# Achieving Overall Mitigation of Global Emissions under the Paris Article 6.4 Mechanism

## Discussion Paper

Umwelt Bundesamt

DEHSt
Deutsche Emissionshandelsstelle

# Editorial information

**Publisher**
German Emissions Trading Authority (DEHSt)
at the German Environment Agency
Bismarckplatz 1
D-14193 Berlin
Phone: +49 (0) 30 89 03-50 50
Fax: +49 (0) 30 89 03-50 10
emissionstrading@dehst.de
Internet: www.dehst.de/EN

Status: April 2019

**Authors**
Wuppertal Institute for Climate, Environment, Energy
Döppersberg 19
42103 Wuppertal, Germany
Hanna Wang-Helmreich, Wolfgang Obergassel and Nicolas Kreibich

**In cooperation with**
INFRAS
Binzstrasse 23
8045 Zürich, Switzerland

Fraunhofer Institute for Systems and Innovation Research ISI
Breslauer Str. 48
76139 Karlsruhe, Germany

On behalf of the German Environment Agency
Completion date March 2019

Environmental Research of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
Project number: 3717 42 504 0

Cover image: Tkemot/Shutterstock.com

## Abstract

Article 6.4 of the Paris Agreement establishes a new mechanism for Parties to cooperate in achieving their nationally determined contributions (NDCs). One key innovation of the Article 6.4 mechanism is its objective to “deliver an overall mitigation in global emissions” (Art. 6.4(d)). This report develops recommendations on how to implement this objective. A key difficulty lies in the fact that even basics of how the mechanism is supposed to function have so far not been clarified by the Parties. The report therefore first sketches out what has so far been agreed and discussed on the mechanism’s activity cycle. Second, as the concept of overall mitigation has so far also not been clearly defined by Parties, the report derives a working definition from the language that was agreed in the Paris Agreement. In the next step, the report provides a survey of the options to achieve overall mitigation that have so far been discussed in the relevant literature and in the Article 6 negotiations. Many of these options were developed in the context of the Kyoto mechanisms. The report therefore discusses to what extent the options are also applicable under the Paris Agreement or whether adjustments need to be made. In the follow-ing, the options that are applicable under the Agreement are assessed on the basis of a number of crite-ria. The report concludes with a summary of the main findings and recommendations.

## Kurzbeschreibung

Artikel 6.4 des Übereinkommens von Paris hat einen neuen Mechanismus errichtet, mit dem Vertragsstaaten bei der Erreichung ihrer national festgelegten Beiträge (nationally determined contributions, NDCs) kooperieren können. Eine der Schüsselinnovationen dieses neuen Mechanismus ist das Ziel, eine „Gesamtminderung globaler Emissionen“ (Art. 6.4(d)) zu liefern. Dieser Bericht entwickelt Empfehlungen, wie dieses Ziel erreicht werden kann. Eine zentrale Schwierigkeit hierbei besteht darin, dass die Vertragsparteien bisher noch keine Entscheidungen darüber getroffen haben, wie der Mechanismus generell funktionieren soll. Daher zeigt der Bericht zunächst den aktuellen Verhandlungsstand zu dem Aktivitätszyklus des Mechanismus auf. Da die Vertragsstaaten bisher auch das Konzept der Gesamtminderung noch nicht klar definiert haben, leitet dieser Bericht daraufhin aus dem Vertragstext des Übereinkommens von Paris eine Arbeitsdefinition für diesen Begriff her. Im nächsten Schritt präsentiert der Bericht einen Überblick über die Optionen, die bisher für die Erreichung einer Gesamtminderung in der relevanten Literatur und den Verhandlungen über Artikel 6 diskutiert werden. Viele dieser Optionen wurden im Kontext der Kyoto-Mechanismen entwickelt. Daher erörtert der Bericht, inwie-fern diese Optionen auch unter dem Übereinkommen von Paris angewendet werden können, bzw. ob Anpassungen vorgenommen werden müssen. Im Folgenden werden die Optionen, die unter dem Über-einkommen von Paris angewendet werden können, entlang bestimmter Kriterien analysiert. Der Bericht schließt mit einer Zusammenfassung zentraler Erkenntnisse und Empfehlungen.

# Content

# List of Tables



# List of Figures



# Abbildungsverzeichnis



# Abbreviations

| | |
|---|---|
| **CMA** | Conference of the Parties serving as Meeting of the Parties to the Paris Agreement |
| **LDCs** | Least developed countries |
| **NDC** | Nationally determined contribution |
| **SBSTA** | Subsidiary Body for Scientific and Technological Advice |
| **SIDS** | Small island developing states |
| **UNFCCC** | United Nations Framework Convention on Climate Change |

# Summary

## 1 Introduction

Article 6 of the Paris Agreement establishes three approaches for Parties to cooperate in achieving their nationally determined contributions (NDCs). One of these approaches is a new mechanism "to contribute to the mitigation of greenhouse gas emissions and support sustainable development" (Art. 6.4(a)). The UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) has been mandated with developing draft rules, modalities and procedures for this mechanism for consideration and adoption by the Conference of the Parties serving as Meeting of the Parties to the Paris Agreement (CMA). One key innovation of the Article 6.4 mechanism is its objective to "deliver an overall mitigation in global emissions" (Art. 6.4(d)). This report aims to develop recommendations on how to achieve this objective.

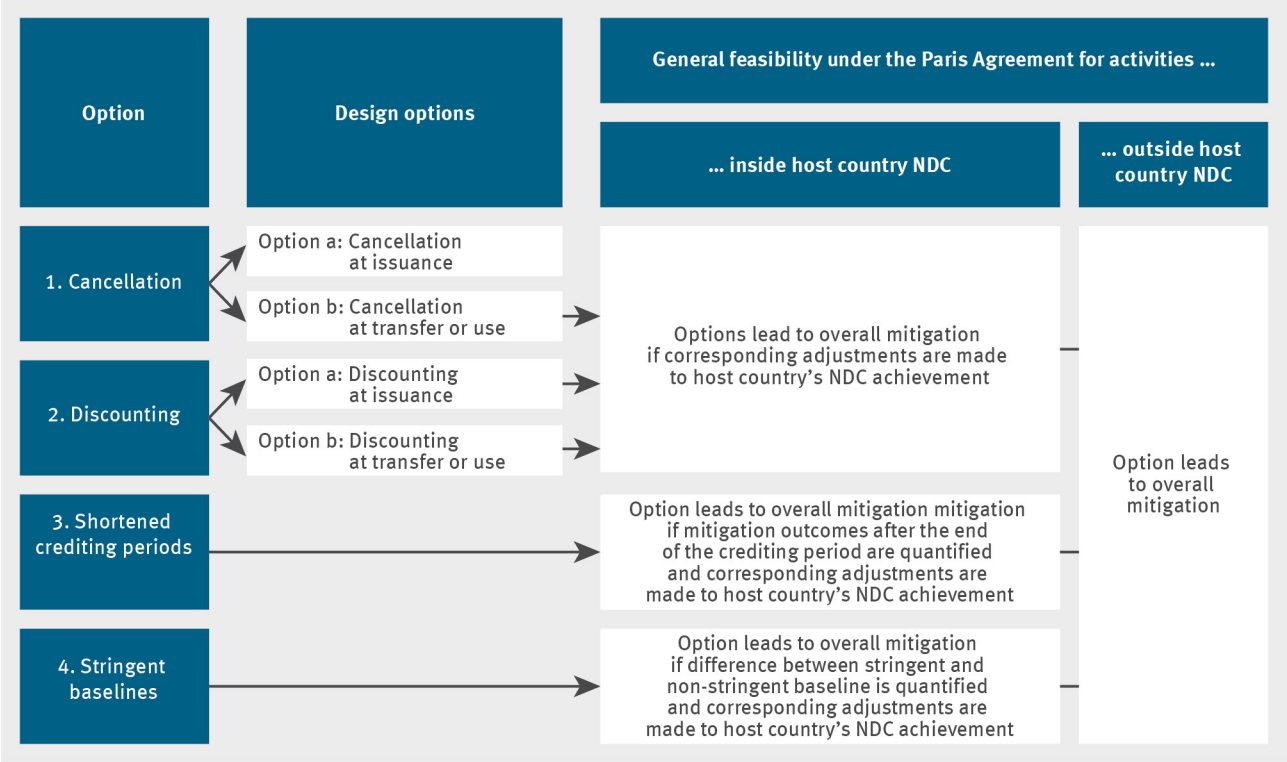
## 2 Definition of Overall Mitigation

The concept of overall mitigation has so far not been clearly defined by Parties. In particular, it must be clearly demarcated from the requirement in Article 6.1 to raise ambition. This report proposes the following demarcation of terms:

- The concept of raising ambition encompasses Parties' targets and actions which Parties take on their own initiative.
- The concept of overall mitigation applies to the net climate benefit of Article 6.4 activities resulting from the mechanism's regulations.

# 3 Options for Obtaining an Overall Mitigation in Global Emissions and their Applicability under the Paris Agreement

Figure 1 provides an overview of options that could make the Article 6.4 mechanism contribute to overall mitigation in global emissions according to this report's definitions of overall mitigation.




Source: Own compilations.

Figure 1: Overview of Design Options and their General Feasibility under the Paris Agreement

It bears noting that according to the body of literature that was reviewed for this report there is no strong difference between discounting and cancellation in case they are implemented at transfer or use. In both cases, overall mitigation is achieved by taking units out of the system. The current SBSTA negotiating text envisages 'cancellation' as applying at the transfer stage and 'discounting' as applying at the use stage. We nonetheless decided to retain the definitions of the terms as used in the literature.

It also bears noting that according to the current negotiating text corresponding adjustments may be made only for international transfers, not directly at issuance. If this approach was chosen, cancellation and discounting at issuance would not lead to overall mitigation; instead, the mitigation benefit would accrue to the host country.

Differentiation: All of these options can either be applied equally to all emission reducing activities or they can be modified to favour specific types of activities or sectors or activities within specific geographical boundaries. While it may be possible to reach political consensus regarding geographical differentiation in international negotiations on Article 6, different treatment of certain types of activities or sectors may prove to be difficult to agree on politically, in particular with regards to discounting and cancelation.

Finally, the implementing entity may significantly affect overall mitigation in global emissions. It has not been decided yet whether the host country or buyer country, or an administrator for the crediting mechanism at UN level would implement the option(s) to achieve overall mitigation.

# 4 Assessment of Options

The assessment of the options for obtaining overall mitigation in global emissions discussed in this report assumes that modalities and procedures for the Article 6.4 mechanism are able to guarantee that only actual emission reductions are credited. The report assesses the options on the basis of the following criteria:

1. **The ease of implementation**
2. **The applicability to different activities and sectors**
3. **The transparency of the option**
4. **The potential for overall mitigation**
5. **The option's impact on the internal rate of return**
6. **The confidence that surplus reductions will be achieved**

The assessment shows that all of the options discussed have clear advantages and disadvantages.

- All in all, **implementation at UN level** seems to yield the most positive outcomes. It would be most likely to guarantee high levels of transparency and lower the risk of double claiming because it is able to centralise relevant accounting tasks. Implementation at UN level would also ensure easier oversight and mainstreaming of standards and procedures, facilitating technical applicability.
- **Differentiation** of the options according to activities, sectors, or geographical regions may boost the mechanisms effectiveness by providing opportunities for mitigating activities that would otherwise not be implemented, e. g. activities in disadvantaged sectors or geographical regions. However, it reduces the costeffectiveness of the mechanism and complicates technical application. Furthermore, it may be very difficult to reach political agreement on specific activities or sectors to be favoured. Giving preferential treatment to specific geographical regions such as to LDCs and SIDS, in contrast, is already established practice under the UNFCCC and may be more feasible. Differentiation according to activities may be politically most feasible if done at the level of the methodologies, as in this case discussions could take place on a factual basis regarding the economic viability of the respective activities.
- **Cancellation and discounting** at issuance, transfer or use without differentiation are the most straightforward options to be implemented and applied.
- **Shortened crediting periods** have many advantages, including high transparency, relatively easy implementation and applicability, and a high potential for overall mitigation as well as backloading of reduced revenue which increases the positive impact on an activity's internal rate of returns when crediting periods are shortened at the end of a mitigating activity's life cycle. However, postponing the benefits to the atmosphere is a serious disadvantage of this option. In addition, installation operators have no incentive to continue monitoring and verification after the end of the crediting period. Monitoring and verification costs would therefore probably have to be covered from other sources, such as the revenue of the Supervisory Body. Shortening crediting periods at the start of a project would eliminate these problems but would seriously reduce the internal rate of return and thereby the economic viability of activities.
- **Stringent baselines** may be most useful where innovative technologies can be incentivised as this advantage could trump the high amount of work that would be needed to implement this option.

Ultimately, what option to choose and how to design it depends on the weight given to the different criteria. If ease of implementation and applicability to all types of activities are a priority, cancellation and discounting without differentiation are clearly the most suitable options. By contrast, if transparency and the option to favour particular types, sectors or geographical regions of mitigation activities are considered to be important, the most favourable options are differentiated crediting periods and stringent baselines.

# Zusammenfassung

## 1 Einleitung

Artikel 6 des Übereinkommens von Paris eröffnet den Vertragsparteien beim Erreichen ihrer national festgelegten Beiträge (nationally determined contributions, NDCs) Möglichkeiten zur Kooperation. Einer der drei Ansätze hierfür ist ein neuer Mechanismus, der „zur Minderung der Emissionen von Treibhausgasen und zur Unterstützung der nachhaltigen Entwicklung“ (Art. 6.4(a)) dienen soll. Das Untergremium für wissenschaftliche und technologische Beratung (Subsidiary Body for Scientific and Technological Advice, SBSTA) der Klimarahmenkonvention wurde damit beauftragt, einen Entwurf für die Regeln, Modalitäten und Verfahren für diesen Mechanismus zu entwickeln, der von der als Tagung der Vertragsparteien des Pariser Übereinkommens dienenden Konferenz der Vertragsparteien der Klimarahmenkonvention (Conference of the Parties serving as Meeting of the Parties to the Paris Agreement, CMA), geprüft und angenommen werden soll. Eine der Schüsselinnovationen dieses neuen Mechanismus ist das Ziel, eine „allgemeine Minderung der weltweiten Emissionen zu erreichen“ (Art. 6.4(d)). Dieser Bericht soll Empfehlungen entwickeln, wie dieses Ziel erreicht werden kann.

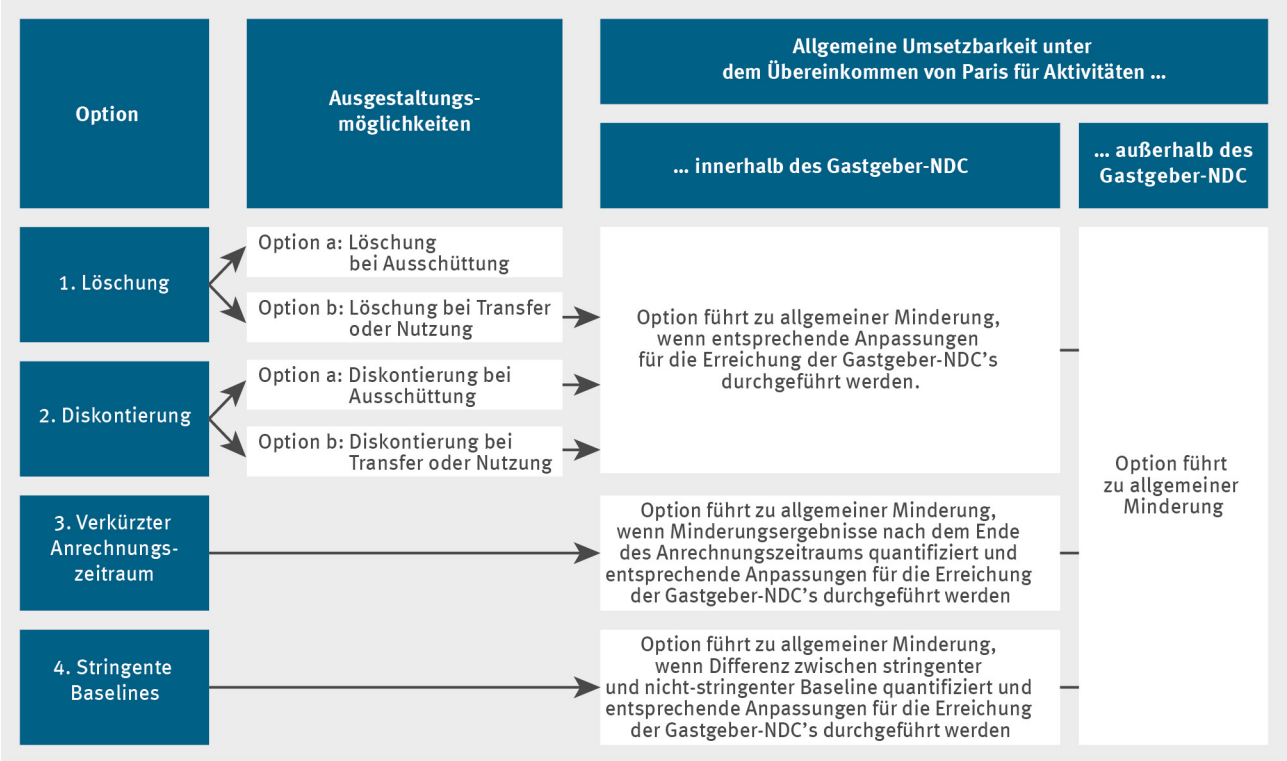
## 2 Definition allgemeine Minderung der weltweiten Emissionen

Bisher haben die Vertragsstaaten das Konzept der „allgemeinen Minderung“ noch nicht eindeutig definiert. Im Besonderen ist eine klare Abgrenzung zur Erfordernis nach Artikel 6.1 notwendig, der zufolge die Nutzung von Artikel 6 zur Steigerung der Ambition der Klimaschutzmaßnahmen beitragen soll. Dieser Bericht schlägt die folgende Abgrenzung der beiden Begriffe vor:

- Das Konzept der Ambitionssteigerung (ambition raising) umfasst die Ziele und Aktionen der Vertragsstaaten, welche diese aus eigener Initiative ergreifen.
- Das Konzept der „allgemeine Minderung“ (overall mitigation) bezieht sich auf den NettoKlimanutzen von Aktivitäten unter Artikel 6.4, die sich aus den Regelungen des Mechanismus ergeben.

# 3 Optionen, eine „allgemeine Minderung“ zu erreichen und ihre Anwendbarkeit unter dem Übereinkommen von Paris

Abbildung 1 beinhaltet alle verfügbaren Optionen, die dazu führen könnten, dass der Mechanismus in Artikel 6.4 einen Beitrag zur „allgemeine Minderung“ entsprechend unserer Definitionen von Ambitionssteigerung und „allgemeiner Minderung“ leistet.




Quelle: Eigene Zusammenstellung.

Abbildung 1: Übersicht über Ausgestaltungsmöglichkeiten und ihrer allgemeinen Umsetzbarkeit unter dem Übereinkommen von Paris

Es ist anzumerken, dass gemäß der Literatur, die für diesen Bericht zu Grunde gelegt wurde, kein wesentlicher Unterschied zwischen Löschung und Diskontierung besteht, wenn sie bei Transfer oder Nutzung der Minderungen eingesetzt werden. In beiden Fällen wird die „allgemeine Minderung“ erreicht, indem Einheiten aus dem System entnommen werden. Die beiden Optionen unterscheiden sich nur, wenn sie bei der Ausschüttung von Einheiten angesetzt werden. Der aktuelle Verhandlungstext des SBSTA verwendet den Begriff Löschung bei Transfers und den Begriff Diskontierung bei der Verwendung von Zertifikaten. Nichtsdestotrotz haben wir beschlossen, die Definitionen dieser Termini entsprechend ihrer Verwendung in der Literatur beizubehalten.

Der aktuelle Verhandlungstext enthält eine Option, der zufolge entsprechende Anpassungen (corresponding adjustments) nur für internationale Transfers und nicht direkt bei der Ausschüttung vorgenommen werden müssen. Falls dieser Ansatz gewählt würde, würden Löschung und Diskontierung bei Ausschüttung nicht zu allgemeiner Minderung beitragen; die Minderung würde dem Gastgeberland zugerechnet werden.

Differenzierung: Alle diese Optionen können entweder gleichermaßen auf alle Minderungsaktivitäten angewendet werden oder sie können angepasst werden, um bestimmte Aktivitäten, Sektoren oder Aktivitäten in bestimmten Regionen zu bevorzugen oder Nachteile bestimmter Aktivitäten auszugleichen. Eine politische Einigung in den internationalen Verhandlungen über Artikel 6 für eine geographische Differenzierung mag erreichbar sein, wohingegen es schwierig werden dürfte, sich auf eine unterschiedliche Behandlung bestimmter Aktivitätstypen und –sektoren zu einigen, insbesondere für Löschung und Diskontierung.

Auch die ausführende Stelle kann die allgemeine Minderung erheblich beeinflussen. Bisher ist noch nicht entschieden ob Gastgeber- oder Käuferland, oder ein Administrator auf UN-Ebene die Option(en) zur Erreichung allgemeiner Minderung umsetzen wird.

# 4 Beurteilung der Optionen

Die Beurteilung der Optionen geht davon aus, dass die Modalitäten und Prozeduren von Artikel 6.4 so funktionieren, dass nur echte Emissionsreduktionen Gutschriften erhalten. Die Beurteilung konzentriert sich auf folgende Kriterien:

1. Die Leichtigkeit der Umsetzung
2. Die Anwendbarkeit auf verschiedene Aktivitäten und Sektoren
3. Die Transparenz der Option
4. Das Gesamtminderungspotenzial
5. Die Wirkung der Option auf die Gewinnrate
6. Die Zuversicht, dass überschüssige Reduktionen erreicht werden

Die Beurteilung ergibt, dass alle diskutierten Optionen klare Vor- und Nachteile haben.

- Insgesamt scheint eine **Umsetzung auf UN-Ebene** die positivsten Ergebnisse zu erzielen. Dies würde mit hoher Wahrscheinlichkeit ein hohes Transparenzniveau garantieren können und das Risiko einer doppelten Beanspruchung der Emissionsreduktionen verringern, da sie in der Lage ist, relevante Buchhaltungsaufgaben zentral zu erfüllen. Eine Umsetzung auf UN-Ebene würde auch Kontrollen sowie das „Mainstreamen" von Standards und Prozeduren einfacher machen, was der technischen Anwendbarkeit begünstigen würde.
- Eine **Differenzierung** der Optionen nach Aktivitäten, Sektoren oder geographischen Regionen kann die Effektivität des Mechanismus erhöhen, da sie die Menge von Minderungsaktivitäten reduziert, die andernfalls nicht umgesetzt werden würde, wie zum Beispiel Aktivitäten in benachteiligten Sektoren oder geographischen Regionen. Andererseits reduziert sie die Wirtschaftlichkeit des Mechanismus und verkompliziert die technische Anwendbarkeit. Darüber hinaus kann es sich sehr schwierig gestalten, politischen Konsens darüber zu finden, welche Aktivitäten oder Sektoren bevorzugt behandelt werden sollen. Eine bevorzugte Behandlung spezifischer geographischer Regionen, wie am wenigsten entwickelte Länder und kleine Inselstaaten, ist hingegen schon etablierte Praxis unter der Klimarahmenkonvention und könnte daher machbar sein. Differenzierung nach Aktivitäten könnte politisch am leichtesten machbar sein, wenn sie auf Methodenebene umgesetzt wird, da in diesem Fall Diskussionen auf Basis von Fakten bezüglich der Wirtschaftlichkeit der Aktivitäten geführt werden könnten.
- **Löschung und Diskontierung** ohne Differenzierung bei Ausschüttung, Transfer oder Nutzung sind die unkompliziertesten Optionen, was Umsetz- und Anwendbarkeit betrifft.
- **Verkürzte Anrechnungszeiträume** haben viele Vorteile (hohe Transparenz, relativ einfache Umsetz- und Anwendbarkeit, hohes Gesamtminderungspotenzial, Rückstellung reduzierter Erträge, der die negative Wirkung auf die interne Ertragsrate verringert, bei Kürzung des Lebenszyklus einer Aktivität an dessen Ende). Der zurückgestellte Klimanutzen ist jedoch ein ernstzunehmender Nachteil dieser Option. Darüber hinaus haben Anlagenbetreiber keinen Anreiz, das Monitoring und Verifizieren von Emissionsreduktionen nach Ende des Anrechnungszeitraums fortzusetzen. Dieses Problem könnte gelöst werden, indem die Kosten für Monitoring und Verifizieren anderweitig gedeckt werden würden, beispielsweise durch Erträge des Aufsichtsorgans. Auch eine Kürzung des Anrechnungszeitraums zu Projektbeginn könnte dieses Problem beheben, hätte jedoch erheblich negative Auswirkungen auf die interne Ertragsrate und damit die ökonomische Durchführbarkeit von Aktivitäten.
- **Stringente Baselines** könnten dort am nützlichsten sein, wo innovative Technologien angereizt werden können. Dieser Vorteil könnte die schwierigere Umsetz- und Anwendbarkeit dieser Option mehr als Wett machen.

Welche dieser Option gewählt und wie diese ausgestaltet wird hängt letztendlich davon ab, welches Gewicht den einzelnen Beurteilungskriterien gegeben wird. Wenn die einfache Umsetz- und Anwendbarkeit auf alle Aktivitätstypen oberste Priorität sind, sind Löschung und Diskontierung ohne Differenzierung klar die geeignetsten Optionen. Steht jedoch Transparenz und die Möglichkeit, Minderungsaktivitäten bestimmter Projekttypen, Sektoren oder geographischer Regionen zu bevorzugt zu behandeln, sind die attraktivsten Optionen differenzierte verkürzte Anrechnungszeiträume und stringente Baselines.

# 1 Introduction

The 2015 Paris Agreement under the United Nations Framework Convention on Climate Change (UN-FCCC) has opened a new page for international climate policy. Breaking with the strict developed-developing country dichotomy of the Kyoto Protocol, the Agreement requires all of its Parties to notify nationally determined contributions (NDC) and to implement measures to achieve them.

As the Kyoto Protocol did, the Agreement provides Parties with options to cooperate in achieving their contributions. Article 6.1 of the Paris Agreement recognizes "that some Parties choose to pursue voluntary cooperation in the implementation of their nationally determined contributions to allow for higher ambition in their mitigation and adaptation actions and to promote sustainable development and environmental integrity." Article 6 subsequently establishes three approaches for countries to cooperate with each other.

One of these three approaches is a new mechanism "to contribute to the mitigation of greenhouse gas emissions and support sustainable development" (Art. 6.4(a)). The Parties are to adopt rules, modalities and procedures which must be observed when implementing activities under Article 6.4. These rules, modalities and procedures are to be adopted at the 24th Conference of the Parties serving as Meeting of the Parties to the Paris Agreement (CMA) in 2018. The UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) has been mandated with developing draft rules, modalities and procedures for consideration and adoption by the CMA.

One key innovation of the new mechanism for which rules still need to be developed is the objective to "deliver an overall mitigation in global emissions" (Art. 6.4(d)). This objective is reminiscent of the long-standing discussion around achieving a "net reduction" in the Kyoto Protocol's flexible mechanisms. Under the Kyoto mechanisms, each tonne of emission abatement achieved may be used by the buyer of the respective emission credits for compliance with their Kyoto commitment. That is, for each tonne of emissions reduced through the flexible mechanisms, the credit buyer can emit one tonne more, the net effect for the atmosphere is zero. There have been detailed discussions and negotiations on reforming the Kyoto mechanisms to enable achievement of a net atmospheric benefit. The Joint Implementation Supervisory Committee actually adopted recommendations for reforming the mechanism accordingly (UNFCCC 2015), but the Conference of the Parties serving as Meeting of the Parties to the Kyoto Protocol decided to conclude its review of the Joint Implementation guidelines without adopting any revisions (UNFCCC 2017).

This report aims to develop recommendations on how to implement the objective of achieving an overall mitigation in global emissions under the Article 6.4 mechanism. A key difficulty lies in the fact that even basics of how the mechanism is supposed to function have so far not been clarified by the Parties. The report will therefore in the first step sketch out what has so far been agreed and discussed on the mechanism's activity cycle as basis for further discussions. Second, as the concept of overall mitigation has so far neither been clearly defined by Parties, the report will derive a working definition from the language that was agreed in the Paris Agreement. In the next step, the report will provide an overview of the options to achieve overall mitigation that have so far been discussed in the relevant literature and in the Article 6 negotiations. Many of these options were developed in the context of the Kyoto mechanisms. The report will therefore discuss to what extent the options are also applicable under the Paris Agreement or whether adjustments need to be made. In the following, the options that are applicable under the Agreement are assessed on the basis of a number of criteria. The report concludes with a summary of the main findings and recommendations.

# 2 Current Status of Agreement on the Article 6.4 Activity Cycle

The Paris Agreement and the decision by the Conference of the Parties adopting the Agreement (Decision 1/CP.21) contain only few elements on how the mechanism is supposed to function:

- The mechanism is established under the authority and guidance of the CMP.
- The mechanism shall be supervised by a body designated by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement.
- Emission reductions resulting from the mechanism shall not be used to demonstrate achievement of the host Party's NDC if used by another Party to demonstrate achievement of its NDC. That is, there is to be no double counting.

- Participation is voluntary and needs to be authorised by each Party involved.
- Emission reductions resulting from mitigation activities need to be verified and certified by designated operational entities.

Key open questions that are relevant for this report include:

- Whether or not transferrable units will be issued for emission reductions resulting from mitigation activities under the mechanism.
- If yes, who would be responsible for their issuance? This could either be the international regulator as in the Kyoto Protocol's Clean Development Mechanism or the host country as in Joint Implementation.
- How the prohibition of double counting is to be implemented. Decision 1/CP.21 envisages that transfers of mitigation outcomes under the Paris Agreement's Article 6.2 are to entail a 'corresponding adjustment' by Parties for both anthropogenic emissions by sources and removals by sinks covered by their nationally determined contributions under the Agreement. It has yet to be decided whether, how and to what extent corresponding adjustments will need to be made for issuance and transfers of Article 6.4 emission reductions.

The climate conference in Katowice resulted in two draft decision texts, the outcome of the SBSTA negotiations (UNFCCC 2018a) and a proposal by the COP President (UNFCCC 2018b). The texts suggest the following regarding the above questions:

- There will be units. The documents refer to them as "Article 6, paragraph 4, emission reduction(s)" (A6.4ER).
- There is to be a mechanism registry to operate issuance and transfer of units.
- Units are to be issued by the UNFCCC Secretariat acting as administrator of the mechanism's registry under the authority of the Supervisory Body.

The question of corresponding adjustments is still open. The current negotiating texts suggest that the guidance relating to corresponding adjustments under Article 6.2 will also apply to transfers of emission reductions from Article 6.4 in some form, but there is as yet no agreement on how exactly. Options in the texts are to apply corresponding adjustments to all emission reductions, or only after the first transfer of reductions from the mechanism registry, or only to emission reductions that are transferred internationally. As will be discussed in the following section, not applying corresponding adjustments to all reductions has some impact on the options to achieve overall mitigation.

In addition, applying corresponding adjustments only after the first transfer from the registry could lead to double counting, as the first transfer may be an international transfer. In this case, the emission reductions from the Article 6 activities would help the host country achieve its NDC – and lead to double counting when the reductions are subsequently used by another Party for its NDC achievement. As this would be inconsistent with the prohibition of double counting in the Paris Agreement, this report will assume that corresponding adjustments will need to be made for all international transfers.

Another question that needs to be clarified regards intermediate buyers: It is still to be decided whether NDCs need to be adjusted for each transaction of units or only for the final use towards NDC achievement. If corresponding adjustments were to apply to each transaction, a follow-up question is whether this should also apply to transactions among non-Party actors, for example among companies covered by emission trading systems. However, the net impact on intermediate buyers' NDCs would be zero. Units would be added to their accounts upon purchase and subtracted upon sale. There is no proposal in the negotiations to implement overall mitigation at the level of first or intermediate buyers.

# 3 Definition of Overall Mitigation

The concept of overall mitigation in global emissions is closely related to the concept of ambition raising, the requirement included in Article 6.1 as cited above, whereby Parties' use of Article 6 is "to allow for higher ambition in their mitigation and adaptation actions". Both concepts describe a situation in which there are more emission reductions than there would be without use of Article 6. Nonetheless, in the view of the authors the concepts must be kept separate: While according to Article 6.1 ambition raising is a requirement for Parties using Article 6, according to Article 6.4(d) overall mitigation is an objective of the mechanism under Article 6.4. Consequently, who the actors are becomes key when deciding whether a particular activity is to be considered ambition raising or a contribution to overall mitigation: In the view of the authors, ambition raising refers to measures taken by Parties, while overall mitigation refers to measures embedded in the rules, modalities and procedures of the Article 6.4 mechanism.

Building on this observation, this report proposes the following demarcation of terms:

- The concept of **raising ambition** encompasses Parties' targets and actions: In line with the aim of Article 4.3, which requires NDCs to progress over time and reflect Parties' highest possible ambition, use of Article 6 is to lead to a 'dynamic' improvement of Parties' midterm mitigation targets (NDCs) and their long-term low greenhouse gas emission development strategies. At the same time, ambition raising may also relate to an immediate climate change mitigation impact, as indicated by the wording of Article 6.1, which refers to Parties' "actions".
- The concept of **overall mitigation** applies to the net climate benefit of Article 6.4 activities resulting from the mechanism's design as such. The contribution to overall mitigation of Article 6.4 activities will therefore be achieved and determined by the decisions on the mechanism's design and irrespective of whether Parties increase their ambition when using the mechanism.

The SBSTA so far arrived at the following draft definition of overall mitigation: "'Overall mitigation in global emissions' is achieved when, through the operation of Article 6, a fixed percentage of emission reductions, duly reported, are not used by any Party or entity to implement or achieve its nationally determined contribution (NDC) or used for any other compliance purposes outside Article 6." (UNFCCC 2018a, Para 1(c)) In the view of the authors, this draft definition is compatible with the above demarcation of terms as it specifies that overall mitigation is to be achieved through the operation of Article 6, with a fixed percentage of reductions to be removed from use.

By contrast, the President's text contains no specific definition and envisages overall mitigation to be achieved through voluntary cancellation of reductions (UNFCCC 2018b, Para 60).

On this basis, the following discusses options how the mechanism under Article 6.4 could be designed to achieve an overall mitigation in global emissions. It does not discuss proposals in which the net environmental benefit is achieved by the Parties using Article 6 acting on their own initiative instead of as a result of the rules of the mechanism, as Parties acting on their own initiative would according to the above definition fall under 'raising ambition'. So, for example, if the rules of the mechanism require Parties to cancel units, this would fall under the definition of overall mitigation, whereas Parties cancelling units voluntarily on their own initiative would fall under the definition of ambition raising.

# 4 Options for Obtaining an Overall Mitigation in Global Emissions and their Applicability under the Paris Agreement

## 4.1 Overview of Options

A fundamental precondition for achieving an overall mitigation is that that the rules, modalities and procedures for the Article 6.4 mechanism are able to guarantee that the mechanism as such functions in the way it is supposed to function. This includes, in particular, that additionality is assessed correctly, baselines are reasonably aligned with the NDC / do not jeopardize compliance with the NDC, leakage is considered appropriately, and non-permanence of emission reduction is taken into account. If these conditions are not met, activities will be issued more credits than they have actually reduced emissions, leading to higher instead of lower global emissions (Lazarus et al. 2013).

The available literature (e. g. CCAP (n.d), Lazarus et al. (2013), Obergassel (2017), Schneider (2008, 2009) Schneider et al. (2018), Strand (2016), UNFCCC (2015, 2018a and b) and Vrjoljik and Philips (2013)) discusses various design options regarding the question how to make mechanisms contribute to overall mitigation in global emissions:

1. **Cancellation** of units so that they cannot be used for NDC achievement;
2. **Discounting** of emission reductions so that the reductions are not counted fully;
3. **Shortened crediting periods** allowing fewer years in which units can be generated;
4. **Stringent/conservative baseline**s set crediting baselines below the emission levels that would be achieved by the host country's NDC (NDC baseline);
5. **Conservative default emission factors** may contribute to conservative baseline setting;
6. **Limited project type eligibility** to project types that are deemed to have greater net mitigation impacts, or to policy or sector-based crediting;
7. **Additionality** of emission reducing activities, i. e. ensuring that they would otherwise not have occurred;
8. **Any other measures** selected by participating Parties voluntarily.

Following our definition of ambition raising and overall mitigation, only obligatory options that are built into the Article 6.4 mechanism would make the mechanism contribute to overall mitigation. Option 5 is to safeguard environmental integrity and could only contribute to overall mitigation in case default emission factors are set more conservatively than would be required to ensure environmental integrity. This option is subsumed in this study under option 4. As for option 6, net mitigation is not a question of types of activities but a question of how mitigation impacts are accounted for, namely whether or not they are used completely for NDC achievement. Additionality (option 7), again, does not contribute to overall mitigation by itself, but rather ensures that only activities that would otherwise not have taken place are accounted for in the mechanism. Thus, the options to be discussed in detail in this study are limited to options 1, 2, 3 and 4.

There are two design options for cancellation and discounting regarding the point of implementation. Thus, units can be cancelled by the host country upon issuance of units (option 1 (a)) or by the acquiring country when units are transferred or used (option 1 (b)). Respectively, discounting can be conducted at issuance (option 2 (a)) or at transfer or use. With discounting at transfer or use, the GHG credit for use by the acquiring country would be lower than for use by the host country (option 2 (b)). For example, the acquiring country could be required to acquire five units to cover four tonnes of emissions.

Furthermore, all of these options can either be applied equally to all emission reducing activities or they can be differentiated, for example by project types or geographically. Equal application to all emission reducing activities implies the same percentage of units to be cancelled, the same discount, equal crediting periods, or the reduction of the same percentage of emissions from NDC baselines, respectively, for all emission reducing activities. In contrast, lower discounts and percentages of units to be cancelled, as well as longer crediting periods and less stringent baselines for particularly desired emission reducing activities could boost desired emission reducing activities, or even restrict activities entirely. This could be done, on the one hand, to favour specific types of activities or sectors, e. g. energy efficiency projects or the transport sector, or, on the other hand, to favour emission reducing activities within specific geographical boundaries, e. g. in least developed countries (LDCs) and small island developing states (SIDS). While it may be possible to reach political consensus regarding geographical differentiation in international negotiations on Article 6, different treatment of certain types of activities may prove to be difficult to agree on politically. In the context of the Kyoto mechanisms, a number of Parties have in the past always insisted on maintaining strict technology neutrality.

## 4.2 Overall Mitigation in the Context of the Paris Agreement

While options 1, 2, 3 and 4 have already been discussed at length in relation to the Kyoto mechanisms, the framework conditions under the Paris Agreement differ significantly from those under the Kyoto Protocol. Most importantly, under the Kyoto Protocol there has been a large 'uncapped environment', i. e. the majority of global emissions has not been covered by mitigation commitments. Under the Paris Agreement, all Parties are required to make contributions. While not all NDCs include economy-wide emission targets, the majority of Article 6 activities can be expected to take place within the boundaries of the host countries' NDCs as most NDCs are quite comprehensive and usually include the most attractive mitigation options, which may also be interesting for Article 6 activities.

Options 1–4 outlined above will all directly achieve an overall mitigation if the mitigation activity takes place outside the NDC boundary. By contrast, any mitigation outcome achieved within the boundary of an NDC will accrue to the host country unless the NDC or the emissions levels are adjusted correspondingly. The respective accounting requirements differ for the different options.

When the first two of the above options – cancellation of units or discounting of reductions – are applied, overall mitigation will be achieved if

- first, units are issued for all emission reductions achieved by an activity and the host Party's NDC or total emissions are adjusted correspondingly, and then
- second, a share of the units is cancelled or discounted.

It bears noting that according to the body of literature that was reviewed for this report there is no strong difference between discounting and cancellation in case they are implemented at transfer or use. In both cases, overall mitigation is achieved by taking units out of the system. The two options differ only if applied at issuance. With cancellation, units are first issued and then cancelled, while with discounting at issuance, the amount of units to be issued is reduced before they are issued. In the case of discounting, the corresponding adjustment would need to apply to the full volume of reductions achieved. Otherwise, the discounted volume would contribute to achieving the host country's NDC.

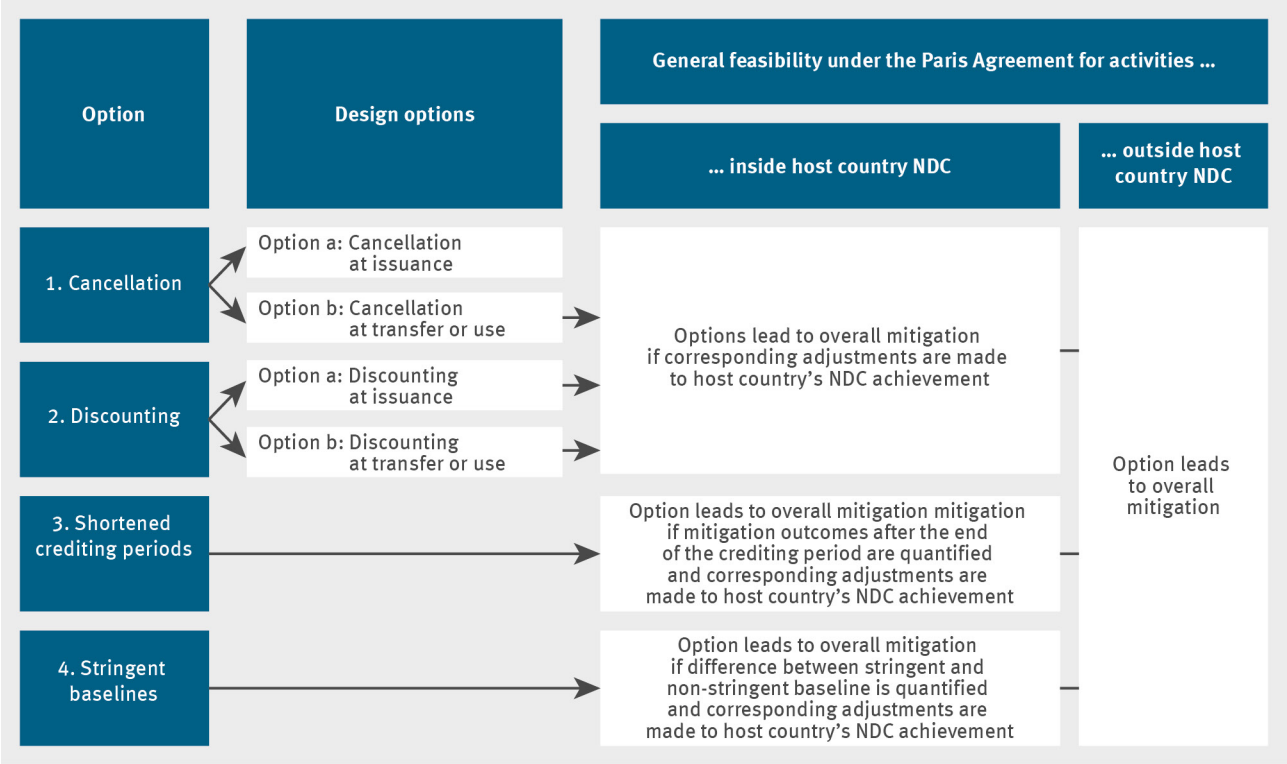
However, as noted above, the current negotiating texts after Katowice (UNFCCC 2018a and b) are not yet settled on when corresponding adjustments are to be applied. If corresponding adjustments are to be applied only after the first transfer or for international transfers, discounting or cancellation at issuance would not lead to overall mitigation; instead the mitigation benefit would accrue to the host country.

It also bears noting that the latest SBSTA text (UNFCCC 2018a) has a different definition of cancellation and discounting; the document differentiates between the two by the point at which overall mitigation is applied. The document envisages 'cancellation' as applying at the issuance or transfer stage and 'discounting' as applying at the use stage. We nonetheless decided to retain the definitions of the terms as used in the literature.

In the third and fourth option – limitations on crediting period length and stringent baselines – units are not issued for all the emission reductions achieved by the activity. Therefore, if the activity is within the host country's NDC, the difference between the amount of units issued and the amount of emissions that has actually been reduced would automatically accrue to the host country unless further accounting provisions are implemented:

- In the case of shortened crediting periods, the emission reductions accruing after the end of the crediting period would need to be quantified and deducted from the host Party's NDC achievement. In theory, this could be achieved on the basis of continuing monitoring and verification of the mitigation activity. However, as no sellable units would be issued, the operator would not have a financial incentive to do so.
- In the case of stringent baselines, two baselines need to be established, not only the stringent baseline but also the non-stringent baseline. This is necessary in order to be able to quantify the mitigation impact of the stringent baseline and adjust the host countries' NDC correspondingly.

The following figure provides an overview of the different options as well as their general feasibility under the Paris Agreement. The subsequent sections will discuss practical implementation questions in more detail.




Source: Own compilations.

Figure 2: Overview of Design Options and their General Feasibility under the Paris Agreement

# 5 Assessment of Options

## 5.1 General Considerations

With the requirement to contribute to overall mitigation in global emissions, more emissions have to be reduced per tradable unit of the Article 6.4 mechanism. This has an impact on the profitability of mitigation activities as well as on global emissions:

- Impact on the profitability of mitigation activities: As more emissions have to be reduced per tradable unit, producing units becomes more expensive. As developers of mitigation activities usually pass these additional costs onto unit buyers, units become more expensive. Schneider (2009) analyses a number of scenarios with different framework conditions and concludes that when introducing the requirement to achieve overall mitigation with the CDM, in many cases the increase in unit prices exceeds the increased costs of producing tradable units. The introduction of overall mitigation would thus actually increase the internal rate of return of mitigation activities. Furthermore, in many scenarios, the volume of the market for units may increase with the implementation of options to achieve overall mitigation due to higher unit prices, in particular when use of the mechanism's units is limited. These findings can be transferred to the Article 6.4 mechanism which Schneider et al. (2018) do in their latest paper. They conclude that the elasticity of demand determines in how far implementing overall mitigation under Article 6 reduces the transaction of credits. Based on analysis of a number of scenarios, they furthermore explain that under a broad range of circumstances, the abatement in transferring countries is higher with larger rates of overall mitigation. While cost increases of credit supply are outweighed by higher credit prices, offset buyers rather than project developers bear the costs of achieving overall mitigation (Schneider et al., 2018).
- Impact on global emissions: With higher unit prices, on the one hand, potential unit buyers have a stronger incentive to reduce emissions at home. On the other hand, additional mitigation is achieved in host countries where more activities have to be implemented to produce the same amount of tradable units. Where emissions are reduced largely depends on the extent to which overall mitigation is to be achieved with the Article 6.4 mechanism, the extent to which Article 6.4 units may be used, abatement opportunities and costs, and national climate policies and actions.

## 5.2 Assessment Criteria

Starting from these considerations and from assessments of discounting, cancellation, shortened crediting periods, and stringent baselines in CCAP (n. d.), Lazarus et al. (2013), Schneider (2008, 2009), Schneider et al. (2018), Strand (2016) and Vrjoljik and Philips (2013), the following expands the literature's assessment to the options for obtaining overall mitigation in global emissions regarding the following criteria:

1. **The ease of implementation** of the option in general, explaining how easy or difficult it is to implement the option.
2. **The applicability to different activities and sectors**, explaining how easy or difficult it is to apply the option to various mitigation activities and sectors.
3. **The transparency of the option**, explaining how easy or difficult it is to verify that the option has been applied correctly and yields the emission reductions it claims.
4. **The potential for overall mitigation**, i. e. the extent of the net atmospheric benefit that could be achieved with this option.
5. **The option's impact on the internal rate of return**, estimating the option's impact on the profitability of mitigation activities.
6. **The confidence that surplus reductions will be achieved:** Whether or not surplus reductions envisaged by the developer of an emission reducing activity beforehand will be achieved cannot be assured to the same extent for every option. How likely it is that surplus reductions will be achieved depends on the potential for overall mitigation, but also on the envisaged emission reducing activity itself, i. e. whether the developer of an emission reducing activity is actually able to implement the activity as planned, including related emission reductions that result in a surplus.

## 5.3 Overarching Aspects

Furthermore, additional considerations seriously affect the overall performance of all options discussed. Thus, whether or not the options are applied equally to all types of activities, sectors, and geographical regions has a huge impact on both how easy it is to implement the options and how easy it is to apply them to different activities and sectors. In general, implementation of all options is easier when they are applied equally to all types of activities, sectors, and geographical regions and becomes more complicated with differentiation. Favouring some emission reducing activities over others may, however, distort the market for Article 6.4 units, reducing the cost-effectiveness of the Article 6.4 mechanism.

Regarding all of the options discussed, the **implementing entity** may significantly affect overall mitigation in global emissions. It is to be decided yet whether the host country or the acquiring country, or an administrator of the crediting mechanism at UN level would implement the option(s). While appointing a crediting mechanism administrator at UN level as implementing entity for shortened crediting periods and stringent baselines seems most sensible as these options apply at the level of the methodologies, cancellation and discounting could also be done at host country or acquiring country level, respectively.

Generally, administration at UN level is associated with higher levels of transparency and a lower risk of double claiming because the implementing entity is in this case able to centralise relevant accounting tasks. Furthermore, oversight is ensured and mainstreaming of standards and procedures is easier, facilitating technical applicability and easier implementation of the options.

Implementation of the options by host country or acquiring country, in contrast, entails the risk of lower transparency as well as double claiming, as governments may be tempted to claim net mitigation benefits for NDC compliance or as their contribution to ambition raising. Moreover, implementation at host country or acquiring country level would be technically and administratively more challenging for each individual country, as standards and procedures have to be put in place for every participating country.

## 5.4 Assessment

The following provides an assessment of the options for overall mitigation according to the six criteria listed at the beginning of this chapter. One result is that cancellation and discounting have essentially the same implications.

### Option 1 (a): Cancellation at issuance

- The main difficulty with this option lies in achieving policy agreement on the percentage of units to be cancelled. Technically, this option is fairly **easy to apply** if a uniform cancellation rate is agreed on. However, if types of activities or sectors are to be treated differently, effort would need to be invested to determine appropriate cancellation rates for each one. It may also prove to be very hard to reach political agreement on such differentiation. Differentiation according to geographical regions, for example, exempting activities in LDCs and SIDS, would not be as methodologically challenging and is established political practice under the UNFCCC.
- With a uniform cancellation rate, this option can easily be applied **to all types of activities**. With differentiation, it is most effective for the types of activities with high confidence in additionality and NDC baseline, and low marginal abatement costs, as in this case, the appropriate cancellation rate can be quantified easily.
- The **transparency** of this option depends on the implementing entity. While administration at UN level would lead to high transparency, host or buyer country as implementing entity would leave transparency to be considered only low to medium.
- The **potential contribution to overall mitigation** depends on the percentage of units to be cancelled and is equivalent to the amount of units cancelled in the end.
- With the positive impact of overall mitigation on unit prices outweighing the higher unit costs, this option has a **positive impact on the internal rate of return** of mitigating activities.
- The **confidence that surplus reductions will be achieved** is medium to high as certified reductions are cancelled.

## Option 1 (b): Cancellation at transfer or use

This option's assessment equals the one regarding option 1 (a), except for the confidence that surplus reductions will be achieved. Until units are cancelled at transfer or use, they may be used for NDC compliance in the host country. Each unit cancelled and not used leads to overall mitigation.

## Option 2 (a): Discounting at issuance

- Again, the main difficulty lies with achieving policy agreement on the discount rate. Technically, this option is **easy to apply** if there is a uniform discount rate and more difficult if there is to be differentiation.
- With a uniform cancellation rate, this option can easily be applied to all **types of activities**. With differentiation, it is most effective for the **types of activities** with high confidence in additionality and NDC baseline, and low marginal abatement costs, as in this case, the appropriate discount can be quantified easily.
- Depending on the implementing entity, this option scores low to medium regarding **transparency** when host or buyer countries are administering the discount, but high with administration at UN level.
- The **potential for overall mitigation** depends on the discount rate and equals the discount.
- This option has a **positive impact on the internal rate of return** of mitigating activities because the positive impact of overall mitigation on unit prices outweighs the higher unit costs.
- The **confidence that surplus reductions will be achieved** with this option is medium to high because some verifiable mitigation outcomes are not credited (with discounting at issuance) or certified reductions are cancelled (with discounting at transfer or use).

## Option 2 (b): Discounting at transfer or use

Again, this option's assessment equals the one regarding option 2 (a), expect for the confidence that surplus reductions will be achieved. Each unit cancelled and not used leads to overall mitigation.

## Option 3: Shortened crediting periods

- Again, the **ease of implementation** would depend on whether crediting periods are set uniformly or differentiated by activity types or geographies. In relation to the CDM, there have already been discussions on differentiating crediting periods as uniform periods can lead to inefficient overallocation of resources to projects with short payback periods. Differentiation according to project types may therefore be politically easier than in the case of cancellation and discounting. If the desire to limit inefficient allocation of resources leads to crediting periods being differentiated anyway, integrating a factor for achieving overall mitigation would probably create little additional methodological effort. However, as noted above, installation operators would have no incentive to continue monitoring after the end of the crediting period. In theory, the operators could simply be required to continue monitoring. However, this would require proper enforcement, which would probably need to be done by the host countries and thus depend on their respective enforcement capacity and willingness. Alternatively, the costs of monitoring and verification could be covered from other sources, such as the revenue of the Article 6 supervisory body.
- This option is feasible for **all types of activities** that are likely to continue operation after the end of the crediting period, or where shorter periods are sufficient to trigger implementation. This may be the case in projects that are one-off interventions which remain in place in any case, such as building retrofits, or which have sufficient non-credit revenue streams. By contrast, this option would not be applicable to activities that depend on constant carbon market revenue for their operation. However, given the need for ambition raising, indefinite cash flows to projects should conceivably not be envisaged anyhow (Warnecke at al. 2018).
- As an administrator at UN level is likely to be the implementing entity of this option, **transparency** is considered to be relatively high. Buyer or host country as an implementing entity, in contrast, would lower transparency significantly.

- Crediting periods are usually shortened at the end of a mitigation activity's life cycle. In this case, in contrast to all other options discussed in this study, the benefits to the atmosphere of this option are postponed and only occur after the end of the crediting period. Then, the **potential for overall mitigation** is considered to be high for types of activities that do not depend on carbon market revenue for their continued operation. Shortening crediting periods at the beginning of a mitigation activity's life cycle would prevent postponing benefits to the atmosphere.
- However, shortening crediting periods at the beginning of a mitigating activity's life cycle would have serious negative impacts on the internal rate of return of an activity. Backloading of reduced revenue with shortened crediting periods at the end of a mitigating activity's life cycle, again, lowers the negative impact of higher unit costs on the **internal rate of returns**, which is outweighed by increased unit prices.
- Nevertheless, the **confidence that surplus emission reductions will be achieved** is considered to be only medium to low as surplus reductions depend on the continuation of emission reducing activities and them being additional beyond the crediting period.

### Option 4: Stringent baselines

- Developing stringent baselines is time-consuming and requires complicated technical and methodological work as well as frequent updates of the baselines. For their application, changes have to be made in each methodology, or a fixed discount factor has to be applied for all methodologies. This further complicates the political decisionmaking process regarding this option. Compared to the other options assessed in this study, stringent baselines are **much more difficult to apply**, especially, when they are differentiated for individual activities, sectors, or geographical regions.
- Stringent baselines are most effective for the **types of activities** with high confidence in additionality and NDC baseline, and low marginal abatement costs. Under these conditions, baselines can be set relatively straightforward.
- This option's **transparency** is considered to be medium to high: On the one hand, likely administration at UN level boosts transparency, on the other hand, the calculations needed to prove emission reductions may complicate transparency. Instead of a simple subtraction of emission reductions as in the other options, the amount of overall mitigation would have to be calculated individually for each activity. Acquiring or host country as an implementing entity would lower transparency furthermore.
- A clear advantage of this option is the fact that it may provide stronger incentives to use innovative technologies in some sectors compared to the other options discussed. Stringent baselines would tend to eliminate crediting for small improvement in emissions performance (i. e. activities that fall between NDC baseline and the stringent baseline), whereas the other options would credit all activities that exceed NDC baseline emission performance. Moreover, pre-issuance discounting and cancellation would apply to all emission reductions achieved by an activity, whereas with stringent baselines each further emission reduction would be fully rewarded by one additional credit. This provides an incentive to push reductions as far as possible. This option therefore has a high **potential for overall mitigation**.
- The positive impact of overall mitigation on unit prices can be expected to outweigh the higher unit costs caused by this option in most cases, leading to an increased internal rate of return.
- The confidence that surplus reductions will be achieved when employing this option is medium to high, as some verifiable mitigation outcomes are not credited.

The following table provides an overview of the assessment of the options for obtaining overall mitigation in global emissions.

Table 1: Assessment of options for obtaining overall mitigation in global emissions

| Assessment field | Cancellation at issuance | Cancellation at transfer or use | Discounting at issuance | Discounting at transfer or use | Shortened crediting periods | Stringent baselines |
|---|---|---|---|---|---|---|
| **1. Implementation** | Easy to apply without differentiation, more difficult with differentiation | Easy to apply without differentiation, more difficult with differentiation | Easy to apply without differentiation, more difficult with differentiation | Easy to apply without differentiation, more difficult with differentiation | Easy to apply without differentiation, difficult with differentiation<br>Installation operators have no incentive to continue monitoring after end of crediting period | Application methodologically challenging even without differentiation |
| **2. Applicability to different activities and sectors** | Applicable to all activities, more difficult with differentiation | Applicable to all activities, more difficult with differentiation | Applicable to all activities, more difficult with differentiation | Applicable to all activities, more difficult with differentiation | Feasible for types of activities that are likely to continue operation after the crediting period | Most feasible for activities for which baselines can be set relatively straightforward |
| **3. Transparency** | Depends on implementing entity | Depends on implementing entity | Depends on implementing entity | Depends on implementing entity | High as administration most likely at UN level | Medium to high: administration most likely at UN level, but complicated calculations |
| **4. Potential for overall mitigation** | Depends on percentage of units to be cancelled | Depends on percentage of units to be cancelled | Depends on discount rate | Depends on discount rate | Postponed benefits to the atmosphere when applied to end of life cycle, but then high potential | Stronger incentives to maximise reductions |
| **5. Impact on internal rate of return** | Positive impact of overall mitigation on unit price outweighs higher unit costs | Positive impact of overall mitigation on unit price outweighs higher unit costs | Positive impact of overall mitigation on unit price outweighs higher unit costs | Positive impact of overall mitigation on unit price outweighs higher unit costs | Positive impact of overall mitigation on unit price outweighs higher unit costs. Backloading of reduced revenue further lowers impact of higher unit costs.<br>Frontloading of reduced revenue strongly impairs IRR. | Positive impact of overall mitigation on unit price outweighs higher unit costs |
| **6. Confidence that surplus reductions will be achieved** | Medium to high as certified reductions are removed without counting for compliance | Medium to high as certified reductions are removed without counting for compliance | Medium to high as verifiable reductions are not credited | Medium to high as certified reductions are removed without counting for compliance | Medium to low as surplus reductions depend on continuation and additionality beyond crediting period | Medium to high as verifiable reductions are not credited |

Source: Own compilation expanded on synthesis of CCAP (n. d.), Lazarus et al. (2013), Schneider (2008, 2009), Schneider et al. (2018), Strand (2016) and Vrjoljik and Philips (2013).

# 6 Summary and Conclusions

## 6.1 Definitions and Options to Achieve Overall Mitigation in Global Emissions

In order to develop recommendations on how to implement the objective of achieving an overall mitigation in global emissions under the Paris Agreement's Article 6.4 mechanism, this report proposed the following demarcation of terms:

- The concept of **raising ambition** encompasses Parties' targets and actions.
- The concept of **overall mitigation** applies to the net climate benefit of Article 6.4 activities resulting from the mechanism's design as such.

Of the options discussed in available literature, cancellation, discounting, shortened crediting periods, and stringent baselines can contribute to overall mitigation according to this definition. Cancellation and discounting can either take place upon issuance, or at transfer or use. All of these options will directly achieve an overall mitigation if the mitigation activity takes place outside the NDC boundary. By contrast, any mitigation outcome achieved within the boundary of an NDC will accrue to the host country unless the host country's NDC or emissions level are adjusted correspondingly.

It bears noting that according to the current negotiating text corresponding adjustments may be made only for international transfers, not directly at issuance. If this approach was retained, cancellation and discounting at issuance would not lead to overall mitigation; instead, the mitigation benefit would accrue to the host country.

## 6.2 Assessment of Options along Defined Assessment Criteria

The assessment of the options for obtaining overall mitigation in global emissions focused on the following criteria:

1. **The ease of implementation**
2. **The applicability to different activities and sectors**
3. **The transparency of the option**
4. **The potential for overall mitigation**
5. **The option's impact on the internal rate of return**
6. **The confidence that surplus reductions will be achieved**

Furthermore, whether or not the options are **applied equally to all types of activities, sectors, and geographical regions (differentiation)** has a huge impact on both how easy it is to implement the options and how easy it is to apply them to different activities and sectors. Finally, the **implementing entity** may significantly affect overall mitigation in global emissions.

The detailed assessment of the different options brings to light great differences between the options as well as similarities. Thus, the introduction of stringent baselines is by far the most challenging of the options while all of the other options are relatively **easy to apply**, in particular without differentiation. Differentiation reduces the ease of implementation of all options.

Cancellation, discounting and stringent baselines may be **applied to all types of activities**. With differentiation, application becomes more difficult and will in all cases be most feasible for types of activities with high confidence in additionality and NDC baselines, and low marginal abatement costs. Shortened crediting periods are most feasible for activities that are likely to continue operation after the end of the crediting period, or where shorter periods are sufficient to trigger implementation. A further problem is that installation operators would have no incentive to continue monitoring after the end of the crediting period.

**Transparency** highly depends on the implementing entity. In case of host country or buyer country implementation, transparency is considered to be only low to medium. Shortened crediting periods are considered an option with high transparency due to their likely administration at UN level. Stringent baselines score medium to high regarding this criterion because, on the one hand, necessary calculations complicate transparency, but on the other hand, this option is likely to be administered at UN level.

The **potential for overall mitigation** depends on the percentage of units to be cancelled for options 1 (a) and (b) and on the discount rate for options 2 (a) and (b), respectively. In the usual application of option 3, shortening crediting periods at the end of a mitigating activity's life cycle, the benefits to the atmosphere are postponed to after the end of the crediting period, but then the potential contribution to overall mitigation is considered to be high. An advantage of stringent baselines consists in them having the potential to incentivise the use of innovative technologies in some sectors considerably. In the end, all options' contribution to overall mitigation depends on the ambitiousness of negotiating Parties: The higher the percentages for units cancelled or the discount rates, the shorter the crediting periods and the more stringent baselines are set, the higher the mechanism's potential contribution to overall mitigation will be.

However, making the Article 6.4 mechanism contribute to overall mitigation would also increase the costs per unit. For all options, however, increased unit costs can be expected to be outweighed by higher unit prices in most cases, leading to an overall positive **impact on the internal rate of return** of mitigating activities. Compared to the other options, shortened crediting periods would further increase this impact as the reduced revenues are backloaded until after the end of the crediting period, which would be a clear advantage for investors.

Finally, the **confidence that surplus reductions will be achieved** is medium to high for cancellation, discounting and stringent baselines, as either verifiable mitigation outcomes are not credited or certified reductions are cancelled instead of being used for NDC achievement. By contrast, the confidence that surplus reductions will be achieved is only medium to low for shortened crediting periods because in this option surplus reductions depend on the continuation and additionality of the activity beyond the crediting period, which poses significant challenges.

## 6.3 Key Insights and Recommendations

All of the options discussed have clear advantages and disadvantages.

- All in all, **implementation at UN level** seems to yield the most positive outcomes. It would be most likely to guarantee high levels of transparency and lower the risk of double claiming because it is able to centralise relevant accounting tasks. Implementation at UN level would also ensure easier oversight and mainstreaming of standards and procedures, facilitating technical applicability.
- **Differentiation** of the options according to activities, sectors, or geographical regions may boost the mechanisms effectiveness by providing opportunities for mitigating activities that would otherwise not be implemented, e. g. activities in disadvantaged sectors or geographical regions. However, it reduces the cost-effectiveness of the mechanism and complicates technical application. Furthermore, it may be very difficult to reach political agreement on specific activities or sectors to be favoured. Giving preferential treatment to specific geographical regions such as to LDCs and SIDS, in contrast, is already established practice under the UNFCCC and may be more feasible. Differentiation according to activities may be politically most feasible if done at the level of the methodologies, as in this case discussions could take place on a factual basis regarding the economic viability of the respective activities.
- **Cancellation and discounting** at issuance, transfer or use without differentiation are the most straightforward options to be implemented and applied.
- **Shortened crediting periods** have many advantages, including high transparency, relatively easy implementation and applicability, and a high potential for overall mitigation as well as backloading of reduced revenue which increases the positive impact on an activity's internal rate of returns when crediting periods are shortened at the end of a mitigating activity's life cycle. However, postponing the benefits to the atmosphere is a serious disadvantage of this option. In addition, installation operators have no incentive to continue monitoring and verification after the end of the crediting period. Monitoring and verification costs would therefore probably have to be covered from other sources, such as the revenue of the Supervisory Body. Shortening crediting periods at the start of a project would eliminate these problems but would seriously reduce the internal rate of return and thereby the economic viability of activities.
- **Stringent baselines** may be most useful where innovative technologies can be incentivised as this advantage could trump the high amount of work that would be needed to implement this option.

Ultimately, what option to choose depends on the weight given to the different criteria. If ease of implementation and applicability to all types of activities are a priority, cancellation and discounting without differentiation are clearly the most suitable options (see also Schneider et al. 2018). By contrast, if transparency and the option to favour particular types, sectors or geographical regions of mitigation activities are considered to be important, the most favourable options are differentiated crediting periods and stringent baselines.

## Acknowledgements

The authors of this report would like to thank the participants of the expert workshop "Development of Options and Design Options for the New International Market Mechanism under Art. 6 of the Paris Agreement", which was conducted on behalf of the Federal German Environment Agency (Umweltbundesamt) on 30 October 2018 in Berlin, for valuable discussions and inputs:

Stefanie Böther, Dietrich Brockhagen, Gilles Dufrasne, Jürg Füssler, Antoine Diemert, Thomas Forth, Markus Gornik, Kristian Holmberg, Aki Kachi, Karsten Karschunke, Stephanie La Hoz Theuer, Denis Machnik, Konrad Raeschke-Kessler, Esther Rohena, Lambert Schneider, and Carsten Warnecke.

# 7 References

**CCAP (Center for Clean Air Policy, n. d.):** CCAP Submission on Internationally Transferred Mitigation Outcomes.

**Lazarus, Michael, Peter Erickson and Lambert Schneider,2013:** Potential for International Offsets to Provide a Net Decrease of GHG Emissions. Working Paper 2013-06. Stockholm: SEI (Stockholm Environment Institute).

**Obergassel, Wolfgang, 2017:** Shaping the Paris Mechanisms Part II. An Update on Submissions on Article 6 of the Paris Agreement. JIKO Policy Paper 01/2017. Wuppertal: Wuppertal Institute for Climate, Environment and Energy.

**Schneider, Lambert, Carsten Warnecke, Thomas Day and Aki Kachi, 2018:** Operationalising an "overall mitigation in global emissions" under Article 6 of the Paris Agreement. Berlin/Cologne: NewClimate Institute.

**Schneider, Lambert, 2009:** A Clean Development Mechanism with global atmospheric benefits for a post-2012 climate regime. International Environmental Agreements: Politics, Law and Economics, Vol 9 (2), pp. 95-111, doi: 10.1007/s10784-009-9095-9.

**Schneider, Lambert, 2008:** A Clean Development Mechanism (CDM) with atmospheric benefits for a post-2012 climate regime. Discussion paper. Dessau-Rößlau: German Federal Environment Agency.

**Strand, Jon, 2016:** Assessment of Net Mitigation in the Context of International Greenhouse Gas Emissions Control Mechanisms. Policy Research Working Paper 7594. World Bank Group, Development Research Group, Environment and Energy Team.

**UNFCCC (United Nations Framework Convention on Climate Change), 2018a:** Draft Text on SBSTA 49 agenda item 11(b), Matters relating to Article 6 of the Paris Agreement: Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement, Version 2 of 8 December 10:00 hrs. Available online at unfccc.int/sites/default/files/resource/SBSTA49_11b_DT_v2.pdf.

**UNFCCC (United Nations Framework Convention on Climate Change), 2018b:** The Katowice Texts. Proposal by the President.
Available online at unfccc.int/sites/default/files/resource/Katowice%20text%2C%2014%20Dec2018_1015AM.pdf.

**(2017):** Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its twelfth session, held in Marrakech from 7 to 18 November 2016. Addendum. Part two: Action taken by the Conference of the Parties serving as the meeting to the Parties to the Kyoto Protocol at its twelfth session. Decisions adopted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol. FCCC/KP/CMP/2016/8/Add.1. 31 January 2017.

**(2015):** Draft Recommendation. Proposed further recommendations on the review of the joint implementation guidelines. Version 01.0. JI-JISC36-AA-A03.

**Vrolijk, Christiaan and Gareth Philips, 2013:** Net Mitigation through the CDM. A report for the Swedish Energy Agency.

**Warnecke, Carsten, Niklas Höhne, Ritika Tewari, Thomas Day and Aki Kachi, 2018:** Opportunities and safeguards for ambition raising through Article 6. The perspective of countries transferring mitigation outcomes. Köln/Berlin: NewClimate Institute.

German Emissions Trading Authority (DEHSt) at the German Environment Agency
Bismarckplatz 1
D-14193 Berlin

www.dehst.de/EN | emissionstrading@dehst.de