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# **How do regulated and voluntary carbon-offset schemes compare?**

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## **Abstract**

The purchase of Verified Emission Reductions through the voluntary carbon market has become a mainstream practice across business and individuals who aim to offset their greenhouse gas emissions. This voluntary market relies on offset projects which may or may not follow the standards of the Kyoto Protocol's Clean Development Mechanism. In this article, we review the international policy context in which the voluntary market has developed, its institutional structure, including general procedural rules, existing registries, actors involved, volume of emission reductions transacted, and its methodological and certification standards. We then conduct an analysis of project typologies and their potential sustainable development benefits. With all this information, we compare the voluntary market with the Clean Development Mechanism, we trace their differences, and we identify what the voluntary carbon market is good for and where its weaknesses lie.

## 1. Introduction

It may be argued that, by definition, the CDM and voluntary offset schemes have different objectives, although they share a number of similarities and continually influence each other. On the one hand, the CDM is a market mechanism aimed at facilitating compliance with emissions reduction objectives under the Kyoto Protocol by reducing the overall mitigation cost whilst promoting the sustainable development of developing countries - according to their own perception of what sustainable development is. On the other hand, voluntary offset schemes are not compliance instruments but a means for individuals and entities to reduce greenhouse gas emissions over and above mitigation goals set by regulations. In principle then, achieving low mitigation costs is not a priority of voluntary offset initiatives which instead often pursue wider environmental and social benefits. Consequently, one could assume that the CDM, as a market mechanism, would seek first to reduce emissions where mitigation costs are lower, whereas voluntary offset schemes would focus on projects where the overall benefits are higher and visible, or on sectors that the CDM cannot reach due to its current rules and market conditions.

Moreover, being a compliance mechanism, emissions reductions generated through the CDM should achieve the highest possible quality to ensure the integrity of the international mitigation regime represented by the Kyoto Protocol – which has so far implied high transaction costs and lengthy bureaucratic processes. On the other hand, voluntary schemes should ensure that the service they provide is also real, but making sure that transaction costs do not become an obstacle for the development of projects where other social and environmental goals may be considered more important and where the carbon component is merely a co-benefit and a potential source of additional funding (although this concept seems to be changing). The CDM is not fulfilling its sustainable development objective, in part as a result of an uneven distribution of projects around the world and the prioritisation of emission reduction activities which do not necessarily have a wider environmental benefits or a strong social component (Lohmann, 2006; Wara, 2007). For this reason, advocates of voluntary carbon offsetting argue that projects implemented under this scheme often achieve significant social and environmental benefits with a different geographical distribution (i.e., with more participation from African countries) (Hamilton et al., 2007).

Finally, in the case of the CDM, demand drivers are obvious (complying with the emissions reduction targets of developed countries) and such demand is expected to continue in the coming decades, subject to the continuation of the international climate regime and the establishment of further stringent emission cuts in a new regime post-2012. In fact, the uncertainty about future targets has currently limited CDM investments beyond 2012. In contrast, the drivers of the voluntary market are diverse and depend upon the interest and circumstances of offset buyers.

In the following sections, we attempt to compare the CDM with voluntary offset markets in order to shed light over a number of questions concerning these two institutions for climate mitigation: do they support different emissions reductions projects and sectors?; do these projects provide distinct overall environmental and social benefits?; have CDM and voluntary markets distinct geographic coverage?; do they provide the same quality of offsets; And finally, what is driving the voluntary offset market and how sustainable such demand may be into the future? We start providing a brief introduction to the origin and institutional structures of both regulated and voluntary offset schemes. In section three we analyse the evolution of these markets and in section four we provide a comparison in terms of numbers and project typologies, distribution, contribution to sustainable development, offsets quality and demand

drivers. This analysis permits to highlight that these two instruments may not be as different as they are often supposed to be and we challenge the idea that voluntary markets may perform better than the CDM in terms of local sustainable development.

## 2. An overview of regulated and voluntary carbon offset schemes

### 2.1. The Clean Development Mechanism

#### 2.1.1 Origins and fundamentals

Collaborative efforts between two or more countries (or entities in two or more of them) to reduce greenhouse gas (GHG) emissions and increase and/or maintain carbon stocks in land use activities under the United Nations Convention on Climate Change (UNFCCC) were first introduced as a part of the provisions related to Annex I country commitments. Indeed, Article 4.2 of the Convention states that these Parties may implement policies and measures on climate change mitigation by limiting their anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs “jointly with other Parties”. Accordingly, the Conference of the Parties to the Convention (COP), at its first session (1995), agreed to start a pilot phase of Activities Implemented Jointly (AIJ) – both among Annex I Parties and between such Parties and developing countries – and established a set of indicative criteria for the implementation of such activities (**Box 1**). These criteria served as the basis for subsequent collaborative project-based mechanisms to mitigate GHG emissions under the Kyoto Protocol, although AIJ activities could not be used for the fulfilment of the emission limitation and reduction commitments set out by the Convention<sup>†</sup> under the Protocol. However, these activities could contribute to achieve Annex I Parties’ commitments regarding the promotion, facilitation and financing required to transfer environmentally sound technologies and know-how to other Parties, particularly developing countries.

#### **Box 1. Criteria for AIJ projects**

Activities must be supplemental, and should only be treated as a subsidiary means of achieving the objective of the Convention,

Activities in no way modify the commitments of each Party under the Convention,

Activities should be compatible with and supportive of national environment and development priorities and strategies, contribute to cost-effectiveness in achieving global benefits and could be conducted in a comprehensive manner covering all relevant sources, sinks and reservoirs of greenhouse gases;

Activities require prior acceptance, approval or endorsement by the Governments of the Parties participating in these activities;

Activities should bring about real, measurable and long-term environmental benefits related to the mitigation of climate change that would not have occurred in the absence of such activities;

AIJ shall be additional to the financial obligations of Parties included in Annex II to the Convention within the framework of the financial mechanism as well as to current official development assistance (ODA) flows;

No credits shall accrue to any Party as a result of greenhouse gas emissions reduced or sequestered during the pilot phase from AIJ activities; through project-based approaches.

Source: own elaboration

The first COP also launched a process to “take appropriate action for the period beyond 2000, including the strengthening of the commitments of the Parties included in Annex I to the

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<sup>†</sup> Under Article 4.2, Annex I countries are committed to return to their 1990 levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol by the year 2000.

Convention (...) through the adoption of a protocol or another legal instrument”<sup>‡</sup>, which resulted in the adoption of the Kyoto Protocol in 1997. The Protocol establishes an overall emission reduction and limitation commitment of six greenhouse gases of 5.2% over 1990 emissions levels for Annex I Parties - distributed among them through individual quantified mitigation commitments - which must be achieved in the period 2008-2012. At the same time, the Protocol defines three “flexibility mechanisms” – two of them project-based, the Clean Development Mechanism (CDM) and Joint Implementation (JI), and the third one, Emissions Trading (ET), based on the “cap and trade” concept -, aimed at reducing the cost of fulfilling such commitments.

The CDM, as defined by Article 12 of the Kyoto Protocol, has the dual objective of assisting Parties not included in Annex I to contribute to the ultimate objective of the Convention and to achieve sustainable development goals, and assisting Parties included in Annex I to meet their quantified emission limitation and reduction commitments. CDM projects shall generate Certified Emission Reductions (CERs) additional to any that would occur in the absence of the project and provide real, measurable, and long-term mitigation benefits. Participation in the CDM is voluntary and limited to Parties to the Protocol, which shall designate a national authority for the CDM. Private and/or public entities may participate both in the implementation of projects and in the acquisition of CERs. Annex I Parties are eligible to use CERs for compliance if it has calculated and registered its assigned amount, has in place a national system to estimate its emissions and a national registry. Additionally, Annex I Parties must have submitted their most recent required emissions inventory, as well as information on their assigned amount. Drawing on the Brazilian proposal, a share of the proceeds from CDM projects is used to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation, as well as to cover administrative expenses. Moreover, CERs obtained during the period from the year 2000 up to 2008 can be used to assist in achieving compliance in the first commitment period (2008-2012).

### *2.1.2. Institutional structure and project cycle*

The operation of the CDM implies the participation of a number of actors, namely the Conference of the Parties serving as the meeting of the Parties (COP/MOP), the supreme body of the Kyoto Protocol; the CDM Executive Board, in charge of supervising the CDM, under the authority and guidance of the COP/MOP, which implies, e.g., approving new baseline and monitoring methodologies, accrediting operational entities and making recommendations to the COP/MOP for their designation (as well as for the suspension and withdrawal of this designation), registering projects and issuing CERs; Designated Operational Entities (DOEs), which validate proposed CDM projects and verify and certify emissions reductions resulting from such projects; Designated National Authorities for the CDM (DNAs), established by each Party willing to participate in the Mechanism to assess the environmental and social impacts of projects and, if applicable, issue letters of approval of voluntary participation, including confirmation that the project activity assists the host Party in achieving its sustainable development; and project participants.

The process leading to the issuance of CERs by the CDM-EB is described in the Marrakech Accords –the rulebook of the Kyoto Protocol– and is known as the CDM project cycle. This cycle starts with the validation of the proposed project by a DOE based on the information submitted by the project participants in a Project Design Document (PDD). During this

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<sup>‡</sup> Decision 1/CP.1, also known as the “Berlin Mandate”.

process, the DOE carries out an independent evaluation of the project against the requirements of the CDM, particularly regarding consultations with local stakeholders, environmental impacts, additionality and the adequacy of applied baseline and monitoring methodologies. Additionally, at the validation stage the DOE must receive from the project participants the letters of approval issued by the DNAs of all Parties involved in the project. If the DOE determines the proposed project activity to be valid, it submits a request for registration to the CDM-EB, who then registers the project unless a review is demanded.

Once registered, the project's performance is monitored by its developers following the plan submitted at validation. Then, a DOE carries out the ex post verification of the monitored reductions in emissions that have occurred as a result of the implementation of the project activity during the verification period. The DOE shall, based on its verification report, certify in writing that the project activity achieved the verified amount of reductions in emissions that would not have occurred in the absence of the CDM project. The certification report constitutes a request for issuance to the EB of CERs equal to the verified amount of emissions reductions. The issuance of CERs is considered final 15 days after the date of receipt of the request for issuance, unless a Party involved in the project activity or at least three members of the EB request a review regarding issues of fraud, malfeasance or incompetence of the DOE. Upon being instructed by the Executive Board to issue CERs for a CDM project, the CDM registry administrator forwards the issued CERs – after discounting the share of proceeds to cover administrative expenses and to assist in meeting costs of adaptation – to the registry accounts of Parties and project participants involved. Each CER issued has a unique serial number.

In order to ensure the credibility, transparency and accuracy of the mechanism, the operation of the CDM is supported by a centralized registry and a number of publicly accessible databases – e.g., for methodologies, projects, issued CERs, DNAs, DOEs and EB decisions – the international transaction log and standards for the accreditation of operational entities. Additional guarantees are provided by the fact that, if an operational entity ceases meeting the accreditation standards or applicable provisions of the COP/MOP, it may be suspended, or its designation may be withdrawn. Moreover, if significant deficiencies are identified in the relevant validation, verification or certification report for which the entity was responsible and a review reveals that excess CERs were issued, such entity shall acquire and transfer an amount of reduced tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) equal to the excess CERs issued.

## ***2.2. Voluntary offset schemes***

### *2.2.1. Origins and fundamentals*

Voluntary offset schemes can be defined as those aimed at generating GHG emissions reductions not required by Kyoto Protocol's derived regulation. Through these schemes, industries and individuals voluntarily compensate their emissions or provide an additional contribution to mitigating climate change. These schemes had their start on the desire of conservation organizations to find new ways of financing their projects (Hamilton et al., 2007). The first project developed under this concept was carried out in 1989 - long before the creation of the CDM in 1997 and even before the adoption of the UNFCCC in 1992 - when AES Corp, a US electricity facility invested voluntarily in an agro forestry project in Guatemala. The idea was to pay Guatemalan farmers to plant 50 million trees, which would sequester carbon dioxide and thus compensate the GHG emissions arising from the generation of electricity and thus improve the image of the company (Corbera and Benet, 2007). Offset

schemes gained popularity a few years later, when, in 1995 the AIJ pilot phase was launched by the UNFCCC. A total of 159 projects, of which 20 were carbon sequestration (forestry) projects, were implemented in developing countries and countries with economies in transition with the support of Annex I governments and entities. These initial efforts under the UNFCCC are also considered voluntary given that, as mentioned above, none of the emissions reduced or the carbon sequestered can be accredited to any of the Parties involved in such projects (ibid.). Since then, a voluntary offsets market has been operating at different levels of activity, as will be shown later in this article.

Voluntary offset schemes have been praised for their flexibility vis-à-vis the regulated schemes regarding eligible project types –the wide inclusion of forestry projects being the most notable difference–, their focus on social and environmental benefits and their relatively low transaction costs (which have been linked to lower quality controls compared to the regulated mechanisms). Further, these schemes arguably provide insights into public interest in climate change, as well as where the broader market may be heading towards (Hamilton et al., 2007).

### *2.1.2. Institutional structure and project cycle*

Unlike the Kyoto project-based mechanisms, voluntary offset schemes do not have a unique overseeing authority, a common set of rules, procedures and standards, or a centralized registry. Instead, a number of independent protocols, standards, verification procedures and registries have emerged trying to guarantee the quality of the offsets traded in the market. These include, for example, the Voluntary Carbon Standard (VCS), TÜV Süd's VER+ Standard, the Gold Standard, the Climate, Community, and Biodiversity Standard (CCB), and the ISO 14064/65 standard (**Table 1**). Even though voluntary offset schemes are defined by a lack of regulatory drivers, they are heavily influenced by the regulated mechanisms explained above (i.e., CDM, JI), particularly concerning basic rules, processes and actors. Consequently, projects developed through voluntary schemes must prove that they reduce emissions against an established baseline and that such reductions are additional. Moreover, under many of the existing standards, projects must demonstrate sustainable development benefits and, in some cases such as the CCB program, the latter is the main objective of the standard.

Likewise, the most complete existing standards include a project cycle similar to the one in place for the CDM, encompassing validation, monitoring, and verification. Project registration is also a requirement under many voluntary offset programmes. Following the example of the CDM, third party verification is widely used in voluntary market. According to a survey carried out by New Carbon Finance and The Ecosystem Marketplace in 2007, there is an overwhelming use of third party verifiers in the voluntary market (77% of the offset sellers interviewed), rather than the customer's and seller's own verification procedures (Hamilton et al., 2007). Additionally, in many cases, validators and verifiers approved by these standards are those designated by the CDM Executive Board.

Many of the existing standards issue a particular type of credit or logo at the end of the verification process, although many aspects surrounding them (e.g., issuing body, crediting period, issuing fees) are not harmonized between standards. Instead of a unique credit accounting system, the voluntary market relies on a number of registries, some of which are independent whilst others are linked to specific standards, programmes or verifiers (**Table 2**). The aforementioned survey found that registries are several steps behind standards as priorities for the voluntary offset markets. In summary, out of a total of 64 suppliers surveyed, 25% indicated that holding credits in a registry was not applicable to them. Of the 48





















































