

THE CLEAN DEVELOPMENT MECHANISM IN BRAZIL

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1 INTRODUCTION

The Kyoto Protocol, adopted on December 11th, 1997, in Japan, was a milestone in international efforts to tackle climate change, by establishing a legally binding commitment to reduce anthropogenic emissions of greenhouse gases (GHGs).

This regulatory framework stood out for its innovative nature, providing for the pricing of gases controlled by the Kyoto Protocol and the trading of reduction certificates among the signatory Parties. Moreover, it became an incentive for investments in alternative, less emission-intensive technologies.

The Kyoto Protocol allowed for the use of market-based climate policy instruments, among various other elements, to help developed countries in complying with their quantified commitments for the reduction and limitation of GHG emissions. In the case of Brazil, involvement in this market occurs via the Clean Development Mechanism (CDM), as it is the only mechanism in the Kyoto Protocol that admits the voluntary participation from developing countries.

The CDM is based on the development of project activities that reduce GHG emissions. The projects in the scope of the CDM are implemented in the least developed and developing countries, which can trade GHG emission reductions, known as Certified Reduction Emissions (CERs) to developed countries, thus helping them achieve their emissions reductions targets and commitments taken on before the Kyoto Protocol. These projects must generate extra emissions reductions, in addition to those that would occur in the absence of the CDM project, ensuring actual, measurable and long-term benefits for the mitigation of climate change.

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As an earlier developer of the CDM projects, Brazil has played a significant role in creating and institutionalizing the CDM during the international negotiations for the use of market mechanisms. The first CDM project activity developed in Brazil was registered on 18 November 2004 – an Energy Project based on Landfill Gas, of NovaGerar EcoEnergia Ltd.

From that time up to April 2017, 342 Brazilian project activities have been registered under the CDM Executive Board, a subsidiary body of the United Nations Framework Convention on Climate Change (UNFCCC), which is equivalent to 4.4% of the total number of projects registered globally. This figure ranks Brazil 3rd in the global ranking.⁴

Since its creation, the CDM has been through several changes and adjustments. However, these changes did not have as much impact as those related to the uncertainty generated by questions on the continuity of the CDM after the end of Kyoto Protocol's First Commitment Period⁵ and the decision by the European Union, the world's largest carbon market, to only buy credits from projects registered by December 31st, 2012 (Santos, 2014) – which have contributed significantly for the excess supply of carbon credits in the global market.

During the 21st Conference of the Parties (COP-21), in 2015, a series of provisions have been agreed on, in order to establish a new market mechanism under the Paris Agreement – the Sustainable Development Mechanism (SDM). It was expected that this mechanism would go beyond traditional compensation, based on lessons learned with the CDM.

2 BRAZILIAN INSTITUTIONAL FRAMEWORK

Regulation of projects, within the scope of the CDM, is under the responsibility of the CDM Executive Board, headquartered in Bonn, Germany, and by the Government of the project's host Party.

The Board oversees the Kyoto Protocol's CDM,⁶ under the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). The said Board is the last point of contact for CDM project participants to obtain registration of projects and CERs issuance.

4. For further information, please refer to the CDM project search databank. Available at: <https://cdm.unfccc.int/Projects/projsearch.html>. Accessed on: June 2017.

5. The first commitment period of the Kyoto Protocol started in 2008 and ended in 2012.

6. The Kyoto Protocol is an international agreement under the UNFCCC. Adopted in Kyoto (Japan) on December 11th, 1997, it entered into effect on February 16th, 2005. Detailed norms for the implementation of the protocol were adopted during the COP-7, in Marrakesh, Morocco, in 2001, and are referred to as the Marrakesh Agreement.

The National Designated Authority (NDA) is the host Party's focal point before the CDM Executive Board. Appointing an NDA is a requisite for Kyoto Protocol signatories to participate in the CDM.

Out of the NDA's responsibilities are the definition and establishment of norms for the implementation of the CDM in the country; assessment of the CDM project proposals submitted; and the issuance of letters of approval attesting that the project contributes towards sustainable development, that the Party has ratified the Protocol and that participation of the country in the CDM is voluntary. This letter is a pre-requisite for requesting project registration at the CDM Executive Board.

In Brazil, the Interministerial Commission on Global Climate Change (CIMGC) was responsible for assessing CDM projects, and, in addition to other roles provided for in Presidential Decree dated July 7th, 1999, acted as the Brazilian NDA.⁷ This Decree established that the Minister of Science, Technology, Innovations and Communications would chair the Commission, with the Minister of the Environment as co-chair. It also established that the Ministry of Science, Technology, Innovations and Communications will act as Executive Secretariat of the CIMGC.

Law No. 12,187, dated December 29th, 2009,⁸ established in its Art. 7, item II, that the CIMGC was the institutional instrument for the implementation of the National Policy on Climate Change (PNMC). It also established, in Art. 6, item V, resolutions of the CIMGC as instruments of this policy.

In addition to the Ministries above chairing and co-chairing the CIMGC, the Commission was also composed by representatives (incumbent and substitute members) of the following bodies: Ministry of Foreign Affairs, Ministry of Agriculture, Livestock and Supply; Ministry of Transport, Ports and Civil Aviation; Ministry of Mines and Energy; Ministry of Planning, Development and Management; Ministry of the Environment; Ministry of Science, Technology, Innovations and Communications; Ministry of Industry, Foreign Trade and Services; Chief of Staff to the Presidency; Ministry of Cities; and Ministry of Finance.

The CIMGC, in its role as NDA, acted with respect to acquired rights and perfect legal acts in terms of compliance with the applicable legislation. In this context, the Commission applied the norms described in its resolutions⁹ without retroacting, reserving the right to cancel or revoke the letter of approval in case a project activity beached the law or conflicted with public interest after receipt of said letter.

7. Decree establishing the CIMGC. Available (in Portuguese) at: <https://goo.gl/5eWifP>.

8. National Policy on Climate Change. Available (in Portuguese) at: <https://goo.gl/JDSb7f>.

9. CIMGC Resolutions. Available at: <https://goo.gl/xyU2wj>.

3 REQUISITES FOR THE APPROVAL OF CDM PROJECTS IN BRAZIL

Projects within the scope of the CDM are called project activities, because they refer to activities that are part of an undertaking or provide for GHG emissions reductions or an increase in carbon dioxide removal (CO₂), that would not occur in the absence of those activities (baseline scenario).

The baseline can be understood as a level of GHG emissions that an undertaking would emit in the absence of the CDM project activity – that is, it is a reference scenario in relation to which the GHG reductions effectively achieved by the CDM project activity can be estimated (CGEE, 2010).

CDM project activities must go through several stages before CERs are issued: preparation of the Project Design Document (PDD); validation; approval by the host country; registration at the CDM Executive Board; monitoring; and verification and certification of emissions reductions. The CDM Executive Board only issues CERs, which is the last part of cycle, when there is proof that reductions in gas emissions resulting from the CDM's design activities were definitively considered to be real, that is, when emissions reductions can be verified a posteriori.

The CDM Executive Board issues CERs on behalf of project activities participants, as stated in the letters of approval issued by the host country's government, deducting 2% of the total CERs issued. The percentage deducted is allocated to the Adaptation Fund to help the most vulnerable countries adapt to the effects of climate change.

In an attempt to reduce the transaction costs of the implementation of CDM projects, and aiming at simplifying the process, UNFCCC established the Programmatic CDM, or Program of Activities (PoA). This instrument enables, with only one contract and a single application, the registration of different project activities.

The steps related to the Programmatic CDM are practically the same as those followed in the development of a project activity, except that the various project activities that make up the PoA (called component project activities – CPAs) can be added to the PoA after registration, provided that they follow the same rules established in the PoA and that their inclusion is informed to the Secretariat of the CDM Executive Board (CGEE, 2010).

When assessing CDM project activities and PoAs submitted, the CIMGC considers the following aspects: voluntary participation of each party involved, Project or PoA Design Document, Validation Report and project contribution for the country's sustainable development, known as Annex III. In relation to Annex III, through CIMGC Resolution No. 1, five criteria have been established for the

assessment of CDM projects: income distribution, local environmental sustainability, development of work conditions and net job generation, technological capacitation and development, and regional integration and articulation with other sectors.

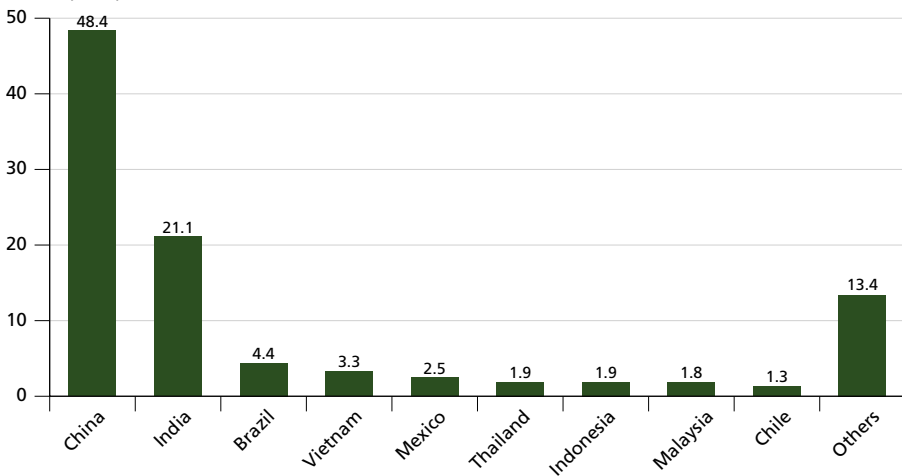
The list of documents to be sent to the CIMGC aiming at obtaining approval for CDM project activities and PoAs is mentioned in the resolutions of this commission. In order to facilitate the submission of CDM projects in Brazil and detailed information about applicable rules (necessary documents, procedures and deadlines) were collected in a single document, the *Guidelines for Submitting CDM Project Activities to the CIMGC, aiming at obtaining a letter of approval from the Brazilian Government* (Brazil, 2008a).

4 EVOLUTION OF CDM PROJECT ACTIVITIES AND POAS IN BRAZIL AND OVERSEAS

4.1 Project activities

Regarding the CDM global status, by April 30th, 2017, 7,770 project activities had been registered under the UNFCCC. Brazil ranked third in this list, with 342 registered project activities, which corresponded to 4.4% of the global total. China ranked first, with 3,763 (48.4%), and India ranked second, with 1,642 (21.1%), as per the figures presented in graph 1.

GRAPH 1
Distribution, by percentage, of CDM project activities registered by country (April 30th, 2017)
 (In %)



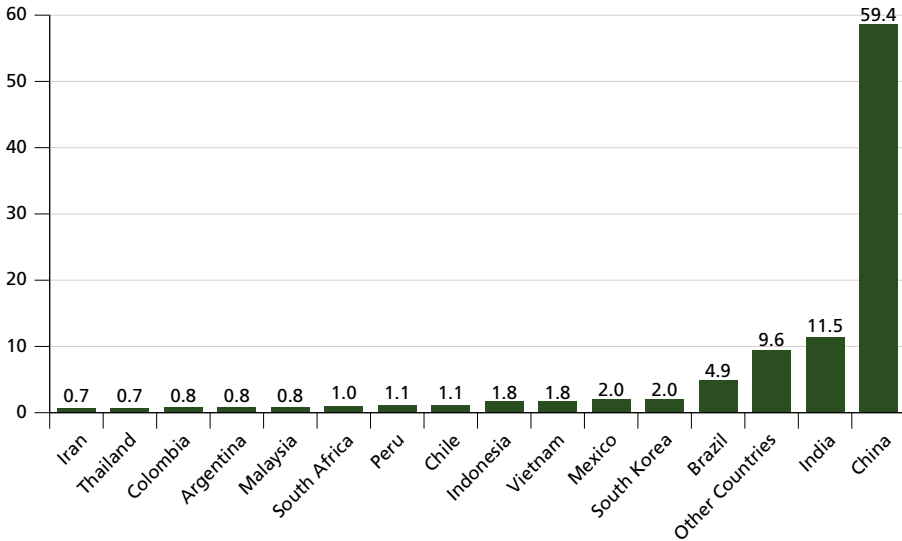
Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/gzSnSw>. Accessed on: April 2017.
 Obs.: Total activity projects registered: 7,770.

In terms of annual estimates of GHG emissions reductions associated to CDM project activities registered by April 2017, Brazil ranked third, with 49,192,159 tCO₂e annually, which corresponds to 4.9% of the world's total emissions reductions. China ranked first, with an average annual reduction of 596,329,439 tCO₂e (59.4%), followed by India, with 115,450,986 tCO₂e, which corresponds to 11.5% of the world's total (graph 2).

Considering the first crediting period, which may be a maximum of ten years for fixed-period projects, or seven years for renewable-period projects (three times for a total of 21 years), Brazilian CDM project activities registered until April 2017 had a GHG emission reduction potential of 379 million tCO₂e.¹⁰

GRAPH 2

Annual GHG reduction potential, by percentage, by country, of CDM projects (April 2017)
(In %)



Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hvQUcP>. Accessed on: April 2017.

Obs.: Total GHG reduction potential per year: 1,003,836,468 tCO₂e.

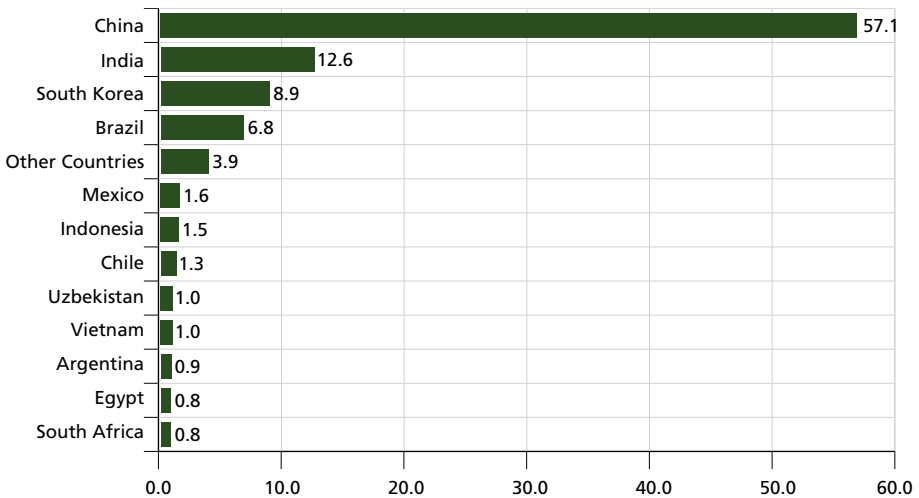
With regard to CERs effectively issued by the CDM Executive Board to participants in project activities, the data presented in figure 3 indicate that 1,814,448,567 CER units were issued to project participants by April 2017. Out of that total, 123,648,417 correspond to projects developed in Brazil (6.8%),

10. Calculated based on the CDM project control file of the CIMGC's Executive Secretariat.

equivalent to some 124 million tCO₂e that have been avoided,¹¹ which ranks Brazil fourth in the world list of issued CERs. China ranks first, with 57.1% of issued CERs, followed by India, with 12.6%, and South Korea, with 8.9%.

GRAPH 3

CERs issued in percentage, by host country, for CDM project activities (April 2017)
(In %)



Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>.
Obs.: Total number of issued CERs: 1,814,448,567 tCO₂e.

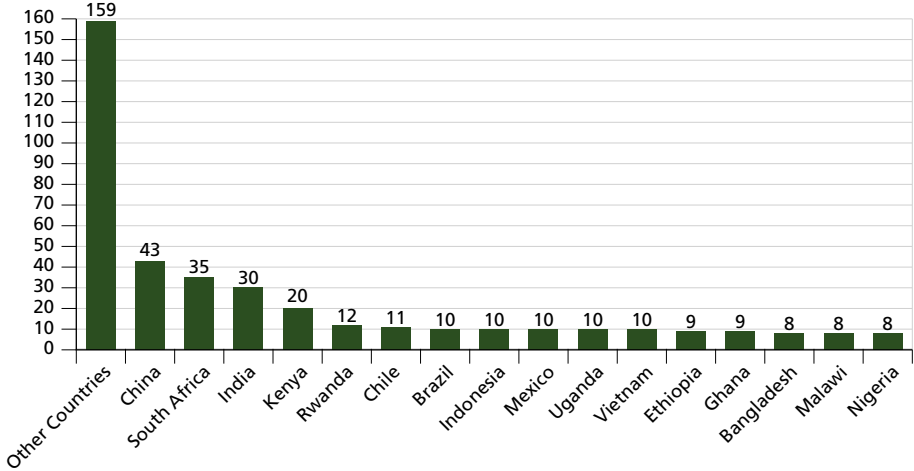
4.2 Programs of activities

With regards to PoAs, Brazil had 10 PoAs registered under the CDM Executive Board by April 2017, thus ranking 7th in the world (graph 4) and taking the lead in the number of component project activities, with about 52% of the world's total CPAs, thanks to its first PoA, registered in 2009, developed in the area of methane capture and combustion (CH₄), which enabled the registration of 1,050 CPAs under the UNFCCC.

11. One CER unit equals 1t of carbon dioxide equivalent (Fronidzi, 2009).

GRAPH 4

PoAs, per host country, registered under the CDM Executive Board (April 2017)

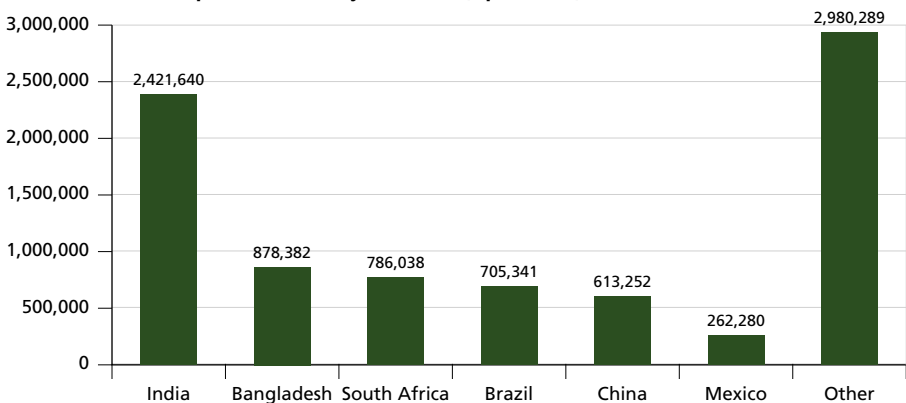


Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>. Accessed on: April 2017.
Obs.: Total PoAs registered: 402.

With regards to CERs effectively issued by the CDM Executive Board to PoAs registered under the UNFCCC, data presented in Graph 5 indicate a total of 8,647,222 CER units by April 2017. Out of the total, 705,341 CERs were destined to Brazil (8.2%), which corresponds to 700 thousand tCO₂e effectively cancelled, ranking fourth in the world. India ranked first, with 28.0% of issued CERs, followed by Bangladesh, with 10.2%, and South Africa, with 9.1% (graph 5).

GRAPH 5

Issued CERs, per host country, for PoAs (April 2017)



Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>. Accessed on: April 2017.

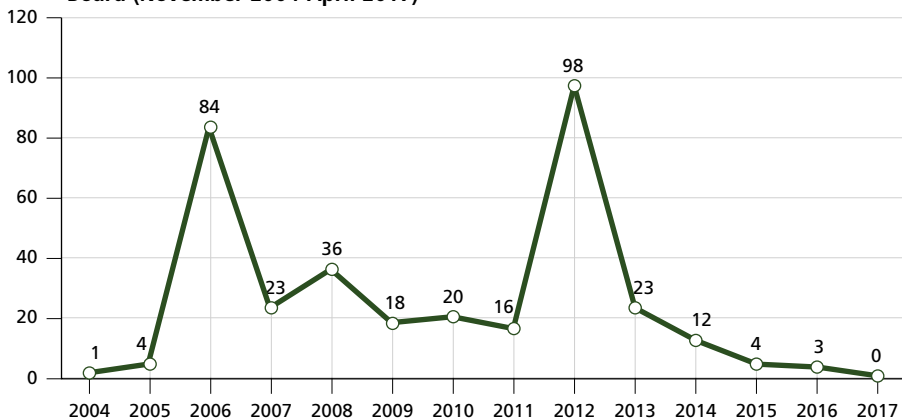
5 PROFILE OF PROJECT ACTIVITIES OF THE CLEAN DEVELOPMENT MECHANISM IN BRAZIL

In the period between February 2004 to April 2017, the CIMGC received 464 CDM project activity proposals aiming at obtaining a letter of approval from the Brazilian NDA (CIMGC). Out of this total, 424 project activities were approved by the CIMGC, one project activity was rejected and 39 were not finished or cancelled by request of project’s participants.¹²

Out of the 424 project activities approved by the CIMGC, 342 were registered under the CDM Executive Board between November 2004 and April 2017. During the same period, 31 project activities were rejected by the CDM Executive Board, eight were withdrawn from the registration process by request of project participants and 43 did not apply for registration.¹³

The annual distribution of Brazilian project activities registered by the CDM Executive Board is presented in graph 6 below. There were two peak registration periods. The first in 2006, when the CDM started to consolidate in the carbon Market; and the second one in 2012, when the first commitment period of the Kyoto Protocol ended.

GRAPH 6
Annual distribution of Brazilian activity projects registration under the CDM Executive Board (November 2004-April 2017)



Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>.
Obs.: Project activity registered: 342.

12. CDM Projects. Available at: <https://goo.gl/KGR5PM>.

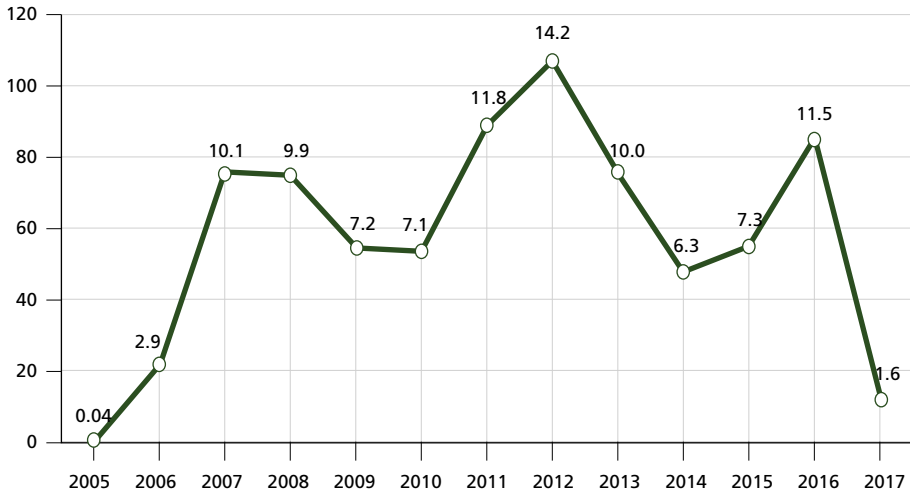
13. CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>. Accessed on: April 2017.

5.1 Certified GHG Emissions Reductions from Brazilian CDM project activities

Graph 7 presents data related to the annual distribution of CERs to participants of CDM project activities in Brazil between 2005 and April 2017. Of note, years 2007 and 2008, with 19.9% of total issued CERs in the period, as a consequence of the intense competition in the global market to encourage GHG reduction projects. In the occasion, the value of carbon credit reached the highest figures, being negotiated at a price range between € 16 to € 18 in the last trimester of 2007 (World Bank, 2008), thus encouraging project participants to monitor, verify and certify their projects' emissions reductions, generating CERs for sale.

GRAPH 7

Annual distribution of CERs issued by Brazilian CDM project activities (2005-April 2017)
(In %)



Source: CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>.

Obs.: Total CERs issued: 123,648,417 tCO₂e.

2001 and 2012 stand out, adding up 26% of all CERs issued in the period (as per graph 7). Although there is no proper explanation for this, it appears that participants of registered projects intensified monitoring and verification of GHG emissions reductions, in view of the uncertainties regarding continuity of the CDM after the end of the first commitment period of the Kyoto Protocol.

The global economic downturn and the uncertainties regarding global actions towards GHG emissions reductions fully reflected in a significant decline in the

demand for carbon credits after 2012, which led to an excess supply, and has driven down the price of CERs to € 0.34/tCO₂ by the end of 2012.¹⁴

Concerned with the future of the Clean Development Mechanism, the CDM Executive Board has encouraged actions towards reducing the number of CERs offered, aiming at recovering their price. In this regard, it has established rules for the voluntary cancelling of CERs in the CDM registration, thus facilitating their commercialization in new compensation markets such as South Korea, Mexico and South Africa, as well as in international organization programs, such as the Pilot Auction Facility for Methane and Climate Mitigation,¹⁵ among others.

Based on the information provided by graph 7, a recovery trend can be observed in the issuance of CERs as of 2015, reaching a significant value in 2016, with 11.4% of the total CERs issued for Brazilian projects, although their average price has presented their lowest level since that significant fall in 2012, reaching an average value in 2016 of €0.27/tCO₂e for CERs traded on the Inter-Continental Exchange.¹⁶

This data allows for the assumption that the possibility of trading CERs in new compensation markets and programs at more attractive prices, although still falling short of the price level practiced before 2012, had some effect in terms of encouraging the Brazilian participants to resume their monitoring, verification and certification actions in relation to their projects' GHG emissions.

5.2 CDM project activities by type of greenhouse gas and activity

The distribution of registered projects activities in Brazil by April 2017, by type of GHG reduced, is presented in Graph 8. It should be noted that CO₂ is the most relevant, followed by CH₄ and nitrous oxide (N₂O). Data in table 1 show that the majority of project activities developed in Brazil is in the energy sector, which explains the predominance of CO₂ in the balance of Brazilian emissions reductions.

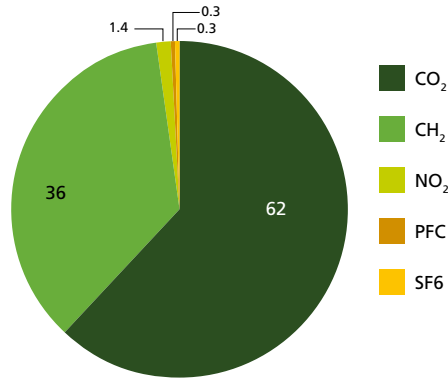
14. Further information at the QUANDL Corporation database. Available at: <https://goo.gl/HLa3uH>. Accessed on: June 2017.

15. Climate finance model developed by the World Bank Group to stimulate investment in projects that reduce greenhouse gas emissions while maximizing the impact of public funds and leveraging private sector financing. Available at: <https://goo.gl/Phrr9h>. Accessed on: June 2017.

16. Further information at the QUANDL Corporation database. Available at: <https://goo.gl/Vzc1zk>. Accessed on: June 2017.

GRAPH 8

Distribution of project activities in Brazil, by type of greenhouse gas, registered under the UNFCCC (April 2017)
(In %)



Source: CDM Projects. Available at <https://goo.gl/hPvdvm>.
Obs.: Total amount of project activities registered: 342.

TABLE 1
Distribution of CDM project activities in Brazil, by type of project activities

Types of project activities	CDM project activities		Estimated GHG emissions reductions	
	Quantity	Percentage in relation to total	tCO ₂ e	Percentage in relation to total
Hydropower station ¹	94	27.5	138,473,415	36.5
Biogas ²	63	18.4	24,861,823	6.5
Wind power station	57	16.7	44,306,593	11.7
Landfill gas	52	15.2	91,367,345	24.1
Energetic biomass	41	12.0	16,091,394	4.2
Substitution of fossil fuels	09	2.6	2,664,006	0.7
Methane avoided ³	09	2.6	8,627,473	2.3
N ₂ O decomposition	05	1.5	44,660,882	11.8
Heat use and recovery	04	1.2	2,986,000	0.8
Afforestation and reforestation	03	0.9	2,408,842	0.6
Use of material	01	0.3	199,959	0.1
Solar photovoltaic energy	01	0.3	6,594	0.0
Energy efficiency	01	0.3	382,214	0.2
SF ₆ substitution	01	0.3	1,923,005	0.5
PFC reduction and substitution	01	0.3	802,860	0.2
Total	342	100.0	379,762,405	100.0

Source: CDM Project. Available at: <https://goo.gl/ziKsuP>.

Notes: ¹ Micro Hydropower (MHP) Plants, Small Hydropower (SHP) Plants and Large-Scale Hydropower (LHP) Plants.

² Swine breeding and waste water treatment.

³ Water treatment, composting and incineration of waste.

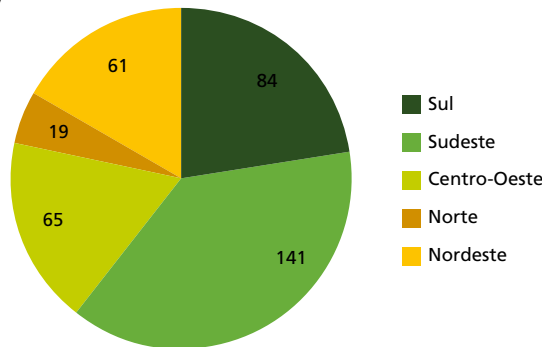
Data presented in table 1 show that 27.5% of total CDM Brazilian projects registered under the CDM Executive Board by April de 2017 originate in hydropower plants (94 projects). Biogas activity projects (18.4%) come next, leading in quantity, followed by wind power plants (16.7%), landfill gas (15.2%) and energy biomass (12.0%). In terms of GHG emission reduction potential, the largest contributions are from hydroelectric, landfill gas, N₂O decomposition and wind power plants.

5.3 Distribution of CDM activity projects by region and by state of the Federation

Graph 9 presents the regional geographic distribution by number of project activities registered at the CDM Executive Board by April 2017. Most CDM project activities in Brazil (38% of the total) are concentrated in the Southeast region, with 141 project activities, out of which landfill gas (32), biogas (32), hydroelectric (27) and energy biomass (25) stand out. In addition, the region concentrates the total number of projects for fossil fuel substitution, heat use and recovery, SF₆ and solar energy substitution, and 80% of N₂O decomposition project activities.

The Southern region ranks second, with 84 CDM project activities in effect in its territory, predominantly hydroelectric power plants (35), biogas (17), wind power plants (11), energy biomass (10) and landfill gas (8). The Center-West region, with 65 project activities, has a predominance of hydroelectric power plants (30) and biogas (29). The Northeastern region registered 61 project activities, with predominance of wind farms (45), landfill gas (8) and biogas (3). Finally, the Northern region of Brazil, with only nineteen CDM project activities, predominantly hydroelectric power plants (9), landfill gas (3), wind power plants (2) and energy biomass (2).

GRAPH 9
Distribution of project activities in Brazil, by region,¹ registered under the UNFCCC (April 2017)

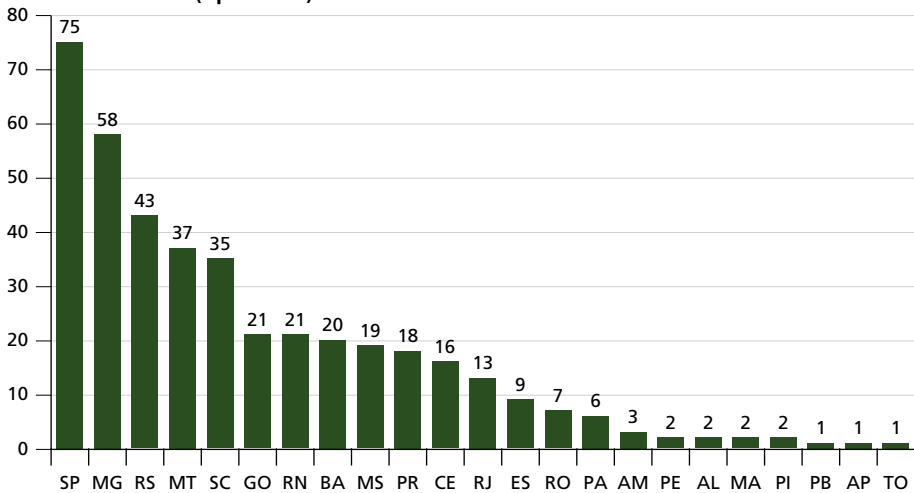


Source: CDM Projects. Available at: <https://goo.gl/Uo8ps9>.
 Note: ¹ Some project activities encompass more than one state/region.

Regarding the distribution of CDM project activities in Brazil, by state of the Federation (graph 10), the state of São Paulo ranked first in April 2017, with 75 project activities, followed by the states of Minas Gerais (58) and Rio Grande do Sul (43), which shows a predominance of projects in the center-south of the country.

GRAPH 10

Distribution of project activities¹ in Brazil, by state of the Federation, registered under the UNFCCC (April 2017)



Source: CDM Projects. Available at: <https://goo.gl/Uo8ps9>.

Note: ¹ Some project activities encompass more than one state/region.

6 PROFILE OF PROGRAM OF ACTIVITIES IN THE CLEAN DEVELOPMENT MECHANISM IN BRAZIL

With regard to the Program of Activities (PoAs), by April 2017, Brazil had ten PoAs registered under the CDM Executive Board, four of them being wind farms, two hydroelectric plants (SHP), two of biogas, one of landfill gas and one of renewable energies (wind, SHPs, geothermal, wave¹⁷ and tidal¹⁸), with total estimated GHG emission reduction for the first crediting period of 11,573,375 tCO₂e (table 2).

17. Power generation through waves.

18. Power generation through tidal movements.

TABLE 2
Distribution of Brazilian PoAs, by type of project, registered under the CDM Executive Board (April 2017)

Type of project	Number of PoAs	Total GHG emissions reduction estimates (tCO ₂ e) ¹
Wind power plants	4	823,648
Hydropower plants (SHP)	2	233,149
Biogas	2	4,164,643
Landfill gas	1	4,868,813
Renewable energy ²	1	1,483,125
Total	10	11,573,378

Source: CDM Projects. Available at: <https://goo.gl/Uo8ps9>.

Notes: ¹ First crediting period (seven years).

² Wind power, SHP, geothermal and wave energy plants.

7 FINAL COMMENTS

Brazil has stood out in the international arena as an important actor linked to the clean development mechanism. The CDM was created on the basis of the 1997 Brazilian proposal for the establishment of a Clean Development Fund, which was adopted by the Group of 77 and China and later modified into a mechanism, which was adopted by the Kyoto Protocol. In addition, Brazil was one of the first countries to establish, at the local level, the legal bases that were necessary for the development of projects under the CDM, with the creation of its Designated National Authority, through the Presidential Decree of July 7th, 1999. Brazil was also the first nation to formalize the registration of its DNA in the CDM Executive Board. The first methodology approved in the scope of the CDM in its Executive Board is also Brazilian (Landfills Salvador da Bahia). Subsequently, it was the first country to have a project effectively registered under the CDM - Energy Project from Landfill Gases, of the company NovaGerar EcoEnergia Ltda. (Brazil, 2008b).

Since its creation, the CDM has reached a global dimension, and currently involves 99 countries¹⁹ with more than 7,700 project activities registered under its Executive Board, estimating a total emission reduction for the entire crediting period of about 8.5 billion tons of CO₂. Brazil continues as one of the leading nations in this process, and occupies a prominent position, together with China and India, in terms of number of registered project activities and estimated GHG emission reduction.

19. CDM/UNFCCC Pipeline. Available at: <https://goo.gl/hVQUcP>. Accessed on: April 2017.

The future of the CDM is not yet defined, nor will it be the transition from the CDM to the new mechanism, if at all. However, it is understood that the new mechanism will probably use many elements of the CDM in order to build upon the experience gained by trying to learn from mistakes while adopting the best practices and, possibly, the best methodologies (Brazil, 2016).

REFERENCES

BRAZIL. Ministério da Ciência e Tecnologia. **Manual para submissão de atividades de projeto no âmbito do CDM**. Brasília: MCTIC, 2008a. (Publicações da CIMGC). Available at: <https://goo.gl/4ejB3K>.

_____. Ministério das Relações Exteriores Ministério da Ciência e Tecnologia; Ministério do Meio Ambiente; Ministério de Minas e Energia; Ministério do Desenvolvimento, Indústria e Comércio Exterior. **Contribuição do Brasil para evitar a mudança do clima**. Brasília: MCTIC, 2008b. (Publicações da CIMGC). Available at: <https://goo.gl/4ejB3K>.

_____. Ministério da Ciência, Tecnologia, Inovações e Comunicações. **Relatório de Atividades 2015 da Comissão Interministerial de Mudança Global do Clima**. Brasília: MCTIC, 2016. Available at: <https://goo.gl/mocMGq>.

CGEES – CENTRO DE GESTÃO DE ESTUDOS ESTRATÉGICOS. **Manual de capacitação sobre mudança climática e projetos de mecanismo de desenvolvimento limpo**. Brasília: CGEE, 2010.

FRONDIZI, I. M. R. L. (Coord.). **O mecanismo de desenvolvimento limpo: guia de orientação 2009**. Rio de Janeiro: Imperial Novo Milênio, FIDES, 2009.

SANTOS, V. F. **Os resultados do mecanismo de desenvolvimento limpo no Brasil: primeiro período do Protocolo de Quioto**. 2014. Monografia (Bacharelado) – Universidade de Brasília, Brasília, 2014.

WORLD BANK. **The state and trends of carbon market 2008**. Washington: World Bank Institute, 2008. Available at: <https://goo.gl/8BNqj7>.