sides of negotiations to work together and make concessions—if developing countries withdraw their proposal on the CERs transition, developed countries should reciprocate by agreeing to capitalise a compensation fund for developers of the associated activities. Further, inadequate pre-2020 climate mitigation by some developed countries has reduced the carbon space for developing countries (Prasad, Pandey, and Bhasin 2021). The envisioned voluntary purchase and cancellation of CERs by developed countries could help them demonstrate their commitment to the success of the UNFCCC process. At the same time, this could spur emerging economies to adopt more ambitious future decarbonisation trajectories. Such a compromise could potentially settle the debate over the CERs transition and usher in a viable Article 6.4 market mechanism.

1. Introduction

The year leading up to COP26 has witnessed a firming of global climate ambition even as the need for decisive action has become more urgent than ever. This has been accompanied by a recognition of the pressing need to resolve key outstanding issues in climate negotiations to permit a finalisation of the implementation guidelines of the Paris Agreement (UNFCCC 2021a). One of these outstanding issues is the finalisation of the rules, modalities, and procedures pertaining to Article 6, which permits voluntary cooperation between Parties through cooperative approaches that involve the transfer of

> **A key issue associated with Article 6.4 negotiations is the potential carry-over of the CDM, the market mechanism associated with the Kyoto Protocol, to the Paris Agreement.**

5 CMA refers to the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement, the highest decision-making body of the Paris Agreement.

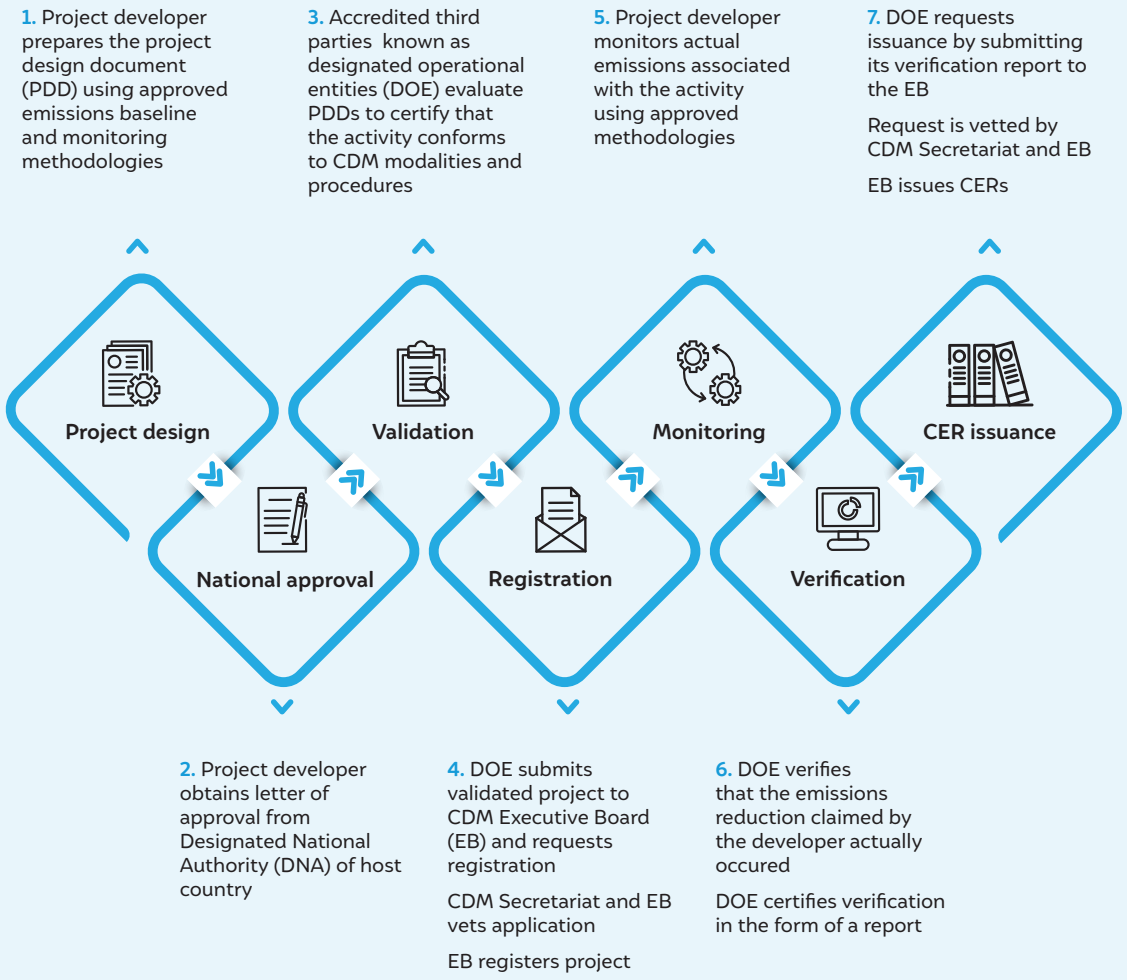
mitigation outcomes under paragraph 2, a market mechanism for mitigation under paragraph 4, and non-market approaches for mitigation, adaptation, and sustainable development under paragraphs 8 and 9 (UNFCCC 2016). A key issue associated with negotiations pertaining to the market mechanism under Article 6.4 is the potential carry-over of the CDM, the market mechanism associated with the Kyoto Protocol, to the Paris Agreement.

The Kyoto Protocol is an international treaty that governed pre-2020 global greenhouse gas (GHG) emissions mitigation efforts. Under the Kyoto Protocol, industrialised countries (known as Annex 1 countries) were expected to lower their GHG emissions in line with pre-determined targets over the first (2008-2012) and second (2013-2020) commitment periods. To complement domestic mitigation efforts towards the attainment of emissions reduction commitments, the Kyoto Protocol provided for three market mechanisms that enabled Annex B countries (Annex 1 Parties that actually committed to emissions reduction under the Kyoto Protocol) to offset their domestic emissions through the transfer of emissions mitigation units between countries. The CDM is one of the three market mechanisms. It allowed Annex B countries to purchase CERs (emissions mitigation units equivalent to one tonne of CO_2 abatement) associated with emissions mitigation activities in developing countries and in the process support

Box 1 CDM project cycle and current state of play

A set of defined steps has to be followed in the CER issuance process (Figure 1).

Figure 1 The CDM project cycle consists of seven steps



Source: UNFCCC 2021b

Collapse in CER prices

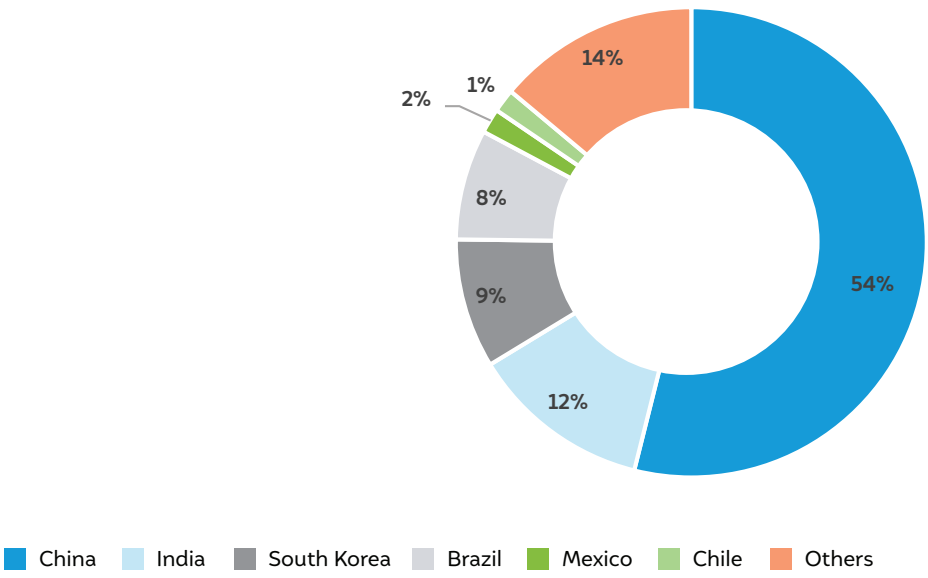
Thirty-seven countries undertook binding emission reduction commitments in the Kyoto Protocol's first commitment period (2008-2012). The majority of the deals for CERs in the initial years were forward contracts and trading was characterised by low volumes as very few CERs had been issued. The EU Emissions Trading System (EU ETS) represented the largest source of demand for CERs and prices for issued CERs rose to as high as EUR 23 in 2008 (Bose et al. 2014). Prices corrected sharply downwards in 2009 as a result of a moderation in demand triggered by the subdued economic conditions in the wake of the Global Financial Crisis. However, prices stabilised between EUR 10-15 per CER over 2009-2011 (Bose et al. 2014). From late-2011, the withdrawal of Canada from the Protocol, the refusal of Russia, Japan, and New Zealand to take on new targets in the second commitment period, and stringent eligibility restrictions imposed by the EU ETS on CER imports applicable for the period 2013 onwards (restricting eligible CERs to those issued by least developed countries—which excludes emerging economies, the major issuers of CERs) severely restricted demand (Berntsen et al. 2021; UNFCCC 2021c). As a result, prices collapsed sharply after 2011. Prices stood at USD 0.20-0.30 per CER in 2020 (Berntsen et al. 2021).

mitigation and sustainable development in the latter (refer to Box 1 for details of the CER issuance process and the current state of play).

The Paris Agreement, the successor to the Kyoto Protocol, is an international treaty that governs post-2020 mitigation action. Unlike the Kyoto Protocol, which required only industrialised countries to conform to top-down emissions mitigation targets, the Paris Agreement calls upon all countries to undertake mitigation action in line with self-determined targets. To enable countries to pursue more ambitious climate mitigation, the Paris Agreement allows voluntary cooperation between Parties in mitigation actions including through the Article 6.4 market mechanism.

While the Paris Agreement does not specifically provide for it, a possible transition of CDM activities, credits, methodologies for setting baselines and monitoring emissions, and infrastructure and institutional arrangements to the Article 6.4 mechanism has become a part of ongoing climate negotiations (UNFCCC

Figure 2 Four emerging economies account for the lion's share of cumulative CER issuances



Source: UNEP DTU Centre on Energy, Climate and Sustainable Development 2021a

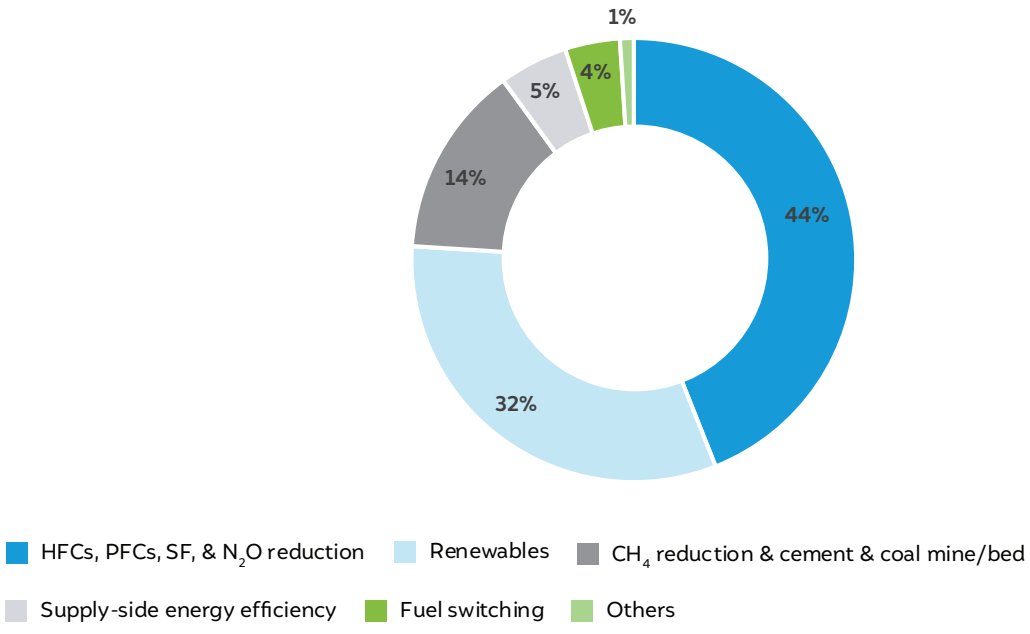
Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) 2019; Lo Re and Ellis 2021). This is largely because of the concerns of emerging economies, particularly China, India, and Brazil, where CDM activities are left with large quantities of unutilised CERs (Figure 2) (Michaelowa et al. 2021). These unutilised CERs are the outcome of demand from Annex 1 countries evaporating after 2011 as a result of regulatory changes affecting demand for CERs from the EU and limited commitment to the Kyoto Protocol from other advanced economies (Box 1). This reduction in demand occurred even as the poor participation and performance of many developed countries in their pre-2020 mitigation action has reduced the carbon space available to developing countries (Prasad, Pandey, and Bhasin 2021).

While negotiations on the transition of activities, methodologies, and infrastructure are in relatively advanced stages, the issue of the CERs transition remains contentious (Lo Re and Ellis 2021; UNFCCC 2021d; UK COP26 2021). This paper focuses on the contentious issue of the CERs transition with the objective of proposing solutions that could potentially advance Article 6 negotiations. On the one hand, the exclusion of pre-2020 CERs from the Article 6.4 mechanism without credible redressal could severely undermine private sector confidence in UNFCCC market mechanisms (Press Information Bureau, Government of India 2019). These CERs are associated with a wide spectrum of activities across emerging economies (Figures 2 and 3), evidence that the CDM was successful in catalysing mitigation activities in the developing world. Moreover, the registration of each of the activities associated with pre-2020 CERs was approved by the CDM EB after following the due process (outlined in Box 1). Leaving investors that set up legitimate projects stranded with unutilised CERs without any compensation could conceivably even jeopardise large-scale private sector participation in successor UNFCCC market mechanisms.

On the other hand, some developed countries, the Alliance of Small Island States (AOSIS), the Independent Alliance of Latin American and Caribbean States (AILAC), the Least Developed Countries (LDCs), and the African Group of Negotiators (AGN) have expressed reservations about a CERs transition on the following grounds (Michaelowa et al. 2021):

- Concerns that a transition of pre-2020 units would hinder the rapid decarbonisation needed to achieve Paris Agreement targets if countries start using pre-2020 units towards their NDCs instead of undertaking new mitigation activities (Lo Re and Vaidyula 2019).

Figure 3 **Industrial gas reduction and renewables projects account for three-quarters of cumulative issuance**



Source: UNEP DTU Centre on Energy, Climate and Sustainable Development 2021a

- Concerns over the environmental integrity of mitigation actions stemming from the possible double counting of emission reductions: pre-2020 CERs being used to offset post-2020 climate commitments, with the underlying emission reductions already factored into devising host countries' NDC scenarios or progress towards the same (Michaelowa et al. 2021).
- Concerns over the additionality of some CDM activities as well as concerns over the environmental integrity of specific activities (such as large hydro power projects, projects limiting industrial gas production, and activities implemented at coal-based power projects) (Brescia et al. 2019; Michaelowa et al. 2019; Taskforce on Scaling Voluntary Carbon Markets 2021).
- Concerns that permitting the eligibility of pre-2020 CERs would result in oversupply in NDC-related compliance carbon markets and depress prices of carbon credits (Brescia et al. 2019; Lo Re and Vaidyula 2019; Michaelowa et al. 2019). Depressed prices could disincentivise new private sector investments under the Article 6.4 market mechanism thereby affecting the viability of the markets themselves.

A breakthrough in the existing deadlock in negotiations associated with the CERs transition is necessary to pave the way for the introduction of the Article 6.4 mechanism. Taking cognisance of the positions of various Parties, this paper objectively evaluates the feasibility of a possible CERs transition by assessing the likely balance of supply and demand. Building upon this analysis, it proposes a possible solution geared towards facilitating a credible breakthrough in Article 6 negotiations. The emphasis is on finding solutions that maintain the credibility of UNFCCC emissions mitigation efforts and set the stage for rapid decarbonisation going forward.

2. What is the scale of CER supply in the event of a full transition?

The first step in assessing the viability of a possible CERs transition is sizing up the supply. In the event of an unrestricted transition of emissions units, the supply of CERs could comprise three components.

- **Latent CER issuance:** This component captures the possible issuance from registered CDM activities that have monitored their associated emissions mitigation but have not been issued CERs. These activities can retrospectively have CERs issued against this mitigation if market signals indicate the possibility of better pricing (Schneider et al. 2017). Estimates of latent CER issuance correspond to the second Kyoto commitment period (2013-2020), a period over which depressed demand and prices prevailed, limiting actual issuance to a fraction of the potential. This component has been estimated by deducting actual issuance over 2013-2020 from estimates of supply potential over 2013-2020 made by Ishikawa et al. (2020). Estimates of supply potential by Ishikawa et al. factor in the impact of EB rulings restricting the renewal of crediting periods (Ishikawa et al. 2020; UNFCCC 2018; UNFCCC 2019).
- **Available CERs:** This component represents the existing stock of unutilised CERs out of those that have actually been issued. This figure has been estimated by Michaelowa et al. (2021) by deducting the stock of used (cancelled or retired) CERs from cumulative CERs issued as of 30 April 2021. Using a bottom-up analysis of CER registries, Michaelowa et al. traced most unutilised CERs to CDM (0.40 billion) and Annex B registries (0.42 billion), with around 0.13 billion CERs remaining unaccounted for in the system (residual issuances). These unaccounted CERs could correspond to unreported holdings in national registries (Michaelowa et al. 2021). Unutilised CER holdings in national registries represent those CERs for which payments have been made to developers but which have not been retired or cancelled. In the event of an unrestricted CERs transition, all unutilised CERs could request transition. However, only those in the CDM registry represent unsold CERs, that is, those for which developers have not received any payments.
- **Future CER issuance:** CDM activities can potentially continue generating CERs beyond 2020. However, the future of the CDM itself is uncertain post the conclusion of the second Kyoto commitment period on 31 December 2020. It is unlikely that the CDM would operate under a new commitment period of the Kyoto Protocol given that Parties agreed to the Paris Agreement for the post-2020 regime. The CDM EB has implemented temporary measures to govern the CDM until the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP), the highest decision-making body of the Kyoto Protocol, can offer guidance on its future. The CMP is slated to meet at COP26. Per the temporary measures announced by the EB, the issuance of CERs after 2020 will remain provisional (UNFCCC 2021e). CERs issued

until 30 April 2021 are included in the estimate of the stock of available CERs. However, from the perspective of sizing CER supply associated with the transition, any future issuances are not considered.

Thus, the two components (Latent and Available CERs) taken together indicate a potential supply of 4.46 billion CERs that could request transition (Table 1). Out of this total, the supply of unsold CERs requesting transition would amount to 3.91 billion (Table 1).

Table 1 Estimating supply (in billions) in case of an unrestricted CERs transition

Supply potential over 2013-2020	4.10
(-) Actual issuance over 2013-2020	0.59
= Latent issuance (A)	**3.51**
Cumulative CER issuance until 2020	2.10
(-) Used (cancelled or retired) CERs	1.15
= Available CERs (B)	**0.95**
Total CER supply (=A+B)	**4.46**
(-) CER holdings in Annex B countries (C)	0.42
(-) Residual issuances (D)	0.13
= Total supply of unsold CERs (A+B-C-D)	**3.91**

Notes:
1. The table includes the supply of CERs associated with both projects and programmes of activities
2. CER holdings in Annex B countries are those for which developers have actually been paid and residual holdings are those for which developers are assumed to have been paid (details in the main text).
3. Sources for estimates of latent issuance:
   - Supply potential 2013-2020: Ishikawa et al. (2020)
   - Actual issuance over 2013-2020: UNEP DTU (2021c)
4. Sources for estimates of available CERs:
   - Cumulative CER issuance: as of April 2021, sourced from Michaelowa et al. (2021).
   - Used CERs: as of April 2021, sourced from Michaelowa et al. (2021).
5. Source for estimate of CER holdings in Annex B countries and residual issuances: as of April 2021, sourced from Michaelowa et al. (2021)

3. Sizing demand for CERs

The next step in the assessment of the viability of the CERs transition is the estimation of the likely demand for the units that could transition. An accurate estimate is challenging since many of the policies and market mechanisms that would shape demand are yet to be finalised. Nevertheless, it is still possible to assess the likely order of magnitude of this demand. Before assessing the scale of demand in the scenario of a CERs transition, the paper first examines sources of demand for CERs in the pre-2020 regime.

3.1 What were the pre-2020 sources of demand for CERs?

At least four distinct sources of demand existed for CERs in the pre-2020 regime.

3.1.1 Supranational/national/subnational carbon pricing initiatives

Carbon pricing initiatives such as emissions trading schemes and carbon taxes have been employed as policy tools by various supranational, national, and subnational entities to control emissions in their jurisdictions in pursuit of climate goals. The purchase of carbon offsets is generally one of the options available to obligated entities under such carbon pricing initiatives to meet their compliance obligations. While a number of national and subnational carbon pricing systems exist or are in the works, only the Republic of Korea Emissions Trading Scheme (Korea ETS), EU Emissions Trading System (EU ETS), Colombia carbon tax, Mexico carbon tax, and South Africa carbon tax actually permitted the use of CERs in the pre-2020 regime (World Bank Group 2020). However, these carbon pricing initiatives have applied qualitative restrictions based on vintage and geography (Table 2) that have limited the demand for CERs.

3.1.2 Demand for Kyoto Protocol compliance outside carbon pricing initiatives

The demand for CERs from some carbon pricing initiatives mentioned in section 3.1.1 was directed towards meeting the Kyoto Protocol compliance requirements of governments. In addition, direct demand for CERs from governments with emissions reduction commitments constituted another source of demand.

3.1.3 CORSIA

CORSIA is a market mechanism developed by the ICAO that aims to achieve carbon-neutral growth in the civil aviation sector from 2020 onwards (ICAO 2021). While CERs were deemed eligible carbon offsets under CORSIA for the pilot phase (2021-2023) per guidelines released in March 2020, eligibility is restricted to CERs issued by activities that started their first crediting period January 2016 onwards and for emissions reduction occurring up to December 2020 (Table 2). This severely restricts the pool of eligible CERs. Eligibility for the first (2024-2026) and second (2027-2035) phases is yet to be determined.

Table 2 Eligibility restrictions imposed by carbon pricing initiatives on CERs

Initiative	Eligibility period	Eligible CERs
EU ETS Phase 1	2005-2007	CERs from all geographies eligible
EU ETS Phase 2	2008-2012	CERs from all geographies eligible
EU ETS Phase 3	2013-2020	Issued by CDM activities in least developed countries only
EU ETS Phase 4	2021-2030	No CERs eligible
Korea ETS Phase 1	2015-2017	Issued by domestic CDM activities
Korea ETS Phase 2	2018-2020	CERs issued from June 2016 onwards from international CDM projects developed by domestic companies
Korea ETS Phase 3	2021-2025	
Mexico carbon tax	Dec 2017 onwards	Issued by domestic CDM activities
South Africa carbon tax	June 2019 onwards	Issued by domestic CDM activities
Colombia carbon tax	2017 onwards	In 2017: CERs from all geographies From 2018: Issued by domestic CDM activities
CORSIA pilot phase	2021-2023	CERs issued up to Dec 2020 by activities with first crediting period starting Jan 2016 onwards

Source: Author's compilation based on Santiago et al. (2018), Alarcon-Diaz et al. (2018), Louw et al. (2016), ICAO (2020), International Carbon Action Partnership (2021), European Commission (2021a), European Commission (2021b)

3.1.4 Voluntary markets

These are independent carbon crediting mechanisms used for voluntary offsetting purposes by organisations and individuals. The American Carbon Registry, the Climate Action Reserve, the Gold Standard, and the Verified Carbon Standard are crediting mechanisms that supply credits for these voluntary markets (World Bank Group 2020). When CERs are purchased on the voluntary markets, the developer has to request voluntary cancellation from the CDM registry.

The total demand for primary CERs from all sources combined (Figure 4) has declined considerably over the years and remains paltry compared to the supply (Table 1). Secondary trades have been higher.

3.2 Sizing demand for CERs in the post-2020 regime

The following sources of demand could potentially be available to CERs in the post-2020 regime.

3.2.1 NDCs

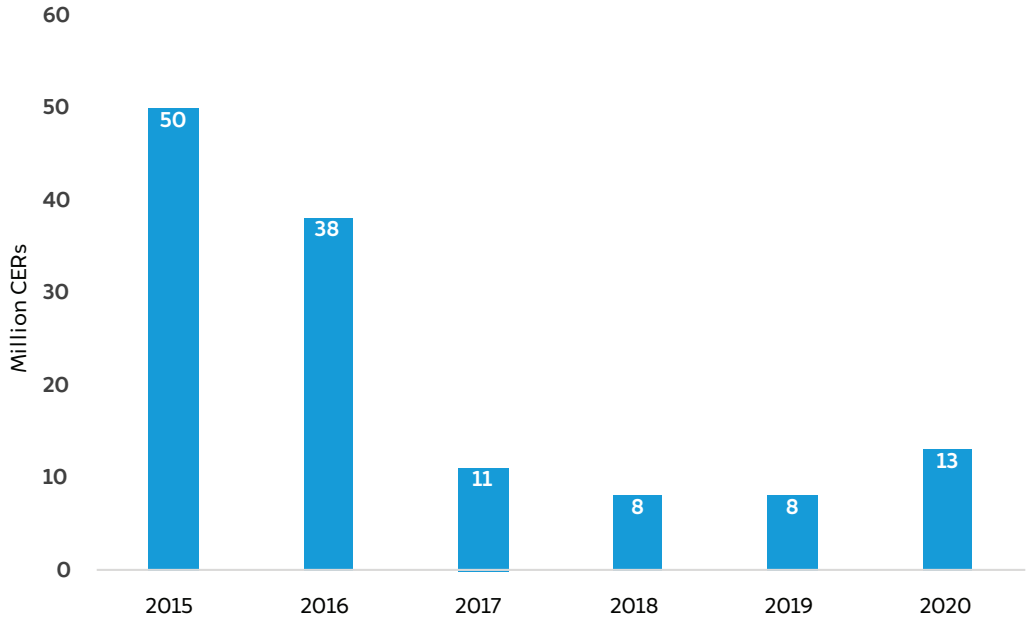
The Paris Agreement permits the use of Article 6.4 credits towards the fulfilment of NDCs. A gap totalling 21.4 $GtCO_2$ over the period 2021-2030 exists between global emissions trajectories based on current policies and those needed to meet unconditional NDCs (United Nations Environment Programme 2019). In case of a transition of pre-2020 units to the Article 6.4 mechanism, the possible utilisation of these units towards meeting NDCs could in theory open up a large additional source of demand not available to CERs in the pre-2020 regime.

However, many developed as well as developing countries have clearly voiced their opposition to allowing the utilisation of carried over pre-2020 CERs towards the attainment of NDCs (Carbon Brief 2019; Direccion de Cambio Climatico, Ministerio de Ambiente y Energia-Republica de Costa Rica 2021). Parties are also generally unwilling to use market mechanisms for meeting NDC targets, as evident in their updated NDC submissions. Only 7 out of 51 Parties submitting updated NDCs have indicated their willingness to use market mechanisms towards meeting their NDC targets (Brandemann, Kreibich, and Obergassel 2021). As of July 2021, many Parties remain sceptical about permitting the transition of pre-2020 CERs (UK COP26 2021). In the absence of any indications of a consensus emerging on the issue, the utilisation of pre-2020 units towards NDCs remains only a remote possibility.

3.2.2 Sources of demand beyond NDCs

Given the opposition to the utilisation of pre-2020 CERs towards the fulfilment of NDCs, does demand for pre-2020 CERs exist outside the Paris Agreement? This scenario would exclude demand from national or subnational carbon pricing initiatives that help Parties towards the achievement of their climate commitments. Outside of these carbon pricing initiatives, CORSIA and voluntary markets represent other sources of possible demand.

Figure 4 Global primary market CER volumes have been subdued in recent years



Source: Berntsen et al. 2021; Kolos et al. 2019

> Many developed as well as developing countries have clearly voiced their opposition to allowing the utilisation of carried over pre-2020 CERs towards the attainment of NDCs.

CORSIA first (2024-2026) and second (2027-2035) phases collectively represent a demand for 2.59 $GtCO_2$ in offsets (Lo Re and Vaidyula 2019). This demand figure is valid if there is a recovery in aviation traffic post the COVID-19 pandemic, else actual demand could be lower. In the absence of guidelines on eligibility of offsets for the first and second phases, demand visibility for CERs is lacking. However, if vintage restrictions on CER eligibility similar to those imposed in the pilot phase are maintained in the first and second phases (Table 2), CORSIA is unlikely to represent a large source of demand for CERs.

Voluntary markets would constitute another source of demand for CERs outside the Paris Agreement. Volumes in voluntary carbon markets stood at 104 million tonnes of carbon dioxide equivalent ($MtCO_2$) in 2019, with volumes in 2020 estimated to match those in 2019 (Donofrio et al. 2020). Without prejudice to any eligibility conditions that could be imposed, the overall size of voluntary markets seems inadequate from the perspective of the capacity to absorb pre-2020 CERs.

Thus, sources of demand do not even get close to demonstrating the capacity to absorb the 4.46 billion pre-2020 units that could become available in case of a full CERs transition (Table 1).

4. Implications for Article 6 negotiations

The continued opposition of many parties to the utilisation of pre-2020 CERs towards NDCs is the chief obstacle to a potential CERs transition. The foregoing demand-supply analysis also indicates that sources outside the purview of the Paris Agreement possess only limited capacity to absorb pre-2020 units. In the absence of visibility on additional sources of demand, pre-2020 units are unlikely to find buyers going forward.

As a compromise solution, many observers have proposed a limited CERs transition by applying vintage, sectoral, or geographic restrictions on the

> If vintage restrictions on CER eligibility similar to those imposed in the pilot phase are maintained in the first and second phases, CORSIA is unlikely to represent a large source of demand for CERs.

eligibility of pre-2020 units that could transition to the Article 6.4 mechanism (Brescia et al. 2019; Ishikawa et al. 2020; Lo Re and Vaidyula 2019; UNFCCC 2021e). However, while such restrictions could help rationalise supply, these appear arbitrary from the perspective of developers. Such measures could undermine investor confidence in UNFCCC market mechanisms if fair compensation is not offered to the developers of CDM activities associated with the excluded CERs. Thus, other solutions need to be considered.

5. Resolving the deadlock at climate negotiations

The finalisation of the implementation guidelines of the Article 6.4 mechanism at COP26 is desirable to facilitate the raising of climate mitigation ambitions necessary to meet Paris Agreement targets. Given the urgency of the need to take action on climate mitigation, Parties should consider a compromise in case a consensus on the CERs transition cannot be accomplished - as appears to be the case. While a breakthrough in negotiations could also be achieved from outside Article 6 (such as a compromise on non-Article 6 rules), this paper suggests a simpler compromise within Article 6 (subject to the purview of the CMA) and the CDM (subject to the purview of the CMP).

To arrive at this compromise, if Parties proposing the carry-over of CERs were to withdraw their proposal, it would break the deadlock and facilitate the creation of the Article 6.4 mechanism. This would also allow the Article 6.4 mechanism to start from a blank slate, that is, with no transition of CERs, and therefore a viable balance of demand and supply. At the same time, this would also address concerns related to the environmental integrity of post-2020 mitigation. However, in return, developers of CDM activities associated with the pre-2020 CERs must be offered some form of fair compensation.

In case of a scenario of no transition of CERs translating into an agreement on the Article 6.4 mechanism, this paper proposes that the CMP initiate deliberations on the constitution of a compensation fund for developers of CDM activities. In addition, the paper proposes that the COP guarantee the constitution and capitalisation of the compensation fund by acknowledging proceedings associated with the fund in the outcome text of COP26. This would ensure that discussions may be taken up at future climate summits in case an agreement on such a fund cannot be reached at Glasgow. Such steps would be essential for maintaining investor confidence in UNFCCC market mechanisms and could even be necessary to ensure large-scale private sector participation in the Article 6.4 mechanism. So, how much would this cost?

5.1 Compensation fund for CDM activities

This paper proposes the setting up of a fund that offers fair compensation to the developers of CDM activities that would remain unpaid for their emissions mitigation achievements if CERs are excluded from the Article 6.4 mechanism. This includes unsold CERs in the CDM registry as well as latent CER issuances. These correspond to activities that either could not sell CERs amid subdued demand and pricing conditions or did not issue CERs against the mitigation achieved. The associated volumes total up to 3.91 billion (Table 1). Such a proposal is made to maintain continued investor confidence in UNFCCC market mechanisms by ensuring that developers that took on investment risks and set up activities in good faith are not penalised over factors beyond their control. Since the registration of these activities was approved by the CDM EB, developers should not be penalised for the evaporation of demand stemming from retrospective question marks over the environmental integrity of the associated CERs. If latent issuers choose to claim compensation, they would be required to bear the transaction costs of CER issuance, which have already been borne by activities that have actually issued CERs. Payments from the compensation fund would only be offered to developers of CDM activities, several of which are financed by equity capital from developed countries (Bhaskar 2019). This compensation would not flow to governments of emerging economies.

- In order to allay any concerns over end use of proceeds from the fund, certain conditionalities could be applied on end use. For example, developers may be required to restrict deployment of proceeds towards either supporting existing CDM activities or investing in new mitigation activities. In case proceeds are used for making new investments in mitigation activities, these activities may be required to be consistent with the standards of environmental

> **This paper proposes that compensation be offered to developers for unsold CERs in the CDM registry and for latent issuances, which total to a combined 3.91 billion CERs.**

integrity to be determined for the Article 6.4 mechanism. Developers could also be required to monitor and report on the end use of proceeds.

- The CERs should be priced fairly in determining the compensation amount. Existing CER prices (USD 0.20-0.30 per CER) reflect depressed demand stemming from eligibility restrictions associated with existing sources and the complete absence of demand from other markets, driven largely by concerns over their additionality and environmental integrity. However, developers that set up their activities in good faith should not be penalised over these concerns, particularly since the registration of these activities was approved by the CDM EB. This paper proposes two alternatives for determining compensation prices – using weighted average prices across carbon crediting mechanisms and price discovery through a reverse auction mechanism.
- The prevailing weighted average prices across voluntary carbon crediting mechanisms could offer guidance on fair pricing for the purpose of compensation since CER prices could conceivably have been much closer to average prices had demand not evaporated. The prevailing weighted average price of carbon offsets across voluntary carbon crediting mechanisms stands at around USD 2.98 per unit (Table 3). Based on prevailing weighted average carbon credit prices, the paper recommends a price of USD 3 per CER for determining the compensation amount. Considering volumes of 3.91 billion to be compensated and factoring in a price of USD 3 per CER, a fund totalling USD 11.7 billion should be sufficient to compensate all CDM activities.
- Alternatively, Parties could also consider a reverse auction mechanism for the discovery of compensation prices. In this mechanism,

Table 3 Estimating global average carbon credit prices

Sector	Volume of credits transacted in $MtCO_2$ (V)	Average price per credit in USD (P)	P x V (USD Million)
Wind	12.60	1.43	18.02
Solar	6.20	2.21	13.70
Landfill methane	5.40	2.16	11.66
Clean cookstoves	4.50	3.54	15.93
Run-of-the-river hydro	4.00	1.71	6.84
Large hydro	1.90	0.55	1.05
Water purification	1.80	4.50	8.10
Biogas	1.70	4.35	7.40
Blue carbon	0.30	5.75	1.73
Livestock methane	0.10	8.68	0.87
Sustainable agriculture	0.10	12.52	1.25
Rangeland management	0.10	11.80	1.18
Livestock methane	0.02	12.90	0.26
Afforestation/reforesation	3.00	7.69	23.07
Energy efficiency	2.10	4.27	8.97
Improved forest management	2.10	8.03	16.86
Total	45.92		136.88
Weighted average price in USD			**2.98**

Source: World Bank (2021)

Notes:
The table does not capture volumes associated with all segments but those with the highest volumes transacted across voluntary markets, as presented in the World Bank's State and Trends of Carbon Pricing 2021 report. The calculation in Table 3 excludes REDD credits (volumes transacted 23.3 $MtCO_2$ at an average price of USD 3.79) as avoided deforestation is not an eligible activity under the CDM.

developers holding CERs can bid for a price from a compensation fund. Such a mechanism could potentially result in the rationalisation of the compensation price and the compensation amount needed.

- While this paper presents two alternatives for determining the compensation amount, it recommends that the compensation fund be capitalised by developed countries (the COP in coordination with the CMA and CMP could designate to a subsidiary body the task of identifying the specific countries that capitalise the compensation fund). This recommendation is largely because:

  a. A compromise in negotiations requires Parties on both sides to make concessions. If developing countries withdraw their demand for a CERs transition, developed countries should reciprocate with a commitment to capitalise the fund to advance the negotiations process.

  b. The primary reason behind insufficient demand for CERs has been the lack of commitment to the Kyoto Protocol (including the Doha Amendment) from developed countries through a combination of eligibility restrictions in their markets, limited participation, and non-participation. This has resulted in reduced carbon space for developing countries, disrupting the pursuit of equity in global emission mitigation efforts. The voluntary purchase and cancellation of CERs offers developed countries a chance to demonstrate their commitment to the UNFCCC climate mitigation process.

  c. Such a move on the part of developed countries would uphold the credibility of the UNFCCC and could encourage emerging economies to embrace more ambitious climate mitigation plans, thereby injecting fresh momentum into post-2020 climate action.

6. Conclusion

Given the scale and urgency of decarbonisation necessary to avert a climate catastrophe, decisive action is needed at COP26. Addressing the issue of the CERs transition could help usher in the Article 6.4 mechanism, which in turn can facilitate more ambitious climate mitigation. A vibrant carbon market requires viable carbon prices and must enjoy the confidence of the private sector. It is clear that demand and therefore viable pricing would be challenging in the event of a full-scale transition of CERs, whereas a partial transition would undermine private-sector confidence. A one-time settlement funded by developed countries could be the best bet from the perspective of a resolution. Capitalising the proposed fund also offers these countries a chance to make amends for shortfalls in pre-2020 climate action and demonstrate their commitment to the success of UNFCCC climate mitigation efforts. This could nudge emerging economies to pursue more ambitious mitigation trajectories and thereby accelerate global climate mitigation action going forward.

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