

THE CLIMATE CHANGE CONVENTION AND ITS KYOTO PROTOCOL AS ACTION DRIVERS¹

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1 BRIEF BACKGROUND OF THE CLIMATE CHANGE CONVENTION

In 1988, the United Nations Environmental Program (UNEP) and the World Meteorological Organization (WMO) established the Intergovernmental Panel on Climate Change (IPCC), aiming at evaluating, on a scientific perspective, knowledge on climate change, assessing possible socio-economic and environmental impacts, and formulating realistic strategies to address the causes and consequences of increased concentration of greenhouse gases in the global climate system. This was one of the most important steps in the recognition of this phenomenon.

The IPCC had the participation of important scientists and experts on climate-change related issues. The first panel's evaluation report was published in 1990 and led the General Assembly of the United Nations (UN) to adopt in New York in May 1992 the text that gave rise to the United Nations Framework Convention on Climate Change (UNFCCC).

An intense political-preparatory process was necessary for the adoption of the convention, as there was a need to develop international climate-change related policies and legal instruments. This process, together with other global environmental issues, culminated in the 1992 United Nations Conference on Environment and Development in Rio de Janeiro (Rio 92). The agreement came into force in 1994 and Brazil was the first country to sign it.⁵

1. This text reflects the personal position of the authors and not of the institutions of the Government to which they belong, nor do the authors necessarily share the same view on the issues addressed in this book by other chapter authors. Any contradictory views with this chapter are the result of possible divergences of opinions.

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5. In order to follow up other countries' ratification status, see: <https://bit.ly/1ujgxQ3>.

The UNFCCC was one of the conventions signed during Rio-92. The conference report is the Agenda 21 document and two other conventions were adopted in addition to the UNFCCC, which also aim at addressing global environmental priority issues: the Convention on Biological Diversity and the United Nations Convention to Combat Desertification and Mitigating the Effects of Drought.

The UNFCCC was signed by Brazil on June 4th, 1992 at the Rio de Janeiro Conference, to which 165 countries subsequently joined. For Brazil, the Convention was internalized in the legal system on May 29th, 1994, ninety days after its ratification by the National Congress on February 28th, and its deposit with the UN, in the Secretariat of the convention. The Convention entered into force on March 21st, 1994, ninety days after being ratified by fifty countries. Currently, 197 Parties have ratified it (196 Parties and a Regional Organization for Economic Integration), which makes it the most universal of the United Nations conventions.⁶ Only a few countries, usually countries facing internal problems such as wars, have not adhered to the Convention on Climate Change.

Even at the time, and considering the lack of full knowledge on climate change processes and impacts, the Convention text has brought great advances to the discussion of sustainable development. The Convention recognizes, among other elements, that:

- climate change and its adverse effects to the Earth's climate are a common concern of humankind;
- developed countries cause the largest share of global, historical and current greenhouse gases emissions; and
- per capita emissions from developing countries are still relatively low and the share of their global emissions will increase so that they can meet their social and development needs.

2 OBJECTIVE OF THE CONVENTION ON CLIMATE CHANGE

The aim of the convention is to achieve the stabilization of greenhouse gases concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the global climate system. This level should be achieved within a time frame that is enough to allow ecosystems to adapt naturally to climate change, ensuring that food production is not threatened and allowing economic development to proceed in a sustainable manner.

6. A list of countries that have ratified the Convention and respective signature dates can be found at <https://bit.ly/1ujgxQ3>. Accessed on: May 7th, 2018.

In the text of the Convention, there are two major groups of countries: the so-called group of countries in Annex I to the Convention, which is formed by developed countries, i.e. the Organization for Economic Cooperation and Development (OECD) and the bloc formed by countries of the former Soviet Union and Eastern Europe; and the group known as non-Annex I, formed by developing countries. Each of these groups, however, are alliances of countries whose interests are not homogeneous, for example: among developed countries, specific negotiation groups with greater affinities on climate change issues such as the European Union and the group known as *umbrella*, which includes Japan, the United States, Canada, Australia and New Zealand; among developing countries, the Alliance of Small Island States (AOSIS), the Organization of the Petroleum Exporting Countries (OPEC) and, especially in the case of Brazil, the group of large emerging developing countries known as BASIC in English, which includes Brazil, South Africa, India and China. Also worthy of note is the G77 + China group of developing countries, of which Brazil is also part.

3 THE CONVENTION'S COMMITMENT ON CLIMATE CHANGE

The *National Communication* is a document provided for in the Convention⁷ and represents the official information of the Government of Brazil on anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol.⁸ The document also contains an overview of the measures taken or envisaged for the implementation of the convention in the country.

The elaboration of the *National Communication* follows the guidelines established by the Convention in Decision No. 8/CP 11. The inventory follows the guidelines established by the IPCC for the preparation of national inventories of greenhouse gases.

Other general commitments for all parties are listed in Article 4, paragraph 1, in particular in subparagraph (b), which states that the Parties shall formulate, implement, publish and regularly update national and, where appropriate, regional programs containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change.

7. As per the binding commitment established in Article 4, paragraph 1, letter "a" and Article 12, paragraph 1, letter "a", of the UNFCCC.

8. The Montreal Protocol on Substances that Deplete the Ozone Layer is an international treaty that entered into force on January 1st, 1989. The document signed by the Parties sets specific obligations, particularly the binding progressive phase down in production and consumption of substances which deplete the ozone layer (SDOs) until its complete phase out. Some of these substances are also greenhouse gases, but since they were already controlled under this protocol, the Convention on Climate Change did not double control.

4 PRINCIPLES OF THE CONVENTION ON CLIMATE CHANGE

The Convention on Climate Change aims at stabilizing atmospheric concentrations of greenhouse gases at such levels that the climate system (atmosphere, oceans and biosphere) is not affected in a dangerous way. It also states that the speed of climate change should not exceed such value that ecosystems may have difficulty adapting to changing conditions. It also considers that stabilization of concentrations should not be made at the cost of sharp reductions in emissions levels as to adversely affect social and economic development.

The Convention on Climate Change does not specify what future levels of emissions should be, although Article 4, paragraph 2 (b) states that the Annex I countries had the aim of returning, whether individually or jointly, their anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol to their 1990 levels. Moreover, the judgment as to whether or not a particular climate change is characterized as dangerous is to a large extent a judgment which will depend on the frequency and magnitude of the adverse impacts of climate change.

In its text, which is the result of a difficult negotiation process for its elaboration and adoption, the Convention on Climate Change establishes several principles, the most important of which are listed below.

The precautionary principle, i.e. lack of full scientific certainty, should not be used as a reason for postponing the adoption of measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Even in the absence of complete certainty in forecasts, and taking into account the magnitude of the likely adverse effects, caution should be exercised and the worsening effect must be avoided.

The principle of common but differentiated responsibilities of all countries is another principle established by the Convention. Greenhouse gases have long lifetimes in the atmosphere – a decade for methane, and centuries for carbon dioxide and nitrous oxide – and are rapidly mixed in the atmosphere by planetary movement. So, it is no use thinking about climate change in only one country, as everyone will be affected.

Responsibility is differentiated among countries, as historical records show that emissions that cause climate change vary widely among them. In recognition of the fact that emissions, once produced, have a long-term effect, the Convention recognizes that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that *per capita* emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs.

Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

The rationale behind the process of emissions and development is based on the following: *i*) in the initial part of the curve, those countries still in an initial stage of development (low gross domestic product – GDP *per capita*, like most African countries) would have a very low, close to zero, emissions rate; *ii*) as the GDP increases, emissions growth accelerates (for example, China, India, Brazil, middle-income countries), as the incorporation of larger portions of the population into the formal economy results in emissions through increased human activity; and *iii*) finally, in the stage of developed countries, with stable or declining population and economy changing from industrial to services, there is a stabilization of emissions with GDP increase. The convention states that countries in the middle of the curve (such as Brazil, China and India) should increase their emissions in order to ensure sustainable development and poverty eradication. In addition, it states that the developed countries responsible for most historical emissions of greenhouse gases must take the lead and make significant and absolute reductions in their emissions.

5 THE KYOTO PROTOCOL

The climate change policy that led to the Kyoto Protocol was conditioned by decisions made within the framework of the Convention on Climate Change itself and in the so-called Berlin Mandate – resolution of the first conference in Berlin of countries that ratified the Convention, which launched the negotiation of the Kyoto Protocol.

Following the entry into force of the Convention in 1994, the Conference of the Parties (COP) 1 was held in Berlin in 1995. At that first meeting, it was possible to identify that an increase in greenhouse gas emissions was taking place and that the proposed initial emission reduction target for developed countries would not be adequate.

The Berlin Mandate established that developed countries should set quantitative emission reduction targets for 2005, 2010 and 2020, as well as describe the policies and measures that would be required to achieve those targets, the deadline being COP 3 in Kyoto, Japan, which would be held in December 1997.

For developing countries, as is the case of Brazil, no additional commitments were established, but these countries should make progress in meeting existing commitments. That is, developing countries should establish programs to address the problem, without quantitative targets for limiting or reducing greenhouse gas

emissions, and conditioned to adequate financial and technological resources being made available by industrialized countries.

The problem, therefore, for the negotiation of the Kyoto Protocol was to first decide on the emission levels of greenhouse gases that could be tolerated in the near future and then decide how the burden would be shared in order to obtain the necessary reductions among countries.

The establishment of objective and fair criteria for sharing the burden of climate change mitigation was of crucial importance for developing countries. There was a clear tendency to replace the principle of common but differentiated responsibility⁹ agreed in the convention by other mechanisms that, in practice, had in effect of transferring the burden of mitigation instead of just allocating this burden according to the responsibilities of each country.

For instance, carbon budget and *per capita* emission approaches would favor developed and populous countries, respectively. Both approaches do not adequately address relevant socioeconomic issues: they are inadequate in terms of equity and are “shortsighted” because they simply focus on a given time period and disregard the historical perspective.

6 BRAZILIAN PROPOSAL OF 1997 ABOUT THE CLEAN DEVELOPMENT FUND

The Brazilian proposal for elements for the preparation of the Kyoto Protocol, elaborated by the Ministry of Science and Technology in 1997, quantified in a practical and objective way the sharing of costs of tackling climate change, according to the effective responsibility of each country in causing the problem – a principle known as “the polluter pays” principle.

Brazil proposed the adoption of a model in which each country’s responsibility for climate change was estimated not in terms of its causes, i.e. the greenhouse gas emissions that give rise to the problem, but in terms of their effects – measured by the contribution of each country to the increase in the average temperature of the Earth’s surface – in the effective climate change caused by those emissions.

According to the Brazilian proposal, the responsibility of each country should be attributed in terms of its relative contribution to the increase in global average temperature and not only in terms of greenhouse gas emissions in a given year or even the contribution to the concentration of gases in the atmosphere. This difference in parameters indicated that Annex I Parties had a greater contribution to the problem. While some studies estimate that emissions from developing countries may equal those of industrialized countries in two to three decades,

9. For further information on the scope for interpretation of the *principle of common but differentiated responsibilities*, see Chapter 16 (notes from the editors).

the developing countries' responsibility for increased emissions as a result of their emissions will only match that of developed countries within more than a century.

There is no single path for greenhouse gas emissions for a certain level of temperature stabilization or a given level of concentration in 2100; the path will depend on the assumptions about: *i*) patterns of economic and population growth, energy production and consumption, changes in land use and conversion of forests to other uses; *ii*) scientific uncertainties in the treatment of the global carbon cycle, global climate system response, climate sensitivity, uncertainties about natural radiative forcing, cloud formation, among others; and *iii*) choices between how much to mitigate as quickly as possible or how to adapt (adaptation becomes more costly and less effective as climate change progresses).

In theory, in order to achieve a certain level of stabilization temperature by 2100, infinite concentration paths are possible and, for a certain level of concentration, infinite emission paths are possible. For bigger emissions in the initial years, bigger reductions will have to occur in subsequent years. Defining a single path or a maximum emission limit on a certain date implies assuming a set of hypotheses that are often not explicit.

The Brazilian proposal also contained a mechanism for the provision of financial resources for actions in developing countries, through a global fund that would be fed by contributions made as a result of penalties (US\$/°C exceeded) to industrialized countries that did not comply with their agreed quantitative targets for limiting or reducing greenhouse gas emissions.

The resources made available by developed countries could be used by developing countries for projects to reduce greenhouse gas emissions (and a small portion for adaptation projects) that would enable these countries to move forward in implementing the Convention and at the same time continuing the development process in a sustainable way. This approach was fully consistent with the fact that the Convention on Climate Change recognizes that the priorities of developing countries in this context are the promotion of sustainable development and the eradication of poverty.

6.1 Adoption of the Clean Development Fund by G77 + China

Upon presenting the Brazilian proposal, the part related to the Clean Development Fund had a wide repercussion among the countries composing the G77 + China and after several meetings, it was adopted at the meeting of the subsidiary bodies, as a proposal of the group itself.

The proposal led to the Clean Development Mechanism (CDM), as will be described below.

7 ADOPTION OF THE CDM AS ARTICLE 12 OF THE KYOTO PROTOCOL

The Kyoto Protocol was adopted at COP 3, held in Kyoto, Japan, in December 1997. The Protocol established a commitment to reduce by at least 5% the greenhouse gas emissions of industrialized countries (Annex I) below levels recorded in 1990, between 2008 and 2012.

The CDM originated from the Brazilian proposal of the Clean Development Fund, which was then adopted as a G77 + China proposal. On the eve of the Kyoto Conference, a delegation from the United States came to Brazil to negotiate the terms of the Clean Development Fund proposal. The United States had two objections to it. First, they did not accept the idea of penalty in an international treaty. Second, they did not consider that a burden should be imposed on the taxpayer from Annex I countries, but on consumers participating in activities that emit greenhouse gases. From the discussions in Brazil, a joint Brazil-United States CDM proposal was elaborated, and was jointly submitted in the first week of the Kyoto conference.

This mechanism consisted in the possibility for an Annex I country to acquire certified emission reductions (CERs) – also known by the more general name of carbon credits – in projects implemented in developing countries. Thus, Annex I countries could fulfill part of their domestic commitments at lower costs, while promoting sustainable development in developing countries.

The proposal, modified in a discussion group established to negotiate it, was adopted in Kyoto and became Article 12 of the Protocol.

8 ESTABLISHMENT OF AN INTERMINISTERIAL COMMITTEE AS THE CDM NATIONAL DESIGNATED AUTHORITY

Entry into force of the Kyoto Protocol, with its resource mobilization potential of many tens of billions of dollars per year, a fraction of which could be CDM-oriented, pointed to the importance of formalizing a mechanism before the Government that could direct that potential to the development priorities. Thus, in order to achieve this objective, on July 7th, 1999, the President of the Republic, exercising the attribution conferred by Art. 84, item II, of the Constitution, enacted a decree creating the Interministerial Commission on Global Climate Change (CIMGC). The duties of the committee are:

- provide opinions, whenever required, on sectoral policy proposals, legal instruments and standards that contain a relevant component for mitigating global climate change and for adapting the country to its impacts;

- provide inputs to Government positions in negotiations under the UNFCCC and subsidiary instruments of which Brazil is a Party;
- define additional eligibility criteria to those considered by the Convention Bodies in charge of the CDM, as provided for in Article 12 of the UNFCCC Kyoto Protocol, in accordance with national strategies for sustainable development;
- assessing opinions on projects that result in emission reductions and that are considered eligible for the CDM, and approve them, as the case may be; and
- articulate with representative entities of the civil society, in order to promote the actions of governmental and private bodies, in fulfillment of the commitments made by Brazil to the UNFCCC, and the subsidiary instruments of which Brazil is a Party.

Thus, the Interministerial Commission represented an effort to articulate global climate change-related government actions. This commission is the Designated National Authority within the scope of the CDM under the Kyoto Protocol.

It should be noted that in order for countries with no quantified greenhouse gas emission reduction targets to be able to host CDM projects, there was a need for them to constitute their Designated National Authorities. In this sense, Brazil was the first country to domestically regulate the protocol, designating the Interministerial Commission on Global Climate Change, established since 1999, as its Designated National Authority. The Interministerial Commission published its first resolution in September 2003, internalizing the modalities and procedures of the CDM in Brazil,¹⁰ following the decisions of the CDM Executive Board and the Brazilian legislation. The resolutions of the Interministerial Commission seek to internalize the modalities and procedures established at the international level, respecting the Brazilian specificities.

The Interministerial Commission's resolutions truly reflect the rules of the Kyoto Protocol and the decisions of the COPs as the meeting of the parties (MOP) of the Kyoto Protocol. In addition, they define the documentation to be submitted by the Parties, such as declarations of compliance with labor and environmental legislation, and make an additional requirement that binds proponents to provide greater transparency and opportunity for participation to affected or interested parties in specific projects. There is also the regulation of the approval process of the projects by the Brazilian Designated Authority.

10. For further information about the establishment of the Brazilian DNA, see Chapter 2. Regarding the shortcomings of this process, see Chapter 8 (notes from the editors).

The requirements to demonstrate the project's contribution to sustainable development are clear and simple and, at the same time, contain relevant aspects to guarantee it.¹¹ Annex III of the Interministerial Commission Resolution No. 1 states that project participants should describe whether and how the project activity will contribute to sustainable development with respect to the following aspects:

- contribution for local environmental sustainability;
- contribution for the development of work conditions and net job generation;
- contribution for income distribution;
- contribution for capacity-building and technological development; and
- contribution for regional integration and articulation with other sectors.

9 BRAZILIAN CDM PROJECT ACTIVITIES

It is possible to affirm that the CDM has achieved an unquestionable success for the achievement of real, measurable and long-term emissions reductions, especially when the results achieved are considered in a proper manner. This result is intrinsically associated with ensuring that emission reductions are in addition to those that would occur in the absence of the certified project activity. This element is one of the fundamental pillars to ensure the environmental integrity of the Kyoto Protocol. There are clear contradictions to this principle with some proposals made by developed countries to seek greater “flexibilization” of CDM modalities and procedures. These alleged flexibilizations or simplifications need to be evaluated with caution in order to avoid harm to the environmental integrity of the protocol.

Brazil was the first country ever to use this mechanism, having its first CDM Project (Novagerar, for reusing landfill biogas) registered under the UN in 2004, even before the Protocol entered into force, with ratification by the Russian Federation. Likewise, a Brazilian project methodology was one of the first ever approved by the Executive Board of the CDM: sanitary landfills in Salvador (state of Bahia).

Data from the latest CDM Executive Board report indicated that by July 13th, 2017, 7,776 CDM project activities and 310 programs of activities (PoAs) had been registered, with 2,061 components included; 1,843,750,188 CERs would have been issued for CDM project activities and 8,938,800 for PoAs; and 22,464,732 CERs would have been canceled voluntarily.¹²

11. For further information on the requirements for assessing the contribution to sustainable development, see Chapter 8 (note from the editors).

12. For further information on this topic, see Chapter 2. Further analysis of some CDM project typologies can be found in chapters 4 through 7, which deal with specific sectors that had some prominence (note from the editors).

On April 30th, 2017, the country ranked third in number of project activities, with 342 registered project activities (4.4% of the world's 7,770 CDM project activities), with China ranking first, with 3,763 projects (48.4%), and India ranking second, with 1,642 projects (21.1%).¹³

In terms of the estimated reduction of greenhouse gas emissions associated with projects in the CDM cycle, by April 2017, Brazil ranked third and was responsible for the reduction of 49,192,159 tCO₂eq, corresponding to 4.9% of the world total for the first crediting period.¹⁴

In terms of number of project activities, carbon dioxide (CO₂) was the most relevant at that time, with 195 project activities, followed by methane (CH₄), with 121 project activities, and nitrous oxide (N₂O), with five project activities.

The sectoral scopes that most attracted the interest of participants in CDM project activities in the country by December 31st, 2013 were the energy industry with 191 projects, followed by waste treatment and disposal (81), agriculture (59), manufacturing industry (9), chemical industry (6), afforestation and reforestation (3), metal production (3), and fugitive emissions (1).

As for the number of Brazilian project activities developed by type of project, by December 31st, 2013, hydroelectric power led with 26%, followed by biogas (20%), wind power plants (16%), landfill gas (15%) and energy biomass (13%). The project types with the highest CO₂eq emission reduction estimate were the hydropower, biogas and N₂O decomposition activities, which totaled 73.2% of the total CO₂eq emissions to be reduced in the first generation period credits. These three sectors had an emission reduction estimate of 268,529,454 tCO₂eq during the first crediting period of the project activities.

The total installed capacity of the CDM project activities recorded by December 31st, 2013 in the energy area was 18,168 MW. The hydroelectric plants led with 1,780 MW; followed by biogas (2,668 MW), landfill gas (2,462 MW), energy biomass (2,128 MW) and wind power plant (1,780 MW).

In terms of CERs units issued by December 31st, 2013, Brazil ranked fourth in the world, with more than 90 million CERs, being surpassed by China, with more than 868 million; India, with 189 million; and South Korea, with 120 million CERs issued. The CDM, therefore, was an important source of funding for the reduction of greenhouse gas emissions in Brazil, mainly in the energy sector.¹⁵

13. For further information on this topic, see Chapter 2. Further analysis of some CDM project typologies can be found in chapters 4 through 7, which deal with specific sectors that had some prominence (note from the editors).

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15. For further information, see Chapter 4 (note from the editors).

There are other non-exhaustive examples: the emission reduction achieved by the thirty Brazilian projects in the scope of reducing CH₄ (methane) in landfills¹⁶ already registered in the Executive Board corresponds to 55% of national landfill emissions in 1994. Similarly, five Brazilian projects to reduce N₂O (nitrous oxide) in the production of adipic acid and nitric acid practically zeroed N₂O emissions in this industrial sector (chemical industry). In addition, 67 CDM projects are carried out in the area of swine farming, promoting responsible waste management and raising the awareness of agricultural entrepreneurs in making their businesses sustainable.

With regard to PoAs, Brazil had, by December 31st, 2013, eight PoAs registered in the UNFCCC, three wind power plants, two hydroelectric plants, two biogas plants and one landfill gas, with emission reduction estimates of more than 10 million tCO₂eq, occupying the eighth position in the world ranking.

As for the number of project component activities (CPAs) of PoAs, Brazil led with more than 65.8% of the world total. The first Brazilian PoA, registered in 2009, was developed in the area of capture and combustion of CH₄. It had, by December 31st, 2013, 1,050 small-scale CPAs registered under the UNFCCC. The participation of more than 1 thousand pig farms in the program demonstrates the relevance of the CDM to enable initiatives that did not have the necessary incentives to occur.

10 INDUCTION OF MITIGATION ACTIONS IN BRAZIL DUE TO THE CDM

CDM has been important in Brazil as a driver of new technologies and expansion of energy sources that had not been developed until then in the country. One can cite the case of landfills (flare methane burning), small hydroelectric plants and cogeneration using sugarcane bagasse, which had a high implementation rate due to the use of the CDM.

Evidence of the importance of CDM in electricity cogeneration using sugarcane bagasse can be measured by the paralysis following the CDM Executive Board's definition of a 25% "common practice" limit for this technology. From that point on, there were no CDM project registrations in this area, either in Brazil or in India, which demonstrates the importance of the CDM to enable the penetration of this technology.¹⁷

In addition to inducing the installation of new technologies, such as the N₂O burner installed by Rhodia in Paulínea in the adipic acid production line, the first of its kind in South America, the massive introduction of biodigesters in swine farms has led to improved conditions socioeconomic, health and environmental

16. For further information, see Chapter 5 (note from the editors).

17. For further information on the discussion on the impact of change on the sector, see Chapter 4 (note from the editors).

standards. These benefits brought about by the CDM continue even without the current support of the mechanism. Likewise, the results of emission reductions last beyond the crediting period under the mechanism.

10.1 Human and institutional capacity-building fostered by the CDM

The training of human resources dedicated to the theme of climate change, as well as in particular the reduction of greenhouse gas emissions and the promotion of sustainable development due to the CDM should be added to its technological development.

In this sense, there was capacity building in all institutions involved with the CDM, from the developers of greenhouse gas emission reduction projects in the various sectors to the training of new auditors specialized in the validation and registration of emission reduction projects, as well as emission reduction certification for these projects.

In the academy and non-governmental organizations, there was also training in the theme in general and search for innovative initiatives to reduce greenhouse gas emissions as compensation for individual emissions in travel, conferences (including the initiative of the Brazilian government at the Conference of Nations (Rio+20) and others such as Inhotim (MG) initiative to offset the emission caused by visitors to Inhotim Park.

Although restricted to parts of the Kyoto Protocol, the CDM was first used for non-compliance purposes (i.e. for use other than partial use of targets by Annex I countries) when CERs were voluntarily canceled by Brazil to offset emissions from the Rio+20 organization in Rio de Janeiro in 2012. The voluntary cancellation of CERs was one of the four steps taken by the COP 19 in Warsaw in 2013 to help reduce the ambition gap. Subsequently, there was a voluntary cancellation initiative to offset the emissions by the organization of the Soccer World Cup in 2014 by the Brazilian government and, more recently, similar initiatives by the Government of the State of Rio de Janeiro for the Olympic Games in 2016.

11 PROPOSED USE OF CERS AS VOLUNTARY COMPENSATION IN RIO+20 AND IN THE WORLD CUP IN BRAZIL

11.1 CERs as voluntary compensation in Rio+20

The idea of offsetting emissions by the Rio + 20 organization, held between June 13th and 22nd, 2012, in Rio de Janeiro, by the Brazilian government, was to create an additional demand for CERs of greenhouse gases in a moment when the European Union announced that it would no longer buy the CERs under the scope of the CDM of emerging countries.

In order to estimate the greenhouse gas emissions associated with the event, a greenhouse gas inventory of the activities corresponding to the Rio+20 organization was prepared, taking into account internationally accepted standards. The inventory consisted of determining the following anthropogenic emissions of greenhouse gases:

- the ones related to the *consumption of fuels in generators* in official negotiation venues during the days of the event;
- the ones related to the *consumption of energy of the Brazilian electricity grid* in the official negotiation venues during the days of the event;
- the ones related to the *adequate management of solid waste generated and collected* in the official negotiation venues during the days of the event; and
- the ones related to the *use of fuels in official ground transportation* of delegations and entourage organized by the National Organizing Committee of Rio+20 (CNO) during the days of the event.

In addition, institutional arrangements were set up to offset emissions corresponding to the organization of the Rio+20 Conference, which enabled participants and official delegations to understand the greenhouse gas emissions corresponding to their travel and participation in the conference. The preliminary inventory estimate was 150,000 tCO₂eq of emissions generated around the event.

The institutional arrangement enabled the cancellation of CDM CERs associated with Brazilian project activities and donated by partner companies in the number of tons of carbon dioxide equivalent (tCO₂eq) equal to that indicated in the *ex-post* inventory. This way, these companies had the opportunity to publicize their CDM project activities and the association of their brands with the protection of the global climate system, guaranteed by the environmental integrity of the mechanism, as well as the benefits package already offered to the companies by the organization of the event.

In order to perform the cancellation, the owner of the CERs (CDM project participant) or the receiving entity must have a CDM registration account. The organization then entered into an institutional agreement with the United Nations Development Program (UNDP), which received information on donations and cancellations of CERs from partner companies. UNDP monitored and filed requests for cancellation of CERs donated to the CDM registry, which could be canceled by the donors themselves or transferred to an account indicated by the program for later cancellation.

Finally, organizers created a virtual calculator of greenhouse gas emissions for participants and delegations to present their individual and/or collective data. In a broad sense, this calculator considered the following source as the basis for the preparation of individual and collective estimates (delegations): greenhouse

gas emissions from *fuel use in the air transportation* of participants and delegations during arrivals and departures in Rio de Janeiro.

In order to quantify those estimates, the virtual calculator was made available by qualified personnel, distributed by the official Rio+20 Conference sites. It was also available on the Conference's official website.

The calculator presented the estimates of total greenhouse gas emissions that were generated by the individual or collective participation (delegation) at the Rio+20 Conference, after data entry of each participant and/or delegation. Users of the calculator had, at the end of their data collection, the opportunity to contribute voluntarily to offset their emissions by supporting one or more Brazilian CDM project activities, which had space for publicizing the logo and individualized advertisement of each project on the official website and calculators provided at the event. The UNFCCC Executive Secretary itself has voluntarily participated in the voluntary cancellation.

11.1.2 Voluntary cancellation adopted by the CDM Executive Board

As set out in Annex 2 (*Procedure for implementing voluntary cancellation in the CDM registry*) of the report of the CDM Executive Board at its 69th meeting, held in Bangkok, Thailand, from 9 to 13 September 2012, after discussion at the meeting, a procedure to implement the voluntary cancellation of CERs in the CDM registry was adopted. The adoption ratified the procedure that Brazil had used in Rio+20 and that had been a pioneer in the world.

It is important to note that in the modalities and procedures of the CDM there was no impediment to voluntary cancellation, it was not explicitly mentioned. Due to different legal interpretations, this procedure was adopted by the Board only after the proposal made by the Brazilian representative in the CDM Executive Board, taking into account the fact that already occurred in Rio+20 with the support of UNDP in the execution.

11.1.3 Voluntary cancellation adopted at COP 21

Following the recognition by the CDM Executive Board of the possibility of voluntary cancellation of CERs, a subsequent COP 19 decision in Warsaw, Poland, reiterated the invitation to the Parties to promote the voluntary cancellation of CERs (Decision No. 1 / COP 19, paragraph 5c – *Inviting Parties to promote the voluntary cancellation of CERs, without double counting, as a means of closing the pre-2020 ambition gap*).

Decision 1/CP.21 of COP 21 in its Part IV – pre-2020 Enhanced Action, “encourages Parties to promote the voluntary cancellation by Party and non-Party stakeholders, without double counting, of units issued under the Kyoto Protocol, including certified emission reductions that are valid for the second commitment period”.

Finally, in 2016, the Convention secretariat established an Internet portal to facilitate the purchase of CERs by individuals or entities in a simplified way, units originated from CDM project activities that offered their available credits at a certain price in the portal.

11.2 CERs as voluntary compensation at the World Cup in Brazil

Following the success of the idea of offsetting emissions during the Rio+20 Conference in Rio de Janeiro, the Brazilian government pursued the same goal of creating additional demand for CERs in the absence of demand, given the decision of the European Union of no longer acquiring CERs from major emerging countries, in the international event of the Football World Cup of the International Football Federation (FIFA) in 2014.

Like in Rio+20, four scenarios of greenhouse gas inventories associated with the event were made, increasing coverage of emissions from the organization of the event to the arrival of fans from several countries abroad, adding new sources of greenhouse gas emissions by making compensation more comprehensive in scope.

The four scenarios prepared by the Ministry of the Environment were:

- related to the direct emissions of the *construction of stadiums and the hosting of delegations and the operational logistics of the Confederations Cup and the 2014 FIFA World Cup* in the official spaces reserved for the delegations of the national teams during the event period – this scenario was estimated to reach emissions of 59,216 tCO₂eq;
- related to emissions from the previous scenario *plus domestic flight emissions from the 2014 FIFA World Cup* – this scenario was estimated to reach emissions of 188,115 tCO₂eq;
- related to the emissions from the previous scenario *plus the emissions of the international flights of the 2014 FIFA World Cup* – this scenario was estimated to reach emissions of 1,413,609 tCO₂eq; and
- related to emissions from the previous scenario modified to include *emissions life cycle analysis for stadium construction* – this scenario was estimated to reach emissions of 2,889,103 tCO₂eq.

The Ministry of the Environment received voluntary offers of cancellation from participants of Brazilian projects in the amount of 545,500 tCO₂eq. This successful result was achieved by the partnership with 16 companies that contributed with CERs in the range of 5 thousand to 105 thousand tCO₂eq. The company that contributed the most was Tractebel (currently Engie do Brasil), with 105

thousand tCO₂eq (CER units), followed by Rhodia (which currently belongs to the Solvay Group), with 100 thousand tCO₂eq.

12 CDM RESULTS IN TERMS OF INVESTMENT ATTRACTION AND REDUCTION OF GREENHOUSE GAS EMISSIONS

Considering that the largest portion of the 90 million CERs issued for Brazilian project activities by December 31st, 2013, was traded in the initial CDM period, using a conservative value of US\$ 10/tCO₂eq, a revenue impact of project participants of about US\$ 900 million was estimated.

This value demonstrates the importance of the CDM in financing project activities, which were mostly innovative in their respective sectors and allowed sustainable development.

13 OBSTACLES CREATED BY THE EUROPEAN UNION DECISION AND THE RETAINING OF CERS

In a similar way, in 2012, the decision by the European Union (which until then was the largest source of demand for CERs), was unfavorable to multilateral market mechanisms, only to recognize, for the fulfillment of Community obligations in the area of climate change, CDM from activities of relatively less developed countries and small island states. CERs from large developing countries, such as Brazil, South Africa, China and India, were no longer accepted, which had contributed most to CDM projects and to the scale achieved by the mechanism.

The said decision led to a collapse in the value of CERs, and consequently, to the relative discredit of the CDM as a whole, together with the private sector.¹⁸ From then on, there was a gradual disengagement from project entrepreneurs, designated operational entities (DOEs) and other stakeholders involved in the process of emission reduction certification and in the CDM. After 2013, at the end of the Kyoto Protocol's first commitment period, which went from 2008 to 2012, there was a low level of registration of CDM project activities.

14 DISCUSSIONS ABOUT A NEW MECHANISM AND THE USE OF THE CDM'S CERS

Emissions from aviation represent some 2% of global anthropogenic CO₂ emissions. However, the significant increase in emissions from domestic aviation is expected as developing markets in emerging countries mature, which explains in the importance of measures to mitigate these emissions through the CDM. The International Civil Aviation Organization (ICAO) has been working with the UNFCCC

18. Several chapters of the publication deal with the impact of the restriction on the commercialization of CERs by the European Union. Graph 4 in Chapter 6 shows the change in CER prices for the period (note from the editors).

Secretariat and in 2015, during the 87th meeting of the CDM Executive Board, the first methodology to reduce aviation emissions in the CDM was approved, even before COP 21.

As per paragraph 5 of Resolution No. A39-3, dated October 2016,¹⁹ the OACI decided to implement a global market-based mechanism – GMBM in the form of carbon-offsetting and reduction scheme for international aviation – CORSIA. The aim was to address the annual increases of any total CO₂ emissions from international civil aviation (i.e. flights departing from one country and landing in another) above 2020 levels. Domestic aviation emissions are addressed by each Party under the UNFCCC.

According to paragraph 4 of the same resolution, the aim is to complement a broad package of measures to achieve the global aspirational goal of carbon neutral growth as at 2020. The scheme further reinforces the need for further progress in improving operational technologies, traffic management, infrastructure, efficient operation, and sustainable alternative fuels. It aims to ensure that progress is achieved in all elements in a balanced way, with a percentage of emission reductions increasing with time as a result of other measures (other than market-based mechanisms).

14.1 Implementation of CORSIA in stages

The implementation of the CORSIA scheme will be phased in order to take into account the different capacities and circumstances of the different countries, particularly the developing ones, and to minimize market distortion. A pilot phase will be implemented from 2021 to 2023 in countries willing to participate voluntarily.

The first phase will be implemented from 2024 to 2026 in the countries participating voluntarily in the pilot phase, as well as in any other country that wishes to join. The second phase of the scheme will be implemented from 2027 to 2035 in all countries whose share in revenue ton-kilometer (RTK) volume in 2018 is above 0.5% of the total, or whose cumulative participation in the list of countries sorted from highest to lowest RTK reach 90% of total.

The resolution strongly encourages all countries to volunteer for the pilot phase and first phase; developed countries have already volunteered and are taking the lead. It is clear that over 60 countries have agreed on taking part.

19. Go to <https://bit.ly/2yoJe8o> to see the resolution. Accessed on: May 11th, 2018.

14.2 Calculation formula of emissions to be offset

The quantity of CO₂ emissions to be offset by an aviation carrier in a given year starting in 2021 is calculated with the use of a formula that takes into account the increase of emissions during this given year in relation to the average of 2019 and 2020. The formula applies a weight to include both sectoral emissions growth and individual operator growth. The weight is 100% for the industry by 2029 and then has an increased weight of individual growth (to be defined by ICAO in 2028).

The resolution still has some work to do, particularly in relation to monitoring and standards. It lists a number of areas for future work and further details to be elaborated. For instance, it highlights the need for safeguards in order to ensure the sustainable development of the aviation sector, and is against the inadequate economic burden on the sector, requiring the Board to decide on what bases and criteria this action will be taken and identify how to tackle those issues.

A global market-based mechanism – GMBM requires an independent standardization and validation process in order to assure that carbon emissions are adequately balanced in the offsetting project. ICAO has developed standards in this area and the International Air Transport Association (IATA) is one of the four organizations qualified to verify which programs comply with the standards.

The resolution does not significantly provide further details about an appropriate monitoring, reporting, verification – MRV system. It is necessary that such a system is developed to be adopted by the Board in 2018.

Likewise, the development and guidelines for emissions unit criteria – EUCs, as well as recommendations for eligible emissions units are areas still underway.

14.3 The CDM creates a precedent

Verification procedures and the agreement that describes EUCs are clearly crucial for credibility and success. The Resolution decided that emission units generated in mechanisms established by the UNFCCC and Paris Agreement are eligible for CORSIA.

15 TRANSITION FROM THE CDM TO A SUSTAINABLE DEVELOPMENT MECHANISM (SDM) AS PROPOSED BY BRAZIL

The international climate change regime's ability to ensure a smooth transition from the CDM to the SDM will be pivotal for the Convention's reputation. Failure in guaranteeing that CDM stakeholders, especially project developers, will have their efforts recognized and honored and will continue to have tangible effects in the context of the Paris Agreement will threaten legal certainty as well as prevent CERs from contributing to action the pre-2020 ambition. Ultimately, it will promote the loss of credibility of the international regime by CDM project participants

and will result in the loss of effectiveness of the mitigation instrument due to the lack of participation of public and private entities.

When Brazil understands that SDM is the successor to the CDM, it is of the utmost importance that there is a smooth transition between the two, in particular as regards: *i*) continued validity of CDM units through the conversion of CDM CERs for use in nationally determined contributions (NDCs) or cancellation by the parties, public and private entities for other uses; *ii*) continued validity of the CDM methodologies under the SDM; *iii*) issuance of SDM CERs for registered CDM project activities; and *iv*) transposition of the CDM accreditation system into the MDS.

Consistent with the text of the Paris Agreement, the scope of Article 6, paragraph 4, is similar to that of the CDM. In this sense, its rules, modalities and procedures should encompass the verification and certification of CER units by a DOE of the long-term, measurable and real benefits related to additional emission reductions resulting from voluntary activities authorized by each party involved and supervised by a body designated by the COP serving as the meeting of the parties to the Paris Agreement. Brazil sees the SDM as the ultimate international mechanism to certify action to combat climate change and issue credits.

The proper operationalization of the concept of additionality is central to the SDM objective and to its potential to broaden the ambition of the climate change regime. Additionality should reward projects that would not be feasible in the absence of the mechanism under Article 6, paragraph 4. With the progressive implementation of the Paris Agreement and policies implemented in the context of the NDC, it should be expected that earlier policies will not be able to demonstrate which are the first of their kind or that pass in the analyzes of common practice, barriers or investment. Brazil's view is that the CDM methodologies should also be applied to the SDM to ensure that additionality is adequately assessed.²⁰

The rules, modalities and procedures of the SDM should reflect the fact that the mechanism innovates in relation to the CDM by further aiming at "encouraging and facilitating participation in the mitigation of greenhouse gas emissions by public and private entities authorized by a part"²¹ (UN, 2015, p. 29). While the demand for CERs under the CDM was originally conducted by Annex I parties, units issued under the SDM can be used by any stakeholder for any purpose that encompasses the MRV of actions to combat climate change, including finance.

20. As per the document *Views of Brazil on the process related to the rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement*, of the UNFCCC. Available at: <https://bit.ly/2tskPZU>. Accessed on: May 11th, 2018.

21. Chapter 16 presents this aspect as one of the CDM legacies, as it more recently provided for the voluntary cancellation of CERs as a way of ensuring greater participation by different agents (note from the editors).

16 TRANSITION FROM A GLOBALIZED WORLD TO A FRAGMENTED WORLD

The CDM as part of the Kyoto Protocol follows the trend of the late 1990s globalization. The rules defined in the protocol were made in the top-down approach, with a goal of global emission reduction (although restricted only to those developed countries that should take the lead in the process of fighting climate change), and their distribution between the countries was made so that there was a corresponding responsibility and capacity to meet the goals.

The Paris Agreement breaks down the trend of globalization in a more fragmented environment, with countries tending to strengthen national ties, such as the UK's decision to let the European Union and the United States withdraw from the Free Trade Agreement of North America (Naphta). The very definition of the objectives of the Paris Agreement represents this fragmented view of the world with commitments being NDCs, with no regulation implying that the sum of contributions will meet some goal that will actually help avoid the average temperature rise of the Earth's surface.

Unfortunately, in this new paradigm, the CDM seems anachronistic with its international cooperation approach, as a mechanism to limit the cost of implementing global emission reduction measures where they are most cost-effective. For countries with a very high reduction cost (e.g., Japan), a system of purchasing units to meet their targets is perfectly logical from the economic point of view. The joint Brazil-European Union proposal to extend to the SDM (Article 6 of the Paris Agreement) the ideas and principles of the CDM is the last chance to maintain a top-down approach to international cooperation and a better cost-benefit ratio for deployment of project activities, with the vision of compliance with an international treaty within the UN, even considering the trend of greater importance of national values in a fragmented world.

REFERENCE

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