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Abstract

The Paris Agreement includes Article 6 with several provisions, which allow for the use of the international carbon market. In this paper, Cooperative Approaches (CA, Art. 6.2-3) and the Mechanism for Sustainable Development and Mitigation (MSDM, Art. 6.4-7) will be considered as the market mechanisms, which constitute the basis of the international carbon market under the United Nations Framework Convention on Climate Change (UNFCCC). The purpose of this paper is to identify the main goals and aims of the international carbon market, take into account the general context and environment for carbon markets under the Paris Agreement, identify and discuss the main issues of the relevant paragraphs and analyse issues of the interaction and relationship of the provisions including synergies and conflicts. The paper aims at facilitating the discussion among UNFCCC parties while, given the dynamic nature of the topic, it can obviously only be a snapshot of the current status of the discussions.

Our analysis suggests that the purpose of international carbon markets has changed. While increasing economic efficiency was more prominent during the first development phase of international carbon markets, raising mitigation ambition may become more important in the phase to come. In terms of the design of the two market mechanisms pursuant to Art. 6.2 and 6.4, negotiations have just started. Many fundamental or more technical questions still have to be negotiated and it is not yet clear which positions individual parties will take. Some of these questions are overarching and are similar for both mechanisms, e.g. the relationship to Nationally Determined Contribution (NDCs) or procedures to ensure robust accounting. Others, such as the nature of the Internationally Transferred Mitigation Outcomes (ITMOs) or governance issues are quite different and very specific for each of the mechanisms.

Kurzbeschreibung

Das Pariser Abkommen enthält Artikel 6 mit mehreren Bestimmungen, die die Nutzung des internationalen Kohlenstoffmarktes ermöglichen. In diesem Papier werden Kooperationsansätze (Art. 6.2-3) und der Mechanismus für Nachhaltige Entwicklung und Minderung (Art. 6.4-7) als Marktmechanismen betrachtet, die die Basis für den internationalen Kohlenstoffmarkt unter der Klimarahmenkonvention (UNFCCC) bilden. Ziel dieses Papiers ist es, die wichtigsten Zwecke und Ziele des internationalen Kohlenstoffmarktes zu identifizieren, den allgemeinen Rahmen und das Umfeld für die Kohlenstoffmärkte im Rahmen des Pariser Übereinkommens zu berücksichtigen, die wichtigsten Themen der einschlägigen Paragraphen sowie Interaktion und Beziehung der Regelungen einschließlich ihrer Synergien und Konflikte zu erörtern und zu diskutieren. Das Papier zielt auf die Erleichterung der Diskussion zwischen UNFCCC-Mitgliedsstaaten, während angesichts der Dynamik des Themas, es natürlich nur eine Momentaufnahme des Status der aktuellen Diskussionen kann.

Unsere Analyse deutet darauf hin, dass sich der Zweck der internationalen Kohlenstoffmärkte geändert hat. Während die Steigerung der wirtschaftlichen Effizienz in der ersten Entwicklungsphase der internationalen Kohlenstoffmärkte im Vordergrund stand, könnte in der kommenden Phase die Förderung der Ambitionssteigerung von Emissionsminderung an Bedeutung gewinnen. Bei der Ausgestaltung der beiden Marktmechanismen gemäß Art. 6.2 und 6.4 haben die Verhandlungen erst begonnen. Viele grundlegende oder mehr technische Fragen müssen noch verhandelt werden und es ist noch nicht klar, welche Positionen einzelne Staaten ergreifen werden. Einige dieser Fragen sind übergreifend und für beide Mechanismen ähnlich, z.B. Beziehung zu national festgelegten Minderungsbeiträgen (NDCs) oder Prozeduren, um eine robuste Anrechnung zu gewährleisten. Andere, wie die Natur von International Transferierten Minderungsergebnissen (ITMOs) oder Fragen zur Governance sind für jeden der Mechanismen unterschiedlich und sehr spezifisch.

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Abbreviations

BAU	Business-As-Usual
CA	Cooperative Approaches
CDM	Clean Development Mechanism
CER	Certified Emissions Reductions
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO₂	Carbon Dioxide
CO₂eq	CO ₂ equivalents
CPR	Commitment Period Reserve
CU	Certified Units
DCS	Data Collection System
EB	Executive Board
GMBM	Global Market-Based Measure/Mechanism
ICAO	International Civil Aviation Organisation
IMO	International Maritime Organisation
INDC	Independently Nationally Determined Contribution
ITMO	Internationally Transferred Mitigation Outcome
JCM	Joint Crediting Mechanism
JI	Joint Implementation
MSDM	Mitigation and Sustainable development Mechanism
NDC	Nationally Determine Contribution
NGO	Non-Governmental Organisation
NMA	Non-Market Approaches
SoP	Share of Proceeds
UNFCCC	United Framework Convention on Climate Change

1 Introduction

The Paris Agreement includes an Article with several provisions, which allow for the use of the international carbon market, even though the term ‘market’ is not at all mentioned in these provisions. Article 6 of the Paris Agreement, plus the respective paragraphs in Decision 1/CP.21 (36-40), provide

- ▶ for **Cooperative Approaches** (CA) among United Nations Framework Convention on Climate Change (UNFCCC) Parties to be used towards achieving their Nationally Determined Contribution (NDC) through the transfer of mitigation outcomes (Art. 6.2-3),
- ▶ for a **Mitigation and Sustainable Development Mechanism** (MSDM) with some similarities but not identical to Clean Development Mechanism (CDM) and Joint Implementation (JI, Art. 6.4-7) and
- ▶ for a framework for **Non-Market Approaches** (NMA, Art. 6.8-9), which will not be the subject of this discussion paper.

In this paper CA and MSDM will be considered as the market mechanisms which constitute the basis of the international carbon market under the UNFCCC.

While it was expected that some provision on the transfer and use of international carbon market units are to be included in the Paris Agreement, both the level of detail and the relative clear reference to environmental integrity, avoidance of double counting and the promotion of sustainable development were somewhat unexpected. However, less than two pages of text cannot sufficiently regulate such a complex issue like the international carbon market. For example, the modalities and procedures of the CDM, the so-called Marrakesh Accords, include 30 pages and they are further specified by thousands of pages of regulation text issued by the CDM Executive Board (EB).

Quite obviously, the Paris Agreement is not the end of the negotiation to establish an international carbon market for the post-2020 period but rather it is the beginning. The Paris Agreement provides a new mandate and general directions for these negotiations but also postponed many issues, which were controversially discussed in the previous years.

The purpose of this paper is to identify the main goals and aims of the international carbon market, to take into account the general context and environment for carbon markets under the Paris Agreement (Section 2), to identify and discuss the main issues of the relevant paragraphs (Sections 3 and 4) and to analyse issues of the interaction and relationship of these provisions including synergies and conflicts (Section 5). Finally, we will draw conclusions and provide recommendations for the negotiations on establishing and implementing a global carbon market under the UNFCCC (Section 6). The paper aims at facilitating the discussion among UNFCCC parties while, given the dynamic nature of the topic, it can obviously only be a snapshot of the current status of the discussions.

2 General issues

Before identifying and scrutinizing specific issues related to both of the markets mechanisms it is worthwhile to look at the purpose of the international carbon market and to which extent the Paris Agreement provides for changes in this regard. Based on these considerations we also look into the context for the mechanisms, particularly into the issue of supply of and demand for units from the international carbon market and other factors influencing the potential structure and shape of the international carbon market post-2020.

2.1 Purpose of the international carbon market

Until today, the international carbon market served many purposes:

1. Provide for flexibility in achieving targets;
2. Increase economic efficiency, i.e. harvest cheapest mitigation first;
3. Enable ambition raising (due to higher flexibility/efficiency);
4. Involvement of developing countries in mitigation activities;

5. Facilitated the participation of private entities (contribution/opportunities);
6. Promote sustainable development, technology transfer, capacity building;
7. Awareness raising for climate change and GHG mitigation;
8. Transition towards a global carbon market which caps global GHG emissions;
9. Tool for results based climate funding with a view to foster transformative change.

This list is not a complete list and it can certainly be extended by further purposes. And even though there is no official order of the purposes since many actors involved in the international carbon market will prioritise different purposes, the order provided above may to some extent represent an order of how these purposes emerged historically. An international carbon market was initially promoted by environmental economists, which highlighted the advantages in terms of flexibility and thus economic efficiency. Some also envisaged establishing global emissions caps through the gradual extension of the international carbon market with the view that it should finally include all countries. The purpose of awareness-raising was most likely not in the minds of those who promoted the establishment of an international carbon market initially but was identified only much later as an important side-effect ('distributing money is one of the most effective public relations tools'). The same applies to using experiences and methodologies from the international carbon market as a tool for results-based climate funding since climate finance was not such a prominent issue in the early years of the UNFCCC negotiations as it is today.

The Paris Agreement establishes a new paradigm in international climate policy. While the Kyoto Protocol was essentially based on the so-called 'targets & timetables' the Paris Agreement is based on the so-called 'pledge & review' paradigm. The Kyoto Protocol was therefore based on commonly agreed targets for certain Parties (Annex I) and stringent provisions for emissions accounting and compliance control under the UNFCCC, including enforcement provisions (Art. 18). The Paris Agreement is somewhat weaker in this regard. Instead of 'targets' it speaks of 'nationally determined contributions' (NDC) and even though it includes an Article on compliance (Art. 15), it does not refer to enforcement but highlights that this process shall be "facilitative in nature and function in a manner that is transparent, non-adversarial and non-punitive".

This paradigm shift may also have influenced the nature and purpose of the international carbon market established by Article 6 of the Paris Agreement. And indeed, comparing markets provision in the Kyoto Protocol and the Paris Agreement in this regard provides interesting insights. While the Paris Agreement clearly highlights that article 6 allows for "higher ambition in their mitigation and adaptation actions" none of the respective Kyoto Protocol articles (6, 12 & 17) mention ambition raising but state meeting commitments as the main purpose of the international carbon market.

Another difference between the Kyoto Protocol and the Paris Agreement is that the first was designed for an initial reduction of global GHG emissions – quasi as a kickstart of this process – over a limited commitment period. However, it is clear now that this is by far not enough. Despite the adoption and coming into force of the Kyoto Protocol, global GHG emissions continued to grow and it is clear now that severe impacts of global climate change cannot be avoided if net GHG emissions are not reduced to zero in the second half of this century. This understanding is reflected in the Paris Agreement, particularly in Articles 2.1 and 4.1, which both describe the long-term goal of the Paris Agreement. In addition, in 1/CP.21, para 17 Parties state that current NDCs do not provide for a below 2 °C pathway and "much greater emissions reduction efforts will be required".

On this background it becomes obvious that ambition raising is a key concern of the Paris Agreement and that Article 6 can and should contribute to this goal. The transition towards a global cap on GHG emissions, through the involvement of developing countries in carbon markets, is no longer such an important issue because the NDC process essentially involves all countries and establishes something similar to a global cap - albeit less stringent. Moreover, flexibility and economic efficiency are neither that prominent as an aim today and are replaced by increasing mitigation and adaptation ambition. Despite the fact that the language in Article 6.1 is somewhat weak because it does not establish a requirement but speaks of "allow[ing] for higher ambition", ambition raising is now the most prominent purpose of the international carbon market. However, ambition raising can be implemented in several ways:

- ▶ Purchasing international carbon market units in addition to an NDC, which is intended to be achieved by domestic policies only;

- ▶ Increasing the level of the NDC compared to earlier versions while committing that the increase will be achieved through the purchase of international carbon market units;
- ▶ Using international carbon market units or methods from the international carbon market in the context of results-based carbon funding;
- ▶ Ambition raising in the host country, for example, by using carbon markets until the end of the crediting, while the activity continues operating hereafter and its mitigation contributions are integrated in the next NDC cycle.

There are certainly more ways and in practice, it may be difficult to clearly identify or distinguish these ways. While the new importance of ambition raising seems to be obvious and clear at the general conceptual level, it is less clear how that can be operationalised in rules, modalities and procedures for Article 6. However, this will be discussed in more detail in the context of the individual Articles 6.2 (Chapter 3) and 6.4 (Chapter 4) and in the context of their interaction (Chapter 5).

2.2 Supply and demand

In addition to the changes in the key purpose, the Paris Agreement has also changed the context in terms of supply of and demand for international carbon market units. While the Art. 6 and 17 of the Kyoto Protocol established an international carbon market for trading of units among Annex I Parties and Art. 12 of the Kyoto Protocol established an option to offset parts of Annex I mitigation commitments through the purchase of Certified Emissions Reductions (CER) from non-Annex I countries, Article 6 of the Paris Agreement does not at all distinguish between developed and developing countries in terms of their roles as suppliers or buyers of international carbon market units. Both developed and developing countries can thus offer or purchase international carbon market units. This may considerably change the structure of the international carbon market.

Table 1: Intention to Use International Carbon Markets Indicated in INDCs

Intended use of carbon market	Annex I, EU or OECD	Developing country	Total
No	32	12	44
Not Specified	2	52	54
Not in INDC, but in the longer term		7	7
Use will be considered	2	15	17
Yes	10	57	67
Total	46	143	189

Sources: IETA 2016; Obergassel & Gornik 2015; Rocamora 2016; WRI 2016, authors' own compilation

To get an idea how the international carbon market may look like, it is worthwhile to look into the INDCs, where many countries have indicated their envisaged involvement in the international carbon market despite the fact that at the point when the INDCs were developed, it was neither clear whether the Parties could agree on establishing an international carbon market post-2020 nor how it would look like. Table 1 provides an overview of what countries stated in their INDCs in terms of using the international carbon market. The overview provides several insights and provides for some expectations:

- ▶ Roughly only half of the countries intend to use or consider the use of the international carbon market;
- ▶ Most of those intending to use or considering the use of carbon markets are developing countries and it is not clear whether they intend to purchase or sell international carbon market units;
- ▶ Some of the developing countries which indicated their intention to use the international carbon market have conditional INDCs, which would be increased provided that appropriate support is provided to implement their additional mitigation actions; it can be expected that at least some of them also envisage the international carbon market as one route to mobilise the required financial support;
- ▶ There are only a few developed countries which indicated that they want to use the international carbon market, including Canada, Mexico, Japan, New Zealand, South Korea and Switzerland;

- ▶ Almost a quarter of countries stated that they do not intend to use the international carbon market towards fulfilling their NDCs, among them a number of developed and developing countries with significant shares in global GHG emissions including the European Union, Malaysia, Norway, Russian Federation, Serbia, United States, Venezuela plus a number of small island states (Jamaica, Madagascar, Marshall Islands, Palau, Seychelles, Tuvalu).

Even though it is impossible to draw clear conclusions from this overview and these observations, some hypotheses can be derived. There are only a few countries with relevant demand for international carbon market units, while it is likely that many countries intend offering international carbon market units. Even though these intentions may not materialise in all cases, it can still be assumed that the potential supply may be larger than the demand. The total size of the market is likely to be smaller than under the Kyoto Protocol because many large players have clearly stated that they do not intend to participate in the international carbon market in order to fulfil their NDCs.

Despite these hypotheses further aspects have to be taken into account for drawing a somewhat more complete picture of the international carbon market outlook post 2020.

On the 6th of October in 2016, Parties to the International Civil Aviation Organisation (ICAO) adopted a global market-based measure (GMBM) to address CO₂ emissions from international aviation, which comes into force from 2021 onwards.¹ The GMBM is called the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) and requires that all CO₂ emissions of international aviation above the emission level of 2020 shall be offset by units from other sectors (carbon neutral growth). For the first period from 2021 to 2035 the accumulated demand could amount to approx. 3.3 Gt provided that all routes would be included in the CORSIA. However, the amount may be somewhat smaller since several routes are exempted: from 2021 to 2026, countries are encouraged to join voluntarily while offsetting is mandatory for all airlines on routes included in the CORSIA. From 2027, all countries need to join the CORSIA unless they are least developed, small island or landlocked developing states or if their share of the international aviation market is not included in the group of countries for which their shares add up to 90 % of the international aviation market. From 2021 to 2026 many routes are exempted from offset requirements. As of the 7th of October, 66 States joined the CORSIA² and it is expected that further States may declare their participation before the end of 2016. First estimates suggest that the demand for offsets may amount to approx. 80 % to 85 % of the full demand without any exemptions.

This figure compares with an accumulated amount of Certified Emissions Reductions (CER) of 1.7 Gt issued by the CDM EB as of the 30th of June, 2016.

At the International Maritime Organisation (IMO) Parties are currently focussing their discussion on a data collection system (DCS) for CO₂ emissions from international shipping. Once this system is implemented and its results are assessed, Parties may decide on further policies to mitigate GHG emissions from international shipping. Indeed, some Parties have already requested to start the discussion on a potential GHG mitigation target for international shipping and policies for achieving this target, including through offsetting or other ways of using the international carbon market. It can therefore not be ruled out that further demand for international carbon market units may emerge from international shipping, though certainly at a later stage.

In other words, the demand for international carbon market units from international aviation and shipping may be remarkable and thus may be an important driver for the development of the international carbon market post-2020. However, to ensure consistency of the international carbon market it is important that units used for offsetting international aviation and shipping emissions are not also used towards achieving the NDC of any country. Otherwise these units would be claimed more than once (double counting) and undermine global GHG mitigation efforts (Cames & Schneider 2016).

Even though many uncertainties remain with regard to the shape and volume of the post-2020 international carbon market, it does not seem to be too bold to conclude that there will be significant demand and supply for a liquid carbon market and that it is therefore important to elaborate consistent rules, modalities and procedures in due course, certainly well ahead of 2021. Even though many of the big players in the UNFCCC carbon market negotiations, such as the EU or the USA, do currently not envisage using the international carbon market towards their NDCs, they should still have an interest and a more than valid justification to continue actively

1 http://www.icao.int/Meetings/a39/Documents/WP/wp_530_en.pdf.

2 <http://www.icao.int/environmental-protection/Pages/market-based-measures.aspx>.

being involved in the UNFCCC negotiations on the development of pragmatic and sound rules, modalities and procedures for the future international carbon market.

2.3 Maintaining ambition

The shape and volume of the post-2020 international carbon market and particularly its contribution to global mitigation efforts may also be influenced by the potential existence and volume of so-called ‘hot air’. Under the Kyoto Protocol hot air “refers to the concern that some governments will be able to meet their targets ... with minimal effort and could then flood the market with emissions credits, reducing the incentive for other countries to cut their own domestic emissions” (UNFCCC 2016a).

Under the Paris Agreement, hot air can emerge if a country’s emission target notified in its NDC is significantly higher than its business-as-usual (BAU) GHG emission projection. The issue of hot air may be less relevant than under the Kyoto Protocol because the global mitigation effort – despite the remaining gap to stay well below 2°C – are in aggregate considerably below global BAU emissions (UNEP 2015), mainly because most countries have submitted INDCs below their BAU projections. It is therefore unlikely that some countries with potential hot air may fully undermine these efforts. On that background hot air – if made use of – could be considered an implicit financial transfer, which perhaps may be acceptable if limited in volume and if the ‘recipient’ is e.g. a least developing country. However, one can also argue that making use of hot air results in globally higher GHG emissions compared to the situation where it is not used because it substitutes emission reduction in countries with ambitious mitigation targets by cheap hot air units. In addition to reducing the global carbon price level, hot air also undermines the reputation of carbon markets as valuable tools for global GHG mitigation. For these reasons, the use of potential hot air should be avoided if not entirely to the extent possible.

The amount of hot air can be determined by deducting the respective BAU projection from the NDC. If the figure is positive, the result can be considered as potential hot air. However, the BAU projection may be inflated by unrealistic or inappropriate assumptions so that the figure appears to be negative even if it were to be positive.³ These considerations illustrate that it is not easy to identify and determine hot air. Identification and estimation require judgements which may deviate depending on who is judging.

With the INDC process, Parties essentially agreed to determine contributions independently and to avoid an assessment of the ambition and effort involved in the INDCs under the UNFCCC. The only data that can be used under the UNFCCC is the respective INDC and it can under the UNFCCC not be classified as ‘unambitious’ or be rejected. It could therefore be argued that in the context of the Paris Agreement hot air formally cannot exist.

However, comparative assessment of independent research institutions clearly identified that the ambition of INDCs deviates considerably among countries and that some INDCs may even include remarkable amount of hot air (Australian-German Climate and Energy College 2016; Climate Analytics et al. 2016; Meinshausen 2016). Countries which intend to make use of the international carbon market and which are serious in their commitment to contribute to global mitigation efforts should not ignore such information even if it has no formal status under the UNFCCC. If they would purchase such questionable units, they would effectively undermine their own ambition and should thus refrain from doing so.

As long as a country with hot air does or cannot not sell parts of its potential hot air through the international carbon market, there is hardly a problem. Ironically, hot air would virtually contribute to increase global mitigation efforts. Provided that all other countries would achieve their NDC, the respective country would virtually ‘overachieve’ its NDC and thus contribute to increasing the global mitigation ambition compared to the aggregated ambition of all the NDCs. However, if the hot air is sold to other countries and used towards their NDCs, the global emission mitigation may not achieve the level established by the aggregation of all the NDCs. In a way it can thus be concluded that only the existence of an international carbon market enables the use of potential hot air. Assuming that there is hot air and that it is used by other parties, global GHG emissions would be higher if an international carbon market is established compared to the situation without an international carbon market.

³ Under the UNFCCC, no guidance on developing GHG projections has been provided so far. For EU Member States guidance on the development of GHG projects are available (TNO et al. 2012). This guidance could basically be used by other countries as well.

Since Article 6 establishes options to make use of potential hot air, Parties which intend to use the international carbon market or which are generally interested in ensuring environmental integrity of the Paris Agreement face a specific responsibility to establish measures which prevent that significant amounts of hot air are being used. However, since the hot air can hardly be determined formally under the UNFCCC, limitations established in the Kyoto Protocol such as the commitment period reserve⁴ or the so-called Art. 3.7ter⁵ can most likely be ruled out as a feasible option.

Potential solutions may thus be formal or informal agreements among Parties interested in the environmental integrity of the Paris Agreement, to transfer units only among Parties with sufficiently ambitious NDCs. In such a 'carbon club' (Victor 2011; Weischer et al. 2012) they need to ensure that the ambition of its members remains sufficiently high and that none of the members are involved in transfers to Parties that do not meet the stringent ambition requirements of the club because such trades would indirectly undermine the ambition of the entire club and of all its members. However, perhaps it is not even necessary to establish a formal or informal carbon club. If countries with potential hot air can clearly be identified and if the number of those countries is small, it may be even sufficient if research institutes and environmental non-governmental organisations (NGOs) clearly enumerate those countries so that governments of other countries would be hesitant to allow purchasing Internationally Transferred Mitigation Outcomes (ITMOs) of these countries (naming & blaming).

So far it can certainly be concluded that hot air remains a potential issue under the Paris Agreement which should be further scrutinised. Questions which need to be addressed more thoroughly in this context are:

- ▶ How can hot air be identified and estimated?
- ▶ Which countries are potential candidates for hot air?
- ▶ How large is its potential volume?
- ▶ How likely will it be used?
- ▶ Which options exist to avoid its use?

Since the ambition of the INDCs submitted is not enough to achieve the long-term temperature goal, any issue which may undermine this ambition requires careful attention until it is clearly proven that its impact is marginal compared to other existing uncertainties.

3 Cooperative Approaches (Art. 6.2-3)

Cooperative Approaches (CA) enable Parties to use ITMOs towards their NDCs and requests Parties to apply robust accounting, which avoids double counting. This way it will, inter alia, be possible to link domestic emissions trading systems internationally and to reflect bilateral approaches such as the Joint Crediting Mechanism (JCM) appropriately under the UNFCCC. The mechanism should promote sustainable development and ensure environmental integrity and transparency consistent with guidance to be adopted by the APA. The robust accounting should be ensured through corresponding adjustments (Section 3.3.1) by the Parties involved in the respective transfer.

This approach seems in principle to be quite lean and simple. However, discussions among Parties at the session of the UNFCCC's subsidiary bodies in May 2016 in Bonn revealed that a number of issues have to be addressed and solved before CA can effectively be implemented. In the following sections we identify the main issues, consider potential options of how these issues can be addressed and assess, where required and possible, the advantages and disadvantages of the options.

4 In order to address the concern that Parties could 'oversell' units, and subsequently be unable to meet their own emissions targets, each Party is required to maintain a reserve of units in its national registry. This reserve should not drop below 90 % of the Party's assigned amount or 100 % of five times its most recently reviewed inventory, whichever is lowest (UNFCCC 2013).

5 A 'shaving mechanism', which allows emission growth in the second commitment period of the Kyoto Protocol only if the growth is backed by surplus assigned amount units from the first commitment period (Seppänen et al. 2013).

3.1 Scope of the guidance

Art. 6.2 essentially includes three general concepts: the application of robust accounting, the promotion of sustainable development and the ensuring of environmental integrity.⁶ In addition it establishes ITMOs to be used towards NDCs and mentions guidance to be adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA). Parties diverge in their views on whether this guidance should include the application of robust accounting only or whether the promotion of sustainable development and ensuring of environmental integrity should be subject of this guidance as well.

While it seems to be obvious that not only the application of robust accounting but also the promotion of sustainable development and ensuring of environmental integrity are quite broad concepts, which are not self-explaining and whose operationalization in the context of the CA certainly requires more detailed rules, the dispute may mainly refer to the legal status and the bindingness of the relevant guidance. To avoid a deadlock in this issue, discussions should be focussed on potential options for the operationalization of the three main concepts. Since there is no disagreement that the guidance should include the application of robust accounting, discussion could initially focus on this concept while discussions on the other concepts are postponed to a later point in time.

3.2 Nature of ITMOs

Art. 6.2 establishes “Internationally Transferred Mitigation Outcomes” (ITMOs), which may be used towards NDCs. This raises a number of questions on the specific nature of this term or concept:

- ▶ It is probably common sense that international transfers of mitigation outcomes require a **measuring unit** since the necessary adjustments can only be made if there is a common understanding about the quantities of the adjustments. Given the experience already gained with metric tonnes of GHG equivalents (t CO₂eq), it is likely that these adjustments may be measured in t CO₂eq. However, a number of NDCs refer to quantities of renewable energy capacities or quantities of generation from these capacities. Would it also be possible to transfer x additional MW of wind capacities or y GWh of electricity generated from new hydro plants or would such mitigation outcomes need to be converted into CO₂eq before they could be transferred internationally? Such a multitude of measuring units would certainly not enhance the transparency in terms of global GHG mitigation efforts and would without doubt complicate the accounting considerably. They can, nevertheless, not be fully ruled out from the outset.
- ▶ It is probably also not questionable that for conducting a corresponding adjustment an **accounting unit** is required. The same number of units, which are added in one country need to be deducted in another country or vice versa. The transfers need to be recorded somehow so that they can be checked and be backtracked. However, would that unit also be issued as a (virtual) **certificate** which can be issued, cancelled and surrendered and may also be transferred several times between different Parties or would it be a pure accounting unit which only exists in the GHG ‘accounts’ of the involved parties?
- ▶ If ITMOs are certificates, which could be traded on the secondary market, should they then include a unique serial number and information on its origin (mitigation activity, vintage, country, etc.)? And should it also be considered whether all units are equivalent and thus fully fungible or whether different types of ITMOs should be established, e.g. some with unlimited validity while others are only temporary?
- ▶ What exactly is meant by “mitigation outcome”? Does that require that each transfer is mirrored by or linked to a specific mitigation activity? Would more implicit mitigation outcomes such as cancelled allowances of a domestic emissions trading scheme also be considered as a mitigation outcome? Or would it be fully up to the involved parties to decide whether and how ITMOs are directly or indirectly lined to certain emission reductions or removals so that it only depends on the acquiring Party whether it accepts the ITMOs offered by the host country.

Given the nature of the Paris Agreement, it may be more likely that ITMOs will not constitute a certificate but rather a measuring and accounting unit notified in t CO₂eq.

⁶ Ensuring environmental Integrity in the context of market mechanisms means generally that the use of the mechanism should not result in higher GHG emissions compared to the situation without the use of market mechanisms. This includes issues such as ensuring that a ton used as an offset represents at least a ton GHG mitigation (conservativeness), comprehensive monitoring and reporting of emissions and removals (completeness, accuracy, etc.), prevention of any form of double counting and avoiding the use of hot air.

However, these UNFCCC accounting units may be backed by domestic carbon market certificates, which may also be traded internationally if countries bilaterally or as a ‘club’ of countries agree to mutually accepting those certificates while mirroring the net international transfer through corresponding adjustments under the UNFCCC.

3.3 Robust accounting

Pursuant to Art. 6.2, Parties shall ‘apply robust accounting’. For establishing robust accounting procedures, a number of questions need to be addressed, including what should be adjusted, how, by whom and when.

3.3.1 What should be adjusted?

While para 36 of 1/CP.21 introduces the concept of ‘corresponding adjustments’ if ITMOs are actually transferred between two parties, it remains unclear what exactly should be adjusted. Basically two options are conceivable:

- ▶ **NDC-based adjustments:** Para 36 further elaborates that the adjustments should be made for GHG emissions and removals covered by their NDC. This may suggest that the NDC should be adjusted. Parties with a net purchase of ITMOs could add this amount to their NDC while sellers of ITMOs would need to subtract them from their NDC.
- ▶ **Inventory-based adjustment:** Para 36 refers to emissions and removals and these are compiled and reported in national GHG inventories, which therefore could be another basis for adjustments. Parties with a net purchase of ITMOs could subtract this amount from their inventory while sellers of ITMOs would need to add them to their inventory.

Essentially corresponding adjustments are relevant for determining whether a country achieved its NDC or not (compliance control pursuant to Art. 15 of the Paris Agreements). For a country with an economy-wide mitigation target notified in GHG emissions and without the use of ITMOs this task is basically straightforward. The country’s net emissions and removals reported in its inventory need to be compared with its NDC.⁷ If the emissions are smaller than their NDC, the country has achieved its contribution while it would have failed doing so if the emissions are larger than their NDC. With the use of ITMOs a third figure needs to be taken into account: the net purchase or sale of ITMOs.

The term ‘adjustment’ may be somewhat misleading in this context as it suggests that either the target stated in the NDC or the amount of emission reported in the inventory may disappear or be replaced by different values. However, both values will remain unchanged by the adjustment but the equation will be enhanced by an additional parameter, the number of ITMOs.

Quite obviously either of both figures could basically be adjusted to reflect the impact of ITMOs.⁸ However, NDCs are much less harmonised than inventories, for which already detailed guidelines exist (IPCC 2006) and up to 20 years of experience in many countries. NDCs are therefore to a lesser extent internationally comparable than inventories. Moreover, pursuant to Art. 4.3 and 14.3 of the Paris Agreement, NDCs will be updated in the course of time.

This suggests that inventory-based adjustments may provide greater reliability because determining aggregated national emissions through GHG inventories is a well-established process under the UNFCCC. However, if ITMOs are used, compliance control needs to take into account all three figures, the inventory, net transfers and the NDC for determining whether a country achieved its target or not. The uncertainty, which may be embedded in the NDC, will thus not be eliminated if inventory-based adjustment is applied. It may therefore be of lesser importance, which approach is finally applied. It may even conceivably be that Parties decide individually, which of both approaches they prefer. However, for transparency reasons it is certainly preferable if all Parties could agree on one common approach.

⁷ For countries, whose targets are not expressed in GHG emissions or whose target does not cover the entire economy, this task will certainly be more complex.

⁸ To conduct this comparison, all three figures need to be available in the same dimension. If the NDC is notified e.g. in percentage terms relative to a base year, it could be converted into an absolute figure. If the NDC is notified e.g. as an increase in the share of electricity generation from renewable sources, either the ITMO needs to have the same dimensions or one or both figures need to be converted into dimensions that enable a comparison.

3.3.2 How should it be adjusted?

This question essentially refers to the understanding of what is exactly meant by ‘corresponding’. In the first place it refers to the fact that if an amount of ITMOs is added to one country, the same amount has to be deducted at another country or vice versa. One country may have transfers of ITMOs with several countries and some of them may result in additions, while others would involve deduction.

However, each of those transactions can be described by a country pair where a certain amount of ITMOs is added at one country and deducted from the other.

Beyond the basic mathematics of 1:1 adjustments, it also needs to be discussed and agreed whether all ITMOs are equivalent and fully fungible or whether differences in their quality such as vintage, origin or type of ITMO may need to be taken into account:

- ▶ **Vintage:** To avoid an overestimation of emission reductions in the case of single year targets (Section 3.4) it could be considered to require that only ITMOs generated and/or issued in the same year as the buyer’s target year may be accepted. If banking or borrowing between NDC periods will be allowed or disallowed it would be necessary to determine the vintage of the ITMO and distinguish between different vintages or periods.⁹
- ▶ **Origin:** To allow acquiring countries assessing the quality of the ITMO, it may be useful if the country, the kind of mitigation activities or the technology used to generate the mitigation outcome are stated.
- ▶ **Type:** While emission reductions are usually permanent, removals are often non-permanent so that GHG may be released to the atmosphere again. To reflect such differences ITMOs backtraced to removals may be qualified as temporary so that they have to be replaced or renewed after a certain period of time.¹⁰

These aspects are to large extent familiar from the Kyoto Protocol so that use of the knowledge gained there can be made. However, the Paris Agreement is in many aspects quite different to the Kyoto Protocol so that concepts and procedures certainly need to be adapted to the new paradigm. For example, was the quality of emission allowance or reduction credits under the Kyoto Protocol ensured through standards and procedures under the UNFCCC. Under the Paris Agreement, this will be to a much lesser extent the case. In contrast, Parties will need to decide individually with which other Parties they engage in transfers of ITMOs. To facilitate such decisions and to ensure the transparency requested by Art. 6.2 it will be important that the ITMOs contain detailed information on the vintage, origin and type of the ITMO.

3.3.3 When should it be adjusted?

Since Art. 6.2 does not specify when transfers of ITMOs may be conducted, it can be assumed that transfers may be made at any time. However, adjusting after each transfer would only be possible if NDC-based adjustments were agreed (Section 3.3.1). Inventories will be available only with a time lag of two years after the end of the respective year so that adjustments could only be made once the inventories are available.

Ultimately, adjustments need to be made available to the implementation and compliance committee established by Art. 15 of the Paris Agreement. This committee, in turn, relies also on the information Parties are requested to provide in the context of the transparency framework of the Paris Agreement (Art. 13), particularly on the inventories, which most of the Parties are requested to submit on a biennial basis (Para 90, 1/CP.21). On this background, it could be considered to conduct the adjustments also on a biennial basis and align the rhythm with the cycle of the compliance committee.

Another option would be to conduct the adjustments in the context of the global stocktake pursuant to Art. 14 of the Paris Agreement. The first global stocktake is due in 2023 and will be repeated every five years thereafter, so that the net transfers of ITMOs could also be adjusted over those five-year periods. The majority of countries aim to achieve their targets by 2025 or 2030. The global stock take in 2028 would thus be an opportunity to consolidate corresponding adjustments for the period 2020 to 2025.

However, as both inventories and NDCs refer to individual years, transfers of ITMOs should be accounted towards the year in which they are made before they are aggregated over the two- or five-year period.

⁹ If banking or borrowing were applied, continuous monitoring over the entire affected NDC periods would be required in addition the vintage of the ITMOs used.

¹⁰ There are other approaches to reflect non-permanence risks of emission reductions (see e.g. Estrada et al. 2014). However, it is not in the scope of the paper to elaborate on this issue in more detail.

3.3.4 By whom should it be adjusted?

This question essentially refers to the governance of transfers and adjustments. Art. 6.2 requests Parties to apply robust accounting. On that background, a range of options for the potential governance can be envisaged.

At one end of that range, Parties may just report about their transfers of ITMOs to or from other countries and make, the corresponding adjustments in the context of their reporting required under the transparency framework of the Paris Agreement (Art. 13). Under this option, there would be hardly any coordinated governance under the UNFCCC. The guidance referred to in Art. 6.2 may ensure that all parties report their transfers and adjustments in a similar or even the same format.

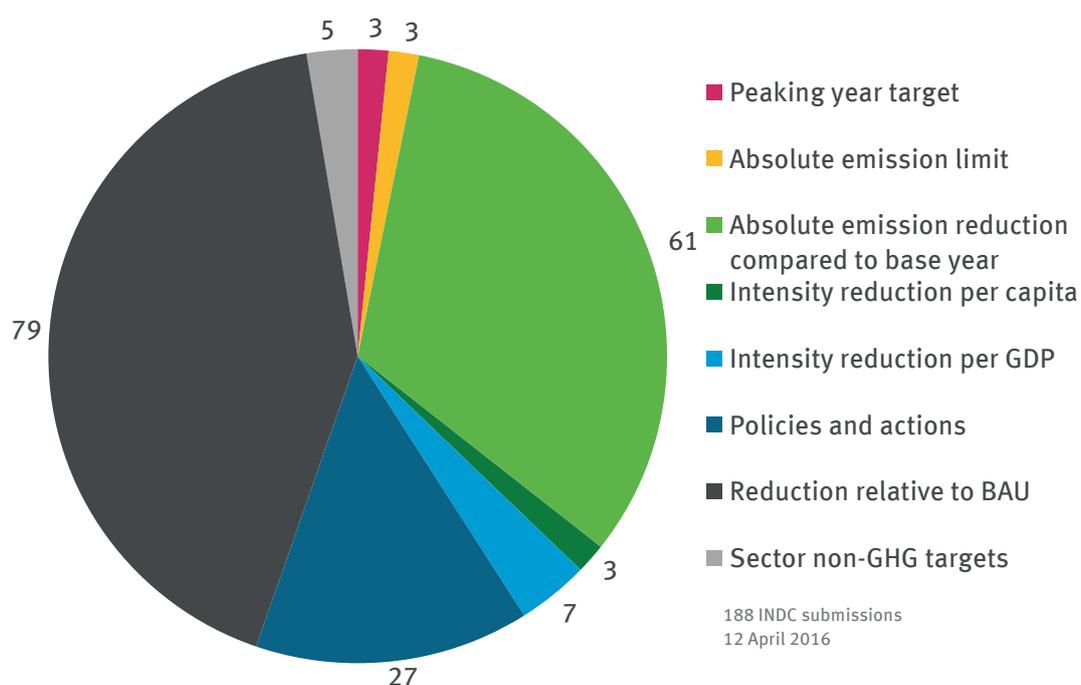
At the other end of the range Parties may agree, although not mandated in the Paris Agreement, to establish a tracking facility under the UNFCCC which administers all transfers of ITMOs and their use towards NDCs with a view to ensuring overall consistency of using ITMOs.

A middle ground option would be to establish a common registry, which may be operated by the UNFCCC Secretariat. This registry would provide a common platform for all parties for transfers and adjustments, while Parties may remain responsible for the consistency of the information fed into the registry.

3.4 Relationship to nationally determined contributions

Due to different responsibility for climate change and actual capacities to address climate change, INDCs differ quite considerably in their ambition. However, since the contributions are nationally determined and since the process was hardly harmonised, they also differ in terms of many other aspects such as the type (Figure 1) and the target year or period (Figure 2). This poses significant challenges with regard to accounting, particularly if ITMOs will be used by Parties.

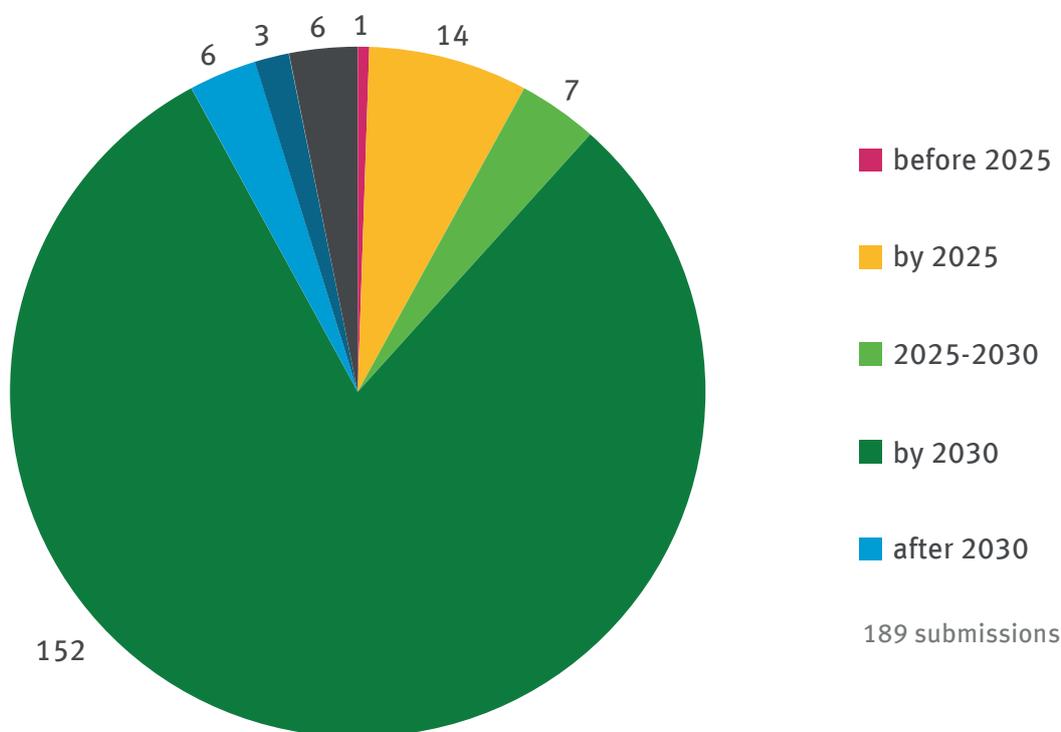
While adjustments will be straightforward with certain types of targets such as absolute emission limits or absolute emissions reductions compared to a base year, adjustments will be virtually impossible with targets, which refer to policies and actions or which refer to certain sectors of the economy but are not specified in GHG emissions or removals. Intensity targets, either per capita or per unit of GDP or reduction targets relative to Business-as-Usual (BAU) will require some additional regulation in order to ensure the corresponding adjustments can be made appropriately.



Source: Authors' own compilation

Figure 1: Types of targets

The vast majority of the countries determined that they aim to achieve their target by 2030. However, some countries specified an earlier or later target year or did not even specify when they aim to achieve their target. If the countries with shorter target horizons will update and extend their NDCs in a timely manner, the difference in target horizons may not be a major problem. However, most of the targets are determined for a single target year and do not provide any target figures for the period up to their target year. This certainly poses a challenge to corresponding adjustments and deserves further attention and regulation.



Authors' own compilation

Figure 2: Target years or periods

International carbon markets provide flexibility in achieving targets both in terms of where and when emission reductions are achieved most cost efficiently. However, if targets are not determined as a trajectory, which includes clear intermediate targets for each year of the covered period, it will be challenging to enable the flexibility in terms of in which year emissions reductions may be achieved.

A target trajectory represents a commitment to limit cumulative emissions over a continuous period, from the start to the end of the target period. In contrast, a single-year target represents a goal or commitment for the target year only, with no specific ambition for the years prior to the target. This is a crucial difference because what matters for climate change is how much is emitted altogether: cumulative emissions. Achieving the long-term temperature goal requires limiting cumulative emissions and thus, accounting for them (Kollmuss et al. 2014).

The problem occurs on the side of both the sellers and the buyers of ITMOs. Several methods are conceivable to overcome this problem:

- ▶ **Eligibility:** Exclude countries, which do not provide a clear target trajectory for the use of ITMOs as both sellers and buyers;
- ▶ **Conversion of NDCs:** Request parties to convert their single year target into a clear target trajectory for their entire target period;¹¹
- ▶ **Ensure same vintage:** Only ITMOs 'generated' or achieved by the seller in the same year as the buyer's target year can be used for corresponding adjustments, regardless when the ITMOs were transferred;

11 Since most countries provided just individual target years but no trajectory, many countries would need to be required to do their 'homework' and provide continuous target trajectories.

- ▶ **Division of purchased ITMOs:** Divide the number of ITMOs purchased in the course of the target period to be used in the target year by the number of years of the target period;
- ▶ **Methodologies to convert target years into a trajectory:** Common methodologies could be developed under the UNFCCC with the view to provide a clear trajectory for all years of the common target period. It could, for example, be assumed that the trajectory is a straight line from the 2020 inventory emissions to the target year or that the target year figure should be applied to all years of the target period, i.e. that the trajectory is a horizontal line at the level of the target year.

This list is certainly neither complete nor mutually exclusive. Some of the potential options are virtually identical or would at least result in the same outcome and may in addition not be in line with the spirit of the Paris Agreement, which pretty much relies on the self-determination of countries and avoids such concepts as eligibility or conversion requirements in the context of NDCs. Some may be in line with the Paris Agreement but still limit the flexibility in terms of when reductions are achieved (ensure same vintage).

Actually most of these options do not seem to be appropriate. Since climate change is caused by the accumulation of GHG emissions, single target years are just not appropriate. A single year may be easier to communicate and agree domestically but since climate change is caused by accumulated GHG emission, only a budget approach can adequately address the respective challenges. Single year targets therefore need actually to be transformed into a budget even though this budget may be named differently, e.g. target trajectory, to avoid any similarities to the Kyoto Protocol approach. On this background, the last of the above mentioned options may perhaps be the most promising. It would not limit flexibility in terms of ITMO vintages and would also be in line with the spirit of the Paris Agreement since it does not change the NDC but just further specifies it. Parties may even have the possibility to choose among several issues for the specification of a target trajectory. The only requirement they may face if they want to make use of ITMOs as buyers or sellers is that they need to select one of the potential methods for the conversion of a single year target into a target trajectory.

4 Mitigation and Sustainable development Mechanism (Art. 6.4-7)

The Mitigation and Sustainable development Mechanism (MSDM) enables Parties to implement GHG mitigation activities whose results can be used towards fulfilling NDCs. The emission reductions achieved through the activity can either be used by the Party which implements the mitigation activity towards its NDC or by another Party. It can be expected that in most cases parts of the emission reductions achieved will be used towards the NDC of the Party, which implements the activity while other parts will be used by other Parties.

The MSDM will be governed by a body under the UNFCCC, which will ensure a harmonised approach in terms of estimating the amount of emission reduction achieved and that these mitigation activities result in real, measurable, and long-term benefits. On the one hand, the MSDM resembles pretty much the CDM in terms of language and concepts (Table 2):

Table 2: Similarities between the CDM and the MSDM

CDM (Art. 12 of the Kyoto Protocol)	MSDM (Art. 6.4-7 & Para 37-38 of the Paris Agreement)
Resulting in certified emission reductions	Verification and certification of emission reductions
Achieving sustainable development and in contributing to the ultimate objective of the Convention	Contribute to the mitigation of greenhouse gas emissions and support sustainable development
Additional to any that would occur in the absence of the certified project activity	Additional to any that would otherwise occur
Supervised by an executive board of the CDM	Supervised by a body designated by the CMA
Approval of the party involved	Authorised by each Party involved
May involve private and/or public entities	Incentivise and facilitate participation ... by public and private entities authorised by a Party

CDM (Art. 12 of the Kyoto Protocol)	MSDM (Art. 6.4-7 & Para 37-38 of the Paris Agreement)
May use the certified emission reductions ... to contribute to compliance	Be used by another Party to fulfil its NDC
Share of the proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation	Share of the proceeds from activities ... is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation
Elaborate modalities and procedures	Adopt rules, modalities and procedures
Voluntary participation	On a voluntary basis

Source: Authors' own compilation

Although not explicitly stated, neither in the Kyoto Protocol nor in the Paris Agreement, both mechanisms are obviously crediting mechanisms.

Despite these similarities there are, on the other hand, also significant differences:

- ▶ While the **CDM** clearly distinguishes the roles of **Annex I Parties** and **non-Annex I Parties**, this distinction is entirely dropped out of the MSDM. While under the CDM developing countries were hosts for mitigation projects, the developed Parties' role was to acquire CERs. Under the MSDM both **developing and developed countries** could basically take both roles, i.e. implement mitigation activities to be certified under the MSDM as well as purchasing emission reduction units;
- ▶ The CDM is clearly **project-based** (project activities). This was later enhanced by the EB to programmes, which include a number of similar projects. However, in essence the CDM remains a project-based mechanism. The MSDM, in contrast, **does not specify the scope** of the mitigation activities but requests that an eligible scope of activities should be further specified in the rules, modalities and procedures. It could thus also be considered as a sectoral mechanism (Bosi & Ellis 2005; Schneider & Cames 2009; Sepibus & Tuerk 2011; Sterk et al. 2014) with many similarities to the New Market Mechanism (NMM) under the UNFCCC, which was defined but never actually implemented;
- ▶ The CDM is essentially an **offset mechanism**. From a global perspective, it does not directly contribute to reduce global GHG emissions because each additional unit of GHG emission reduced in one country will be offset by another unit not reduced in another country. The MSDM includes a provision that it shall aim at delivering an overall mitigation in global emissions. Although it still needs to be defined how that requirement can be operationalised, it seems to be clear that the MSDM should aim at going **beyond pure offsetting**.

Although the MSDM can build on experiences from the CDM, a number of issues still have to be discussed and agreed among UNFCCC Parties before the MSDM can effectively be implemented. This is especially the case if the MSDM will be applied at the sector instead of the project level. In the following sections we identify the main issues, consider potential options for how these issues can be addressed and assess, where required and possible, the advantages and disadvantages of the options.

4.1 Scope

As already eluded to, the MSDM does not specify the scope of the mitigation activities covered by the mechanism. This certainly provides more flexibility in terms of which types of mitigation activities can be addressed by the MSDM. In addition to project- and programme-based mitigation activities, as they are well-known from the CDM, the scope could be extended to entire sectors or even to policies.

Whether parties will agree on regulating the scope or whether they will provide full flexibility depends on a number of aspects, mainly related to the question to which extent mitigation outcomes of larger scopes can be accurately identified and monitored. Below we outline a number of questions which need to be discussed and

agreed in the context of the scope of mitigation activities:

- ▶ How could a sector or a policy be clearly distinguished from another sector or policy, i.e. how could a sector or policy be exactly delineated from another? For sectors, international classifications are available. However, they were mostly elaborated from an economic and financial accounting perspective and may thus not be appropriate for emission reduction monitoring. The sectors defined by the IPCC for GHG inventories may be another option. However, some of them involve a number of very different mitigation activities while certain policies could target mitigation activities in several of these IPCC sectors, which makes monitoring and accounting more complex. For policies, no such international classification exists. Many policy makers and researchers even disagree upon which policies should be considered as market-based instruments and which should not;
- ▶ The heterogeneity in terms of potential mitigation technologies may be an additional challenge. Some technologies may be applicable across many sectors or incentivised by different kinds of mitigation policies, while other technologies may cover only a section of a certain sector or may only be incentivised by a very specific policy;
- ▶ Data availability may pose another problem. Even if sectors or policies may be clearly defined and delineated, there may be no appropriate data to identify base year emissions or to estimate BAU emission projections. Lack of appropriate data may require that several years of data monitoring need to be inserted prior to the start of a mitigation policy.

Even though these considerations seem to be very specific for sectors or policies, they are actually more general and apply at least to some extent to projects or programmes as well. Difficulties in delineation, heterogeneity of mitigation technologies and data availability are challenges, which are quite familiar from project- and programme-based approaches. They constitute challenges for these approaches, though perhaps at a different level. One can say that the challenges in determining emission reductions sufficiently accurately grow with the scope. If the scope is larger and/or more heterogenic, the uncertainty is likely to be larger as well. To remain conservative and to ensure that a ton used offset is at least a ton mitigated, uncertainty margins need to be appropriately larger to reflect such incertitude.

These considerations should not be misunderstood as an argument against enhancing the scope of mitigation activities covered by the MSDM. It rather points to the similarities between different scopes and that all scopes face comparable challenges. It also points to the assessment that any efforts to establish approaches based on the idea 'one size fits all' are likely to be moribund. The only way out is, to elaborate scope-specific and, if appropriate, technology-specific methodologies for the determination of baselines and the monitoring of emission reductions. These methodologies should be, as known from and proven by the CDM, gradually be improved once additional knowledge on emission reduction monitoring becomes available and be conservative so that the amount of emission reductions is not overestimated. Based on such a gradual approach, the scope of the MSDM can indeed be enhanced while the coverage of individual methodologies may also be enhanced over time to other sectors or policies. Due to the similarities, such approach can build on many insights, principles and values developed in the context of CDM and JI methodologies.

Another issue which needs to be discussed is whether an initial investment in new technologies as under CDM and JI is required or whether mainly operational activities may qualify under the MSDM as well. Despite all challenges to determine additionality of an initial investment it is still easier to identify the additionality of an investment than of purely operational activities. However, also CDM and JI are not strictly restricted to project activities which require significant upfront investment, also because it is in many cases challenging to clearly distinguish between upfront investments and operational expenditures.

4.2 Relationship to nationally determined contributions

Different to the CDM, which allows generating CERs only in countries without targets, the MSDM can basically be used by all Parties. Under the Paris Agreement virtually all Parties now have NDCs, which include different types of targets. This creates several issues, which have to be discussed and agreed prior to the implementation of the MSDM.

4.2.1 Activities inside or beyond the NDC

The first question is how it could be determined whether an activity is within or beyond the coverage of the NDC. If the NDC does not cover the entire economy but only certain sectors, mitigation activities in sectors, which are not covered by the NDC, are clearly beyond the NDC. The same applies if not all GHGs are included in the NDC but for example only CO₂. Activities aiming at non-CO₂ GHG emissions would then also clearly be beyond the coverage of the NDC. Transfers of credits generated from mitigation activities beyond the coverage of the NDC would not require an adjustment of the NDC. If inventory-based accounting is applied and the activity is covered by the inventory, the respective adjustment would be required, though.

However, even if the NDC is economy wide and covers all gases, there may be still mitigation activities, which are beyond the ambition of the NDC. However, identifying them would require that the NDC is clearly substantiated by a complete list of policies and measures whose mitigation impact is quantified and justified that the NDC is achieved. Theoretically, this approach appears to be straightforward. However, despite the fact that these policy and measures lists are not yet included in the INDCs, it is in practice usually quite challenging to estimate and project the mitigation contribution of individual policies and measures so that high uncertainties can be expected. To ensure conservative estimates and projections, appropriate uncertainty margins would need to be taken into account. Mitigation activities which are not on that list might be considered beyond the ambition of the NDC. They could be transferred to other countries, since they would result in over-achieving the NDC, provided that the NDC is actually achieved.

Even credits generated from mitigation activities, which fall into the scope of the list of policies and measures could be transferred to other countries if the contribution projected is over-achieved. In this case, the MSDM resembles a JI-style rather than a CDM-style mechanism. Parties with an ambitious NDC will have an incentive to ensure that the amount of credits transferred is actually achieved because they would risk to not achieve their NDC or would need to make up the deficit through increasing other mitigation activities. They would therefore ensure that the respective NDC policy or measure is adequately reflected in the baseline of the mitigation activity used for determining its additionality and monitoring its emissions reduction so that only mitigation beyond that baseline could generate transferable credits.

Countries with a NDC above their BAU projection, i.e. with hot air, would, on the contrary, have little incentive to ensure that their NDC policies and measures are appropriately reflected in the baseline of mitigation activities (Kollmuss et al. 2015). Credits generated from mitigation activities with such inflated baselines could, regardless of whether within or outside the scope of the NDC, undermine the environmental integrity of the Paris Agreement since they would result in higher global GHG emissions unless the transfer of these credits would not be conducted. Measures to prevent such impacts were already discussed in Section 2.3.

Different to credits generated by mitigation activities beyond the coverage of the NDC, all transfers of credits generated from mitigation activities within the coverage of the NDC require adjustments of the NDC or inventory even if they are beyond the ambition of the NDC.

4.2.2 Activities covered by conditional parts of the NDC

A number of developing countries distinguish their NDC in one unconditional part and another part, which could be additionally achieved if appropriate support is received. The support required could have several forms, e.g. bilateral carbon finance or through the Green Climate Fund, technology transfer or capacity building. Revenues from carbon credits could be another form of that transfer.

From a carbon market perspective the conditional NDC appears in the first place to be irrelevant. Policies and measures as well as ambition covered by the unconditional NDC would need to be adequately reflected in the baselines of mitigation activities within the scopes of the NDC. However, if there are other forms of support to 'harvest' the conditional parts of the NDC, it would need to be ensured that they are adequately reflected in the baseline of the respective mitigation activities to avoid double counting between carbon markets and other forms of support.

Since this may become quite complicated, it may be advisable to clearly target support to individual policies or measures. It may even be considered whether only one form of support may be applicable to each mitigation activity in order to properly avoid double purpose, a specific form of double counting (Schneider et al. 2015a), between different forms of support.

If a country would clearly assign a certain mitigation activity to be supported through revenues from carbon markets while parts of the mitigation potential of that activity should be contributed as domestic actions this would need to be similarly reflected in the baseline. However, while this again appears to be straightforward conceptually, it may be quite challenging to adequately estimate the mitigation potential and to clearly distinguish the domestic and supported share. Methodologies for determining additionality and monitoring emission reductions would certainly need to be type specific while they should be improved over time and their application may case by case be enhanced to similar mitigation activities.

4.2.3 Strengthening of the NDC

Art. 4.3 of the Paris Agreement requires that NDCs become more stringent over time. Since domestic policies and measures need to be reflected appropriately in the baseline of MSDM activities, this poses an additional challenge to MSDM implementation because the shape of the baseline may in many cases be uncertain at the start of the mitigation activity. This challenge could be addressed in several ways.

- ▶ Crediting periods of MSDM activities could be limited to the period of the NDC, i.e. to 5 years. Since the NDCs are usually adopted somewhat in advance of their entry into force, there may be enough lead time to develop MSDM projects. However, five years may be long enough or even too long for certain types of activities but certainly not for all types of activities so that for some activity types limited extensions into the next NDC period may be considered;
- ▶ Baselines and financial additionality of the MSDM activity could be reassessed and potentially be adapted once a new NDC is notified to the UNFCCC;
- ▶ NDCs could be adopted several periods in advance so that baselines for longer crediting periods could be derived, enabling longer crediting periods and creating an additional incentive to develop a long-term mitigation strategy;
- ▶ An increase in a NDC's ambition could be ignored entirely with only the conditions at the start of the MSDM activity considered, though only for certain types of activities and provided that the crediting periods are not longer than say 7 or 10 years.

Quite obviously none of these options is optimal and fits to all potential mitigation activities, which are conceivable under the MSDM. On the other hand, some of them may not be mutually exclusive but rather complementary. It could therefore be considered which of these options should be applied and this may depend on the type of the MSDM mitigation activity.

4.3 Governance

Similar to the CDM, the MSDM will be supervised by a body under the guidance of the COP/CMA. The EB of the CDM could thus be a role model for this body. Rules and procedures for preparing decisions and for decision-making could be built on those for the CDM, which were continuously refined and improved of the years since it was established. However, there are also important differences to the CDM. Since Art. 6 does not assign certain roles to groups of countries (non-Annex I hosting projects versus Annex acquiring CERs), the composition of the body may be different to the composition of the EB and may perhaps not be proportionate with respect to the share of developed and developing countries. On the one hand, this may contribute to establishing a less politicised body than the EB, particularly if the members of the body would be elected based on their capacities rather than on their origin from one of the UN regions. On the other hand it can be expected that the final composition of the body will not deviate considerably from the EB, since this region-specific composition is applied in several other UN bodies and not only used under the CDM.

In addition to the composition of the body, Parties also need to agree on the competences of the body, such as accreditation of independent verifiers, issuance of units, establishing and maintaining a registry, etc.

Basic and important definitions, principles and approaches should be agreed by the COP/CMA and be enshrined in the rules, modalities & procedures. This includes among others general agreements on the scope(s) of the mechanism, the treatment of existing CDM projects under the MSDM, the interaction with NDCs, etc. However, rules on technical details such as methodologies, parameters and issues where the COP/CMA could not agree upon may be developed little by little by the body after its establishment.

Pursuant to the principle ‘form follows function’, details on the composition of the body and other rules on the government of the mechanism such as decision making, tenure, election of members, etc. should only be addressed once other details of the mechanism become clearer. In other words, governance is an important issue, which should not be neglected but only discussed and addressed at a later stage of the negotiations.

4.4 Purpose

The purpose of the MSDM is quite general: “to contribute to the mitigation of greenhouse gas emissions and support sustainable development”. In addition, it is specified that the MSDM should facilitate the participation of public and private entities, contribute to emission reduction in host Parties and acquiring Parties and deliver an overall mitigation of global emissions. Compared to the purpose of the CDM, which “shall be to assist Parties not included in Annex I in achieving sustainable development ..., and to assist Parties included in Annex I in achieving compliance with their ... commitments”, the Paris Agreement appears to be more open for other purposes than just contributing to achieving targets under the UNFCCC.

Despite the more limited purpose of the CDM, it was already possible to use it for other purposes rather than for compliance with mitigation obligations under the UNFCCC:

- ▶ Private entities, such as individuals or companies, cancelled CERs to offset voluntarily emissions not covered by any obligation (flight, events, products, etc.) through certain service providers (atmosfair, firstclimate, myclimate, etc.). The EB reacted to these developments and established, also as an attempt to compensate declining demand for CERs, a platform which allows private entities to cancel CERs directly under the UNFCCC for offsetting any private emissions (UNFCCC 2016b);
- ▶ The methodologies and tools developed by the CDM may also be used in the context of results-based carbon funding. It is also conceivable that CERs are directly used and cancelled in the context of results-based carbon funding. Schneider et al. (2015b) analysed which project types would be most suitable for this purpose and which aspects have to be taken into account to ensure that results-based carbon funding achieves a high mitigation impact and also provides incentives for a transition towards a low carbon economy in host Parties;
- ▶ CERs may also be used to offset CO₂ emissions from international aviation above the 2020 baseline emissions (ICAO 2016).¹² Since emissions from international aviation are neither covered by GHG inventories nor by (most of the) INDCs, it is important that any CER used towards offset obligations under the International Civil Aviation Organisation’s global market-based measure is appropriately cancelled under UNFCCC to avoid double claiming of the same emission reduction, a specific form of double counting (Schneider et al. 2015a).

It can be assumed that these ‘extended purposes’ will play an even greater role under the MSDM since the scope of the Paris Agreement is larger and more heterogenic than the Kyoto Protocol. However, despite these enhancements of how the MSDM is used, its role in terms of identifying and finally implementing cost efficient mitigation options may largely continue as under the CDM. By providing incentives to public and private entities to gain financial support for the implementation of a broad range of climate mitigation technologies, crediting mechanisms trigger competitive search for costeffective mitigation options. Different to ‘traditional’ carbon funding by the Green Climate Fund or national Overseas Development Agencies, which usually ensures that the funds provided are spent appropriately to prevent misspending and/or corruption but does not accurately monitor the outcome in terms of mitigation delivered, results-based carbon funding puts more emphasis on the impact of the funding. Obviously, this cannot be applied to all areas of potential mitigation since in many areas monitoring impacts and output is virtually impossible. However, in areas where impacts can be monitored sufficiently accurately, results-based carbon funding may provide ‘more value for money’ in terms of mitigation.

12 It is unlikely that the CDM will be able to generate CERs post-2020. However, it is currently discussed under ICAO whether CERs generated up to 2020 may become eligible.

This may not be relevant for all countries because many developed and developing countries are already establishing domestic carbon markets (ICAP 2016). However, smaller countries or least developing countries may not have the capacities to develop a full-fledged market-based policy domestically and may thus considerably profit from the incentives provided through the MSDM.

4.5 Existing CDM and JI projects

The Kyoto Protocol and thus CDM and JI do not have an end date so they can formally continue to exist even beyond 2020, even without any further commitment period under the Kyoto Protocol. Due to the true up period, the administration of mechanisms needs to continue for some 3 years beyond 2020 to ensure that all requirements for the second commitment period of the Kyoto Protocol can be appropriately processed. Whether CDM and JI can generate new credits after 2020 is a different and legally debated question. However, even if there was a clear legal opinion that CDM and JI could continue to issue credits post-2020, it remains uncertain whether Parties could politically agree on the continuation of these mechanisms. As soon as the MSDM comes into force, there is little sense to maintain other crediting mechanisms which aim at reducing the same emissions and are largely based on the same concepts but do not take into account the new context under the Paris Agreement. Therefore, it seems very unlikely that CDM and JI will continue generating and issuing credits post-2020.

These considerations trigger the question of how existing CDM and JI projects should be dealt with under the MSDM. Obviously, there are a number of potential answers. The most extreme answers would be no continuation of existing projects at all and quasi automatic continuation under the MSDM as suggested by some Parties. While agreement upon the latter option is very unlikely since it fully ignores the new context, particularly in respect of the fact that many host countries now have developed NDCs and domestic climate policies which are not at all reflected in the baselines of existing projects, the former option may be the ‘fallback’ if Parties cannot agree on another option. Between these extremes there are a range of not mutually exclusive options which would allow at least certain projects to continue generating credits under the MSDM:

- ▶ Continuation of certain project types, for example those which have a great risk that the mitigation activity would be ceased if no further revenues from credits could be expected;
- ▶ Continuation only in certain countries, for example least developed countries; many of those did not have the capacity to develop projects in the early years of the CDM and started to make use of the mechanism only very late. For those countries it would be a major drawback if those projects were not be able to continue generating credits;
- ▶ Continuation after an adjustment of the baseline which takes into account the host countries NDC;
- ▶ Continuation after a reregistration of the project under the rules, modalities and procedures of the MSDM.

An important criterion for determining which or which combination of these options is most appropriate is their potential contribution to reducing global GHG emissions. Certain project types such as renewable energy projects are likely to be continued even without credit revenues, since the electricity revenues are larger than the operational cost. Continuation of such projects would not result in further emissions reductions and may thus not provide the best value for money in terms of global GHG mitigation. Other project types such as the N₂O avoidance from nitric acid projects may on the other hand depend on revenues from credits for continuation of the project (Schneider & Cames 2014; Warnecke et al. 2015). In other words, the question of which projects, if any, may be continued under the MSDM should clearly focus on their potential to contribute to enhancing GHG mitigation. In addition, these projects should be clearly reflected in the inventory and appropriate accounting of their CERs should be ensured.

5 Interaction of the Paris Agreement’s market mechanisms

On the one hand, it is essential to carefully elaborate the guidance and the rules, modalities and procedures for each of the market mechanisms separately to ensure comprehensiveness and integrity of their design. On the other hand, it is important to look at the similarities and differences as well as at their interaction from the outset. In the following we will therefore, firstly, look at the similarities and differences in order to identify whether there is a ‘level playing field’ for the coexistence of both market mechanisms and, secondly, look at their potential interaction from a governance perspective.

5.1 Level playing field

Both market mechanisms, CA and MSDM allow for the international transfer of international carbon market units among UNFCCC parties. However, despite such fundamental similarities there are significant differences (Table 3):

Table 3: Differences between the market mechanisms

	Art. 6.2	Art. 6.4
Raising of ambition	Neither explicitly mentioned in Art. 6.2-3 nor in the respective decision paragraph (36 of 1/CP.21)	Art. 6.4(d) requires that the market mechanism shall “deliver an overall mitigation in global emissions ”
Bindingness: guidance versus rules, modalities and procedures	Parties are mandated to develop guidance for the implementation of the market mechanism	Parties are mandated to elaborate more comprehensive and binding rules, modalities and procedures for under Art. 6.7
Promotion of contribution to sustainable development	Just speaks of promotion of sustainable development	Speaks more strongly of a contribution to sustainable development
Governance	Absolutely silent on any governance	A body to supervise the implementation of mechanism is established
Share of Proceeds (SoP)	No such provision	Activities under the MSDM shall provide a share of proceeds to cover administrative expenses and support adaptation on particularly vulnerable countries

Source: Authors’ own compilation

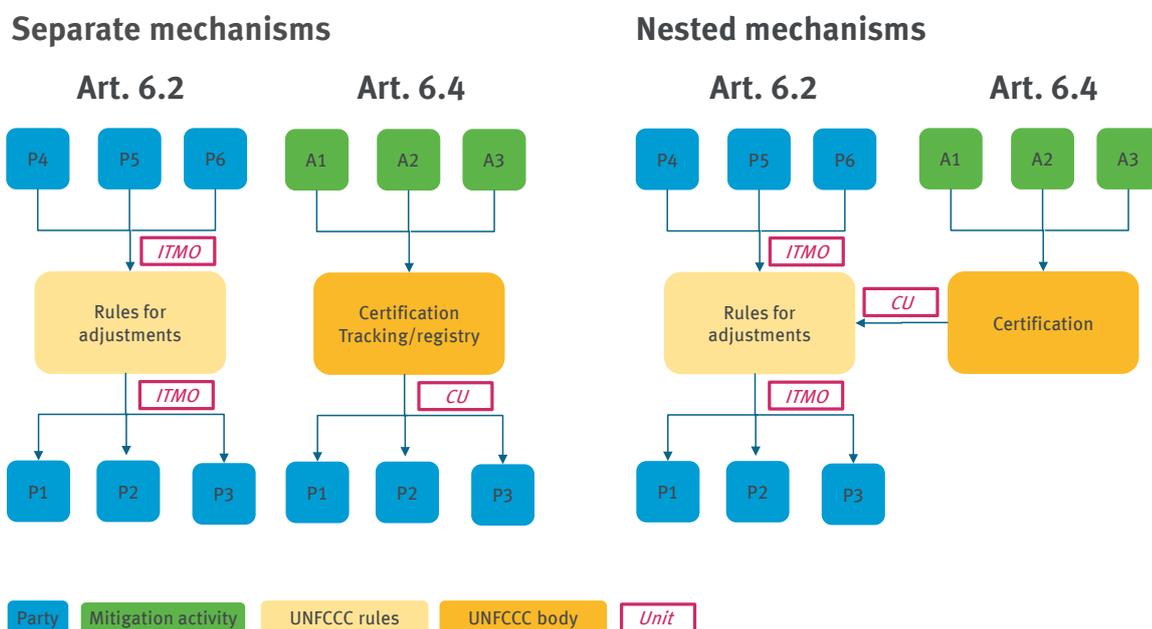
- ▶ Raising of ambition: As already eluded to, is the purpose of allowing for higher ambition clearly mentioned in Art. 6.1, which is essentially the chapeau of Art. 6 and applies thus to all its articles and related provisions. Despite this general statement in the chapeau, the purpose is neither explicitly mentioned in Art. 6.2-3 nor in the respective decision paragraph (36 of 1/CP.21). In contrast, Art. 6.4(d) requires in addition to the chapeau that the market mechanism shall “deliver an overall mitigation in global emissions”;
- ▶ Guidance versus rules, modalities and procedures: Under Art. 6.2 Parties are mandated to develop guidance for the implementation of the market mechanism while they are mandated to elaborate more comprehensive and binding rules, modalities and procedures for under Art. 6.7;
- ▶ Promotion of contribution to sustainable development: Art. 6.2 just speaks of promotion of sustainable development whereas Art. 6.4 speaks more strongly of a contribution to sustainable development;
- ▶ Governance: in Art. 6.4 a body to supervise the implementation of mechanism is established while Art. 6.2 is absolutely silent on any governance so that potential governance of this market mechanism may even be limited to unilateral reporting of Parties involved in international transfers without any scrutiny under the UNFCCC. However, the establishment of a rudimentary body or executing certain oversight functions such as tracking of units or accreditation of verifiers by already existing bodies may not be fully ruled out;
- ▶ Share of Proceeds (SoP): Activities under the MSDM shall provide a share of proceeds to cover administrative expenses and support adaptation on particularly vulnerable countries. Parts of the financial advantages of using international carbon market units from this market mechanism will thus be skimmed in contrast to activities under CA, where no such provision exists.

The list may be extended further. However, these entries already illustrate that there are significant differences among both market mechanisms, which may constitute a considerable ‘distortion of competition’ between both market mechanisms. It seems that the provisions for the MSDM are significantly more stringent and perhaps also more cumbersome than those for CA. Parties may thus prefer CA over MSDM so that finally only one of the market mechanisms may constitute the basis for the international carbon market. This may be a pity and perhaps a waste of resources if a lot of effort is invested in the development of details rules, modalities and procedures for a market mechanism, which is hardly applied in practice.

However, such a development cannot be reliably predicted and thus not fully avoided. If one of the market mechanisms appears to be more attractive to the Parties, this should be accepted, provided that both ensure the same level of environmental integrity. Yet, this can be questioned since the provisions for CA are obviously less stringent and involve less scrutiny of environmental integrity than those for the MSDM. To ensure a somewhat level playing field among both market mechanisms the guidance for CA should thus ensure that the CA contributes similarly to both raising the global mitigation ambition and sustainable development and is equally stringent in terms of environmental integrity.

5.2 Governance

In May 2016 in Bonn, during the first discussions on the implementation of Art. 6 some parties raised the question whether both market mechanisms are operated and governed separately or whether their governance could or should somehow be intertwined. The MSDM resembles, on the one hand, to some extent the CDM and could thus be considered as a separate, independent mechanism which also includes functions such as registration and tracking of transferred units with a view to conduct the corresponding adjustments of the involved parties. On the other hand, CA need to ensure corresponding adjustments of any ITMO. It is obvious that there is at least some overlap in the functions required and that thus it is conceivable to make use of potentially synergies.



Source: Authors' own compilation

Figure 3: Potential relationships of CA (Art. 6.2) and MSDM (Art. 6.4)

Under such a ‘nested’ approach each of the mechanisms could be focussed on certain functions required for a well-functioning international carbon market. Figure 3 illustrates the differences between ‘separate’ and ‘nested’ mechanisms:

- ▶ Under the separated approach the body of the MSDM would scrutinise whether the respective activities comply with the rules, modalities and procedures and finally issue certified units (CU). The body would also implement the procedures which are required that these CUs can be used towards the NDCs of other countries, including registration and tracking of those CUs;
- ▶ Under a nested approach the governing body would still scrutinise the activities and if they comply finally issue CUs. However, these CUs are similar to ITMOs so that their international transfers could be processed in the same way as ITMOs are dealt with under CA.

While the separated approach may ensure independence of each mechanism and facilitate internal consistency, the nested approach may increase the overall consistency of the international carbon market under the UNFCCC. Under the nested approach, CUs could also be used towards purposes beyond the international carbon market, for example in the context of results-based carbon funding. These considerations illustrate that both approaches are at least conceivable and cannot be ruled out from the outset. Both have advantage and disadvantages. However, this issue may be not the most urgent issue at this point in time. It can therefore be parked at the time being and again be picked up once the picture of the post-2020 international carbon market becomes more detailed.

6 Summary and conclusions

Our analysis suggests that the purpose of international carbon markets has changed. While increasing economic efficiency was more prominent during the first development phase of international carbon markets, raising mitigation ambition may become more important in the phase to come. Demand for carbon market units for compliance purposes under the UNFCCC is likely to be smaller than under the Kyoto Protocol since many of the potential buyers are expected to refrain from using carbon market units for compliance purpose in the future. However, demand from other areas, such as ICAO, or for other purposes, such as results based carbon funding, may create considerable demand to revitalise the international carbon market.

First estimates also suggest that some countries with relatively weak NDCs could potentially, as under the Kyoto Protocol, make use of international carbon markets and sell excess and ambitionless carbon market units (aka ‘hot air’) through the Art. 6 mechanisms. However, it is not yet clear whether these abundant amounts could and will actually be converted into units and offered under Art. 6 mechanism. If so, carbon club approaches could be an effective tool to prevent that global mitigation ambition is undermined by such units.

In terms of the design of the two market mechanisms pursuant to Art. 6.2 and 6.4, negotiations have just started. Many fundamental or more technical questions still have to be negotiated and it is not yet clear which positions individual parties will take. Some of these questions are overarching and are similar for both mechanisms, e.g. relationship to NDCs or procedures to ensure robust accounting. Others, such as nature of the ITMOs or governance are quite different and very specific for each of the mechanisms.

A key question will also be, whether, and if yes, how a level playing field can be ensured between both mechanisms. The difference in language in the Paris Agreement for both mechanisms suggests that Art. 6.2 may be less stringent both in terms of ensuring ambition and in terms of strictness of the procedures: Art. 6.2 does not explicitly refer to raising ambition but only implicitly through the chapeau of Art. 6 (6.1) while 6.4 requires delivery of an overall mitigation in global emissions; Art. 6.2 mandates the elaboration of guidance whereas 6.4 envisages the elaboration of rules, modalities and procedures; and finally, sustainable development should be promoted under Art. 6.2 while Art. 6.4 requests that the mechanism should contribute to sustainable development.

Art. 6.2 may thus be more attractive for many Parties since it may be easier to harmonise its requirements with domestic carbon market policies and instruments. However, for smaller Parties or Parties with, so far, less developed domestic GHG mitigation policies, Art. 6.4 may be an attractive option to facilitate and promote the development of domestic carbon markets.

On that background, we can distinguish three different types of countries:

- ▶ Parties with developed domestic carbon markets, which are mainly interested in linking their domestic emissions trading schemes to the international carbon market with the view to enhance liquidity and efficiency of their carbon market;
- ▶ Parties, which are at the beginning of the development of domestic carbon policies and which do not have NDCs that could be used for corresponding adjustments;
- ▶ Finally, a group of countries in-between both previous categories, which would focus on the development of sectoral approaches under Art. 6.2 such as the JCM.

We think it is worthwhile, to further scrutinise the options for the involvement in international carbon markets through in-depth case studies for all three categories of countries.

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