



Transitioning elements of the Clean Development Mechanism to the Paris Agreement

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Abstract

This discussion paper assesses how different elements of the Clean Development Mechanism (CDM) – including its rules, its institutional framework, its projects, and its certified emission reductions (CERs) – could be used under the Paris Agreement.

The analysis identifies a number of regulatory elements, overarching processes and procedures along the CDM project cycle and elements of the CDM institutional framework that may, to a large extent, be used for the Article 6.4 mechanism, but that require significant revisions and updates. The CDM rules for baseline-setting and additionality demonstration appear to a much lesser extent transferable to the Article 6.4 mechanism or may need to be considerably restricted in their use. The establishment of the new Article 6.4 mechanism provides an opportunity to take on board the considerations and discussions of the CDM reform process and to implement an improved governance structure for the supervisory body.

We find that the migration of CDM *projects* and/or *CERs* could significantly increase aggregated GHG emissions and at the same time further erode the trust and confidence by investors. In order to address these risks, rules for the migration of projects should prioritize projects that are vulnerable to discontinuing GHG abatement in the absence of revenues from CERs, as well as new projects that are likely to be additional and are implemented in response to the new post-2020 demand. As for the use of CERs, the challenges in establishing meaningful restrictions speak in favour of not using CERs towards the achievement of mitigation targets after 2020.

Kurzbeschreibung

In diesem Diskussionspapier wird erörtert, wie verschiedene Elemente des Clean Development Mechanism (CDM) unter dem Pariser Übereinkommen genutzt werden könnten. Hierzu zählen Regeln und Institutionen des CDM, als auch Projekte und zertifizierte Emissionsminderungen (Certified Emission Reductions, CERs).

Die Analyse identifiziert regulatorische Elemente, übergeordneten Prozesse und Prozeduren und Elemente des institutionellen Rahmens aus dem bestehenden CDM, welche zu einem großen Teil für den Artikel 6.4-Mechanismus genutzt werden könnten, allerdings zum Teil revidiert werden müssten. Die Regeln des CDM zur Bestimmung der Baseline und der Zusätzlichkeit scheinen hingegen weit weniger anwendbar unter dem Artikel 6.4-Mechanismus und könnten nur unter Einschränkungen Verwendung finden. Die Schaffung des neuen Artikel 6.4-Mechanismusses bietet die Gelegenheit, die Überlegungen und Diskussionen des CDM-Reformprozesses konsequent umzusetzen und verbesserte institutionelle Strukturen für das Aufsichtsgremium für den Artikel 6.4-Mechanismus vorzusehen.

Bezüglich der Überführung von CDM Projekten und der Nutzung von CERs nach 2020 kommt die Analyse zu dem Ergebnis, dass die Überführung von Projekten und CERs die globalen Treibhausgasemissionen erheblich erhöhen könnte und darüber hinaus das Vertrauen von Investoren in den Markt weiter untergraben könnten. Um diese Risiken zu vermeiden, sollten bei einer Überführung Projekte favorisiert werden, die ohne die Einnahmen aus CERs möglicherweise die weitere Minderung der Treibhausgasemissionen einstellen würden, also auch neue Projekte, die wahrscheinlich zusätzlich sind und aufgrund der neuen Nachfrage nach CERs nach 2020 umgesetzt wurden. In Hinblick auf die Überführung von CERs gibt es erhebliche Herausforderungen bei der Gestaltung von effektiven Regeln zur Begrenzung einer Überführung. Dies spricht dafür, CERs nicht zur Erreichung von Klimazielen nach 2020 zu nutzen.

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Abbreviations

AAU	Assigned Amount Unit
BAT	Best available technology
BAU	Business-As-Usual
CDM	Clean Development Mechanism
CER	Certified emission reduction
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO₂	Carbon dioxide
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	CDM Executive Board
ERU	Emission reduction unit under the Joint Implementation mechanism
ETS	Emissions trading system
EU	European Union
GHG	Greenhouse gas
ICAO	International Civil Aviation Organization
IPCC	Intergovernmental Panel on Climate Change
ITMO	Internationally transferred mitigation outcome
JI	Joint Implementation
LDC	Least Developed Country
LEDS	Low-Emission Development Strategies and Plans
LoA	Letter of Approval
NDC	Nationally determined contribution
PoA	Programme of Activities
SB	Standardised baselines
tCO₂e	Tonnes of CO ₂ equivalent
UNFCCC	United Nations Framework Convention on Climate Change

Executive summary

Article 6 of the Paris Agreement enables countries to use international carbon market mechanisms towards the achievement of mitigation targets in their nationally determined contributions (NDCs). While COP24 in Katowice in December 2018 brought the adoption of a comprehensive rulebook for the implementation of the Paris Agreement, no agreement could be reached on the decisions relating to Article 6 which leaves further work on these rules ahead. In this context, one of the issues under consideration is whether and how the existing project-based mechanisms under the Kyoto Protocol could be transitioned to Article 6 or how elements of them could be used under Article 6. This discussion paper assesses how different elements of the Clean Development Mechanism (CDM) – including its rules, its institutional framework, its projects, and its certified emission reductions (CERs) – could be used under the Paris Agreement. The analysis presented here aims to inform the international negotiations. It focuses on technical aspects and does not provide an analysis of positions of countries in the Article 6 negotiations on this matter.

Using CDM rules

Drawing upon various elements of and lessons learnt from the CDM may be efficient and help to avoid some of the weaknesses of the CDM when designing the rules of the Article 6.4 mechanism.

Our analysis assesses key regulatory elements of the CDM with regard to their usefulness and consistency with the Paris Agreement, with a focus on environmental integrity. We find that a number of regulatory elements may, to a large extent, be used for the Article 6.4 mechanism, including the large body of methodological approaches for quantifying greenhouse gas emissions from specific sources, as included in CDM methodologies. Using these approaches under the Article 6.4 mechanism might require revisions and (regular) updates. Also, the use of CDM approaches for developed countries may require further revisions.

Similarly, the overarching processes and procedures along the CDM project cycle – including stakeholder consultation, third party validation and verification as well as accreditation – provide a good blueprint for rules for the Article 6.4 mechanism. Areas that require fundamental changes for the Paris Agreement include the authorisation process for international transfers by Parties, including their agreement on corresponding adjustments; demonstrating the contribution to sustainable development; stakeholder consultation and improved oversight over validators/verifiers. With the CDM being essentially a project-by-project mechanism, CDM rules are probably the most useful for those mitigation activities under Article 6.4 that are also project- or programme-based. For mitigation activities that are implemented on a more aggregated level such as sectoral or policy crediting (if eligible under Article 6.4), the use of CDM rules appears to be rather limited.

The CDM rules for baseline-setting and additionality demonstration appear transferable to the Article 6.4 mechanism to a much lesser extent or may need to be considerably restricted in their use. Firstly, the experience with the commonly used CDM investment analysis indicates that this approach may be subject to significant uncertainties and that the likelihood of additionality may often be deemed more questionable for projects in which CER revenues provide only a relatively small financial impact, particularly projects in renewables and energy efficiency. Investment analysis remains an important tool for additionality testing but is probably not sufficient to test additionality. Secondly, in contrast to the Kyoto Protocol, under the Paris Agreement all host countries have NDC targets; this needs to be taken into account when setting crediting baselines and determining additionality for mitigation actions under the Article 6.4 mechanism. New rules are therefore necessary for baseline-setting and additionality determination for the Article 6.4 mechanism. New rules for baselines and additionality are also necessary to mitigate the risk that international transfers or non-additional emission reductions undermine the ability of the host country to achieve its NDC target.

With the scope and the ambition of NDCs being enhanced over time, CDM approaches might become less relevant for defining crediting baselines in the context of the Article 6.4 mechanism but remain important for measuring mitigation impact for domestic measures to demonstrate progress in meeting a country's NDC target.

Using the CDM institutional framework

Different elements from the CDM institutional framework may be considered when designing the institutional framework for the Article 6.4 mechanism.

In principle, the institutional arrangements for the supervisory body of the Article 6.4 mechanism could build on the blueprint of the CDM Executive Board which may allow for a swift transition and start-up of the new mechanism. However, the current institutional arrangements have been criticised and several Parties and stakeholders proposed reforms, which never materialised. Moreover, the composition and decision-making arrangements of the CDM Executive Board builds on the division between Annex I and non-Annex I Parties. This may no longer be appropriate, given that the Article 6.4 mechanism is applicable to all Parties. The establishment of the new Article 6.4 mechanism provides an opportunity to take on board the considerations and discussions of the CDM reform process from its onset and to implement an improved governance structure, including in relation to its composition, selection and training of members, professionalisation, improved transparency of processes and decisions, inclusion of stakeholders and appeals procedure.

Host countries authorising their participation in the Article 6.4 mechanism may choose to appoint existing Designated National Authorities from the CDM for this task. They may have to play a more prominent role than is currently the case under the CDM as the transfer of emission reductions abroad may impact the ability of the host country to meet its NDC target. The national authorities may thus need to check the appropriateness of the transfer as well as its compliance with sustainable development criteria.

Regarding third party validators and verifiers accredited by the CDM Executive Board, transitional arrangements could facilitate their availability at an early point of time in the implementation of the Article 6.4 mechanism.

The various technical panels of the CDM provide the CDM Executive Board with technical expertise and recommendations, supported by the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC). A similar set-up with panels providing independent technical advice to the Article 6.4 supervisory body would allow the system to be maintained and improved and would ensure that the supervisory body has the necessary technical competence.

The registry and tracking system for the Article 6.4 mechanism could be designed using the architecture and procedures of the centralised infrastructure of the CDM registry as a blueprint. This registry and tracking system may be built and operated by the UNFCCC secretariat using existing capacities or by a similar body.

The private sector will play a pivotal role in implementing Paris Agreement on the ground. Article 6.4(b) specifically stresses the participation by “public and private” entities. However, strengthening the role of the private sector is challenging given the stronger role that national authorities may have in authorising the participation and coordinating between mitigation actions under Article 6.4 and domestic actions.

Migrating projects into the Article 6.4 mechanism

Policy-makers may pursue several different policy objectives when considering the migration of CDM projects into Article 6.4. These include preserving investor trust and confidence; continuing GHG abatement; enabling new mitigation action; facilitating the implementation of the Article 6.4 mechanism; and facilitating an early availability of units in the post-2020 period, among others. A key issue for the migration of CDM projects is safeguarding environmental integrity – that is, that global GHG emissions do not increase as a result of the migration.

Allowing *all* CDM projects to migrate to Article 6.4 is likely to lead to an increase in global GHG emissions, thereby compromising environmental integrity. This is because the vast majority of the CER supply potential is from projects that are not vulnerable to discontinuing GHG abatement in the absence of revenues from CERs, and some of these emission reductions occur outside the scope of NDC targets or in countries that will over-achieve their NDC targets without pursuing any mitigation action. Allowing for the eligibility of all projects is also unlikely to enhance the trust of investors as supply is likely to exceed demand and prices would likely remain low. It is also likely that projects with low vulnerability would outcompete new projects (as well as vulnerable ones) in serving the demand. Failure to establish a robust price signal post 2020 could further erode the confidence of investors.

Options for restricting the eligibility of projects could mitigate environmental integrity risks and help restore investor trust and confidence. Environmental integrity would be best safeguarded if eligibility is restricted to two categories of projects: (a) *Projects that are vulnerable to discontinuing GHG abatement* in the absence of revenues from CERs; and (b) *New projects* that are likely to be additional and are implemented in response to the new demand from the Paris Agreement and CORSIA.

Restricting the migration of projects to these two categories would best safeguard environmental integrity, provide incentives to those projects that need it most, and help prevent a situation of oversupply and low prices in the post-2020 period which could further erode investor trust and confidence. Providing regulatory certainty through early decisions on eligibility criteria would be key for the new incentives to bear fruit, both in terms of GHG abatement and in terms of preservation of investor trust and confidence.

Using CERs in the post-2020 period

Using CERs in the post-2020 period is proposed by some Parties with the intention to achieve similar policy objectives as for the migration of CDM projects. In practice, however, allowing all CERs to be used after 2020 could significantly increase aggregated GHG emissions and at the same time further erode the trust and confidence by investors. The prevalence of CERs from projects that are *not* vulnerable to discontinuing abatement and the high risk of double counting with 2020 targets pose significant threats to environmental integrity. Moreover, the large CER supply potential of the existing CDM pipeline creates risks of market oversupply, low prices, and of crowding out new mitigation projects, which could further erode investor trust and confidence.

In order to ensure environmental integrity and avoid the continuation of low prices, policy-makers would have to ensure that any CERs used in the post-2020 period stem from projects that are either vulnerable of discontinuing GHG abatement or have been newly implemented after a decision to allow for the migration of CERs, and that double counting with 2020 targets is avoided. The practical challenges in establishing these restrictions speak in favour of not using CERs towards the achievement of mitigation targets after 2020.

1 Introduction

Article 6 of the Paris Agreement enables countries to use international carbon market mechanisms towards the achievement of mitigation targets in their nationally determined contributions (NDCs). Article 6.2 allows countries to use “internationally transferred mitigation outcomes” (ITMOs) – i. e., climate change mitigation achieved in one country but claimed by another – to achieve their NDC targets. Article 6.4 establishes a new crediting mechanism under international supervision that could be used for similar purposes.

While COP24 in Katowice in December 2018 brought the adoption of a comprehensive rulebook for the implementation of the Paris Agreement, no agreement could be reached on the decisions relating to Article 6 which leaves further work on these rules ahead. In this context, one of the issues under consideration is whether and how the existing project-based mechanisms under the Kyoto Protocol – the Clean Development Mechanism (CDM) and Joint Implementation (JI) – could be transitioned to Article 6 or how elements of them could be used under Article 6. Paragraph 37(f) of decision 1/CP.21, for example, recommends that the rules, modalities and procedures for the Article 6.4 mechanism be adopted on the basis of “experience gained with and lessons learned from existing mechanisms and approaches adopted under the Convention and its related legal instruments.” Several Parties and stake-holders proposed that the CDM and JI (or elements of them) be transitioned to Article 6.4. The CDM and JI are also mentioned in the latest informal document on Article 6.4 being considered in the negotiations (UNFCCC, 2018c).

There are several ways in which the CDM and JI could be incorporated under the Paris Agreement. Firstly, rules and governance arrangements could be adapted to the new mechanisms operating under Article 6. Secondly, projects could be migrated to mechanisms under Article 6, thereby allowing them to generate units for emission reductions achieved after 2020. And thirdly, units issued for emission reductions up to 2020 could be used towards achieving international mitigation targets after 2020, including NDCs under the Paris Agreement and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) recently adopted by the International Civil Aviation Organization.

This discussion paper explores options and implications of all three ways of using existing mechanisms. The analysis focuses on the CDM; the JI – although relevant – is currently inoperative, as the Doha Amendment to the Kyoto Protocol has not yet entered into force, and is therefore not considered here. The paper focuses on the transition specifically into Article 6.4, noting that similar considerations may apply to using (elements of) existing mechanisms under Article 6.2. Moreover, the paper focuses on the impacts on environmental integrity, i. e. on overall GHG emissions, as well as on whether policy objectives such as maintaining the trust and confidence of investors are achieved. The analysis builds on relevant earlier studies (Fuessler, 2012; Greiner & Howard, 2017; Greiner, Howard, Chagas, & Hunzai, 2017; Michaelowa & Hoch, 2016; Schneider & La Hoz Theuer, 2017) – some of which were carried out in the context of the “CDM Transition Initiative” –, on the informal documents under consideration in the negotiations (UNFCCC, 2018b, 2018c, 2018a), and on submissions by Parties.¹ The analysis presented here aims to inform the international negotiations. It focuses on technical aspects and does not provide an analysis of positions of countries in the Article 6 negotiations on this matter.

In this paper, we employ specific terminology and make several assumptions. Article 6.2 of the Paris Agreement does not specify what an ITMO is, nor how transfers should take place. ITMOs could be international units that are transferred between electronic registries or they could be amounts that are reported by countries for accounting purposes (Howard, Chagas, Hoogzaad, & Hoch, 2017; Schneider, Fuessler, Kohli, et al., 2017). It is assumed in this paper that ITMOs are amounts reported by countries. For the sake of simplicity, the term ‘ITMOs’ is used to refer to transfers both of mitigation outcomes generated under Article 6.2 and of emission reductions resulting from the Article 6.4 mechanism. It is also assumed that 6.4 transfers will require corresponding adjustments as under Article 6.2. It is further supposed that ITMOs are expressed in tonnes of carbon dioxide equivalent (tCO₂e); the findings would also hold if this was not the case.

Section 2 discusses the possible use of rules and institutions of the CDM for Article 6.4. Section 3 discusses the possibility of migrating CDM projects into Article 6.4. Section 4 discusses the possible use of CERs towards achieving NDCs. A conclusion is provided in Section 5.

¹ <https://www4.unfccc.int/sites/submissionsstaging/Pages/Home.aspx>

2 Using CDM rules and institutional arrangements under Article 6.4

2.1 Introduction

Decision 1/CP.21, paragraph 37(f), *recommends* that the rules, modalities and procedures for the Article 6.4 mechanism be adopted on the basis of “[...] experience gained with and lessons learned from existing mechanisms and approaches adopted under the Convention and its related legal instruments.” In this context, the present section explores the opportunities and the risks of using CDM rules and institutional arrangements in a future Article 6.4 mechanism. The analysis centres on environmental integrity risks and on the adequacy of CDM rules and institutional arrangements for fulfilling key requirements of Article 6.4, such as the avoidance of double counting. Our analysis does not elaborate on the formal transfer of CDM rules and institutions themselves to the Paris Agreement. Rather, it assumes that rules and institutional arrangements that are deemed useful for Article 6.4 could be used as a basis for regulatory developments under Article 6.4. The analysis builds on earlier studies, including studies conducted under the CDM Transition Initiative (Greiner et al., 2017; Greiner and Howard, 2017), as well as other relevant studies (Schneider and La Hoz Theuer (2017a), Michaelowa and Hoch (2016) and Fuessler (2012)).

Article 6.2 is often regarded as a provision accommodating the international transfer of units from nationally-established mechanisms, which may also build on the CDM rules and experience. While our analysis focuses specifically on the Article 6.4 mechanism, it could also be applied to nationally-run mechanisms and for voluntary offsetting standards used under Article 6.2.

Why is the use of CDM rules and institutional arrangements being considered in the context of the Article 6.4 mechanisms? Besides the specific recommendation in decision 1/CP.21 paragraph 37(f), policy objectives such as seeking efficiency and momentum may warrant their use: Building on well-known and tested CDM rules and institutional arrangements may provide investment certainty and foster a rapid development or fast tracking of the new Article 6.4 mechanism. Building on CDM rules and institutional arrangements, and taking into account related lessons learnt with the CDM, may also contribute to the environmental integrity and acceptance of the new Article 6.4 mechanism.

Requirements for activities under Article 6.4 show similarities with those of the CDM: Article 6.4 activities are to be supervised by a body designated by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA); they involve public as well as private entities; mitigation benefits have to be real, measurable and long-term; additionality needs to be ensured; and emission reductions are to be verified and certified by designated operational entities.

Yet important differences also exist. The Paris Agreement and the Article 6.4 mechanism operate under a different framework than the Kyoto Protocol and the CDM. In particular, many regulations from the CDM may become obsolete and inconsistent with the new context of the Paris Agreement, in which most host countries have NDC targets. Since the CDM is in essence a project-based mechanism, some of its rules may be used for project-by-project activities under Article 6.4 but may be less appropriate for crediting on a more aggregated level, such as sectoral or policy level “scaled-up” mitigation instruments that might be considered under Article 6.4.

Also, while the CDM has led to a significant scaling up of mitigation action in many developing countries and the development of related knowledge and skills, it has also been criticised; concerns have been raised about its environmental integrity, in particular with regard to the additionality of projects where CER revenues have a small financial impact (Cames et al., 2016; Dechezlepetre et al., 2014; Erickson, Lazarus, & Spalding-Fecher, 2014; Haya & Parekh, 2011; He & Morse, 2013; Lütken, 2012; Michaelowa & Purohit, 2007; Purdon, 2014; Schneider, 2009; Spalding-Fecher et al., 2012).

On this basis, we analyse in the following the rules and institutional arrangements from the CDM that could be useful in the design of rules and institutions for the Article 6.4 mechanism.

2.2 Using CDM rules under Article 6.4

The rules, modalities and procedures for the Article 6.4 mechanism are to be based on “experience gained with and lessons learned” from the Kyoto mechanisms and have to address additional requirements set out in Article 6.4 to 6.7 of the Paris Agreement and in paragraph 38 of decision 1/CP.21. In the following we analyse key elements of the CDM rulebook with regard to the experience and lessons learnt in the CDM as well as regarding their compatibility with the Paris Agreement.

We consider the following types of regulations from the CDM with regard to their potential use under the Article 6.4 mechanism:

- ▶ **Emission quantification:** Approaches and methodologies for quantifying GHG emissions from a specific source under a specific scenario;
- ▶ **Baseline setting:** A reference scenario is defined, against which the impact of a mitigation action is measured;
- ▶ **Additionality determination:** Establishing that the mitigation action would not occur in the absence of the mechanism’s intervention;
- ▶ **Processes:** Overarching processes and procedures related to the project cycle, including stake-holder consultation, third party validation and verification, accreditation procedures.

Since it is essentially a project-by-project mechanism, CDM rules are probably most useful for those mitigation activities under Article 6.4 which are project- or programme-based. The following discussion therefore focuses on these aspects. For mitigation activities that are implemented on a more aggregated level, such as sectoral or policy crediting (which might also be eligible under Article 6.4), the use of CDM rules is rather limited (e. g. the use of standardised baselines from the CDM is discussed in section 2.2.2).

2.2.1 Emission quantification

The CDM Executive Board has approved 116 large-scale methodologies, 96 small-scale methodologies and 30 tools that have been submitted, revised and consolidated over more than a decade, covering a broad range of project types and sectors.² They generally build on the IPCC guidelines for national inventories and have been developed by practitioners and methodology experts. They constitute a large body of rules that can be used for emission quantification. This section considers all aspects of CDM methodologies except baseline setting and additionality demonstration, which are discussed in sections 2.2.2 and 2.2.3.

Table 1 provides an overview of the suitability of CDM rules for emissions quantification and provides a preliminary recommendation regarding their use in the context of the development of new rules for the Article 6.4 mechanism.

Sectoral scopes

The CDM “sectoral scopes” classify projects and programmes of activities (PoAs) and serve as a structure for organising methodologies and accrediting designated operational entities (DOEs). While many projects combine different sectoral scopes (e. g. scope 1 for “energy industries” with scope 13 for “waste handling and disposal”), the current structure may serve as a good point of departure for classifying activities under the Article 6.4 mechanism.

Project boundaries

All CDM methodologies define a project boundary that specifies which emission sources are considered and which are neglected in the emission reduction calculations, including a justification of the choice. The current boundaries in CDM methodologies are a useful basis for future methodologies under Article 6.4. However, there is a need to reconsider some of the system boundaries. For instance, some CDM methodologies neglect upstream emissions that occur in Annex-I countries, as it is assumed that they are grouped under Kyoto targets and that increases in those emissions would have to be compensated for by the Annex-I country.

² As of February 2018. Source: <https://cdm.unfccc.int/methodologies/index.html>

This differentiation is not appropriate for the new context of the Paris Agreement, under which most countries have communicated mitigation targets in their NDCs. In this context, it may be necessary to differentiate emission sources related to a specific mitigation action that are within or outside of the scope of the NDC (depending on whether emission sources outside the scope of NDCs are credited and if so, how they are accounted for) and to consider the situation in which a project involves a decrease or increase of emissions in other countries (“leakage”).

Approaches for emission quantification, monitoring, default values, sampling and forms

The main body of existing CDM methodologies consists of step-by-step guidance on how to calculate GHG emissions for a vast number of emission sources. The body of CDM methodologies has undergone considerable consolidation, increase in consistency and streamlining.

Table 1 provides an overview of specific approaches for emission quantification under Article 6.4 and related preliminary recommendations.

While under the CDM only Non-Annex I countries were eligible as host countries, the Article 6.4 mechanism is generally open to all Parties. As CDM methodologies evolved – many of them more than ten years ago – in the context of developing countries, some methodological approaches may not be appropriate for the context of developed countries, or even for advanced developing countries at their current advanced stage of development. If used under Article 6.4, some CDM methodologies would either have to be restricted to specific country groups or would need to be revised in order to ensure their applicability to the context of developed countries or advanced developing countries.

Rules for the monitoring of parameters needed for the quantification of emissions, default values and tools (such as for sampling and surveys) could also be used under Article 6.4.

Last but not least, the CDM also has a large body of document templates and forms facilitating the application of the methodologies that can be widely adopted for the Article 6.4 mechanism.

Table 1: Overview of the suitability of use of CDM rules for emission quantification under Article 6.4

CDM element	CDM experience	PA consistency	Recommendation re use under Art 6.4
CDM scopes	Workable approach to definition of scopes	Consistent	May be widely used under Article 6.4
CDM project/ PoA system boundaries	Large body of approaches in many sectors available	As all parties have NDCs, treatment of upstream emissions may need revision	System boundaries to consider NDC and emissions abroad
Approaches for emission quantification, including equations and models	Large body of methodologies available Regular updates may be needed	Revisions needed to assure applicability to Annex-I countries	May be widely used under Article 6.4; need for moderate revision
Rules for monitoring of parameters	Large body of monitoring protocols including QA/QC procedures	Consistent	May be widely used under Article 6.4; need for moderate revision
Default values	Large body of default factors available	Revisions needed to assure applicability to Annex-I countries	May be widely used under Article 6.4; need for regular update and revision
Guidelines for sampling and surveys	Methods and processes available		May be widely used under Article 6.4; need for moderate revision. More statistical approaches
Related document templates and forms	Large body of templates and forms available	Consistent	May be widely used under Article 6.4; need for adaptation; scope for simplification

Source: Authors' own preliminary analysis

2.2.2 Baseline setting

The definition of a reference scenario against which to measure the impact of a mitigation action, the baseline, is a key element of the CDM methodologies (Schneider, Fuessler, Herren, & Lazarus, 2014). Under the CDM, baselines do not take into account mitigation targets by the Non-Annex I host countries (if they existed). Under the Paris Agreement, many host countries have NDC targets which need to be taken into account when setting baselines in order to mitigate the risk of not meeting the NDC target, given that the double counting of emission reductions that are internationally transferred must be avoided (Schneider, Fuessler, La Hoz Theuer, et al., 2017).

Two cases regarding NDC targets distinguished

NDC targets under the Paris Agreement exhibit a wide range of characteristics (Graichen, Cames, & Schneider, 2016). Regarding the applicability of CDM rules under the Article 6.4 mechanism and the need for baseline-setting to take into account the NDC target, we distinguish two cases in terms of ambition level and scope of the host country's NDC, following Schneider, Fuessler, et al. (2017, sec. 5.2 and 5.4):

- ▶ **Case 1:** Crediting from emission sources under economy-wide NDC targets that are more stringent than Business-As-Usual (BAU);
- ▶ **Case 2:** Crediting from emission sources not covered by NDC targets and/or under NDC targets that are less stringent than BAU and/or that are not clear.

The following analysis concentrates on the situation of ambitious and economy-wide NDC targets (case 1) but also examines the situation of NDC targets that are not economy-wide or above BAU (case 2) as they may pose specific challenges for maintaining environmental integrity and independent evaluations of NDC targets suggest that such situations may apply to a number of countries (Graichen et al., 2016).

Table 2 provides an overview of the suitability of CDM rules for baseline-setting and provides a preliminary recommendation regarding their use in the context of the development of new rules for the Article 6.4 mechanism.

Approaches to baseline-setting, consideration of host country policies

Different approaches to baseline-setting are used under the CDM: CDM baselines are often defined under the assumption that the historic emission levels would be maintained over all crediting periods in the absence of CDM registration (historical baseline, paragraph 48a of the CDM modalities and procedures). Another approach is a pre-defined reference technology would be implemented (paragraph 48b of the modalities and procedures). A third approach is performance benchmarks (paragraph 48c of the modalities and procedures). Over time, these approaches have been amended, in particular by using dynamic baselines, either by monitoring a control group, or by modelling a pathway of the development of baselines emissions over time, taking into account key drivers of emissions such as service levels.

In general, CDM baseline approaches do not consider any national mitigation targets – they simply assume that the country does not have any mitigation targets.

With the Paris Agreement, crediting baseline-setting needs to take into account the host country's NDC target (Schneider, Fuessler, La Hoz Theuer, et al., 2017, sec. 5). Given that double counting of emission reductions must be avoided, a country can – if it intends to achieve its NDC target – only transfer emission reductions that go beyond the country's NDC target. Therefore, the crediting baseline emissions pathway ought, in any case, to be equal or lower than an emission trajectory that is in line with the country meeting its NDC target. In case of crediting from emission sources not covered by NDC targets or under NDC targets that are less stringent than BAU (case (2) above), this requirement is not sufficient and the baseline needs to be at least at or below BAU level.

In case of crediting from emission sources under NDC targets that are more stringent than BAU (case (1) above) a crediting baseline that is not in line with the NDC target is not an immediate threat to the environmental integrity of the Article 6.4 emission reduction, if the NDC target is achieved. But since such a baseline puts the host country at risk of not meeting its NDC target, it would have to compensate for the over-crediting by increasing its mitigation effort in order to still meet the target.

The CDM modalities and procedures require “*that a baseline shall be established: [...] Taking into account relevant national and/or sectoral policies and circumstances [...]*”. However, the consideration of domestic policies and regulations in setting baselines has been operationalized in a different – and somewhat unclear – way: The so called “E-rule”, (EB22-Annex 3; Fuessler 2012, Annex III) stipulates that when defining baseline scenarios, policies and regulations that decrease GHG emissions (an “E-policy”, such as feed in tariffs) implemented after 11.11.2001 “*do not need to be taken into account in developing a baseline scenario*”. This appears to be in contradiction to the above provisions of the CDM modalities and procedures.

The E-rule does not seem an appropriate approach if crediting baselines are established that take into account the NDC target. This is supported by the fact that with the need for corresponding adjustments, host countries (at least the ones with economy-wide NDC targets that are more stringent than BAU, case (1)) have an inherent interest in defining baselines that are consistent with meeting the NDC target. The domestic mitigation planning, e. g. in Low-Emission Development Strategies and Plans (LEDS), could become a central tool for defining crediting baselines (Schneider, Fuessler, La Hoz Theuer, et al., 2017, sec. 5).

In addition, the Paris Agreement requires countries to progress and increase ambition and scope of NDC targets over time, which also has to be reflected in defining and revising baseline emissions scenarios over time.

An example: Electricity grid emission factors

An example for a specific baseline approach is the “Tool to calculate the emission factor for an electricity system” which has a history of development of over fifteen years. The tool may be seen as an early example of a standardised baseline approach including the calculation of operating, build and combined margin emission factors for a given electricity grid. Assuming an NDC includes an emissions target for the electricity sector, it is not sufficient for the baseline emission factor merely to consider the grid emission factor as provided under the CDM because this would not necessarily be in line with meeting the NDC. Under the Paris Agreement, the crediting baseline emission factors should be based on a comprehensive modelling of the development of the power sector for the crediting period and the amount of emission reductions to be internationally transferred from the sector may have to be restricted (Schneider, Fuessler, La Hoz Theuer, et al., 2017). The modelling would need to demonstrate that (and how) the country is able to reach the (sectoral) NDC target even with the crediting activity and taking corresponding adjustments to prevent double counting into account. In addition to defining an upper boundary for the baseline emission factor, the country may also have to restrict the number of emission reductions that may be transferred internationally in order to preserve the necessary mitigation potential in the power sector for domestic action in order to contain the risk of not achieving the (sectoral) NDC target.

It is important to note that determining a crediting baseline for single projects may become rather complex under (sectoral) NDC targets, as the above example of the electricity grid factor illustrates. It may become difficult to break down national or sectoral level NDC targets to related baseline emission levels of individual projects, as this requires the translation of national level NDC targets into domestic policies and measures including tangible subsidy schemes, regulation, taxes, etc. based on a (dynamic) domestic planning of how to achieve the NDC target plays a key role. For some activity types, it may not be possible to use meaningful sectoral baselines (Schneider, Fuessler, La Hoz Theuer, et al., 2017). Breaking down national or sectoral level NDC targets to related baseline emissions builds on many assumptions and may therefore include subjective elements and be subject to gaming, in particular under less ambitious NDCs (case 2). In this case, a less transparent modelling of the grid emission factor as in the above example may lead to a higher over-crediting than if, for example, conventional grid emission factor calculations according to CDM rules were used.

Setting baselines that are consistent with a host country’s NDC target also produces a series of challenges related to the scope and clarity of the NDC, the need for a national plan for implementing the NDC etc. For a discussion of this, see Schneider, Fuessler, et al., (2017)

The challenges outlined above indicate that the approaches used in the CDM for baseline-setting may only remain relevant in specific cases, e. g. for mitigation actions that fall outside the scope of an NDC or for NDC targets that are less stringent than BAU. With raising scope and ambition of the NDC, CDM approaches to baseline-setting will become less relevant for defining crediting baselines in the context of Article 6.4 mechanism but remain important for measuring mitigation impact for domestic measures.

Conservativeness of baselines

The CDM M&P (Decision 17/CP.7) specify that “a baseline shall be established [...] in a transparent and conservative manner regarding the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality, and taking into account uncertainty”. The CDM project standard (Section 5.5 Para 18) requires: “Reduce bias and uncertainties as far as it is practical/cost-effective, or otherwise use conservative assumptions, values and procedures to ensure that GHG emission reductions [...] are not over-estimated”. The initial version of the CDM glossary clarified that with conservative baseline-setting “in the case of doubt, values that generate a lower baseline projection shall be used” (CDM-EB-07, Annex 4).

This principle of conservativeness of baselines was in practice an essential approach for dealing with the inherent uncertainties in baseline-setting and a key safeguard for preserving environmental integrity of the CDM.

The Paris Agreement and decision 1/CP.21 do not refer explicitly to the need for conservative baselines. Given the inherent uncertainties in baselines, it might be important to include the conservativeness principle explicitly in the rules, modalities and procedures for the Article 6.4 mechanism. This is relevant to ensuring the environmental integrity of internationally transferred emission reductions (in case 1) or to mitigating the risk for host countries of not meeting their NDC target (in case 2).

Re-assessment of baseline at renewal of crediting period

According to its modalities and procedures, the CDM requires the regular re-assessment of the baseline at the renewal of the crediting period. A regular re-consideration of the baseline scenario might reduce the considerable uncertainties in the baseline over time and thus serve as a safeguard for environmental integrity. A subsequent decision by the CDM Executive Board (EB 43, Annex 13, paragraph 3), however, limited this check to an assessment of the regulatory framework, an assessment of the remaining lifetime of technical equipment that would be used in the baseline, and an update of data and parameters, such as emission factors. The Board clarified explicitly that the validity of the baseline *scenario* should not be re-assessed, potentially seeking to strengthen investor certainty. This practice led to potential over-crediting, in particular in sectors with fast technological development (Cames et al., 2016). If used under Article 6.4, the potential increase in the ambition and the scope of NDCs also requires a re-evaluation of the baseline *scenario* that goes beyond the current CDM practice.

Under the Paris Agreement, the need for regular updates of NDCs and the increase of their ambition over time leads to challenges for the longer-term definition of crediting baselines. Long crediting periods could impact the validity of the baselines over the project lifetime, in particular if the ambition of NDC targets is enhanced or if the scope of NDC targets is broadened.

Moreover, the duration of crediting periods could be synchronised with the common time frames of NDCs, as envisaged in paragraph 10 of decision 1/CP.21. Baseline methodologies could also require the automatic reflection of any updates of NDCs, and define the baseline emission level as a function of the sectoral NDC target.

Standardised baselines (SB)

In order to simplify baseline-setting and reduce transaction costs, Parties to the Kyoto Protocol established a framework for standardised baselines in 2011. Standardised baselines involve three main elements: the consideration of certain project types as automatically additional, the establishment of a standardised baseline scenario for certain project types, and/or the establishment of default parameters required for the calculation of baseline emissions. Several issues have been identified with the current regulatory framework for standardised baselines that may pose risks to environmental integrity, including that the use of standardised baselines is usually voluntary and that project owners can pick-and-choose between standardised and project-specific approaches. Also, data vintage issues and the lack of consideration of dynamic changes over time may lead to over-crediting and additionality issues (Cames et al., 2016, sec. 3.8; Schneider et al., 2012; Spalding-Fecher & Michaelowa, 2013).

Under the Article 6.4 mechanism, the fact that host countries have NDC targets influences the way that standardised baselines have to be set: the standardised baseline in a specific sector has to be set in such a way that international transfers based on that standardised baseline do not endanger the host country to not reach its NDC target (relevant for case 1; this is similar to the discussion of the example electricity grid emission factor above). This risk mitigation may also need to include a restriction in the total amount of emission reductions that may be internationally transferred within a specific sector.

Even though these challenges with the CDM approach to standardised baselines and their lack of consistency with the Paris Agreement, a new approach to standardised baselines may be considered for use under the Article 6.4 mechanism. For example, standardised baselines could be restricted to certain (sub-)sectors where they are feasible (e. g. because data is available) and then made mandatory for that sector. By applying sufficiently conservative benchmark values, e. g. based on the concept of Best Available Technologies (BAT), in combination with a limitation of the amount of emission reductions transferred, such new approaches could also mitigate the risk for host countries of not meeting NDC targets because of the international transfer (in case 1) or could avoid compromising the environmental integrity (case 2).

For countries that have stringent and economy-wide NDCs (case 1) and have developed a national mitigation plan detailing how the NDC targets are to be achieved over time, standardised baselines may also become an opportunity to foster mitigation action: e. g. the host country could run a domestic subsidy scheme that promotes the implementation of technology that reaches a best available technology (BAT) benchmark (e. g. substituting conventional three stone cook stoves with modern cook stoves of medium efficiency) as part of its action plan to meet the NDC target. This domestic mitigation action (e. g. medium efficiency cook stoves) might then define the standardised baseline. A programme under the Article 6.4 mechanism could then be used to upgrade the domestic programme: The revenues from international transfers would be used to implement a technology that would be more efficient than the domestic BAU technology (e. g. high efficient cook stoves). The difference between the highly efficient technology and the domestic standardised baseline would then be transferred internationally.

Suppressed demand

In order to facilitate the uptake of CDM activities in poor communities where historic emissions have been very low, the CDM introduced the concept of “suppressed demand” for when activity levels may be higher or technologies assumed in the baseline may be more carbon intensive than observed in reality before the project implementation. This builds on CDM modalities and procedures stating that “the baseline may include a scenario in which future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party” (para. 46). If this approach overestimates the baseline emissions in the absence of the CDM registration, this may lead to over-crediting (Cames et al., 2016, sec. 3.10).

Under the Paris Agreement, the ruling out of double counting poses a methodological problem to suppressed demand in case the baseline emissions are overestimated. In this case the actual reduction in national emissions according to national inventory (if existing) may be smaller than the amount of internationally transferred emission reductions calculated on the basis of suppressed demand. This may impact the ability of the host country to achieve its NDC (in case 1).

The concept of suppressed demand under Article 6.4 mechanisms should therefore be reconsidered. An alternative to using market mechanisms with the concept of suppressed demand might be to use climate finance to support this kind of mitigation intervention.

Uncertainty limits the applicability of the baselines concept to certain project types and sectors

The development of CDM baseline methodologies strove to provide approaches for all sectors and project types and for all to be eligible to use CDM (with few exceptions including nuclear energy and avoided deforestation). However, depending on the sector, the setting of (counterfactual) baselines is subject to significant uncertainties (see e. g. Schneider et al., (2014, sec. 4.4). To a certain extent, robust baselines can also be set under moderate uncertainty levels, using the approach of conservative baselines (see above).

It is good practice that project types for which baseline-setting is hindered by a lack of scientific knowledge, data availability and very high inherent uncertainties, are not considered eligible. This restriction has also been the practice of the CDM Executive Board to a large extent. For instance, mitigation measures including only knowledge dissemination and capacity building are not eligible under the CDM for this reason. It is important that this practice is maintained to ensure that emission reductions resulting from the Article 6.4 mechanism are real and measurable.

Table 2: Overview of the suitability of CDM rules for baseline-setting under Article 6.4

CDM element	CDM experience	PA consistency	Recommendation re use under Art 6.4
Baseline: Historical baseline	Simple rule for some project types, may lead to over-crediting	In general not consistent with meeting NDC	Only for restricted project types and time period
Baseline: Reference technology and benchmarks (BM) approach	Very limited application, benchmarks only available for limited number of technologies	Reference/benchmark needs to be made consistent with NDC to avoid double counting Limited consistency with progression of NDCs	Benchmark needs to be consistent with NDC Develop new BM approach
Baseline: Dynamic baseline	Defined in context of project type Uncertainty issue of baseline-setting	Baseline needs to be made consistent with NDC to avoid double counting Limited consistency with progression of NDCs	Crediting baseline needs to be consistent with NDC New rules for baseline-setting necessary
Baseline: Control group approach	Difficulty to define/find control group High transaction costs	Control group needs to be made consistent with NDC to avoid double counting	Crediting baseline needs to be consistent with NDC Limited use
Consideration of emissions related policies of host country (E+/E-rule)	Very challenging implementation; inconsistency in CDM ruling	Not consistent, as Article 6 rules out double counting	E+/E- ruling becomes obsolete
Principle of conservativeness	Key safeguard	No explicit requirement for conservativeness However, necessary for “real and measurable” requirement	Maintain explicit conservativeness principle in Article 6.4 rules
Re-assessment of baseline at renewal of crediting period	In practice, insufficient re-assessment for some fast-developing sectors	Not consistent: regular “ratcheting up” of NDC targets requires regular re-assessment of baseline scenarios	Restricted crediting periods in line with NDC reviews Baseline scenarios to be regularly re-assessed
Standardised baselines (SB)	Data vintage issues Pick-and-choose	SB needs to be consistent with NDC target and progress	New approaches for SB necessary SB as opportunity under Article 6.4
Suppressed demand	Supports energy access Risk of over-crediting	Not consistent: No double counting under Article 6.4	If necessary restrict to LDCs; climate finance may be more suitable

Source: Authors' own preliminary analysis

2.2.3 Additionality determination

Article 6.4 requires additionality regarding both NDC and BAU scenario

The Paris Agreement recommends that reductions in emissions from Article 6.4 mechanism need to be “additional to any that would otherwise occur”. With the Paris Agreement, countries have committed themselves with their NDCs to act beyond the business-as-usual (BAU) situation that determined additionality in the CDM. For the Article 6.4 mechanisms, additionality might be determined by two required components:

- ▶ **NDC additionality:** It has to be demonstrated that the NDC target can be met even if the considered mitigation action were not implemented.
- ▶ **BAU additionality:** It has to be demonstrated that the mitigation action would not be implemented in the absence of the Article 6.4 intervention. This is largely analogous to the existing additionality concept under the CDM.

For a mitigation action under Article 6.4 to be additional, it is necessary that additionality is fulfilled both with regard to the NDC and to BAU.

The following analysis of two cases supports this:

In case of crediting from emission sources under economy-wide NDC targets that are more stringent than BAU (case 1 in section 2.2.2), both NDC and BAU additionality are necessary from a host country perspective to assure that the international transfer does not endanger the country meeting its NDC targets. However, in this context demonstrating NDC additionality in most cases also demonstrates BAU additionality, because on an aggregated level NDC is more stringent than BAU. This does not, however, rule out that in a specific sector BAU additionality may not be necessary.

In case of crediting from emission sources not covered by NDC targets and/or under NDC targets that are less stringent than BAU (case 2 in section 2.2.2), strict BAU additionality becomes particularly important for ensuring the environmental integrity of the international transfer.

As it is both technically and politically difficult to determine whether an NDC target is above or below BAU, it is recommended that both NDC and BAU additionality should be demonstrated in all cases.

NDC additionality may be determined analogously to the setting of crediting baselines under the Paris Agreement (see section 2.2.2): only emission reductions from mitigation actions that go beyond the requirements of the country’s NDC target are deemed additional and may be internationally transferred under Article 6.4. Again, the domestic mitigation planning, e. g. in Low-Emission Development Strategies and Plans (LEDS), becomes a central tool for countries to define which mitigation actions are additional to meeting the NDC. Such domestic planning might result in the definition of criteria or even a “national eligibility list” that defines the range and the volume of mitigation actions that may be used under Article 6.4. This can then serve as a basis for the issuance of Letters of Approval.

BAU additionality for the Article 6.4 mechanisms may build on the numerous additionality approaches of the CDM projects, taking into account the experience and lessons learnt. In the following, some of the most important elements are selected and experiences made with additionality under the CDM mechanism are discussed. The analysis of experiences gathered with the CDM builds mainly on findings from Cames et al. (2016) and is complemented by further insights from the perspective of the Paris Agreement.

Table 3 provides an overview of the suitability of elements for additionality determination from the CDM and provides a preliminary recommendation regarding their use in the context of the development of new rules for the Article 6.4 mechanism.

Investment analysis and the need to demonstrate CDM impact

Most CDM methodologies require demonstration that a prospective project is either not financially viable without the CDM (using investment analysis) or that there is at least one barrier preventing the proposed project without the CDM (using barrier analysis).

The investment analysis builds on the assumption that if a project is not economically viable it would not have been implemented. Although this may hold true from a strictly financial perspective, other factors influence investment decisions, particularly in long-term investment assets and particularly in the largely non-market regulatory environments (e. g. with large role of state-owned enterprises, subsidies and tax rebates for mitigation action) that are found in some of the largest CDM countries. In addition, the required financial input parameters may be subject to high uncertainties in many cases, and the information asymmetry between project developers on the one hand and regulators and validators on the other hand makes it difficult for regulators and validators to check investment data provided by project developers. Together with the numerous options and choices that the investment analysis allows, these factors result in the investment analysis being a rather subjective additionality test in many circumstances. The investment analysis does not require demonstration that the CDM registration has had a decisive impact on the implementation of the project (e. g. through CER revenues). For a detailed discussion, see Cames et al. (2016).

Although the CDM Executive Board has improved the stringency of the investment analysis over time, the fundamental issues related to uncertainty, information asymmetry and the lack of need to demonstrate CDM impact are persisting. This leads to a high risk of non-additionality, in particular for project types in which CER revenues have only a small financial impact on the project investment.

If elements from the CDM investment analysis are to be used to ensure additionality under Article 6.4, different approaches to operationalise the test for impact may be explored:

- ▶ The investment analysis may be complemented by an Article 6.4 registration impact demonstration. For this, project participants would need to demonstrate that, for example, the revenues from the Article 6.4 mechanism contribute significantly to the project's profitability. Although such approaches have been discussed, they are challenging to operationalise, e. g. in terms of defining thresholds levels of decisive impact.
- ▶ Additionality demonstration may be restricted in a simple approach to those project types with medium to high impact from Article 6.4 revenues. These consist primarily of "non-CO₂" projects³, such as those involving industrial gas abatement, manure management, waste water treatment, landfill gas utilisation and coal mine methane capture. Project types with low impact of revenues from the Article 6.4 mechanism on project profitability would not be eligible. These consist primarily of "CO₂-projects" relating to renewable energy (wind, hydro, solar), fuel switch, energy efficiency or waste heat utilisation. This indicates a low likelihood of additionality (Cames et al., 2016, sec. 3.2).

Such a development of eligibility lists for additionality under Article 6.4 would require a comprehensive further analysis of the different project types and typical CER impact to clearly define the criteria to determine the eligibility of certain project types under Article 6.4. One might also consider developing country-specific lists as the profitability also depends on the country context (Warnecke et al., 2017).

Project types with low impact of revenues from the international transfer on project finance are not suitable for implementation under Article 6.4. Other instruments, including international climate finance, may be much better suited to these project types. In practice, host countries with economy-wide NDC targets below BAU levels (case 1) may be expected to be much more reluctant to accept Article 6.4 activities with a very low (financial) impact than under the Kyoto Protocol. Avoiding these project types is therefore also in the interest of host countries.

³ Assuming carbon prices in the order of magnitude around 10–12 USD/tCO₂eq, far above current (February 2018) CER price levels.

Barrier analysis

The barrier analysis is used to demonstrate that a project faces barriers that impede its implementation in the absence of the incentives. As all projects face some sort of barrier, the critical question is what the objective criteria are for deciding that barriers are high enough to prevent the implementation of the project in the absence of the CDM. Therefore, the barrier analysis faces even more challenges in its implementation because of its subjective nature and large uncertainties. Barrier analysis is therefore used almost exclusively as a supporting argument in the context of the investment analysis. For a detailed discussion, see Cames et al. (2016, sec. 3.4).

First of its kind and common practice analysis

Even though the CDM rules for first-of-its-kind and common practice analysis have improved over time, considerable flaws still exist that make the application of these rules problematic, including unclear definitions (e. g. of terms like “20% market diffusion”, “similar projects”) and thresholds appear arbitrary. See Cames et al. (2016, sec. 3.3) for a detailed analysis. They may play a role in the development of positive lists in restricted areas of application, e. g. in the context of LDCs.

Positive lists

Positive lists have been developed under the CDM in various contexts as tools to reduce transaction costs and improve investor certainty. Most importantly, the positive lists in the small-scale and microscale additionality tools are extensively used in the CDM Programme of Activities (PoAs). Positive lists have been developed in the CDM based on various criteria such as market penetration rate, costs, barriers, regulatory environment and location, with limited consistency in the selection of approaches. Also, their update and regular review for validity and temporal lifetime appears not to be consistently managed.

The development of positive lists under Article 6.4 would need to follow transparent and consistent rules, would need to be in line with meeting the NDC target (may therefore also include limitations in the amount of emission reductions per project type). They should be updated and validated on a regular basis in line with market and technology development and NDC updates. They should be based on objective and clear definitions of covered technologies and processes and be complemented by negative lists. By these means, host countries can define their policy with regard to areas that are suitable for the Article 6.4 mechanisms while ensuring that the meeting of their NDC target is not compromised.

General approach to using CDM additionality elements under Article 6.4

From a Paris Agreement perspective, the recommended CDM elements for additionality demonstration are to be used as a second level of BAU-related additionality testing, in addition to the demonstration that the considered mitigation action goes beyond the NDC target.

Table 3: Overview – suitability of use of CDM elements for additionality determination under Article 6.4

CDM element	CDM experience	PA consistency	Recommendation re use under Art 6.4
Investment analysis	High uncertainty, no analysis of CDM impact	Not sufficient to demonstrate additionality; in addition, test of “NDC additionality” required	Needs to be complemented by “Article 6.4 impact” and of “NDC additionality”
Barrier analysis	Limited quantifiability and objectivity Decreasing role	Not sufficient to demonstrate additionality; in addition, test of “NDC additionality” required	Use only where objective barrier analysis is possible
Need for demonstration of role of CDM impact	Only part of barrier analysis, not sufficient	Not sufficient to demonstrate additionality	Include need to demonstrate CDM impact in all additionality tests
First of its kind and common practice analysis	Improved, but still very vague concept	Not sufficient to demonstrate additionality	Common practice analysis is necessary safeguard for additionality but needs to be improved
Positive lists	Global definition of positive lists; issues: criteria and updating	Positive and negative lists are to be made in line with NDC target and progress	New criteria and approach for defining (country specific) positive and negative lists necessary

Source: Authors’ own preliminary analysis

2.2.4 Project cycle

The CDM established a large body of rules and processes related to the entire project cycle, including registration, verification and issuance processes and rules for accreditation of validators and verifiers. Interestingly, the CDM processes are used in similar forms by most other crediting schemes with very little adaptation, but with various levels of stringency (Kollmuss & Fuessler, 2015). These elements and processes have been tested and improved over the years and would be well-suited for further use under the Article 6.4 mechanism with moderate revision.

Table 4 provides an overview of the suitability of elements of the project cycle from the CDM and provides a preliminary recommendation regarding their use in the context of the development of new rules for the Article 6.4 mechanism.

Registration process

The CDM provides a detailed process for the registration of CDM projects submitted by project proponents, including the Letter of Approval from the host country, demonstration of sustainable development benefits, stakeholder consultation, validation by a DOE, completeness check by the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), (potentially review and) final approval and registration by the CDM Executive Board.

These processes have been established and improved over more than 15 years under the CDM. With moderate revision, they can be widely used for the Article 6.4 mechanism.

Under Article 6.4 host countries authorise their participation, which may be operationalised by issuing a Letter of Authorization for a specific mitigation action analogous to the CDM. In this context, host countries with economy-wide NDC targets that are more stringent than BAU (case (1) in section 2.2.2) need to check whether the considered mitigation action is not part of its planned domestic measures to meet the NDC target and goes beyond it. If not, the international transfer of the related emission reduction might jeopardize its achievement of the NDC target. In order to mitigate the risk of not meeting its NDC target, parties may issue a Letter of Authorization for a limited duration and/or specify for each calendar year a maximum amount of emission reductions that are authorised for use by other jurisdictions. As many countries have currently not yet broken down their NDCs into consistent sectorial mitigation plans (such as in LEDS), this requirement poses a considerable barrier for these host countries to commit to Letters of Authorization and the related international transfer at this point in time.

Conversely, host countries with NDC targets not covering the specific mitigation action and/or that are less stringent than BAU (case (2) in section 2.2.2) can therefore issue Letters of Authorization without further analysis as they do not risk not meeting their NDC target. This facilitates participation of these countries in emission trading and may be an incentive for host countries not to widen the scope or ambition level of their NDC.

The assurance of sustainable development benefits under the CDM is the prerogative of the Designated National Authorities (DNAs) of the host countries. While the CDM projects have generally brought numerous sustainable development benefits to host countries, the effectiveness of the CDM approach to ensuring sustainable development benefits has suffered from a lack of incentives for host countries to adopt stringent and clear nationally defined SD criteria, a lack of decision-making procedures and of procedures for monitoring, verifying and reporting the sustainable development outcomes. Also, cases of registered CDM projects violating human rights have fuelled criticism of the CDM's approach to sustainable development benefits. Due to this heterogeneous experience, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) mandated the CDM Executive Board in 2011 to develop voluntary measures to highlight the co-benefits of CDM projects. The resulting voluntary CDM sustainable development tool had a limited impact, mostly because of its voluntary nature, its lack of any "do no harm" safeguards and of robust requirements for stakeholder consultations (Sustainable Development Dialogue 2018; Olsen et al. 2017).

From these lessons learnt, experiences with the CDM approach to ensuring sustainable development benefits and the fact that the Paris Agreement preamble contains an explicit reference to human rights, one might conclude that in order to ensure that mitigation action under Article 6.4 fosters sustainable development, the CDM sustainable development benefit approach may need to be considerably strengthened if it is to be transferred to the Article 6.4 mechanism. Without strengthening at least the use of international guidelines for ensuring sustainable development benefits and "do no harm" rules, some Article 6.4 projects failing to follow these may continue to dominate the discussion and impact the reputation of the Article 6.4 mechanism as a whole.

Stakeholder consultation is an important part of project development and registration in order to minimise potential negative impacts of CDM projects and to ensure the sustainable development benefits. Such processes give the affected population and other stakeholders an opportunity to voice concerns and support regarding the planned CDM project. In conjunction with strengthening of the approach to ensuring sustainable development benefits, the further development of the stakeholder consultation process should be considered.

Processes for verification, issuance and accreditation for validators/verifiers (DOEs)

The CDM provides a detailed process for the verification of CDM projects by Designated Operational Entities (DOEs) and the issuance of CERs into the CDM registry. Also, it provides processes governing for the accreditation of the (currently over 40) DOEs by the CDM Executive Board based on recommendations by the CDM accreditation panel. Also, the quality of the DOE performance is spot checked and in case of non-compliance, DOEs can be suspended by the CDM Executive Board.

These processes have been established and improved over more than 15 years under the CDM. The CDM Executive Board had to intervene in instances of DOEs not performing according to the standards. Therefore, the processes may be widely used for the Article 6.4 mechanism, but further strengthening the instruments of the Article 6.4 Supervisory Body to ensure the quality of DOE work should be considered.

Processes for development of methodologies, tools and standardised baselines

The CDM provides detailed processes for the development of methodologies, tools and standardised baselines. These processes have been established and improved over more than 15 years under the CDM. In order to use these processes under the Article 6.4 mechanism, their moderate revision could be sought to further streamline the processes, increase overall consistency between methodologies and to allow for their continuous update. With this, they may be widely used for the Article 6.4 mechanism.

Table 4: Overview – suitability of use of CDM elements for project cycle under Article 6.4

CDM element	CDM experience	PA consistency	Recommendation re use under Art 6.4
Registration process: validation, completeness check, (EB review), registration	Large body of processes and experience	Consistent with authorisation Includes commitment for corresponding adjustment	May be widely used under Article 6.4; need for moderate revision
Registration process: Host country Letter of Approval	Letter of Approval (LoA)	Consistent with authorisation under PA	May be widely used Letter of Authorization to include host country commitment to corresponding adjustment
Registration process: Contribution to sustainable development	Prerogative of host country; heterogeneous experience	Article 6.4. the need to foster sustainable development	Not suitable Considerable strengthening recommended
Registration process: Stakeholder consultation	Heterogeneous experience	Need for transparency	Consider strengthening
Verification and issuance process	Large body of processes and experience	Consistent, third party verification required Host countries may play a larger role	May be widely used under Article 6.4; need for moderate revision
Accreditation process for validators/ verifiers (DOEs)	DOEs are accredited by CDM Executive Board (and suspended when necessary)	Verification required	May be widely used under Article 6.4 Strengthening oversight
Processes for development of methodologies, tools and standardized baselines	Large body of processes and experience	Consistent	May be widely used under Article 6.4; need for moderate revision

Source: Authors' own preliminary analysis

2.3 Using elements of institutional arrangements from the CDM under Article 6.4

In the following, we consider a few of the most important institutional functions and related bodies of the CDM and discuss their potential use under the Article 6.4 mechanism. The analysis does not consider the direct use of existing bodies, e. g. a situation in which the CMA directly designated the CDM Executive Board as supervisory body for the Article 6.4 mechanism. Rather, it discusses the use of parts of the institutional arrangements and structures from the CDM as blueprints for the development of the new bodies and institutions of the Article 6.4 mechanism. Table 5 provides an overview of institutional arrangements considered in the present analysis.

Table 5: Overview of some institutional arrangements under the CDM and their potential relevance under the Article 6.4 mechanism

CDM	Article 6.4
Executive Board	“Supervisory Body” (Article 6.4)
Designated National Authorities	Authorisation by party’s “national authority”
Designated Operational Entities	Third party verifier (Para 37e)
CDM registry	Registry and tracking system – not mentioned
Technical panels and UNFCCC secretariat	Not mentioned

Source: Adapted from Greiner et al. (2017, p. 53)

2.3.1 Article 6.4 Supervisory Body

The Article 6.4 mechanism explicitly requires supervision by a body designated by the CMA. The new body could be built on the model of the existing CDM Executive Board and use elements of the CDM Executive Board’s institutional arrangements, including the rules and procedure of the Executive Board, the terms of reference for its support structure, and its code of conduct. In principle, these institutional arrangements are well-known and established, and could facilitate a quick start of the Article 6.4 mechanism.

However, the current institutional arrangements have been criticised and several Parties and stake-holders proposed reforms, such as a professionalisation of the Board or the inclusion of representatives from non-governmental organisations. The long process of CDM reform, which should have been finalised in December 2013, (as well as the parallel process for the JI) has stalled and not been implemented to date (May 2018).

Moreover, the composition and decision-making arrangements of the CDM Executive Board builds on the division between Annex I and non-Annex I Parties. This may no longer be appropriate, given that the Article 6.4 mechanism is applicable to all Parties.

The establishment of the new Article 6.4 mechanism provides an opportunity for the CMA to take on board the considerations and discussions of the CDM reform process from its onset and consider designing the institutional arrangements for the new Supervisory Body following earlier proposals, including modifications related to:

- ▶ Composition, selection and training of members
- ▶ Further professionalisation, including considering establishing (some) full-time members
- ▶ Further improved transparency of processes and decisions
- ▶ Further inclusion of stakeholders (Parties, private sector, NGOs)
- ▶ Appeals procedure – grievance mechanism

Regarding the composition of the Supervisory Body it has been questioned whether the current distribution of seats based on Annex I and non-Annex I Parties in the CDM Executive Board is appropriate for the new context of the Paris Agreement and the applicability of the mechanism to all Parties.

2.3.2 Party's national authority

Article 6.4 requires “voluntary participation authorized by Party”. To fulfil this function, Parties may choose to appoint existing DNA from the CDM to be in charge of authorisation of participation in the Article 6.4 mechanism.

With the Paris Agreement and its NDCs, national authorities of the host countries may have to play a more prominent role than is currently the case under the CDM: The transfer of emission reductions abroad may impact the mitigation potential available for domestic action and affect the ability of transferring countries to meet their NDCs, to expand their coverage and to raise ambition levels in future revisions of the NDC. Therefore, the Party may need a process to plan its mitigation policies and actions in order to ensure that it achieves its NDC, including whether it authorises the use of emission reductions outside its own jurisdiction (see section 2.2.4).

Besides authorisation, the tasks to be carried out by the host country National Authority for activities under the Article 6.4 mechanism might include the following activities:

- ▶ Supporting demonstration of sustainable development aspects and “do no harm” safeguards of mitigation action
- ▶ Withdrawal of Letter of Authorization and voluntary de-registration
- ▶ Control and management of a potential quota for international transfers under Article 6 mechanisms (assuming that Letter of Authorization may restrict the amount of emission reductions to be transferred)
- ▶ Definition of national eligibility criteria or even a “national eligibility list” determining issuance of Letter of Authorization or more generally implement the national policy and priorities with regard to the use of the Article 6.4 mechanism (see Section 2.2.3)
- ▶ Providing national data on the domestic NDC implementation supporting baseline-setting (see Section 2.2.2)
- ▶ Providing national data that may be useful for developing monitoring, reporting, and verification methodologies for scaled-up mitigation actions.

The National Authority on the side of the acquiring country may also have stronger role under Article 6.4 than under the CDM. It may not only want to analyse the quality of emission reductions in terms of environmental integrity and sustainable development aspects on the level of a specific project, but may also consider the host country's NDC as an eligibility criterion. Due to the heterogeneity of ambition levels and scope of host country NDCs, acquiring countries may be increasingly challenged to carry out their own assessment of the environmental integrity and the sustainability benefits of Article 6.4 emission reductions that it chooses to accept.

2.3.3 Third party verifier

Third party verification is mentioned in paragraph 37(e) of decision 1/CP.21. Verifiers are not a formal body but accredited private entities. The CDM maintains a system for the accreditation of Designated Operational Entities (DOEs). Transitional arrangements could facilitate that verifiers are available at an early point of time in the implementation of the Article 6.4 mechanism. Entities that are accredited under the CDM could, for example, be deemed automatically eligible to conduct verification activities under Article 6.4 for their current accreditation period. However, this raises questions of how cases of non-compliance or a low performance could be addressed, if the performance monitoring and surveillance are still carried out under the CDM Executive Board under which the scope is limited to CDM verification and validation activities.

2.3.4 Registry and tracking system

The registry and tracking system for the Article 6.4 mechanism could be designed using the architecture and procedures of the centralised infrastructure of the CDM registry as a blueprint. This registry and tracking system may be built and operated by the UNFCCC secretariat using existing capacities or by other stakeholders including international UN agencies or private sector IT service companies.

The centralised Article 6.4 registry may provide for data interfaces to the different potentially hetero-geneous national registry and tracking systems. Alternatively, it would just allow for the issuance and cancellation and/or retirement of emission reduction units, allowing countries (or airlines) to account for emission reductions.

2.3.5 Technical panels and UNFCCC secretariat

The CDM Executive Board is supported by a range of technical panels that cover specific expertise: the Methodologies Panel, the Accreditation Panel, the Registration and Issuance Teams, the Afforestation and Reforestation Working Group and the Carbon Dioxide Capture and Storage Working Group. These panels, supported by the UNFCCC secretariat, carry out numerous tasks that are essential for the CDM: recommendations on the accreditation, observation, suspension and withdrawal of DOEs; recommendations on the approval, revision, top-down development and clarification of methodologies, tools and standardised baselines; recommendations on the approval or rejection of CDM projects; as well as providing policy recommendations to the CDM Executive Board on various cross-cutting questions. In general, the structure and rules managing the work of these panels may also be widely used for the Article 6.4 mechanism in which similar functions will be needed. Furthermore, the Paris Agreement contains provisions for coverage of administrative costs in the form of a “share of proceeds” that may be used to provide an appropriate service to the governing body.

Compared to the CDM, Article 6.4 may require new functions or the extension of existing functions of the technical panels and the UNFCCC secretariat. In particular, several stakeholders propose that the Article 6.4 mechanism enable the scaling-up of mitigation actions, such as crediting at the level of policies or sectors. This would require the strengthening and extension of independent technical capacity to collect data and design crediting baselines. The UNFCCC secretariat would be well positioned to carry out for the Article 6.4 mechanism a similar function as under the CDM.

The scope and range of Article 6.4 mechanism activities may require a modification of the scope of activities and a different structure of panels. In any case, a similar set-up with panels providing independent technical advice as in the CDM would ensure that the supervisory body has the necessary technical competence.

2.3.6 Resources and capacities of the private sector

The explicit aim of the Article 6.4 mechanism is to “incentivize and facilitate participation [...] by public and private entities authorized by a party”. As in the CDM, the private sector will play a pivotal role in implementing Paris Agreement on the ground. It brings a large body of skills, expertise and resources. Important private sector actors include:

- ▶ Project developers, providing the financial and technical resources and skills to implement mitigation actions;
- ▶ Designated Operational Entities (see Section 0);
- ▶ Researchers and consultants, supporting all steps of the project cycle and having, for example, developed most of the current body of CDM methodologies;
- ▶ Technology suppliers;
- ▶ Financial services, providing financial resources and structuring low carbon financial investment.

However, strengthening the role of the private sector is a challenge given the Party-centric architecture of the Paris Agreement. The fact that host country National Authorities may have to check whether an Article 6.4 mitigation activity may impact its ability to meet its NDC target (which was not necessary under the Kyoto Protocol; see Section 2.3.2) may become a barrier to obtaining a Letter of Authority and may weaken private sector participation. There is a need for a much closer interaction between national authorities and project developers. National authority should provide a greater amount of information and guidance on the implementation of the 6.4 mechanism in the country in order to help project developers in their activities.

3 Migrating CDM projects to Article 6.4

3.1 Introduction

In addition to using CDM rules and institutions under Article 6, Parties have also proposed the migration of registered CDM project activities and programmes of activities (hereinafter referred to as ‘projects’, for brevity) to the Article 6.4 mechanism, thereby allowing them to continue issuing credits under the Paris Agreement after 2020 (Greiner et al., 2017).

CDM projects could be migrated not only to the Article 6.4 mechanism, but also to other crediting programs. Indeed, many CDM projects have already been registered under other crediting programs, such as the Verified Carbon Standard (VCS). Parties could potentially engage in international transfers of mitigation outcomes under Article 6.2 by using credits from such programs. In this way, CDM projects that have migrated to other programs could continue issuing credits which could potentially be accounted for as ITMOs when achieving NDC targets.

While the registration procedures under the Article 6.4 mechanism might allow *any* project to seek registration (including CDM projects, perhaps following their de-registration under the CDM), Parties could establish specific provisions for migrating CDM projects, possibly as a simplified or fast-track registration process and subject to eligibility criteria.

Parties and stakeholders have proposed the migration of CDM projects with the intention of achieving a number of policy objectives. In submissions, in the ongoing negotiations and in the literature, Parties and stakeholders mention the following key policy objectives:

- ▶ **Trust and confidence of investors:** Low market prices and political uncertainty about the future of international carbon markets have eroded investor confidence. Some Parties and stakeholders propose migrating CDM projects as a means of restoring the trust and confidence of private sector actors that have already invested in the CDM. This is intended to help incentivise their continued engagement with international markets, thereby preserving private sector capacity. This, however, is likely to depend on the existence of a more robust price signal post 2020.
- ▶ **Continuing GHG abatement:** The migration of projects into Article 6.4 could help prevent the loss of ongoing mitigation activities under the CDM. This is the case if the projects would otherwise discontinue GHG abatement, i. e. when the migration of projects enables the continued operation of projects that are vulnerable to (or at risk of) discontinuing abatement in the absence of revenues from CERs (Warnecke et al., 2017).
- ▶ **Enabling new and additional mitigation action:** The opportunity to continue selling credits after 2020 could spur the development of new mitigation action in the pre-2020 period. This effect would take place in particular if the emerging supply/demand balance creates a price signal that is in line with the financial needs of new and additional projects.
- ▶ **Prompt implementation of Article 6.4:** Past experience gathered with establishing crediting mechanisms indicates that the operationalisation of new mechanisms takes considerable time, even if policy-makers draw on existing rules and experiences. The migration of CDM projects to the Article 6.4 mechanism could help kick-start the Article 6.4 mechanism and allow for early road-testing of its rules and procedures.
- ▶ **Early availability of units:** The prompt implementation of the Article 6.4 mechanism could also facilitate an early availability of units in the years after 2020. The development and registration of new projects through to issuance of units under the Article 6.4 mechanism could entail significant lead times. This could lead to a low supply of units in the first years of operation of the mechanism, making it difficult to serve new demand quickly. A low supply of units could potentially lead to a situation in which countries use mitigation outcomes generated without international oversight, for which environmental integrity might be more uncertain. While the demand for credits by countries is unclear, CORSIA is expected to create demand for around 115 million tCO₂e in the first three years of operation of the scheme (van Velzen & Cames, 2016).
- ▶ **Lowering the cost of achieving targets for acquiring entities:** Lastly, the migration of projects could also help lower the cost of meeting NDC targets, in particular if migrated projects have low marginal costs for issuing credits.

In addition to these overarching policy objectives, countries could also pursue specific objectives based on their national priorities, such as facilitating continuity in the use of CERs in national ETSs or prioritising specific project types that help achieve national objectives. Generally, policy objectives may relate to provisions of the Paris Agreement – such as “allowing for higher ambition” and “promoting sustainable development and environmental integrity” under Article 6.1, as well as to national mitigation priorities – including short and long-term decarbonisation plans.

In this section, we explore different options for migrating CDM projects to the Article 6.4 mechanism. We identify and discuss options with regard to two key considerations: (a) which projects should be eligible for migration; and (b) which procedural steps should be followed. The analysis focuses primarily on environmental integrity, i. e. on impacts on overall GHG emissions, as well as on possible impacts on the trust and confidence of investors. Other policy objectives are also addressed, albeit briefly.

Environmental integrity is a key principle under Article 6 but has not been defined under the UNFCCC. In the context of migrating CDM projects to Article 6.4, environmental integrity could be understood in a way that, *as a minimum*, the migration of projects should not lead to an increase in cumulative global GHG emissions compared to a situation in which no migration takes place. We use this definition to assess the impact of different options for migrating CDM projects.

Below we provide an overview of the CDM pipeline and its context (section 3.2), identify and discuss possible eligibility criteria for the migration of CDM projects to Article 6.4 (section 3.3), and then discuss possible procedural arrangements for migration CDM projects (section 3.4).

3.2 Understanding the status and context of CDM projects

To ensure environmental integrity and achieve the policy objectives summarised above, any international rules for the migration of projects may need to account for the characteristics of the CDM pipeline of projects. In this section, we therefore briefly summarise the status and context of the CDM pipeline of projects with regard to project types, regions, and the risk that projects discontinue abatement.

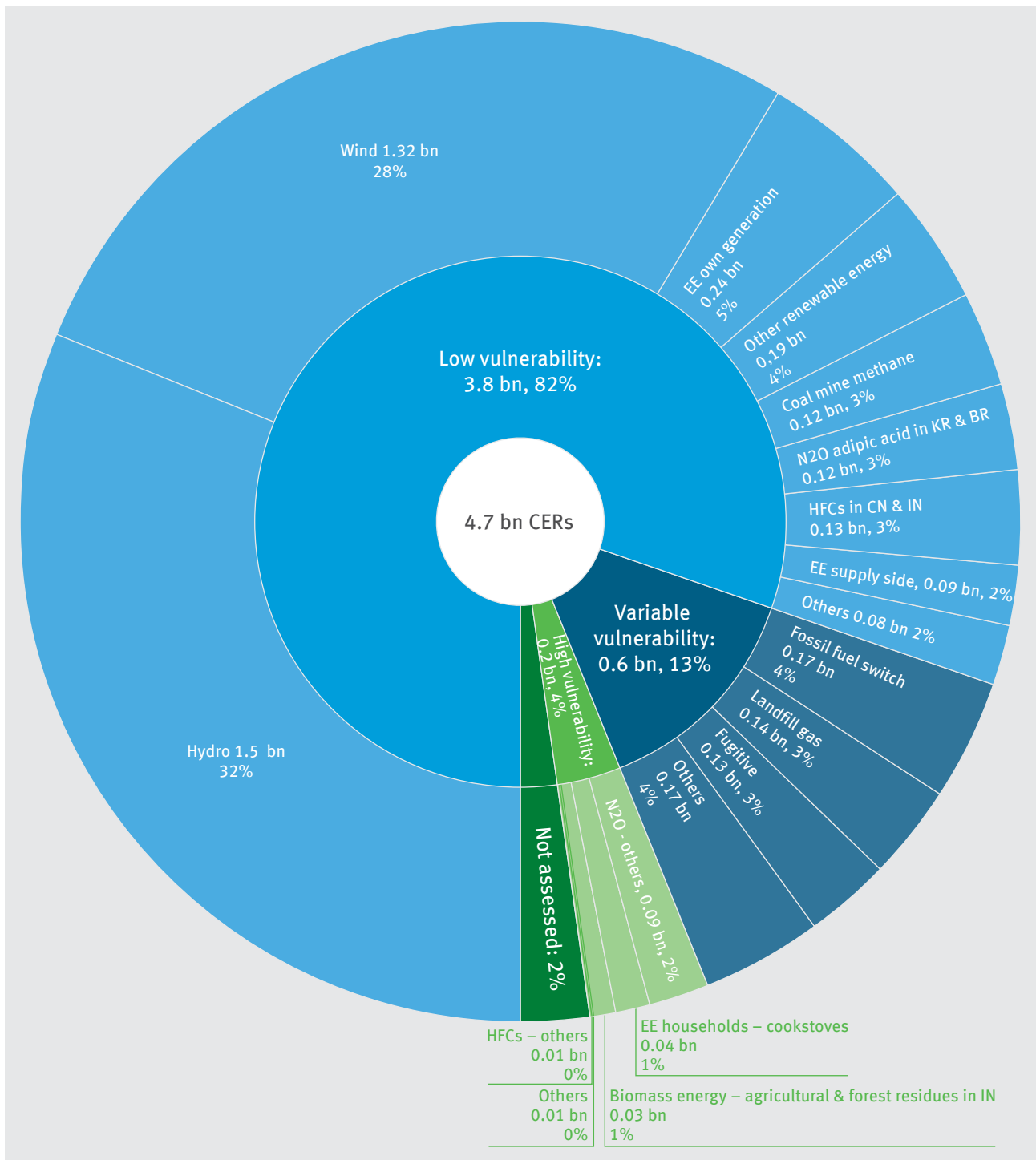
We draw primarily on the analysis of Schneider, Day, La Hoz Theuer, & Warnecke (2017) and Schneider and La Hoz Theuer (2017) who, building on data on the status of CDM projects from Warnecke et al. (2017), conducted a detailed assessment of the current pipeline of CDM projects. Their analysis focuses specifically on the CER supply potential for the 2013–2020 period, yet it seems likely that the post-2020 supply potential is similar in terms of the distribution across project types, regions, and certain project characteristics.

The analysis indicates that although many projects are presently “inactive” and not issuing CERs, most could resume CER issuance under current CDM rules if they had enough incentives to do so. For this reason, the supply potential is also considerable. The CER supply potential from registered and non-registered projects in the CDM pipeline is estimated to amount to about 5.7 billion CERs for the period 2013–2020: 4.7 billion CERs from registered projects and PoAs, and approx. 1 billion CERs from projects that initiated steps to seek CDM status, but had not yet been registered. This volume significantly exceeds current levels of CER issuance: a total of 1.8 billion CERs have been issued to date, of which 337 million were for the Kyoto Protocol’s second commitment period from 2013 to 2020. The supply potential is also significantly larger than the potential demand from CORSIA, which is estimated to amount to about 2.7 billion in the period 2020 to 2035 (van Velzen & Cames, 2016). Of the CER supply potential from registered projects, 68% stems from renewable energy projects, and 82% of the CER supply potential stems from the Asia and Pacific region.

A key consideration for the implications of migrating CDM projects is whether projects are *vulnerable to (or at risk of) discontinuing abatement* in the absence of revenues from CERs. Not all CDM projects require *ongoing* CER revenues to operate: for some project types, such as hydropower or wind power projects, ongoing revenues from electricity sales typically exceed ongoing operational expenditures. Once implemented, these projects have strong economic incentives to continue GHG abatement, regardless of carbon market revenues – because continuing GHG abatement generates more income than discontinuing GHG abatement. These mitigation activities are thus unlikely to be “lost” if they do not have revenues from credits, and have been classified as having a low *vulnerability* to discontinuing GHG abatement (Warnecke et al., 2017). It is important to note that if a project is not vulnerable to discontinuing GHG abatement today, it could still have been additional at the project outset, prior to incurring the initial capital costs. The lack of vulnerability recognizes only that, from today’s perspective of sunk investment costs, the project’s ongoing revenues or cost savings – other than revenues from credits – exceed its ongoing operational expenditures for the GHG abatement. Projects also might continue GHG abatement because policies promote or require continuation or because discontinuation is technically not viable (Warnecke et al., 2017).

By contrast, other projects have ongoing operational costs but insufficient financial benefits beyond carbon market revenues. For example, the abatement of N₂O from nitric acid production requires the regular replacement of catalysts but does not save costs or generate income other than revenues from credit sales. The mitigation action of these projects is at a high risk of being lost in a situation of unfavourable credit prices (i. e. they have a high risk of discontinuing GHG abatement), because continuing GHG abatement is only economically attractive if they have ongoing financial support (Schneider & Cames, 2014; Warnecke et al., 2017). These projects have been classified as having a high vulnerability to discontinuing GHG abatement. For some project types, the risk of discontinuing GHG abatement is variable; for these project types, the vulnerability depends more strongly on local and project-specific conditions (Warnecke et al., 2017).

The risk that CDM projects discontinue GHG abatement has been assessed in several studies and is deemed to be low for most projects (Schneider & Cames, 2014; Schneider, Day, et al., 2017; Warnecke et al., 2017). The analysis conducted by Schneider, Day, et al., (2017) concluded that 82% of the CER supply potential from registered CDM projects is from projects with a low vulnerability to discontinuing abatement. 13% of the supply potential is from projects with a variable vulnerability and only 4% from projects with a high vulnerability to discontinuing abatement, as can be seen in Figure 1.



Source: Schneider and La Hoz Theuer (2017), adapted from Schneider, Day, et al., (2017)

Figure 1: Supply potential from registered CDM projects for the period 2013 to 2020, differentiated by the vulnerability of project types to discontinue GHG abatement

3.3 Assessment of options for project eligibility

Several countries suggest that the migration of CDM projects be subject to eligibility criteria. Eligibility criteria for the migration of projects could aim to ensure environmental integrity or to achieve one or several policy objectives pursued with the migration of CDM projects. They may also depend on whether rules and governance provisions under the Article 6.4 mechanism differ from the CDM. In this section, we assess the following eligibility scenarios for the migration of CDM projects, drawing on previous explorations of possible eligibility criteria in the context of using CERs (Fearnehough, Day, Warnecke, & Schneider, 2018; Schneider & La Hoz Theuer, 2017):

- ▶ Full eligibility of all registered CDM projects;
- ▶ No eligibility of CDM projects;
- ▶ Eligibility criteria based on the vintage of projects or emission reductions;
- ▶ Eligibility criteria on the basis of project features; and
- ▶ Eligibility criteria on the basis of countries or regions.

3.3.1 Full eligibility of all registered CDM projects

Policy-makers could consider allowing the migration of all registered CDM projects, without restrictions other than procedural ones (such as approval by the host country). The impact of a full eligibility of all CDM projects on GHG emissions is complex and depends on several aspects, including (a) whether the migrated projects are vulnerable to discontinuing GHG abatement, and (b) the ambition and scope of the NDC targets.

The vulnerability of projects in the pipeline can have important consequences for the environmental impact of the migration of CDM projects into Article 6.4. A key aspect is the relationship between vulnerability and the scope and ambition of NDCs. The ambition and scope of the NDC target of the host country can affect the global GHG emissions impact from the migration of projects, because the target's scope and ambition may determine whether transferring credits from non-vulnerable projects impacts the country's ability and efforts to achieve its NDC targets (Schneider & La Hoz Theuer, 2018):

1. If a project is *vulnerable* to discontinuing abatement, then the migration of the project and the possibility to sell credits after 2020 could ensure that the project continues GHG abatement. In that case, environmental integrity would be safeguarded – irrespective of the ambition or the scope of the host country's NDC. The host country achieves – through the migration of the project – further emission reductions, which can then, if internationally transferred, be used by another country.
2. If the project is *not vulnerable* to discontinuing abatement, then the GHG impact of the project migration and subsequent international transfer of the credits may depend on whether the project falls within or outside the scope of the NDC target, as well as on the ambition of the NDC target:
 - a. If the migrated project generates emission reductions that fall *within* the scope of the NDC target and the NDC target is *more* stringent than business-as-usual (BAU) emissions, then the GHG impact could be neutral: although the direct effect of the credit transfer from a non-vulnerable migrated project results in an increase in emissions, the country may have to *compensate* for this increase in emissions in order to still achieve its NDC target, by further reducing emissions or purchasing ITMOs.⁴ The more ambitious an NDC target is, the more likely it is that the host country would compensate for the transfer of credits from projects that continue GHG abatement regardless of whether they can sell further credits. Whether a country compensates for a credit transfers from non-vulnerable projects may also depend on *when* transfers are made. Before the target year or period, the country may not have certainty as to whether it will achieve its target and may thus be cautious in approving the migration of such projects. However, once over-achievement of the target becomes certain, the host country may have fewer incentives to ensure that only projects are migrated that would otherwise not continue GHG abatement.

⁴ This assumes that countries achieve their NDCs.

- b. If the migrated project is *not vulnerable* and the project falls *outside* the scope of the NDC, or the NDC is *less stringent* than BAU emissions⁵, then international transfers of units from such projects could lead to an *increase in global emissions* compared to a situation in which the transfer did not take place – because the emission reductions would occur anyway, the credit could be used by another country, and the host country would not need to ‘compensate’ for the transfer by further reducing emissions or acquiring ITMOs. The different possible outcomes are summarised in Table 6.

Table 6: Aggregated GHG emissions impact of international transfers of emission reductions from migrated CDM projects

	The project generates emission reductions that occur within the scope of the NDC target of the host country, and the NDC is <i>more stringent</i> than BAU	The project generates emission reductions that occur within the scope of NDC target, and the NDC target is <i>less stringent</i> than BAU	The project generates emission reductions that occur outside the scope of the NDC target of the host country
Project is <i>vulnerable</i> to discontinuing abatement	Neutral GHG impact	Neutral GHG impact	Neutral GHG impact
Project is <i>not vulnerable</i> to discontinuing abatement	Neutral GHG impact (assuming “compensation” takes place)	Increase in global GHG emissions	Increase in global GHG emissions

Source: Authors’ own considerations based on Schneider, Fuessler, et al. (2017). Assumptions: 1) Credits issued for migrated projects are transferred internationally and used by the acquiring country to achieve its NDC target. 2) The transferring and acquiring country achieve their NDC targets. 3) Robust accounting is applied, in particular double counting between the transferring and acquiring country is avoided on the basis of corresponding adjustments. 4) The possibility to participate in international market mechanisms provides neither incentives nor disincentives for further mitigation action.

The GHG impact of migrating a non-vulnerable project thus depends on whether the emission reductions from the project fall within the scope of the NDC target of the host country and how ambitious the NDC target is. The available information suggests that most CDM projects fall within the scope of NDC targets (Schneider & La Hoz Theuer, 2017) – the most important exception being non-CO₂ emission reductions in China. The available information on the ambition of NDC targets indicates, however, that a number of countries may have NDC targets that are less stringent than BAU (La Hoz Theuer, Schneider, Broekhoff, & Kollmuss, 2017).

Overall, allowing all CDM projects to migrate to Article 6.4 is likely to lead to an increase in global GHG emissions. The extent of the increase depends on which and how many projects would actually be migrated. This is because the vast majority of the CER supply potential is from projects that are not vulnerable to discontinuing GHG abatement, and some of these emission reductions occur outside the scope of NDC targets or in countries who will over-achieve their NDC targets without pursuing any mitigation action. Moreover, if *all* projects were eligible, it is also likely that projects with low vulnerability would outcompete projects that are vulnerable, as projects with low vulnerability have lower costs in the issuing of CERs (Fearnough et al., 2018).

5 I. e. the NDC is such that the country can easily overachieve the NDC even without mitigation action.

If policy-makers allow all CDM projects to migrate to the Article 6.4 mechanism, they may also not achieve the policy objectives that are pursued with the migration. In particular, the impact of full eligibility of all CDM projects on trust and confidence of investors is not straight-forward. Theoretically, it could be argued that the possibility of issuing credits after 2020 could enhance trust, as past investments are recognised. In practice, however, a key question for investor confidence is whether the price for credits will increase beyond the current price level for CERs. Current price levels allow project owners only to cover the administrative costs for verification and issuance but not to generate any significant additional income. Whether price levels will be higher after 2020 depends on supply and demand: if all registered CDM projects are eligible for migration, the supply could considerably exceed demand. Several billion units could (subject to host country approval) potentially be supplied in the period up to 2030. This is likely to exceed the current demand, including from CORSIA. As most CDM projects are likely to continue GHG abatement – whether or not they have revenues from credit sales – they could also issue credits at low costs. An analysis of the marginal costs of issuing CERs suggests that most projects could issue credits at costs far below 1 EUR per tonne of CO₂e (Fearneough et al., 2018). Taking these circumstances together, it is possible that prices would remain at current levels if all CDM projects were eligible to migrate to Article 6.4. Failure to establish a robust price signal post 2020 could, however, lead an outcome contrary to the intended objective of restoring trust and confidence.

Allowing all CDM projects to be migrated into Article 6.4 may also have a mixed outcome on other policy objectives pursued. While it could provide for early availability of units and facilitate a prompt implementation of the Article 6.4 mechanism, it may not prevent the loss of ongoing mitigation activity or trigger further GHG abatement before 2020. If all CDM projects were eligible, it seems likely that migrated CDM projects would outcompete new projects in serving the demand. This is because CDM projects would have comparatively lower marginal costs of issuance and would be subject to shorter lead times than new projects, which would have to be developed, implemented, registered and start operation before being able to issue. Moreover, if Parties were to adopt rules for the migration that allow CDM projects not to comply with all rules under Article 6.4, then this could be perceived as an unfair advantage for CDM projects over new projects.

3.3.2 No migration of CDM projects

The Paris Agreement does not contain provisions for the migration of CDM projects into Article 6.4, and any such migration entails challenges for ensuring environmental integrity as well as for actually achieving the envisaged policy objective. As such, not allowing the migration of CDM projects could be a cautious and conservative approach. There would be a clear separation between the Kyoto and the Paris regimes in terms of the operation of mechanisms, and CERs could still be issued in the period up to 2020 and used to achieve 2020 targets. This option would prevent the environmental harm from the migration of non-vulnerable projects, although it would maintain the status-quo in which projects vulnerable to discontinuing GHG abatement lack incentives to continue operating. This option could help avoid that the current market conditions, with significantly more supply than demand, would prevail after 2020. This, in turn, could facilitate the emergence of a more robust carbon price after 2020, thereby providing more incentives for new mitigation action.

An important consideration is how to provide incentives for new and additional mitigation in the period up to 31 December 2020. In the absence of migration provisions, the regulatory uncertainty in the years running up to the operationalisation of the Article 6.4 mechanism could be a challenge for developing and implementing new mitigation actions. In particular, efforts to effectively incentivise pre-2020 mitigation action could be facilitated by early decisions under the UNFCCC for the eligibility of projects under the Article 6.4 mechanism.

The impact of a no-migration scenario on investor trust and confidence could be mixed. On the one hand, this option would create no benefit for existing projects, and could therefore be seen to further undermine the confidence of current investors. Some investors may have hoped that they could sell CERs to serve post-2020 demand. Enabling projects to sell their CERs could therefore be regarded as helping to restore trust. On the other hand, trust and confidence may not be restored if investors *theoretically* had the possibility of selling their CERs for use after 2020, but would *practically* not have any incentives to do so as CER prices remain low and enable only covering the administrative costs of issuing CERs. Even if a price emerged, it is uncertain whether this would restore trust: future carbon market prices may still be uncertain and volatile, and investors could require more certainty in carbon market prices before investing in new and additional projects, or in projects that are vulnerable to discontinuing GHG abatement. Initiatives like the World Bank's Pilot Auction Facility (PAF) could contribute to such certainty through contracts with guaranteed prices for specified periods.

3.3.3 Eligibility criteria based on the vintage of projects

Policy-makers could establish eligibility criteria that relate to the timeline of CDM projects, such that a project is deemed eligible for migration if it passed a certain development or implementation milestone after a defined point in time. Such eligibility criteria could be used to promote the implementation of new mitigation action already in the pre-2020 period, and/or as a means of reducing the number of projects that are eligible for migration – thereby limiting possible negative impacts of full eligibility, as described in section 3.3.1 above (Fearnehough et al., 2018; Schneider & La Hoz Theuer, 2017).

If the main purpose of vintage eligibility criteria is *promoting new projects*, then the key aspect is differentiating already implemented projects from projects that respond to the new policy incentives of the Paris Agreement and CORSIA. For this, criteria related to the start date of the project (i. e. the date on which project participants commit to making expenditures for the main equipment or service) are the most effective. Restrictions on administrative processes in the CDM – such as the start of validation, the date of registration or the start date of the crediting period – are not appropriate for differentiating between new and already implemented projects, as project participants can often adjust the timing of such processes in response to eligibility criteria⁶. The required start date could be the year following the adoption of the Paris Agreement (i. e. as of 1st January 2016) or the year after the adoption of the rulebook for Article 6 (presumably 1st January 2019).

Eligibility criteria based on a recent start date of the project would help to ensure environmental integrity as they would avoid that projects that continue GHG abatement regardless of the incentives from demand would be able to migrate. This approach would thus avoid the possible negative impacts for environmental integrity of the “full eligibility” scenario. It would provide a high incentive to increasing pre-2020 mitigation action. It would, however, allow only very few of the registered projects in the CDM pipeline to migrate, as most projects have earlier start dates. This option could thus be of limited benefit for project owners of existing CDM projects.

Another option could be vintage restrictions that prioritise projects with start dates within the second commitment period of the Kyoto Protocol. The impacts of this option are uncertain and would depend on whether the resulting supply would already exceed the demand after 2020.

3.3.4 Eligibility criteria on the basis of project features

Eligibility criteria on project features could be used to limit the migration of CDM projects to those that align with specific policy objectives. Criteria could include (Schneider & La Hoz Theuer, 2017):

Additionality: Eligibility criteria on the additionality of projects could be employed to prioritise projects that have a high likelihood of additionality. The likelihood of additionality is often found to differ considerably between project types, and is often deemed more questionable for projects in which CER revenues have a small financial impact (Cames et al., 2016; Dechezlepetre et al., 2014; Erickson et al., 2014; Haya & Parekh, 2011; He & Morse, 2013; Lütken, 2012; Michaelowa & Purohit, 2007; Purdon, 2014; Schneider, 2009; Spalding-Fecher et al., 2012). Policy-makers could restrict eligibility on the basis of a list of project types that are deemed to have a high likelihood of additionality. Existing analyses and project categories considered automatically as additional under the CDM could inform the prioritisation of project types.

Vulnerability to discontinuing GHG abatement: To ensure that environmental integrity is safeguarded when migrating already implemented CDM projects, policy-makers could restrict the eligibility of already implemented projects to those that are at risk of discontinuing GHG abatement in the absence of continued CER revenues (Warnecke et al., 2017). The degree of vulnerability of a project is a judgment similar to – although less uncertain than – the assessment of additionality, and policy-makers could require varying degrees of certainty that a project is at risk of discontinuing GHG abatement.

Programmes of activities: PoAs are often hosted in poorer countries and are typically regarded as targeting disadvantaged communities and generating larger sustainable development co-benefits. Greiner et al. (2017), for example, argue that migrating only PoAs could be perceived as a credible policy option, hence keeping private sector confidence high even though some activity owners would not benefit from it. As for a number of other options, the impact on investor confidence and environmental integrity is uncertain.

⁶ Restrictions on the start of validation and the date of registration would benefit in particular non-registered projects that have already been implemented but could re-start validation if they had the economic incentive to do so (Schneider & La Hoz Theuer, 2017).

Other possible criteria include: *methodological aspects*, e.g. prioritising projects that use standardised baselines with the view to promote further standardisation; *sustainable development co-benefits*, i.e. prioritising project types that typically offer higher sustainable development co-benefits; and *transformational impacts*, i.e. prioritising projects (or project types) that contribute to the transition towards a low carbon economy.

The impacts of these criteria may differ and depend strongly on how they are implemented. With regard to the impact on aggregated GHG emissions from migrating already implemented projects, the vulnerability of discontinuing GHG abatement is critical (see section 3.3.1). Limiting eligibility to projects that are vulnerable could provide incentives for these projects to continue GHG abatement. Among the options considered, this one would therefore best ensure environmental integrity. All other options would likely imply – to a varying degree – an increase in aggregated GHG emissions, as they would partially allow migrating projects that continue GHG abatement regardless of the possibility to sell credits after 2020.

Simplicity of requirements and implementation could be important both for providing certainty for investors and for safeguarding environmental integrity. Clear and simple eligibility criteria may be more effective in contributing to investor confidence through administrative simplicity and by avoiding criticisms of subjectivity. Where the requirements do not relate to GHG impacts, their use could be supplemented by other criteria in order to safeguard environmental integrity. Nevertheless, the use of these criteria could reduce the number of projects eligible for migration and could thereby help *contain* negative environmental impacts.

3.3.5 Eligibility criteria on the basis of countries or regions

Policy-makers could prioritise or limit eligibility of projects to specific host countries or regions. Eligibility criteria could be established, among others, on the basis of relevant UN classifications – notably LDCs and SIDS. An example is the EU ETS, in which eligibility of projects registered after 31 December 2012 was restricted to projects hosted in LDCs (European Commission, 2017). Other options are also possible, such as the World Bank’s classification into low, lower-middle, upper-middle and high-income countries (World Bank, 2017), or a focus on countries that are “underrepresented” in the CDM.

Prioritising or limiting eligibility to specific countries or regions would not address the environmental integrity risks but reduce negative impacts, as many of the projects in such countries are not vulnerable to discontinuing GHG abatement (Schneider & La Hoz Theuer, 2017), but contain the risk, as fewer projects could be migrated. Such restrictions could, however, improve the regional distribution of CDM projects, potentially facilitating a more balanced regional distribution in the period after 2020 if the projects were migrated and continued under Article 6.4.

3.4 Procedural arrangements

The migration of CDM projects into Article 6.4 raises several procedural issues. Parties could adopt procedural arrangements for the migration of CDM projects to enable assessing whether the project satisfied relevant prerequisites or requirements, including that the CDM project:

1. Satisfies any eligibility criteria established by Parties for migration of CDM projects (as discussed in section 3.3);
2. Complies with any requirements that arise from the new context of the Paris Agreement, including any requirements of the Article 6.4 mechanism and any requirements arising from the context of the NDC target of the host country; and
3. Has been approved by the host country for migration, which helps prevent double counting and ensures that the project migration does not negatively impact national priorities.

Each of the elements above could be carried out independently, in different sequences and points in time. For project owners and regulators, it might be simplest if the fulfilment of all requirements can be demonstrated in a single process, similar to the CDM procedure for post-registration changes or renewal of the crediting period. A procedure for migration of CDM projects could be structured as follows:

- ▶ Project owners put forward an application for migration, which includes the updated documentation required to satisfy all relevant requirements, possibly with the exception of the host country approval;
- ▶ The documentation is audited by a third-party validator;
- ▶ If not yet obtained, project owners seek host-country approval for the migration;
- ▶ The documentation is assessed by the Supervisory Body of the Article 6.4 mechanism, which may confirm the migration, e. g. by registering the project under Article 6.4.

This approach could provide for procedural simplicity and could provide ex ante certainty for project owners and credit buyers on the full compliance of the migrated project with the rules for migration. It could also be significantly more cost-efficient in scenarios in which the fulfilment of element (1) entails a project-by-project assessment (see section 3.4.1 below). Although this option could entail high transaction costs early in the migration process (when market uncertainty may be high), this effect could be mitigated by allowing project owners ample time to react to the new rules and market demand.

Alternatively, elements (1) and (2) could be carried out as part of two separate processes, as proposed by Greiner et al. (2017). This option would make more sense in scenarios in which the fulfilment of element (1) does not require a project-specific assessment. In this case, the “application” by project owners could in effect be an “indication of intention” to migrate, with more detailed conformity assessments to take place later in the process, after what Greiner et al. (2017) et al refer to as a “transition period”. By conducting the assessment necessary to satisfy element (2) at the end of a transition period – and not upon the application to migrate the project – project owners could have more time to bring activities into alignment with the post-2020 context. This option, however, could entail significantly more complexity, especially if projects are allowed to issue any units before they satisfy the requirements under element (2) – giving rise to issues of liability in cases of later non-compliance.

In the sections that follow we explore each of three elements that projects may have to satisfy. Timeline considerations are also important for the migration and are discussed in section 3.4.4.

3.4.1 Meeting eligibility criteria

Different types of eligibility criteria (element (1) above) could bring different procedural requirements for how CDM projects could be migrated.

Where eligibility criteria are based on project features that have already been validated or that are given by the administrative procedures of the CDM Executive Board – such as the “start date” of project, the type of methodology used, the sectoral scope of the project, the host country, whether the activity is a PoA or a project, whether a standardised baseline is used, whether additionality was demonstrated through a positive list – then compliance could be confirmed through a very simple check, for which, the UNFCCC secretariat could, for example, have sole responsibility.

Where eligibility criteria require an assessment of project features that have not yet been validated, or of features of certain project types – such as an assessment whether the project is vulnerable to discontinuing GHG abatement – a more elaborate procedure may be required. Two approaches could be pursued:

- ▶ Individual project assessment: Policy-makers could establish a process under which individual projects would have to demonstrate that they satisfy the eligibility criteria. Methodological tools would be required for this purpose.
- ▶ Project type assessment: Policy-makers could establish a list of project types that are eligible, and the project would then need to demonstrate that it belongs to this list.

The second option is administratively simpler but would not be able to reflect the specific circumstances of different host countries and of individual projects. It may thus be politically challenging to establish lists of eligible project types that meaningfully contribute to the policy objective that the eligibility criteria aim to achieve.

3.4.2 Compliance with the new context of the Paris Agreement

In general terms, CDM projects should comply with the new context of the Paris Agreement in order to migrate to the Article 6.4 mechanism. Projects may need to comply with two broad elements (Greiner et al., 2017):

1. Projects may require alignment with the rules under Article 6.4, which are still under development. Alignment may be necessary, for example, with new methodological provisions as well as with new requirements such as contributing to an overall mitigation of global emissions.
2. Projects may also have to be brought into alignment with the context of the host country’s NDC. Projects may be subject to revised assessments of additionality and may need to establish new baseline scenarios when they migrate – taking into account, for example, the BAU and NDC trajectories outlined in the NDC, as well as policies to achieve the NDC targets. A particular challenge in this context relates to the understanding of the host country’s NDC, e.g. in terms of scope, stringency and conditionality. This aspect may thus be connected to the host country approval.

3.4.3 Host country approval

If CDM projects are migrated to Article 6.4 of the Paris Agreement, then the provision of paragraph 37(a) of decision 1/CP.21 – under which participation in the mechanism is authorised by each Party involved – could also apply. The migration could thus be subject to host country approval.

Moreover, if the emission reductions from the CDM projects are used by other countries towards achieving their NDCs, this could impact the host country's ability of achieving its own NDC. Host country approval could thus also be necessary in order to ensure that countries agree to the use of the emission reductions by another country. A host country approval could also reduce the risks for project owners of not being able to sell the credits if the host country at a later date did not agree to account for the transfer of the emission reductions to another country. Lastly, host country approval would ensure that countries have a say about *which* projects can be migrated – i. e. in addition to the eligibility criteria established under Article 6.4. This would allow them to prioritise certain project types, such as projects that are at risk of discontinuing GHG abatement, and to align the migration with possible eligibility criteria under national eligibility policies, such as the type of CERs that are eligible in domestic ETSs.

If host country approval is required, then the processes for granting of approval could remain under the responsibility of individual Parties, perhaps subject to requirements by the body supervising the Article 6.4 mechanism. Authorisations could be provided on a project-by-project basis, e. g. as is currently the case with Letters of Approval under the CDM, and possibly be subject to specific assessments. Alternatively, countries could consider providing “blanket” authorisations for all projects in their territory, or for certain project types – defined, for example, by methodologies, scopes or sectors. Procedures may depend on the extent to which projects are required to adapt to the context of the NDC and on the role assigned to host countries in the migration of projects.

3.4.4 Effective date of migration and avoidance of double issuance

The timeline of the migration determines under which mechanism credits are issued – i. e. under the CDM or under Article 6.4. As of a given point in time, the emission reductions would no longer be credited under the CDM but under the Article 6.4 mechanism instead. This effective date of migration would thus relate to the *timing of emission reductions* (i. e. when the abatement itself took place) and not to the timing of verification of issuance. Whether credits have been issued under the CDM or under the Article 6.4 mechanism may also determine how they may be used (e. g. towards Kyoto Protocol targets or towards NDCs), unless prompt-start provisions for migrated projects are put in place (see section 4.2.8 below). In any event, a clear separation between the CDM and Article 6 is necessary to prevent double issuance across the mechanisms. Moreover, migrated CDM projects would be subject to the same accounting provisions (e. g. with regard to avoiding double counting), as other projects under Article 6.4 (Greiner et al., 2017).

A single date could be used as the effective date of migration for all projects, or the date could be set on a case-by-case basis. A fixed date for all projects (e. g. 1st January 2021) may make it difficult for projects to request migration at a later point in time if they cannot demonstrate compliance with applicable rules as of the fixed date. To address this, rules could be set such that the effective migration date is either a fixed date (e. g. 1st January 2021) or the date from which the project is able to demonstrate compliance with the applicable rules, whichever is later. Other alternatives also exist; Greiner et al. (2017), for example, note that the migration for each activity could take place at the beginning of a new monitoring period that starts after 1st January 2020. This approach, however, would have to take into account the date from which the project complies with the requirements.

A cut-off date may also apply for projects to request migration or obtain final clearance.

4 Using CERs towards achieving NDCs

4.1 Introduction

The previous section explored the possibility of *migrating registered CDM projects* to the Article 6.4 mechanism, so that they can continue to issue credits for emission reductions taking place after 2020. In this section, we discuss the possibility of *using CERs* that were issued for emission reductions that took place in the period up to 31 December 2020 – hereinafter simply referred to as “CERs” – to achieve NDC targets after 2020.

This section does not discuss whether the CDM may issue CERs for emission reductions occurring after 2020. Instead it is assumed that CERs will only be issued for emission reductions occurring until the end of the second commitment period (31 December 2020). For the sake of simplicity, it is also assumed that the Article 6.4 mechanism will not issue credits for emission reductions occurring in the period up to 31 December 2020. It is important to note that use of CERs to achieve NDC targets does not necessarily entail an international transfer, because a CDM host country might use CERs issued for emission reductions in its own territory to achieve its NDC target. Moreover, using CERs after 2020 may not necessarily involve a transfer of CERs between registries: CERs could potentially be cancelled in the CDM registry and then be accounted for by the country towards achievement of its NDC.

Using CERs to achieve NDC targets after 2020 could be pursued with the intention of achieving similar policy objectives to the migration of projects, including restoring trust and confidence of investors, ensuring early availability of units, lowering the cost of achieving targets for acquiring countries, continuing GHG abatement and increasing pre-2020 mitigation, and ensuring environmental integrity.

The issues and options for the use of *CERs* after 2020 are often quite similar to those for the migration of *projects*. In the sections that follow we discuss options for the eligibility of CERs and procedural arrangements in a condensed form, in order to minimise repetition.

4.2 Assessment of options for CER eligibility

Similar to the migration of CDM projects to the Article 6.4 mechanism, policy-makers could consider different options for the eligibility of CERs towards achieving NDC targets (Fearnough et al., 2018; Schneider & La Hoz Theuer, 2017):

- ▶ Full eligibility of CERs in the post-2020 period;
- ▶ No use of CERs in the post-2020 period;
- ▶ Eligibility criteria based on the vintage of projects or emission reductions;
- ▶ Eligibility criteria on the basis of project features;
- ▶ Eligibility criteria on the basis of countries or regions;
- ▶ Eligibility criteria to address double counting risks;
- ▶ Quantitative limits on the use of CERs; and
- ▶ Eligibility of CERs from projects that have been migrated into Article 6.4 (“prompt start”).

Such eligibility criteria could be introduced to pursue several different policy objectives. They might help to achieve different objectives of the Paris Agreement, including promoting environmental integrity, avoiding double counting, or ensuring that the overall ambition is not undermined through the use of mechanisms. In addition, eligibility criteria could be implemented to achieve other objectives pursued by Parties, such as enhancing the regional distribution of offset projects.

In the following sections, we discuss each of these eligibility scenarios, noting that combinations are also possible. We assess the implications for environmental integrity – i. e. the impact on aggregated global GHG emissions – and whether and how the options achieve other policy objectives pursued with the migration of CERs.

4.2.1 Full eligibility of CERs

Policy-makers could consider allowing CERs from all projects to be used after 2020, without any restrictions. This option would be simple from a regulatory point of view and could provide for a large supply of credits already in the early years of the period after 2020. This option would, however, entail considerable risks for environmental risks, due to two important issues: the prevalence of CERs from projects that are not vulnerable to discontinuing abatement, and the risk of double counting with 2020 targets.

As highlighted in section 3.2 above, the supply potential of CERs from emission reductions up to 31 December 2020 is very large: 4.7 billion CERs from registered projects alone. The supply of such CERs would likely exceed demand in the post-2020 period. Importantly, 82% of the supply potential stems from projects that have been implemented and have a low vulnerability to discontinuing abatement. If CERs from these projects were used to serve demand after 2020, this would lead to an increase in GHG emissions compared to a situation in which such CERs were not used (Fearnehough et al., 2018; Schneider, Day, et al., 2017; Schneider & La Hoz Theuer, 2017).

Double counting with 2020 targets (i. e. pledges and Nationally Appropriate Mitigation Actions put forward in response to COP15 in Copenhagen and COP16 in Cancún) is also an important risk (Schneider & La Hoz Theuer, 2017). This is because no accounting framework is in place to prevent double counting with 2020 targets. As such, the emission reductions achieved through the CDM could be claimed twice: once by the CDM host country towards achieving its 2020 targets (through reporting lower emission levels in its GHG inventory and thereby meeting its target), and once by the country using the CERs to comply with its NDC target. If the CERs were used by the host country, for example, this could imply that a single emission reduction is used twice by the same country towards achieving two different mitigation targets: its 2020 target and its NDC target. Double counting with 2020 targets could thereby lead to an increase in global GHG emissions compared to the situation in which the CERs were not migrated. This would also contravene the principle in Article 4.13 which establishes that Parties shall “ensure the avoidance of double counting” when accounting for their NDCs. Similarly, this would contradict the principle of avoiding double counting with pre-2020 mitigation action, as established in paragraph 107 of decision 1/CP.21. Double counting could also occur if CERs are used in emission trading schemes or for voluntary offsetting.

Schneider and La Hoz Theuer (2017) identify that the risk of double counting in the current CDM pipeline is significant: about 77% of the CER supply potential from registered CDM projects originates from sources covered by a 2020 target, and only 18% originate either from countries without a 2020 target or from sectors or GHGs not covered by a 2020 target. Double counting could be addressed through rules requiring that additions and subtractions be made for units transferred across periods.

Allowing all CERs to be used to achieve NDC targets is also unlikely to achieve other policy objectives. CER prices would likely remain low, and thus might not generate sufficient incentives for project owners to develop new projects or continue GHG abatement in vulnerable projects. The low prices and lack of incentives towards mitigation action could also further undermine investor trust and confidence.

4.2.2 No use of CERs in the post-2020 period

Policy-makers could also consider not enabling the use of CERs to achieve NDC targets after 2020. In-deed, several arguments call for caution when considering the use of CERs in the post-2020 period. Most importantly, allowing all CERs to be used in the post-2020 period could lead to a significant increase in global emissions. Another risk is that allowing the use of CERs in the post-2020 period could open discussions about the use of other Kyoto units under the Paris Agreement, i. e. emission reduction units (ERUs) from JI and Kyoto Protocol assigned amount units (AAUs) – which could pose serious threats with regard to environmental integrity (Kollmuss, Schneider, & Zhezherin, 2015; Vieweg et al., 2012). Given the non-entry into force of the Doha Amendment to the Kyoto Protocol, however, are currently not being issued for the second commitment period of the Kyoto Protocol.

Given this background, not using CERs in the post-2020 period is likely the most conservative option from an environmental point of view. As in the case for the non-migration of CDM projects, the impacts of such an option on investor trust and confidence could be mixed. On the one hand, investors of current projects would not have the opportunity to sell their CERs to possible new demand after 2020; on the other hand, this option could lead to a more robust carbon price in the post-2020 period, which could enable more investments in new mitigation action.

4.2.3 Eligibility criteria based on the vintage of projects or of emission reductions

Policy-makers could pursue vintage-related eligibility criteria for the post-2020 use of CERs with the aim of promoting the implementation of new mitigation action in the pre-2020 period under the CDM, and/or as a means of reducing the number of CERs that are eligible for use beyond 2020 – thereby implicitly limiting possible negative impacts on aggregated GHG emissions and helping to safeguard environmental integrity (Fearnehough et al., 2018; Schneider & La Hoz Theuer, 2017).

Vintage-related eligibility criteria for post-2020 use of CERs could be implemented in two ways:

1. As a restriction on the timeline of the implementation or registration of CDM projects, such that CERs are deemed eligible for post-2020 use if the project passed a development milestone after a defined point in time.
2. As a restriction on the *timing of emission reductions*, whereby CERs are deemed eligible for post-2020 use if the emission reductions occurred after a defined point in time.

If the main purpose of vintage criteria is *promoting new or recently developed abatement action*, eligibility criteria based on the *implementation* of projects (i. e. on the ‘start date’ of the project) are most effective. The required date could be, for example, the year following the adoption of the Paris Agreement or the year after the adoption of the rulebook for Article 6. This option would safeguard environmental integrity (as long as the projects are additional and robust accounting is applied) and provide the highest incentive to increasing pre-2020 mitigation action, in particular if newly implemented projects were allowed to be transitioned into Article 6.4 (this latter option would be akin to the possible “prompt start” provisions described in section 4.2.8 below). Such vintage criteria would benefit the few projects that have been developed in recent years despite the current market situation, while most CERs from currently registered projects would not be eligible. By contrast, eligibility criteria based on the *registration* of projects may not be effective, as current CDM rules allow projects that were implemented in the past to be registered at any time in the future, as long as they have submitted a notification to the UNFCCC secretariat.

If the main purpose of vintage criteria is to restrict the *number* of eligible CERs, many options are possible, e. g. requiring a start date within the second commitment period of the Kyoto Protocol. Restrictions on the start of administrative processes in the CDM, such as the start of validation or the date of registration, could also be used. They would, however, benefit in particular non-registered projects that have already been implemented but could re-start validation. Vintage restrictions on the *timing of emission reductions* would require administrative efforts to identify when the emission reductions occurred for each CER, because serial numbers of CERs identify the commitment period, but not the calendar year or precise period in which the emission reductions occur. Vintage restrictions on the timing of emission reductions would not address the environmental integrity concerns but only limit the increase in aggregated GHG emissions, depending on how many CERs would become eligible.

4.2.4 Eligibility criteria on the basis of project features

Policy-makers could also limit eligibility to CERs which stem from projects complying with features that align with specific policy objectives, such as promoting environmental integrity. The possible criteria mentioned in section 4.2.4 also apply here: projects with high likelihood of additionality, projects vulnerable to discontinuing abatement, PoAs, projects based on standardised baselines, projects that have high sustainable development co-benefits, projects with transformational impact, etc. The impacts would strongly depend on the option chosen and how it is implemented. Limiting eligibility to CERs from projects at risk of discontinuing GHG abatement is likely to safeguard environmental integrity the best. All other options would likely lead – to a varying degree – to an increase in aggregated GHG emissions.

4.2.5 Eligibility criteria on the basis of countries or regions

Policy-makers could limit eligibility to CERs stemming from projects from specific host countries, regions, or country groups, such as LDCs/SIDS or countries that are under-represented in the CDM. Such restrictions could be implemented with the aim of improving the regional distribution of CDM projects, potentially facilitating a more balanced regional distribution in the period after 2020. This would not address the environmental integrity risks, but could reduce negative impacts by limiting the supply.

4.2.6 Eligibility criteria for addressing double counting risks

Much of the CER supply potential is associated with risks of double counting with 2020 targets. Mitigating this risk may be essential in ensuring the environmental integrity of post-2020 CER use. Two approaches could be pursued (Schneider & La Hoz Theuer, 2017):

1. Limiting eligibility to CERs issued for emission reductions that are not covered by 2020 targets. This would apply to:
 - a. CERs from host countries without any 2020 target; and
 - b. CERs from host countries with a 2020 target but for which the emission reductions are not covered by the target.
2. Limiting eligibility to CERs from host countries that commit to avoiding double counting. This would require host countries to account for the use of CERs in the period up to 2020. Host countries could, for example, account for CERs by applying “corresponding adjustments”, as envisaged under the Paris Agreement, to their GHG emissions reported under the UNFCCC. Once an accounting framework has been agreed to under the Paris Agreement, host countries might also apply this framework *mutatis mutandis* to the context of 2020 targets.

Both approaches could in principle address the risk of double counting and are not mutually exclusive. Approach 1 would be relatively simple to implement, but could penalise countries that put forward 2020 targets and provide an advantage to countries that were not ready to do so. Approach 2 would enable all countries to benefit from the opportunity of selling CERs for use after 2020, but could be politically challenging as past efforts to gain agreement on common accounting principles under the UN-FCCC have failed. Applying the accounting rules agreed under the Paris Agreement to the pre-2020 period would ensure that a consistent accounting framework is used for both emission reductions from CDM projects in the period to 2020 and any international transfers after 2020. It would also help to ensure that all carbon market units used under the Paris Agreement towards achieving NDC targets comply with the same requirements.

An important prerequisite for Approach 2 is that mitigation targets be transparent, quantified, and expressed in GHG metrics. A practical challenge in applying corresponding adjustments is the diversity of 2020 targets, including their expression as single-year targets for 2020. The impact of Approach 2 thus depends on the robustness of the accounting framework used to avoid double counting.

4.2.7 Quantitative limits or discounting

The use of CERs in the post-2020 period could be subject to other forms of restrictions that are unrelated to characteristics of the underlying project. Greiner et al. (2017) suggest two options. Policy-makers could limit the volume of CERs that countries can use towards achieving the NDC target. This limit could be formulated as a fixed percentage of reported GHG emissions or of the emissions level corresponding to the NDC target. The impact would be similar to other options of limiting CERs supply without “quality” considerations, such as eligibility criteria based on the timing of emission reductions. The implications would largely depend on the extent to which the CER supply is limited.

Alternatively, the use of CERs could be subject to discounting: acquiring countries could be required, for example, to cancel two CERs to account for one tCO₂e towards achievement of the NDC target. Even a discount rate of 50% would still enable a large volume of CERs to be migrated, and could therefore be subject to the same risks as outlined in the case of full eligibility of CERs, albeit with reduced volume. Much like other options that are not based on environmental integrity risks, this option would contain rather than address the environmental integrity risks.

4.2.8 Prompt start of migrated projects

Policy-makers could limit eligibility to CERs that stem from projects that have been migrated into Article 6.4 – referred to here as “prompt-start” provisions.⁷ If (certain) CDM projects are migrated into Article 6.4, then the CERs issued for *pre-2020 emission reductions* from these particular projects could be deemed eligible for use in the post-2020 period, whereas CERs from other projects would not be eligible. Such provisions could be pursued to strengthen incentives for mitigation action in the pre-2020 period. We generally assume in this context that the credits would be issued under the CDM, although it is possible that issuance take place under Article 6.4 (e. g. if the effective date of migration (section 3.4.4) lies in the period before 31 December 2020).

An important challenge of this option is the regulatory uncertainty in the years running up to the operationalisation of Article 6.4 as projects could seek CDM registration in *anticipation* of being eligible for transition to Article 6.4 without, however, having *certainty* of it. Efforts to effectively incentivise pre-2020 mitigation action could be facilitated by early decisions under the UNFCCC for the eligibility of projects under the Article 6.4 mechanism. The paragraphs below discuss the key design options for prompt-start provisions.

Project eligibility: Policy-makers could choose to allow only certain types of migrated projects to benefit from a prompt-start, thereby providing additional incentives to projects that contribute to specific policy objectives. Provisions that prioritise projects vulnerable to discontinuing GHG abatement and address the risk of double counting with 2020 targets are of particular relevance in this context. For example, even if the rules for project migration do not require that projects be vulnerable to discontinuing abatement, then prompt-start regulations for the eligibility of their CERs could nevertheless do so, thereby incentivising the continuation of GHG abatement by vulnerable projects and reducing detrimental impacts in terms of aggregate GHG emissions.

CER eligibility: Once *projects* are deemed eligible for both migration under Article 6.4 and for using their CERs after 2020, the next question that arises is which of the *CERs* from these projects should be eligible for use after 2020. Such vintage-related criteria could be based either on the timing of emission reductions or on the timeline of the implementation or registration of the project. Such criteria could impact both the potential value for project owners and the impact on global GHG emissions. As such, which rules could be best suited for CER eligibility also depends on the overall policy objectives and on the rules for project eligibility. Choices with regard to timing may also be limited by administrative constraints: for example, recognition could not stretch back into the first commitment period of the Kyoto Protocol as CERs issued for reductions in this first period are already no longer valid for use under Kyoto – unless they have been carried over from the first into the second commitment period (Greiner et al., 2017). If the project eligibility fully safeguards environmental integrity (e. g. by restricting eligibility for prompt-start to vulnerable projects while addressing double counting), then the CER eligibility could stretch to most or all CERs generated during the second commitment period of the Kyoto Protocol. By contrast, if the project eligibility criteria do not fully safeguard environmental integrity, then the CER eligibility criteria could aim to restrict the volume of CERs so as to *contain* environmental integrity concerns from such CERs.

A similar but distinct topic relates to the *prompt-start of projects that are eligible under Article 6.4, but that are not registered under the CDM*. Prompt-start provisions for such projects could be subject to similar considerations with respect to vintage restrictions on the eligibility of credits related to emission reductions that took place before 31 December 2020. Provisions to prevent double issuance would also be relevant.

⁷ Greiner et al (2017) refer to this option as “early action”. We refer to “prompt-start” instead, as the term “early action” is often used in a broader context of increasing pre-2020 mitigation action.

4.3 Assessment of options for procedural arrangements

The use of CERs in the post-2020 period raises several procedural issues. Procedural arrangements could be required to ensure that:

1. The CERs satisfy any eligibility criteria for post-2020 use;
2. The accounting for the use of CERs is carried out appropriately; and
3. The host country has approved the use of CERs in the post-2020 period.

4.3.1 Establishing CER eligibility

Different types of eligibility criteria for CERs could bring different procedural requirements for demonstration of compliance. Where eligibility criteria are based on more ‘administrative’ features – such as the host-country and some of the vintage restrictions – compliance could be established in a very simplified manner, especially if the relevant information is identifiable within the serial number of CERs.

The implementation of other eligibility criteria could require information that is not identifiable in the CER serial number, but that is readily available in project documentation and has been validated in the CDM process. Existing project information systems by the UNFCCC secretariat could be amended, as needed, to determine whether or not CERs are eligible for post-2020 use. An amendment of current information systems may, for example, be required for vintage criteria on the basis of the start date of the project as well as for criteria related to specific project types.

Finally, some CER eligibility scenarios could require a more detailed assessment of the underlying project. This could be the case, for example, for eligibility criteria based on project features (e. g. transformational impacts or sustainable development co-benefits) for which eligibility is determined not through a list of accepted project *types*, but rather on the basis of an assessment of the underlying project. This option, although more thorough and flexible, would bring significant procedural complexity. Dedicated procedural provisions and a governance structure could be required, and projects would have to go through an application process.

4.3.2 Accounting for the use of CERs

The use of CERs in the post-2020 period should be consistent with accounting rules for NDCs and for Article 6, which are under development. A country that acquires a CER and uses it towards NDC achievement would thus need either to make an addition to its emission budget or to subtract it from its NDC-covered emissions.

How CERs are used to achieve NDC targets depends on the overall arrangements for the accounting system. CERs could, for example, be transferred into post-2020 registries – where they could be moved across accounts and then retired when used towards the achievement of NDCs. Alternatively, CERs could be cancelled in the CDM registry using existing provisions for voluntary cancellation, which could then be reflected in post-2020 accounting balances.

Another important element relates to the avoidance of double counting with 2020 targets. In order to ensure environmental integrity, CERs that are used post 2020 must not have been used towards any targets or commitments in the pre-2020 period – be them targets under the Kyoto Protocol, the Cancún Agreements, or ETS targets. For this, accounting provisions for the achievement of 2020 targets would be necessary. In addition, provisions may be necessary to avoid the double use of CERs (i. e. two entities claiming the same cancellation of CER in the CDM registry). This could be implemented through rules that require that for any cancellation of CERs in the CDM registry the purpose must be clearly stated, including the country which uses the CERs to achieve its NDC target.

4.3.3 Host country approval

The use of CERs to achieve NDC targets could be made subject to the approval by the host country. This may be required to effectively prevent double counting with Cancún targets (assuming a relevant accounting framework is in place). National processes for granting of approval would remain under the responsibility of individual Parties, perhaps subject to requirements by the Body supervising the Article 6.4 mechanism.

5 Conclusions and recommendations

In this discussion paper, we have assessed how different elements of the CDM could be used under the Paris Agreement, including its rules, its institutional framework, its projects, and its CERs. A particular focus of the analysis was the implications for environmental integrity. The analysis showed that the suitability and implications of using elements of the CDM under the Paris Agreement vary strongly, depending on *which* of the four elements are used and *how* they are used. The conclusions of the Paper aim to inform the discussions around the Article 6 decisions, where no agreement could be reached at COP24 in Katowice and where further work is needed in 2019.

Using CDM rules

Drawing upon various elements of and lessons learnt from the CDM may be efficient and help to avoid some of the weaknesses of the CDM when designing the rules of the Article 6.4 mechanism.

In our analysis, we have assessed key regulatory elements of the CDM with regard to their usefulness and consistency with the Paris Agreement, with a focus on environmental integrity. Our analysis showed that a number of regulatory elements may, to a large extent, be used for the Article 6.4 mechanism, including the large body of methodological approaches for quantifying the GHG emission from specific sources, as included in CDM methodologies. Using these approaches under the Article 6.4 mechanism might require revisions and (regular) updates. Also, the use of CDM approaches for developed countries may require further revisions.

Similarly, the overarching processes and procedures along the CDM project cycle – including stakeholder consultation, third party validation and verification as well as accreditation – provide a good blueprint for rules for the Article 6.4 mechanism. In some areas, either the CDM experience or the requirements of the Paris Agreement warrant a major reconsideration or revision of existing CDM rules. Areas that require fundamental changes for the Paris Agreement include the authorisation process for international transfers by Parties, including their agreement on corresponding adjustments; demonstrating the contribution to sustainable development; stakeholder consultation and improved oversight over validators/verifiers.

With the CDM being essentially a project-by-project mechanism, CDM rules are probably the most useful for those mitigation activities under Article 6.4 that are also project- or programme-based. For mitigation activities that are implemented on a more aggregated level such as sectoral or policy crediting (if eligible under Article 6.4), the use of CDM rules appears to be rather limited.

The CDM rules for baseline-setting and additionality demonstration appear transferable to the Article 6.4 mechanism to a much lesser extent or may need to be considerably restricted in their use. Firstly, the experience with the commonly used CDM investment analysis indicates that this approach may be subject to significant uncertainties and that the likelihood of additionality may often be deemed more questionable for projects in which CER revenues provide only a relatively small financial impact, particularly projects in renewables and energy efficiency. Investment analysis remains an important tool for additionality testing but is probably not sufficient to test additionality. Secondly, in contrast to the Kyoto Protocol, under the Paris Agreement all host countries have NDC targets; this needs to be taken into account when setting crediting baselines and determining additionality for mitigation actions under the Article 6.4 mechanism. Therefore, it is necessary to develop new rules for baseline-setting and additionality determination for the Article 6.4 mechanism. The new rules may build on tools and approaches taken from the CDM but this would require revision and considerable extension in order to be suitable for the different kinds of host countries under the Paris Agreement.

For host countries with economy-wide NDC targets that are more stringent than BAU new rules for baselines and additionality are necessary to mitigate the risk of the country not meeting its NDC target or having to increase its effort to mitigate non-additional emission reductions that are being internationally transferred.

For host countries with NDC targets with partial coverage and/or NDC targets that are less stringent than NDC or unclear, new rules for baselines and additionality are necessary to mitigate the risk of transferring emission reductions with low environmental integrity.

With this, the CDM approaches for baseline-setting and additionality determination may remain relevant only in specific cases, e. g. for mitigations actions that fall outside the scope of an NDC or for NDC targets that are less stringent than BAU. With the scope and the ambition of NDCs being enhanced over time, CDM approaches might become less relevant for defining crediting baselines in the context of the Article 6.4 mechanism but remain important for measuring mitigation impact for domestic measures to demonstrate progress in meeting a country's NDC target.

Using the CDM institutional framework

Different elements from the CDM institutional framework may be considered when designing the institutional framework for the Article 6.4 mechanism.

The Article 6.4 mechanism will be supervised by a body designated by the CMA. In principle, the institutional arrangements for this body could build on the blueprint of the CDM Executive Board which may allow for a swift transition and start-up of the new mechanism. However, the current institutional arrangements have been criticised and several Parties and stakeholders proposed reforms, which never materialised. Moreover, the composition and decision-making arrangements of the CDM Executive Board builds on the division between Annex I and non-Annex I Parties. This may no longer be appropriate, given that the Article 6.4 mechanism is applicable to all Parties. The establishment of the new Article 6.4 mechanism provides an opportunity to take on board the considerations and discussions of the CDM reform process from its onset and to implement an improved governance structure, including in relation to its composition, selection and training of members, professionalisation, improved transparency of processes and decisions, inclusion of stakeholders and appeals procedure.

Host countries authorising their participation in the Article 6.4 mechanism may choose to appoint existing DNA from the CDM for this task. They may have to play a more prominent role than is currently the case under the CDM as the transfer of emission reductions abroad may impact the ability of the host country to meet its NDC target. The national authorities may thus need to check the appropriateness of the transfer as well as its compliance with sustainable development criteria.

Regarding third party validators and verifiers accredited by the CDM Executive Board, transitional arrangements could facilitate their availability at an early point of time in the implementation of the Article 6.4 mechanism.

The various technical panels of the CDM provide the CDM Executive Board with technical expertise and recommendations, supported by the UNFCCC secretariat. A similar set-up with panels providing independent technical advice to the Article 6.4 supervisory body would allow the system to be maintained and improved and would ensure that the supervisory body has the necessary technical competence.

The registry and tracking system for the Article 6.4 mechanism could be designed using the architecture and procedures of the centralised infrastructure of the CDM registry as a blueprint. This registry and tracking system may be built and operated by the UNFCCC secretariat using existing capacities or by a similar body.

The private sector will play a pivotal role in implementing Paris Agreement on the ground. Article 6.4(b) specifically stresses the participation by “public and private” entities. However, strengthening the role of the private sector is challenging given the stronger role that national authorities may have in authorising the participation and coordinating between mitigation actions under Article 6.4 and domestic actions.

Migrating projects into the Article 6.4 mechanism

Policy-makers may pursue several different policy objectives when considering the migration of CDM projects into Article 6.4. These include preserving investor trust and confidence; continuing GHG abatement; enabling new mitigation action; facilitating the implementation of the Article 6.4 mechanism; and facilitating an early availability of units in the post-2020 period, among others. A key issue for the migration of CDM projects is safeguarding environmental integrity – that is, that global GHG emissions do not increase as a result of the migration.

Allowing *all* CDM projects to migrate to Article 6.4 is likely to lead to an increase in global GHG emissions, thereby compromising environmental integrity. This is because the vast majority of the CER supply potential is from projects that are not vulnerable to discontinuing GHG abatement in the absence of revenues from CERs, and some of these emission reductions occur outside the scope of NDC targets or in countries that will over-achieve their NDC targets without pursuing any mitigation action. Allowing for the eligibility of all projects is also unlikely to enhance the trust of investors as supply is likely to exceed demand and prices would likely remain low. It is also likely that projects with low vulnerability would outcompete new projects (as well as vulnerable ones) in serving the demand. Failure to establish a robust price signal post 2020 could further erode the confidence of investors.

Options for restricting the eligibility of projects could mitigate environmental integrity risks and help restore investor trust and confidence. Environmental integrity would be best safeguarded if eligibility is restricted to two categories of projects:

- a) *Projects that are vulnerable to discontinuing GHG abatement* in the absence of revenues from CERs; and
- b) *New projects* that are likely to be additional and are implemented in response to the new demand from the Paris Agreement and CORSIA.

Restricting the migration of projects to these two categories would best safeguard environmental integrity, provide incentives to those projects that need it most, and help prevent a situation of oversupply and low prices in the post-2020 period which could further erode investor trust and confidence. Providing regulatory certainty through early decisions on eligibility criteria would be key for the new incentives to bear fruit, both in terms of GHG abatement and in terms of preservation of investor trust and confidence.

Using CERs in the post-2020 period

Using CERs in the post-2020 period is proposed by some Parties with the intention to achieve similar policy objectives as for the migration of CDM projects. This is particularly controversial, because in practice, allowing all CERs to be used after 2020 could significantly increase aggregated GHG emissions, thereby undermining environmental integrity, and at the same time further erode the trust and confidence by investors. The prevalence of CERs from projects that are not vulnerable to discontinuing abatement and the high risk of double counting with 2020 targets pose significant threats to environmental integrity. Moreover, the large CER supply potential of the existing CDM pipeline creates risks of market oversupply, low prices, and of crowding out new mitigation projects, which could further erode investor trust and confidence.

In order to ensure environmental integrity and avoid the continuation of low prices, policy-makers would have to ensure that any CERs used in the post-2020 period stem from projects that are either vulnerable of discontinuing GHG abatement or have been newly implemented after a decision to allow for the migration of CERs, and that double counting with 2020 targets is avoided. The practical challenges in establishing these restrictions speak in favour of not using CERs towards the achievement of mitigation targets after 2020.

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