

## CDM INSTITUTIONAL-REGULATORY EVOLUTION AND FUTURE PERSPECTIVES<sup>1</sup>

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### 1 INTRODUCTION

The Clean Development Mechanism (CDM) has played an important role in financing projects that contribute to the sustainable development of developing countries. However, the use of the mechanism has been constrained by its high transaction costs, resulting in CDM-generated carbon credits market that is below its true potential. Acknowledging this constraint led to international negotiations among Parties to the United Nations Framework Convention on Climate Change (UNFCCC) with a view to reforming CDM, making it more cost-effective in order to achieve its main objective of promoting the sustainable development of beneficiary countries. In that respect, a Programmatic CDM was created, aiming at broadening project financing possibilities and policies that can promote sustainable development and at the same time reduce greenhouse gas emissions (GHG).

Despite its high transaction costs, the CDM generated over 1.9 billion Certified Emission Reductions (CER)<sup>3</sup> by May 2018, which has attracted private-sector investments in developing countries and contributed to their sustainable development objectives, given their voluntary nature. During the two initial commitment periods, encompassing 2005-2020, the institutional-regulatory structure evolved significantly, with sectoral expansion and its simplification through the Programmatic CDM and the standardization of analysis methodologies. The high transaction costs, despite being a constraint, have contributed to high-quality certification, since projects' environmental integrity enjoys the highest credibility.

It can be stated that the CDM is a certification instrument for the effective implementation of mitigation actions in developing countries in a transparent, verifiable and independent way, as it meets all the criteria, such as monitoring, report and verification (MRV). Therefore, its potential use as a certification mechanism,

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1. The views expressed here are the author's opinions on CDM, that she had expressed before in other publications. Please refer to the author's previous works, see Gutierrez (2009; 2010) (note from the editors).

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in a context of mitigation results-based climate finance, is very high, and applies both to national commitments of countries that are Parties to the Paris Agreement and to financial channels that are being implemented, such as the Green Climate Fund (GCF), in order to assist developing countries. In fact, the debate about establishing a connection between the CDM and financing channels in the scope of UNFCCC is already part of the agenda of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

This chapter is broken down into the following structure: it begins with a background of how the CDM started and its important role in the creation of a carbon market (section 2). The underlying high transaction costs of the certification process of the CDM carbon credits are detailed right after. It is also indicated that the stage of high transaction costs was necessary in order to guarantee projects' environmental integrity. Then, the main outcomes of a research on the CDM transaction costs in Brazil follows suit (section 3). Finally, perspectives on the future use of the CDM infrastructure are detailed in section 4, in which the main conclusions are also presented, particularly the mitigation actions certification mechanism for developing countries, notably Brazil, as established by the Paris Agreement, to receive international financial support.

## 2 THE KYOTO PROTOCOL AND THE CDM

The entering into force of the Kyoto Protocol, in 2005, laid the foundations for a global carbon market, constituted by different regional or national markets, as well as mechanisms of projects reducing emissions, such as the CDM or Joint Implementation (JI). The different markets disagree in several aspects, among which: size, conception characteristics, sectoral and geographic scope, and nature, and may be either voluntary or not. Some of those markets were created with a view to complying with emissions reduction commitments negotiated under the Kyoto Protocol, which includes the CDM, while others are of a voluntary nature, such as the *Chicago climate exchange* (CCX), which functioned from 2003 to 2010. The recent expansion of national or regional initiatives towards the creation of carbon markets demonstrates the high political priority given to this instrument, as a recognition of its economic efficiency advantages and as an instrument that induces technological innovation (World Bank, 2016).

On the one hand, the carbon market trades two types of assets: *i*) emissions allowances allocated under Kyoto Protocol's cap and trade approach; e *ii*) emission reductions based on projects that include the CDM and JI. On the other hand, one can concisely affirm that the carbon market is divided into two segments: *i*) Kyoto, headed by the European Union; and *ii*) non-Kyoto, headed by the United States.

Despite some existing initiatives, such as CCX, it is safe to say that the carbon market was consolidated by the Kyoto Protocol flexibility mechanisms. Two sectors emerge in the carbon market: cap and trade and reduction credit trade, generated by projects that are reducing emissions. The former, as described before, occurs when Annex I countries<sup>4</sup> exceed their cap on the total emissions allowed and trade allowances to other Annex I countries. In this case, the “currency” used is the Assigned Amount Unit (AAU). The latter is originated in the CDM and JI mechanisms. Respective currencies are CERs and ERUs – Emission Reduction Units. In the latter case, while final certification of the reduction generated by projects by the United Nations Organization (UN) is not granted, the relevant concept will be the ERU.

It is worth mentioning that the carbon market is, therefore, a universe that encompasses several transactions through which volumes of GHG emissions reductions are traded, differing in size, format and regulation. Information on this market is limited and many of the transactions take place in a strictly private manner, with no publication of the terms of each agreement, particularly the prices and volumes of GHG reductions.

### 3 THE CDM AND INSTITUTIONAL ASPECTS: HIGH TRANSACTION COSTS

#### 3.1 General Institutional Aspects

Transaction costs, in the context of the Kyoto Protocol, are defined as those costs incurred in the preparation of CERs. Basically, transaction costs are generated by three main sources: *i*) preparation of documents; *ii*) validation and certification by Designated Operational Entities (DOE), including follow-up costs; and *iii*) costs charged by the CDM's Executive Board and host country (CEPAL, 2004).

In 2003, therefore before the Kyoto Protocol came into effect, World Bank estimates indicated an average value of US\$ 270,000, related to the costs of a project only to meet the technical and bureaucratic requirements of the CDM. Even for small-scale projects,<sup>5</sup> which are subject to a simplified analysis, the World Bank estimated that at the time, US\$ 110,000 would contribute to reducing the economic and financial profitability of the CDM projects (OECD, 2004). This is a real financial barrier for many projects, particularly in the absence of specific sources of capital financing or projects that are not being supported by a carbon fund.

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4. Annex I countries are the ones with emissions reductions targets; non-Annex I countries do not have mandatory reduction targets.

5. COP-8 defined simplified modalities and procedures for the CDM projects ranked as small-scale projects: *i*) renewable energy project activities which have an output capacity up to 15 megawatts; *ii*) energy-efficiency up to 15GWh (or equivalent); and *iii*) other projects that aim to achieve GHG emission reductions up to 15t of carbon dioxide equivalent (KtCO<sub>2</sub>e).

A survey conducted by Limiro (2009),<sup>6</sup> apud Souza et al. (2012), demonstrated that transaction costs remain high even after the implementation of the CDM, and varied, in 2009, between US\$ 60 thousand and US\$ 205 thousand, depending on the scale of the project and the need, or not, for proposing new methodology. In 2011, therefore, at the end of the first commitment period of the Kyoto Protocol, even with the intensification of requests for project registration, the costs of preparing the CDM projects averaged US\$ 200 thousand (excluding those resulting from the proposal of new methodologies – US\$ 125,000). Such costs could not be neglected, depending on the number of CERs generated by the projects (Ambrosi, 2011).

Very often, carbon funds and other brokers bear the transaction costs, and then recover them by selling CERs. The initial expectation that transaction costs would fall with a larger number of CDM projects was partially missed because of the CDM Executive Board's rejection of many baseline methodologies and monitoring processes that had already been approved by Designated Operational Entities. The consequence of transaction costs is the significant increase of potential CDM projects' costs, as well as lower supply, given that many projects never get off the ground due to high transaction costs.

The most adverse effect of transaction costs is to favor large-scale projects, which may virtually generate a large number of CERs and maintain a net financial and economic profitability of these costs. Noticeably, projects involving electricity generation and capture of methane, hydrofluorocarbon destruction (HFC), among others, are of the type that tend to maintain economic profitability in the context of the CDM rules. Projects that are the most affected by transaction costs are certainly small-scale ones, which will not be able to generate CERs to cover their own costs.

Furthermore, transaction costs are added to the degree of risk where emission reductions are certified. The trading of most of the reductions, that is, ERU units and not CERs, occurs in a context of uncertainty as to the final certification of these emission reductions, hence directly affecting the expected revenue of the projects, both in terms of volume and price of carbon credits. Other equally important risks include the usual ones, associated with project implementation and success, as well as technological, economic and political risks. In addition to the said transaction costs, the presence of risk at all levels tends to be a source of additional costs, which reduces the CDM's potential profitability (Janssen, 2001). The possible result of the project not being carried out is highlighted, however, it would not eliminate the aforementioned costs.

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6. Limiro, D. *Créditos de Carbono: Protocolo de Kyoto e Projetos de CDM*. Curitiba: Juruá Editora, 2009.

### 3.2 Institutional aspects in Brazil

In Brazil, assessing the CDM projects is a responsibility assigned to the Interministerial Commission on Global Climate Change (CIMGG), which is also Brazil's National Designated Authority (NDA), in charge of implementing the Kyoto Protocol at the national level. In the assessment process, the following aspects are considered: voluntary participation on behalf of each Party involved, project design document (PDD), validation report and project's contribution towards the country's sustainable development. The latter encompasses five criteria: income distribution, local environmental sustainability, development of work conditions and net job generation, capacity-building and regional integration with other sectors. In Brazil, the CDM process has granted certification to project activities and program of activities (PoA).<sup>7</sup>

For a Project to become a CER, project activities and PoAs must necessarily go through the seven stages of the project's cycle: PDD development, validation, national approval, registration, monitoring, verification, and issuance of CERs.

In Brazil, the process of assessing project feasibility is very strict, compatible with the pursuit of environmental integrity as a goal of maximum importance. This process generates high transaction costs, both at the stage of PDD review and after its approval, and requires it to be effectively operational, since it is necessary to verify whether the emission reductions are actually occurring according to the initially proposed estimates. In fact, these high costs were necessary to guarantee project environmental integrity and their alignment with the objectives of sustainable development in Brazil. According to Miguez et al. (2010), the Brazilian approval process is considered exemplary and safe by investors, which guaranteed an additional value to Brazilian projects by reducing regulatory risk at the international level.

A research commissioned by Godoy (2013) tries to answer the question about whether inherent transaction costs to the CDM had an adverse impact in developing a CDM project in Brazil. The universe that has been investigated and included in this research comprises the 89 companies with CDM projects implemented in Brazil that already had certificates issued up to March 2009. Out of these CDM projects, distributed in eleven sectors, 41 responded to the survey, which corresponds to 46% of responses on the total questionnaires sent.<sup>8</sup>

Transaction costs in this research have been divided into *ex ante* (associated to the effective implementation of a project) and *ex post* (incurred after their implementation). *Ex ante* costs include information costs, broker costs and other costs – with particular reference to those arising from the time spent between the preparation of the project and its implementation –, in addition to the costs of

7. Project activity is an action causing a reduction in GHG emissions and program of activities is a program encompassing several component project activities (CPA) with the same purpose.

8. Please refer to Godoy (2013) for further detail.

drafting contracts to guarantee the purchase of carbon credits, since this is an over-the-counter market. Ex post costs are basically associated with monitoring costs.

The research's main conclusions indicate that: *i)* the CDM's most important objective is to look for environmental improvement, even though the possibility of trading CERs has been a relevant encouragement; *ii)* the costs of negotiating CERs are within reason, with the consultancies hired playing the role of middleman between buyers and sellers; *iii)* the intrinsic complexity of the CDM process in all its stages created a need for companies to hire private consulting firms; *iv)* the need to improve the institutional set-up, where there is great dissatisfaction with DOEs and the CDM Executive Committee, has given greater transparency and speed to decisions; *v)* the uncertainty about the future of the CDM at that moment; and *vi)* high rates of registration and auditing, which have often offset the profit obtained with trading CERs.

The research outcomes indicate, beyond question, that inherent transaction costs in the approval process of CDM projects can act as a barrier. It is an extremely complex institutional framework, with strict national and international regulatory aspects, one that is constantly changing, and complying with it involves high financial resources and time, which often becomes an impediment for small and medium enterprises to have access to the CDM. However, it is worth mentioning the scope of environmental integrity, for which, without a doubt, certification of a CDM project is a highest standard seal of environmental quality not only locally, but mainly internationally.

Mindful of transaction costs, the CDM Executive Committee created the Programmatic CDM, through which several projects with common characteristics can be grouped together to manage the process in a unified way, thus significantly reducing transaction costs – PoA, as previously defined. Another important initiative is the systematic search for simplification and consolidation of methodologies.

#### **4 CONCLUSIONS: THE CDM'S INSTITUTIONAL CONTRIBUTION IN THE UNFCCC AND TO THE BRAZILIAN GOVERNMENT**

Despite the end of Kyoto first commitment period and the non-ratification of its second commitment period by the parties to the Convention for it to go into legal effect, its legacy can and should be used as an important tool in the implementation of sustainable development policies to combat climate change. Despite the negative moment experienced by the CDM, where demand tends to be zero, except for the existence of some multilateral agencies and philanthropic supporters, the CDM is nevertheless a unique instrument for the GHG reduction process, via its projects and program of activities in developing countries, and enjoys the highest credibility.

The complex institutional-regulatory framework created with the CDM, with the interaction of several national and international governance levels, was a

very fruitful learning process for the different stakeholders involved in the process. Despite the intrinsic constraints posed by transaction costs, which have significantly limited the use of the CDM – but were necessary at a first instance – the evolution of this structure was positive, and important initiatives were taken to reduce these costs, in particular the possibility of PoA. Once again, it is crucial to highlight the importance of environmental integrity in the CDM projects, which is guaranteed by the process itself, from this framework of sustainable governance and its potential application in other climate change policy contexts.

According to Lutken (2016), the CDM is still the only instrument able to provide significant cash flows for investments with GHG emission reductions benefits. With the upcoming cessation of the CDM, this flow will no longer exist, and projects reducing emissions run the risk of not having access to specific sources of funding. Also, rightly according to him, market-based mechanisms alone are not enough to promote funding for emissions reductions that have not yet been certified: two concrete proposals are presented with a view to providing initial funding for emission reduction projects. The first one suggests the securitization of emission reductions that have not yet been certified; the second one establishes a set value for CERs to be certified (Lutken, 2016). Both proposals aim to guarantee initial capital for CDM-type projects, prior to certification of CERs.

The CDM created a highly credible institutional-regulatory framework, able to measure, report and verify the outcomes of the emissions reduction process in the scope of projects and programs. With the progress of negotiations on future mechanisms, there are alternatives for the use of this infrastructure in various instances of policies related to combating climate chan.

Having that in mind, during the XI United Nations Conference on Climate Change (CMP-11), held in December 2015 in Paris on the occasion of COP-21, the CDM Executive Board was invited to map out new possibilities for the use of the infrastructure developed from the CDM in the context of potential funding channels that emerge under the UNFCCC. The CDM Executive Board (2016) identified several instances in which the CDM infrastructure could be a means to:

- provide an array of opportunities for actions and projects that aim to reduce GHG emissions to have access to specific funding channels, aiming at verifiable mitigation;
- provide flexible options to comply with emission reduction commitments in different contexts (commercial aviation agreements, for example); and
- indicate various possibilities for different stakeholders (companies, cities, international entities, etc.) can voluntarily offset emissions.

The Green Climate Fund (GCF), created in the scope of the UNFCCC to support developing countries in their adaptation and mitigation efforts, aims at supporting projects, programs and policies, via thematic funding windows, with the expectation that the volume of funding will reach US\$ 100 billion annually by 2020. It would be a natural consequence to combine the GCF with the CDM infrastructure, as has been advocated (Mikolajczyk et al., 2016).

In turn, the Paris Agreement is a legal global framework that strengthens response to the threats imposed by climate change, relying on the experience acquired by the UNFCCC in the past few years. In order to accomplish the objective of keeping the average temperature rise, if possible, below 1.5°C, the agreement provides for the urgent implementation of mitigating actions. Expanding the carbon market and strengthening financial institutions in order to increase funding and allow for a transition to a low-carbon economy are crucial points in the Agreement and serve as a basis for the future mechanism established by its Art. 6.4. It should be noted that more than half of the nationally determined contributions (NDCs) submitted do recognize the importance of market mechanisms, through international, regional and domestic emission schemes, including the CDM as a complement to their national mitigation actions, taking into consideration greater efficiency and the lower costs achieved.

The Brazilian NDC provides for greenhouse gas emissions reductions below 2005 levels by 37% by 2025, besides indicating a reduction by 43% below 2005 levels of domestic emissions by 2030. The strategy of ensuring flexibility in national implementation grounded its elaboration, given that it was not detailed by specific policies and sectors. It is worth mentioning that the Brazilian NDC is compatible with and supports the objectives established by the National Policy on Climate Change, defined by Law No. 12,187, dated December 29<sup>th</sup>, 2009, and ruled by Presidential Decree No. 7,390, dated December 9<sup>th</sup>, 2010, comprising the period between 2005-2020. In the list of challenges associated with achieving the NDC's targets, are also those related to the development of a strategy for its financing and the institutional aspects of its implementation, even though there is no conditionality regarding international financial support. Brazil is openly positioning itself for the use of UNFCCC financial mechanisms to possibly receive support from developed countries, aiming at generating benefits (Pretendida..., 2015).

In that respect, the CDM appears as a powerful instrument, capable of attesting/certifying mitigating actions in the different countries that have signed the Paris Agreement in a transparent, verifiable and independent manner, particularly for developing countries. Its potential as an MRV framework provides an important basis for channeling funding for actions that can potentially be considered within the scope of the GCF. In addition, the Paris Agreement also established that national mitigation actions/contributions are reported in a transparent and comparable manner, which makes the CDM infrastructure appropriate to the MRV process of developed countries.



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