CHAPTER 11

LEGAL NATURE AND CREDIT AND TAX ISSUES OF CERTIFIED EMISSION REDUCTIONS[1]

Habib Jorge Fraxe Neto[2]
Hipólito Gadelha Remígio[3]

1 INTRODUCTION

How to finance the adaptation and mitigation measures needed to enable low-carbon economies has been a top priority and at the same time one of the greatest challenges for nations that are part of the United Nations Framework Convention on Climate Change (UNFCCC). Commitments for the transfer of resources from developed to developing countries under the 2016 Paris Agreement involve $100 billion a year as at 2020. The Clean Development Mechanism (CDM) was established by the Protocol of Kyoto, in 1997, on the basis of this north-south dichotomy, in order to finance measures to be adopted by developing countries in the tackling of climate change.

The Kyoto Protocol, enacted in Brazil by Decree No. 5,445, dated May 12th, 2005, established the CDM as one of its three market-based mechanisms. It is the mechanism of this protocol that enables the voluntary participation of developing countries in the effort to reduce greenhouse gas (GHG) emissions, especially from mitigation projects that generate Certified Emissions Reductions (CERs), which can be bought by developed countries in order to achieve their emission reduction targets. This transaction would promote the transfer of resources and technology from developed to developing countries, aiming at consolidating low carbon economies (Torres, Fermam and Sbragia, 2016).

The genesis of the CDM had optimistic expectations of reconciliation of the great differences between developed and developing countries on solutions to the climate dilemma, considering the synergy inherent in the CDM among those countries and their potential contribution to sustainable development.

1. This chapter is the responsibility of the authors and does not reflect the opinion of the Legislative and Budget, Audit and Control Advisories of the Federal Senate, where they both work.
2. Biologist. Legislative Advisor in the environmental area of the Federal Senate.
3. Bachelor of Accounting Sciences. Federal Senate Budget, Audit and Control Advisor. Federal Justice Accounting Expert.

One of the pillars of the CDM is the generation of carbon credits (or CERs) certified by the United Nations (UN), but definitions of their legal nature in the domestic sphere remain to be seen. Some bills – currently filed by the National Congress, as discussed in the next section – aimed at legally conceptualizing CERs, as well as establishing rules on these certificates, which included tax measures to promote CDM projects in Brazil.

This chapter examines the legal nature of CERs and related tax and credit issues with the objective of assessing aspects related to the domestic regulation of carbon credits, considering also the possible replacement of the CDM by the sustainable development mechanism (SDM), provided by the Paris Agreement. In addition to this introduction section, the chapter is organized in another three sections. We will cover the domestic and international context of the CDM in the next section. The following section will cover the legal nature and the credit and tax issues associated with CERs. Then, conclusions will be drawn from the reflections of the two previous sections.

2 DOMESTIC AND INTERNATIONAL CONTEXTS OF THE CDM

The economic rationale of the CDM is associated with the lower cost, for developed countries, for financing mitigation projects in developing countries, compared to the cost that the more industrialized nations would have to reduce their emissions domestically. These projects must result in mitigation, that is, emissions reductions, when compared to a situation of not implementing the project, a characteristic known as additionality.

In fact, CDM projects are subject to a thorough analysis by the National Designated Authority (NDA), which in Brazil is represented by the Interministerial Commission on Global Climate Change (CIMGC, in the Portuguese acronym). Once approved, projects are registered and CERs are issued by the CDM Executive Board (a UN body), corresponding to the total GHG that, due to the existence of the project, will no longer be emitted or will be sequestered.[4] Each CER is equivalent to 1 ton of carbon dioxide equivalent and can be traded and granted via onerous transfer (sold) and used by Annex I countries to meet part of their emission reduction targets under the Kyoto Protocol.

The use of market-based instruments in the execution of public environmental policies can achieve results that would not be achieved otherwise by the traditional instruments of command and control, executed by the public power. Several authors argue that market-based solutions would allow a minimal cost to achieve

4. The National Policy on Climate Change (Law No. 12,187, December 29th, 2009) defines this sequestration as a sink: "a process, activity or mechanism that removes greenhouse gas, aerosol or precursors of greenhouse gases from the atmosphere" (Brazil, Art. 2, IX).

environmental policy objectives, as well as foster technological innovation by the increasing adoption of less polluting techniques within an emissions trading system, for example. However, the CDM is associated with high transaction costs[5] due to the bureaucracy inherent in the process of obtaining credits (Gutierrez, 2010).

Other critical aspects have been evaluated. One of the more comprehensive literature reviews on the CDM suggests that its operation by market forces alone would not contribute significantly to sustainable development[6] in developing countries, and above all it would not contribute to alleviating poverty (Olsen, 2007). In a regional analysis on the impacts of the CDM, the excessive focus on economic aspects of the mechanism and the little importance given to the social dimension are pointed out, (Lazaro and Gremaud, 2017).

The first commitment period of the Protocol, with emission reduction obligations by developed countries (parts of Annex I of the UNFCCC) was in force between 2008 and 2012. The second period was only established at the XVIII Conference of Parties (COP-18) in Qatar, by means of the Doha Amendment (in reference to the capital of that country), which determined that this period would cover years 2013 to 2020, during which Annex I countries would have to reduce emissions by at least 18% below the 1990 levels. However, the amendment has not yet entered into force, as it must be ratified by at least 144 UNFCCC member countries. By October 2019, 134 countries had ratified the amendment.

In Brazil, the National Congress approved the Doha Amendment by Legislative Decree No. 178 of 2017. However, in order for the amendment to enter into force at the domestic level, after ratification by at least 144 countries, it will be necessary that it is enacted by an Executive decree, which is one of the requirements for it to prevail in Brazil with an ordinary law status.[7] It should be noted that the countries responsible for most of the world emissions are in one of the following situations: either they have not ratified the Kyoto Protocol, so they will not ratify Doha (in the case of the United States); they have no obligation to reduce emissions (China, India, Brazil and other developing countries); or they did not sign the Doha Amendment (Russia, Japan and Canada, for example).

This poor adherence to the Kyoto Protocol commitments has negatively influenced the implementation of CDM projects, since the inherent logic of the

5. For further information on transaction costs and its influence on development of CDM projects, see Chapter 10 (note from the editors).

6. For further information on this topic, it is recommended that you read Chapter 8 of this publication, which discusses, carefully and critically, from the perspective of its author, the relevance, relevance and efficiency of the criteria adopted by Brazil for the verification of CDM Projects' contribution to sustainable development (note from the editors).

7. As per the decision by the rapporteur, Minister Celso de Mello, on the Direct Action of Unconstitutionality No. 1,480-3/DF (September 4th, 1997), the Federal Supreme Court considers that the international treaties promulgated by the Executive Branch have normative parity with ordinary laws. It is the so-called thesis of the ordinary legality of international treaties, reaffirmed in later decisions of the Court. See: <https://goo.gl/PEM5rW>. Accessed on: November 19th, 2019.

mechanism is precisely the purchase of CERs by countries that have obligations to reduce emissions, which depends on the commitment of these nations (Voigt, 2008). In addition to this, there is also the decision, by the European Union (the main purchaser of CERs, through the European emissions trading system)[8] to restrict the purchase of these certificates, as at 2013, only for CDM projects from less developed countries.[9] This explains a significant increase in the number of CERs in 2012, since Brazil, China and India (which account for about 75% of the projects) have accelerated their UN registration processes, prior to the beginning of this restriction.

Since the implementation of the CDM to January 2016, the Secretariat of the Convention has recorded 7,690 CDM project activities, according to the CIMGC report.[10] Brazil is one of the 3 countries with the highest number of projects (339, or 4.4% of the total), followed by India (1,598, or 20.8% of the total) and China (3,764, or 48.9% of the total).[11]

The CDM projects registered in the country are responsible for a reduction of 375 million tons of carbon dioxide equivalent, about 5% of the world total emissions that will be avoided as a result of these projects, which corresponds to the first period of obtaining credits. China would account for about 60% of total avoided emissions from CDM projects and India for 11.5%. Approximately 75% of Brazilian CDM projects are associated to the generation of renewable energy, according to the most recent report on the status of projects, prepared by the CIMGC.[12]

It can be stated that the Kyoto Protocol (and the CDM) is in a situation of uncertainty, considering the low commitment of the parties, especially regarding the ratification of the Doha Amendment. Since 1990 (base-year of protocol reduction commitments), world emissions have increased by about 50%, mainly due to economic growth in China and other countries in Asia, South America and Africa. If in 1990 developed nations accounted for two-thirds of emissions, in 2012 those countries emitted less than 50% of total GHG emissions (Schiermeir, 2012). As a result, it can be said that, although the Kyoto Protocol has achieved its objective with regard to developed countries' responsibility under UNFCCC, the regime has lacked other protocols that would contribute to global emissions reductions. Hence, while overall emissions reductions for the stabilization of

8. European Union Greenhouse Gas Emission Trading System – EU ETS.

9. Chapters 14 and 15 of this publication present relevant considerations regarding marketing issues and their impacts on both the CDM and the new market mechanisms and formats, as suggested by PMR Brazil's experience in Chapter 15 (note from the editors).

10. For further information, see the Clean Development Mechanism (CDM) Project Status Report in Brazil - compiled by January 31st, 2016, prepared by CIMGC in 2016. Available at: <https://goo.gl/xCi3Wf>. Accessed on November 19th, 2019.

11. For further information on CDM Projects developed in Brazil, see Chapter 2 (note from the editors).

12. For further information on CDM Projects for the energy sector, see Chapter 4 (note from the editors).

greenhouse gas concentrations in the atmosphere have not been observed, Kyoto laid the groundwork for climate policies adopted today by the parties and served as an experiment for the formulation of the Paris Agreement as a recent multilateral understanding on climate change.

The entering into of the Paris Agreement, enacted by Decree No. 9,073, de 2017, led to a more comprehensive effort to reduce emissions, with voluntary obligations of all parties – not just developed countries, as in the Kyoto Protocol. This effort is brought about by the Nationally Determined Contribution (NDC), established by each country in the agreement – another difference from Kyoto, which defined quantified reduction commitments only for developed countries based on the principle of common but differentiated responsibilities. Unlike Kyoto, the Paris Agreement seeks voluntary cooperation in the implementation of NDCs by the parties to allow greater ambition in their mitigation and adaptation actions.[13]

According to the Paris Agreement, the mechanisms provided for in Art. 6 still require regulation of its modalities and procedures. Under the new agreement, emissions trading mechanisms allow all parties to be both buyers and suppliers of carbon credits as they all commit to reducing their emissions (Fraxe and Kässmayer, 2016).

Of interest for this analysis, the agreement established the SDM, according to Art. 6, Paragraph 4. During negotiations for the regulation of the agreement, as per proposals submitted by Brazil to the Secretariat of the Framework Convention, the country considers the SDM to be "the" international mechanism for certifying climate actions and issuing credits, based on the experience obtained with CDM. The SDM would be, according to the Brazilian proposals, an expanded CDM,[14] a centralized and voluntary certification, subject to multilateral governance to guarantee its environmental integrity. While the use of credits generated in the CDM only assists Annex I countries (to achieve their emissions reduction obligations) rather than Non-Annex I, the SDM has been set up with much greater flexibility to encourage and facilitate participation in mitigation of GHG emissions by public and private entities authorized by any party.

Brazil argues that the new rules have to guarantee a transition from the CDM to the SDM, in such a way that CERs are also instruments for mitigation according to the new agreement. In this sense, it argues that the rules and bodies dedicated to SDM are established based on the structure and standards of the CDM system, considering their rigor, transparency and reliability. It further argues that emission reductions resulting from SDM projects in a given country can be transferred to enable the NDC of another country, with safeguards to avoid double counting in

13. For more information on the format and main features of the Paris Agreement, see Chapter 12 (note from the editors).
14. For more information on the Brazilian proposal for the SDM, see Chapter 12 (note from the editors).

the global inventory; or that they can be used to achieve the NDC of the country proposing the project.

The SDM could indeed be considered an expanded CDM, depending on the regulation that the parties will give to the rules of this mechanism, which, unlike the CDM, enables: *i*) that the project be carried out by both developed and developing countries; *ii*) more levels beyond the national levels – for example, subnational (regional and local) level; and *iii*) that not only countries, but also public and private entities authorized by the party can develop projects.

There is great potential for growth in sectors that can benefit from mechanisms like the CDM and SDM, such as the generation of electricity from solar photovoltaic source, with estimates indicating that this source may represent around 32% of the energy mix in 2040, with investments estimated at BRL 685 billion (Ramos, 2017). According to the National Electric System Operator (NOS), wind power sources have also gained increased share in this mix, mainly in the Brazilian Northeast, where they accounted for about 58% of the total energy generated in August 2017, reaching up to an average 5,873 MW.

Maybe the greatest challenge in transitioning to a low-carbon economy is related to the necessary investments. In this regard, market-based mechanisms, such as the CDM, would contribute to make this transition economically feasible.

Other challenges include the tax burden associated to the development of sectors related to this economy and the creation of a proper regulatory environment. The lack of a legal framework is one of the main obstacles to the necessary legal certainty to support projects (Gutierrez, 2007).

As for legislative proposals that sought such regulation, Bill No. 493 of 2007 dealt with CERs generated from the CDM. The project approached the trading of certificates in the stock exchange or organized over-the-counter markets and provided for tax breaks for investors in CDM projects that generated CERs, with various tax exemptions, which included exemptions from the contribution for the Social Integration Program (PIS) and the Contribution for Social Security Financing (Cofins) for operations involving the transfer of CERs. However, in 2015, the Bill was filed by the Chamber of Deputies, based on a regimental provision that determines the filing of projects that remain without final deliberation over a long period.

Regarding the legal definition of CERs, in addition to Bill No. 594, of 2007 (which intended to define carbon credit certificates as a security), there was Senate Bill No. 33, of 2008, which also leveled CERs with securities, and submitted these certificates to the regulation of the Brazilian Securities and Exchange Commission. However, in 2014, Senate Bill No. 33 was rejected in the Senate, on the basis that

it would not be convenient to consider a CER as a security and that its approval would generate additional and unnecessary costs for the carbon credits market, considering that the Brazilian market would have of some mechanisms capable of financing and structuring projects for the issuance of carbon credits, regulated by the Brazilian Securities and Exchange Commission. Bill No. 594/2007 was filed in the Chamber of Deputies in 2015, due to the delay in achieving a final deliberation.

In the next section, we will cover crucial points for establishing a regulatory environment: defining the legal nature of CERs and the tax and credit issues associated with certificates.

3 LEGAL NATURE AND TAX AND CREDIT ISSUES OF CERS

The concrete effectiveness of the CDM in adding equity in the form of CERs to those who develop projects aimed at reducing GHG emissions is necessarily related to both the certainty (or not) of collecting proceeds from CERs and the possibility of negotiating such assets and, consequently, to the definition of the actual economic results to be obtained.

This effectiveness is also severely influenced by the effects of the negotiation of such assets, especially in a society where the level of private savings is low – a fact that is common to many of the countries not included in Annex I – where credit has a crucial role as a way of financing economic activities. In this context, special attention should be paid to the economic and financial effects of both the effective receipt of asset values and their anticipation through secondary market negotiations. The effects discussed here are fundamentally of two natures: credit and tax.

Credit effects come up when negotiating in the secondary market, and deserve very special attention, since credit in Brazil (as in several developing countries): *i*) takes on high volumes in the financing of projects – that is, usually economic agents that are CERs creditors are indebted to the institutions of the National Financial System; and *ii*) imposes extremely high interest rates when compared to those practiced in the rest of the world.

In this context, CERs holders who are indebted to the National Financial System are tempted to negotiate their bonds before their maturity date, offering significant discounts, since the holder of the purchasing power, as a rule, is the National Financial System. Thus, buyer institutions can at the same time take advantage of the eventual economic fragility of CERs holders and impose on them discounts that also reflect the high rates practiced in the financial market. As a result, the actual amount to be received from CERs, when anticipated, is significantly reduced as a result of the discount offered by the financial market.

The *tax effects* on the efficiency in collecting proceeds from CERs are verified in two moments: due to the collection of CER, and due to its negotiation.

Several authors, especially Silva (2015), point out that tax effects should be examined in the light of the legal nature of CERs, and to this end, this author raises four hypotheses assumed by the doctrine about its legal nature: intangible or immaterial property, environmental commodity, securities or derivatives.

3.1 The legal nature of CERs

Usually, CERs are considered a "transactable financial asset", and this concept is the starting point for the examination of its legal nature. It should be borne in mind, however: *i)* that the definition of the legal nature constitutes a form of classification of the asset among defensible hypotheses; and *ii)* that legal classifications make sense when different categories have different norms that give meaning and relevance to classification.

In fact, as explained above, the National Congress attempted to rank CERs as securities via Bills 493/2007 and 549/2007, which were processed in the Chamber of Deputies, and Senate Bill No. 33/2008. The Bills were shelved in the Chamber of Deputies for not having been approved in two legislatures (each lasting four years). The Senate's was expressly rejected by deliberation of the Committee on Economic Affairs.

Frustration of the attempt to legislate, which would have the effect of concluding the discussion on the legal nature of CERs, does not, however, remove the most lucid understanding on the issue, which was the subject of an earlier article by the authors of this chapter (Fraxe and Remígio, 2010), in which we argue that CERs are securities.

On the other hand, the Brazilian Securities and Exchange Commission distances CERs from the incidence of Brazilian legal regulations related to securities, according to the following text:

> This chapter will present some of these securities and their main characteristics. First, however, an introduction will be made to the concept of securities. This discussion becomes important insofar as the characterization of securities as marketable securities makes them subject to the rules and supervision of the Brazilian Securities and Exchange Commission, with a significant change in the way these securities can be offered and traded in the market (Brazilian Securities and Exchange Commission, 2014, p. 70).

Along these lines, Silva (2015, p. 190-191), following the guidance above, states that

> Discussions on the possibility of CERs being considered as securities originate from the assumption that only those instruments that may be listed under Art. 2 of Law 6,385/76 can have this nature. In this sense, we have the statement of a Brazilian Securities and Exchange Commission director admitting that "securities, more than a theoretical category, are all that the law defines as such, for the purposes of defining the competence of the state regulator." Although the legal list has ceased to be *numerus clausus* since the reform of Law 6,385/76, in 2001, however, a financial instrument can only be considered as a security if it can be classified among the modalities of Art. 2 of the aforementioned law which, since 2001, has come to include derivatives and collective investment contracts. Since the CER is a "financial instrument, tradable in secondary markets", we must verify if it can be included in the modalities of that legal provision.

It is quite true that the authors do not share these thoughts for two very clear reasons: *i)* the wording of the caption of Art. 2 of Law No. 6,385, dated December 7th, 1976, provides that its items only list the "securities" that are "subject to the provisions of this Law"; and *ii)* the scholar admits that the list in Art. 2 is not *numerus clausus*, therefore, it allow for the possibility of other assets being framed there.

The literal interpretation of the above text allows no misconstruction: the subjects of the sentence – which are the subsections – are "securities subject to the regime of this law".

This cannot conduct to the conclusion that: *i)* the list that follows the caption contains the only securities possible; *ii)* consequently, what is not in that list, is not security.

What Art. 2 intends to bind is the listing of items submitted to the effects of the said law – and that is it. It is irrefutable that the text derives from the indisputable characterization of the items as securities. In fact, the policy-maker could even have omitted such an expression and drafted the caption simply with the text: "Are subject to this Law's regime: [...]".

It is clear that the Law only established the characteristics of the items (they are securities), however the legislative writing in no way intended to exhaust the assumptions of securities.

We understand that CERs are securities, given that their nature has the two necessary characteristics for this definition: they are assigned a value and are tradeable. When examining the matter in its essence (ie, abstracting from the mere effects of Law No. 6,385/1976), it is observed that, in practice, all securities are marketable securities.

In other words, if there is a security, it is, by nature, a marketable security, which does not mean that all the securities will be subject to the supervision of the

Brazilian Securities and Exchange Commission, as is the intention of those who (in our view, mistakenly) only recognize those listed in the said Law.

The very concept of securities began with the bill of exchange, notes payable, the duplicate and the check. These securities, however, although they are essentially securities, are not, as a rule, subject to the control and supervision of the CVM.

In the case of the Brazilian Emissions Reduction Market, however, there is legislation that goes beyond Law No. 6,385/1976, which not only expressly recognizes CERs as securities, but also subordinates the market for its negotiations to the authorization of the Brazilian Securities and Exchange Commission. Art. 9 of Law No. 12,187/2009 (Climate Change National Policy) provides that

> The Brazilian Emission Reduction Market will be operated in commodities and futures exchanges, stock exchanges and organized over-the-counter entities, authorized by the Brazilian Securities and Exchange Commission, where trading of securities representing certified emission reduction of greenhouse gas (Brazil, 2009).

As previously stated, in the authors' standpoint, in essence, there is no doubt that CERs are securities.

3.2 Taxation of CERs

In the Brazilian context, there may be up to three types of legal facts that involve CERs and that are of interest to Tax Law, since they subsume under the assumptions of incidence, in general, of income tax, in this case, as capital gain, and of the Social Contribution on Net Profits (CSLL, in the Portuguese acronym): the sale by the holder of the project in the domestic secondary market; the sale by that same original holder to the international buyers of countries listed in the aforementioned Annex I; and, finally, the sale by the buyers in the secondary market to international buyers.

When the sale is made by the original holder, whether on the domestic secondary market or to international buyers, the tax rules are the same, and capital gain is calculated from the following subtraction: value received less the cost of production, according to certain rules that define the expenditures that can be subtracted.

In the specific case of companies that calculate profit by the presumed profit method, the legislation determines that the cost will be 68% of the income earned, in other words, the calculation basis will be 32%, according to Art. 15, Paragraph 1, III, *c*, of Law No. 9,249, of December 26, 1995.

> The basis of calculation of the tax, in each month, will be determined by applying the percentage of 8% (eight percent) on gross revenue earned monthly, observing the provisions in Art. 12 of Decree-Law No. 1598, of December 26, 1977, deducted from the discarded, canceled sales and unconditional discounts granted, without prejudice to the provisions of Arts. 30, 32, 34 and 35 of Law No. 8,981 of January 20, 1995.

> Paragraph 1: For the following activities, the percentage referred to in this article will be: (...)
>
> III – thirty two percent, for activities including: (...)
>
> c) administration, lease or assignment of real estate, movable property and rights of any kind;

In the case of the secondary market, capital gain is calculated by simply subtracting the value obtained from the sale less the amount paid for the purchase.

The result of the operations described will constitute profit, and rates of 15% or 20% will be applied, due to the fact that the company's profit, in theory, were above BRL$ 20,000 per month, as determined by Arts. 3 and 15 of Law No. 9,249/1995.

Regarding the Social Contribution on Net Profits, it is applied at a rate of 9% on profits, whether it is assessed, as the income tax, or in the presumed or actual form. Due to the nature of CERs, its sales are not taxed by other indirect taxes (such as the Tax on Industrialized Products – IPI, the Tax on the Circulation of Goods and Services – ICMS and the Tax on Services – ISS) neither by indirect contributions (PIS and Cofins).

Building from this data, the result is that by the presumed income method, CER income is taxed at the rate of 10.88% (corresponding to 25% of Corporate Income Tax – IRPJ plus 9% of the Social Contribution on Net Profits, applicable to a profit base of 32%); in real profit, this general percentage will only be defined as a result of costs that, in theory, will be higher than 68%, which means that the real rate tends to be lower than 10.88%.

Therefore, there is a significant tax burden on operations involving CERs, which may discourage the gain in scale in CDM projects. In addition to the tax effects, there are credit effects that may also negatively impact the financial results of the CDM project proponents.

3.3 On credit effects

One of the factors of greater relevance for the effectiveness of CERs is the capacity of effective financial reimbursement, from the appropriation of the carbon credit generated. This temporary aspect deserves special importance in view of the adverse economic context that Brazil has faced in recent years.

The low level of internal savings, coupled with the steady reduction in economic activity, leads companies to seek anticipation of their receivables, with a view to the composition of their financial resources destined to working capital and the fulfillment of the obligations assumed by them in the exercise of the economic development activity. In this context, the anticipation of CERs receivables

is relevant, since it constitutes a form of financial income decoupled from any assumption of liabilities.

However, the domestic financial market imposes interest rates that considerably degrade the real value of the asset. In August 2017, for example, consulting the Central Bank's website to obtain interest rates on loans for working capital to less than 365 BCB days[15] showed that such rates vary from 11.33% to 75.70% a year, and present an average of 32.67%, which means that a bond worth, for example, BRL132,667.70 will be negotiated, on average, for BRL100,000, suffering, therefore, a discount of BRL 32,667.70, that is, a discount of 24.62% in one year.

Taking this period as a possible base for real discount, and adding to it the average tax of 10.88% (when it comes to the presumed profit method), the conclusion is that, in order to realize the early entry of a CER, the company will have to give up 24.62% of the security, and, on the net value, pay 10.88% of taxes. That is, it will receive the net amount of BRL89,120.00, in the case of the example of BRL132,667.70, which corresponds to 67.18% of the gross value owed to the company.

4 CONCLUSIONS

There are current uncertainties regarding the effectiveness of the Kyoto Protocol, whose second commitment period (2013-2020) has not even come into effect, particularly as a result of the low commitment of countries with high GHG emissions in ratifying the Doha Round. In addition, the decision by the largest purchaser of CERs, the European Union, to restrict the purchase of credits generated by the CDM only from less developed countries, has reduced the demand for Brazilian CERs, which has negatively affected Brazilian CDM projects.[16]

This critical situation can be overcome with the Paris Agreement, which established the SDM, an instrument that, according to Brazilian proposals, would replace the CDM, with greater flexibility and based on the institutional framework created under the Kyoto Protocol.

Several authors point out the importance of establishing a regulatory framework to ensure the necessary legal and economic security for CDM projects, based on the provisions of the National Policy on Climate Change about the Brazilian Emission Reduction Market. However, the main legislative initiatives on the subject were

15. For further information, refer to *Pessoa jurídica – Capital de giro com prazo até 365 dias* (Legal Entity – working capital with a term of up to 365 days) at the Central Bank website. Available at: https://goo.gl/M4bmgE. Accessed on: Aug 21st, 2017.

16. Several chapters of this publication deal with the impact of restricting the marketing of CERs by the European Union. Chapter 12 identifies the uncertainty and consequences of this decision. Graph 4 in Chapter 6 shows the change in CER prices for the period (note from the editors).

frustrated, by the filing or rejecting of projects. These proposals sought, in addition to other measures, to define the legal nature of CERs.

In addition to the absence of a regulatory framework, other aspects that weaken the effectiveness of the CDM are related to tax and credit effects. The legal nature of CERs is one of the fundamental aspects for the analysis of tax effects. We understand that CERs are securities. And we estimate that, in the case of presumed profit, the CERs are charged an equivalent to 10.88% of the revenues generated; and, in the case of real profits, a rate lower than 10.88%. Considering the effect of an anticipation of CERs credits – with the objective, for example, of capitalizing a CDM project bidder – and based on an average tax of 10.88%, we estimate that such a company will receive around 67% of the gross amount due to it for the generation of CERs.

These tax and credit effects reinforce the importance of an adequate regulatory framework that promotes the scale-up of CDM projects, including fiscal incentive measures for project proponents. Thus, a low-carbon economy would be strengthened through this instrument of the Kyoto Protocol, whose assumptions will eventually be incorporated into the SDM regulation, under the Paris Agreement, in order to enable the fulfillment of the goals taken on by Brazil in the global effort for the balance of the Earth's climate.

REFERENCES

BRAZIL. Law No. 9,249, dated December 26, 1995. Changes the legislation of corporate income tax, as well as the Social Contribution on Net Profits, and makes other provisions. **Official Gazette**, Brasilia, December 27, 1995. Available at: https://goo.gl/mxrQ9r.

_____. Law No. 12,187, dated 29 December 2009. Institutes the National Policy on Climate Change and makes other provisions. **Official Gazette**, Brasilia, December 30, 2009. Available at: https://goo.gl/mXqH6E.

CVM – COMISSÃO DE VALORES MOBILIÁRIOS. **Mercado de valores mobiliários brasileiro**. 3. ed. Rio de Janeiro: CVM, 2014. Available at: https://goo.gl/ToAX6M.

FRAXE NETO, H. J.; REMÍGIO, H. G. Perspectivas de regulamentação do mercado de carbono no Brasil. *In:* ALVAREZ, A. R.; MOTA, J. A. (Orgs.). **Sustentabilidade ambiental no Brasil**: biodiversidade, economia e bem-estar humano. Brasília: Ipea, 2010. (Série Eixos Estratégicos do Desenvolvimento Brasileiro). v. 7.

FRAXE NETO, H. J.; KÄSSMAYER, K. **A entrada em vigor do Acordo de Paris**: o que muda para o Brasil? Brasília: Senado Federal, 2016. (Texto para Discussão, n. 215). Available at: https://goo.gl/cHkvvx.

GERAÇÃO eólica bate novo recorde no Nordeste. **Estadão**, 2017. Available at: https://goo.gl/oPGy2X. Accessed on May 13, 2018.

GUTIERREZ, M. B. O mercado de carbono e o mecanismo de desenvolvimento limpo: a necessidade de um marco regulatório/institucional para o Brasil. *In*: SALGADO, L. H.; MOTTA, R. S. (Orgs.). **Regulação e concorrência no Brasil**: governança, incentivos e eficiência. Rio de Janeiro: Ipea, 2007.

_____. O Protocolo de Quioto e o mecanismo de desenvolvimento limpo: regulamentação no Brasil. *In*: ALVAREZ, A. R.; MOTA, J. A. (Orgs.). **Sustentabilidade ambiental no Brasil**: biodiversidade, economia e bem-estar humano. Brasília: Ipea, 2010. (Série Eixos Estratégicos do Desenvolvimento Brasileiro). v. 7.

LAZARO, L. L. B.; GREMAUD, A. P. Contribuição para o desenvolvimento sustentável dos projetos de mecanismo de desenvolvimento limpo na América Latina. **Organizações e Sociedade**, Salvador, v. 24, n. 80, p. 53-72, jan./mar. 2017. Available at: https://goo.gl/SWPkWu.

OLSEN, K. H. The clean development mechanism's contribution to sustainable development: a review of the literature. **Climatic Change**, v. 84, n. 59, 2007.

RAMOS, C. Salto dos investimentos em energia solar fotovoltaica. **Valor Econômico**, 2017.

SCHIERMEIR, Q. The Kyoto Protocol: hot air. **Nature News**, Londres, v. 491, n. 7426, 2012. (Nature Publishing Group).

SILVA, M. J. A natureza jurídica e a incidência de tributos federais sobre os negócios jurídicos envolvendo as reduções certificadas de emissão (RCE). **Revista da Receita Federal**: estudos tributários e aduaneiros, Brasília, v. 2, n. 1, p. 183-207, jul./dez. 2015. Available at: https://goo.gl/tPJuHD.

TORRES, C.; FERMAM, R. K. S.; SBRAGIA, I. CDM Projects in Brazil: market opportunity for companies and new designated operational entitities. **Ambiente e Sociedade**, São Paulo, v. 19, n. 3, p. 199-212, jul./set. 2016. Available at: https://goo.gl/xVd2P6.

VOIGT, C. Is the clean development mechanism sustainable? Some critical aspects. **Sustainable Development Law & Policy**, v. 8, n. 2. 2008. (Climate Law Reporter).