

## PMR BRAZIL PROJECT: PERSPECTIVES ON THE BRAZILIAN EMISSION REDUCTIONS MARKET

Aloísio Lopes Pereira de Melo<sup>1</sup>  
Beatriz Soares da Silva<sup>2</sup>

### 1 INTRODUCTION

In 2015, with the adoption of the Paris Agreement (PA), during the 21<sup>st</sup> Conference of Parties (COP 21) of the United Nations Framework Convention on Climate Change (UNFCCC), a new phase of discussions began about instruments capable of achieving emission reduction targets taken on by the signatory countries of the agreement. Art. 6 basically establishes four types of mechanisms: *i*) cooperative approaches (paragraphs 6.1); *ii*) international transfer of mitigation results (paragraphs 6.2 and 6.3); *iii*) mechanisms that contribute to emissions mitigation and support sustainable development (paragraphs 6.4 to 6.7); and *iv*) non-market approaches (paragraphs 6.8 and 6.9). The rules, modalities and procedures – for each of these approaches – are to be negotiated in the coming years, shedding a light on what each of these mechanisms will mean in practice and how they can contribute to the achievement of Nationally Determined Contributions (NDCs), at the lowest possible cost.

At the domestic level, Law No. 12,187, of December 29<sup>th</sup>, 2009, established the National Policy on Climate Change, its objectives, guidelines, principles and instruments, as well as specifying the country's voluntary contribution to mitigation of greenhouse gas (GHG) emissions – by 2020. In addition, Decree No. 7,390 of December 9, 2010 outlined the strategy to achieve this mitigation target, listing sectoral plans containing several instruments: command and control – to contain deforestation in the Amazon and Cerrado (Brazilian savanna); incentives – such as the subsidized credit line for investments in low-carbon projects in agriculture, entitled Program for Reducing Emissions of Greenhouse Gases in Agriculture (ABC Program); and development, through funding or investment with funds

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1. Agricultural engineer. Specialist in public policies and government management of the Secretariat of Economic Policy of the Ministry of Finance (SPE/MF).

2. Economist. Specialist in public policies and government management on leave for a PhD on Sustainable Development at the University of Brasilia.

from the General Budget of the Union (OGU). Thus, the strategy outlined was based on the prediction that costing and investment budget resources would be allocated to meet voluntary mitigation targets.

In the case of the energy sector, the scope of the mitigation target is guided by the existing sectoral planning instrument (Ten-Year Energy Expansion Plan). In other sectors, the estimate was to redirect or increase budgetary resources, or to adjust priorities and targets contained in preexisting plans. This strategy proved to be limited in effectiveness, largely due to budget constraints, which made the necessary unfeasible expansions and made it more difficult to redirect resources. In addition, this may have contributed to the lack of confirmation of the National Policy on Climate Change's priorities by sectoral policymakers – in the midst of changes in the direction of the bodies and consequent reviews of priorities – and, in addition, discontinuity in monitoring governance, on behalf of the National Policy on Climate Change, as well as its implementation measures.

In this context, this policy did not evolve into a state of institution of some economic instrument aimed at creating an explicit price signal for the emission of greenhouse gases, either through the operation of a domestic cap-and-trade type emissions trading system (ETS), or by the imposition of a tax on GHG emissions (Carbon Tax – CTax) in the country.

After 2020, the National Policy on Climate Change should be reviewed to incorporate emission reduction targets set for 2025 and indicated for 2030 for the Brazilian NDC. Considering that the phenomenon of global climate change refers precisely to the creation of emission-related externalities, which impose costs on society not borne by those who emit GHGs, the internalization of these externalities – through the creation of a price signal that improves guidance on the decision-making process of economic agents in relation to the optimal level of emissions of their activities – should be a fundamental part of the instruments adopted to mitigate climate change (Stern, 2006).

Currently, the General Coordination of Environment and Climate Change at the Secretariat for Economic Policy of the Ministry of Finance (COMAC/SPE/MF) is implementing the Partnership for Market Readiness (PMR) Brazil Project, aimed at evaluating the costs and benefits of adopting alternative designs of economic instruments for the pricing of emissions in the country (ETS and/or CTax) that can be incorporated into the measures that will achieve the country's goals in the PA. In this sense, the experience acquired with the implementation of clean development mechanism (CDM) projects in Brazil should be incorporated, in some way, into any eventual emission pricing instrument to be adopted in the country. The implementation of the PMR Brazil Project has already identified some challenges harmonizing these instruments, which will be discussed along this chapter.

From the point of view of the new round of international negotiations on the definition of market instruments, with a view to achieving the targets assumed in the NDCs, it is understood that the process of analyzing the adoption of a domestic ETS in the country must be attentive to the UNFCCC negotiations, especially those relating to the issues dealt with under PA paragraphs 6.2 to 6.7. With the possibility of linking a domestic ETS with other national and/or regional markets around the world, it is possible that the results of these future transactions will be interpreted as “international transfers of mitigation results” (paragraphs 6.2 and 6.3) in a future PA regulation; reason why this possibility must be analyzed in a possible future proposal of instrument design.

In addition, the mechanism defined in paragraphs 6.4 to 6.7 of the PA, which is being called a sustainable development mechanism (SDM), also has the potential to interact with a possible national ETS,<sup>3</sup> especially knowing that sectors that could be regulated by this system could also generate credits in the SDM. Therefore, the analysis of the adoption of pricing instruments in Brazil should take into consideration possibilities of harmonizing between different available instruments (ETS/CTax and CDM/SDM), ideally building from the definition of objectives that the country would expect to achieve with the adoption of each of these.

Thus, this chapter intends to bring some elements of reflection about the advantages of adopting an emission pricing instrument (ETS and/or CTax) in the national policy, its relationship with the types of instruments based on the generation of offsets and some challenges already identified in the PMR Brazil Project, regarding the harmonization of these types of instruments in the National Policy on Climate Change. For this purpose, section 2 discusses basic concepts around the instruments of emission pricing, contextualizing the option for such mechanisms in the list of instruments available to deal with mitigation objectives. Section 3 presents the PMR Brazil Project, describing its organization and the activities implemented. Section 4 further discusses the challenges of integration between ETS/CTax (national) and CDM/SDM (international) type instruments. The last section, as usual, approaches conclusions and possible recommendations.

## **2 CARBON MARKET IN THE NATIONAL POLICY ON CLIMATE CHANGE: DEFINITION OF THE POLICY INSTRUMENT AND ITS RELATION TO THE CDM/SDM**

The emissions trading concept discussed here encompasses two types of mechanisms: one known as emissions trading systems (ETS) and the other based on the construction of a baseline with subsequent generation of credits (baseline and credit schemes).

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3. For further information on the proposed MDS under the Paris Agreement, see Chapter 12. Issues about markets in operation and formatting are discussed in Chapter 14 (note from the editors).

An ETS consists of the definition of maximum limits of GHGs (cap) that can be emitted by sources subject to the regulation, located in a certain country or region, in a certain period of time (compliance period). This total limit is distributed or sold – by auction – to the companies that own the regulated sources under the system, through licenses or quotas that represent the right to emit certain amount of GHGs during that period. At the end of the compliance period, firms must submit to the regulatory body the licenses or quotas corresponding to their emissions. Companies that cannot reach the stipulated limits by reducing their emissions – probably because they have very high abatement costs – should buy licenses or permits from those who emitted less than their cap – presumably because they had comparatively better abatement costs. From this transfer of licenses between the companies, comes the market of licenses or emission quotas (trade), where the equilibrium price of allowances is defined.

Another less frequent approach to emissions trading, called a baseline and credit, is one in which certified emission reductions (CERs) – commonly known as carbon credits – are generated for a previously defined baseline. In that case, emissions below the baseline in a given year generate credits that can be sold to any companies that have issued more than the one set in its baseline.

As they are usually applied in relative terms, such mechanisms do not imply the adoption of an emissions cap as in ETS. Thus, by setting baselines that depend on economic performance parameters,<sup>4</sup> companies do not receive their emission allowances in advance, but rather credits that are generated after verification of emission reductions. This means that – once the baseline is defined – the cap-and-trade system is administratively simpler, given that the option for the crediting system means that the system will have to be accounted for and issued annually, whereas the permissions are defined and distributed throughout the compliance period (EEA, 2006).

The rationale behind emissions trade – whether they are ETS or baseline and credit – is that the former allows reductions to be carried out by companies that have lower abatement costs, since the trade of allowances and/or credits in the market would equalize the marginal costs of abatement among all the participants of the scheme. For this reason, it is important that the participants of these schemes have different abatement costs, in order to guarantee the possibility of exchanging emission quotas between them.

In the case of an ETS, for example, given the emission cap of each source, the decision to implement an abatement measure in the company itself or to buy permits in the market will be made by comparing the company's marginal abatement

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4. As in the case where targets are set by emissions intensity.

cost (MAC) and the equilibrium price in the allowance market ( $P_C$ ). If  $MAC > P_C$ , the company will be a buyer in the market of permissions; if  $MAC < P_C$ , the company will be selling in the market of permissions. Obviously, buyers and sellers have alternated over time given the investment decisions in new technologies that lead to differentiations in the marginal costs of each company's future abatement.

Thus, emissions trading schemes ensure that the emissions reductions achieved through them will be implemented primarily by operators whose abatement costs are lower. Hence, the total mitigation costs for the economy as a whole are reduced, with a given target set – either by the cap or by the baseline. In other words, assuming that a market for permits and/or credits operates in perfect competition, the equilibrium price will be such that there is no profitable opportunity for someone to offer emission quotas at a cheaper price on the market, and therefore, these will be the lowest costs that the group of regulated agents can achieve to meet the target emission reduction target.<sup>5</sup>

Moreover, the creation of a price signal for GHG emissions has a great potential to provide incentives for issuers to continue to seek cheaper discounting options in the future through new technologies, which means that this type of instrument can also result in the induction of innovations, as well as new productive investments aimed at generating employment and income and sustainable development.

In turn, a tax on emissions is a charge on the volume of GHGs issued by a given source. The concept of an emissions tax is based on the polluter pays principle, from which it is considered that the owner of a given emission source must bear the costs of any emission reduction necessary to maintain a given environmental/climate objective. Thus, in the absence of other market imperfections and assuming the imposition of a Pigouvian tax,<sup>6</sup> the levying of an emission tax should lead issuers to adopt the cheapest abatement options, making this instrument cost-effective in static sense.

In addition, if perceived by the regulated parties as an instrument that will last in the long term, the tax entails incentives for issuers to continue to seek cheaper options for discount in the future through new technologies, which means that this type of instrument also results in dynamic efficiency. At least in principle, the tax provides a stable price signal to investors, since the only source of price volatility comes from unanticipated political adjustments that might alter the value of the tax (OECD, 2009).

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5. It must be emphasized that this result is theoretically anticipated, assuming that the market operates in perfect competition, since the existence of market power reduces the cost-effectiveness of the instrument. Therefore, issues related to the defense of competition should also be analyzed in the event that concrete possibilities of inclusion of sectors and design alternatives are discussed, in order to avoid the existence of market power in the permits market, which also can have an impact on competition between companies in the product market.

6. A Pigouvian tax is one applied to a market activity to correct externalities. In this case, it would be used to internalize external costs, being employed in the same amount of the generated externality.

For these reasons, instruments that establish a price for emissions are considered cost-effective – that is, their adoption leads to the most efficient results possible, both from the static (with production cost savings and transaction in the present) and dynamic (via generation of innovations and consequent reduction of costs in the future) points of view. It can be concluded, therefore, that price-based instruments are important pieces in a climate change mitigation policy, since not only are they able to correct externalities generated by GHG emissions, but they also result in reduction of compliance costs of fixed targets.

Mechanisms of the type ETS, CTax and baseline and credit are not exclusive. South Africa, for example, has been considering the use of CERs for CDM project activities developed in the country as a mechanism for offsetting the emissions tax that is to be created. In turn, carbon credits generated from a baseline can normally be used as offsets in cap-and-trade schemes, as in the carbon market regulated by the Kyoto Protocol, where credits generated under the CDM – in non-Annex I countries – can be used to offset emissions from sources covered by ETS mechanisms in Annex I countries.

In this type of arrangement, when sources covered by a scheme of the type ETS are defined, it may be allowed that other sources not covered by this regulation generate compensatory credits to be used by the scheme participants. The rationale for this type of authorization is that there are sources that – for one reason or another – cannot be regulated at present but have abatement costs low enough to be appropriated by scheme participants, so that the total cost of a certain cap is even more reduced. In this case, the adoption of a combined cap-and-trade scheme with the possibility of using compensatory credits could increase the cost-effectiveness of the policy.

Given that ETS, CTax and baseline and credit instruments are not necessarily mutually exclusive, it would be important to assess how different types of instruments can promote compliance to the NDC in the country as cost-effectively as possible, considering the regulatory framework to be negotiated in the coming years under Art. 6 of the PA.

From a practical point of view, any strategy to be adopted should take into account everything that has already been built up with the implementation of the CDM – as well as everything that can be leveraged with the implementation of this mechanism – in relation to: *i*) creation of bodies, methodologies, rules and procedures for approval of projects and credits; *ii*) accumulated experience in the country on project development and accounting of emissions at the corporate level; and, *iii*) the possibility of using credits generated by these mechanisms, as part of a domestic pricing scheme.

Therefore, the PMR Brazil Project is an opportunity for this experience to be incorporated into any eventual emission pricing instrument to be adopted in the country in a new phase of the National Policy on Climate Change; some challenges and the subject have been identified, and will be discussed in the next section.

### 3 PMR BRAZIL PROJECT: PROPOSALS AND CHALLENGES

The Partnership for Market Readiness (PMR) was launched in Cancun on December 8<sup>th</sup>, 2010. The Organizational Meeting was held in April 2011 in Bangkok, Thailand, and the 1<sup>st</sup> Meeting of the Partnership Assembly (PA1) took place in May 2011 in Barcelona, Spain. The central objective of the initiative is to support countries in the adoption of cost-effective approaches to mitigation of GHG emissions, focusing on the analysis, preparation and implementation of emission pricing instruments. Another nineteen implementing countries<sup>7</sup> and thirteen contributing countries<sup>8</sup> joined, as well as four countries or subnational entities as technical partners.<sup>9</sup> The Secretariat of the PMR is the World Bank Secretariat and it has a \$127 million fund for non-reimbursable funding of implementing country initiatives.

The central axis of the PMR is technical and financial support to the implementing countries for the analysis, rationale and design of GHG pricing instruments, including the preparation of components necessary for their operation, such as a Monitoring, Reporting and Verification system (MRV) on emissions data or tools for recording and tracking certificate transactions or emission permits. In addition, the PMR was created a platform for the exchange of experiences, technical discussions and collective innovation on innovative instruments geared to the mitigation of GHGs, through workshops and other events, working groups and technical notes.

In these activities, the concrete experience and challenges of policy formulation in the area are analyzed and associated topics such as the economic modeling of pricing instruments, the use of benchmarks, the connection of different ETSs, generation and use of offsets, the possibility of leakage (carbon leakage) etc. Hence, the PMR has contributed to the rapid evolution of this theme by sharing knowledge among government agents, business organizations, civil society entities and international organizations, including the UNFCCC, in a concomitant way with the development of the new framework of commitments created by the PA.

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7. Argentina, Brazil, Chile, China, Colombia, Costa Rica, India, Indonesia, Jordan, Mexico, Morocco, Peru, South Africa, Sri Lanka, Thailand, Tunisia, Turkey, Ukraine and Vietnam.

8. Australia, Denmark, European Commission, Finland, Germany, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and the United States.

9. For further information, see: [www.thepmr.org](http://www.thepmr.org). The Secretariat of the Partnership can be contacted at: [pmrsecretariat@worldbank.org](mailto:pmrsecretariat@worldbank.org).

Brazil joined the PMR through the Ministry of Finance, and it occurred as a consequence of the process of analysis on economic aspects of climate change and carbon pricing, initiated in the Ministry of Finance in 2008.<sup>10</sup> During this period, the Ministry touched base with this subject on different fronts: the process of preparation and approval of the legal framework of the National Policy on Climate Change; the elaboration of Brazil's voluntary targets for the Copenhagen Agreement; and participation in the orientation council of the study *Economics of Climate Change in Brazil: costs and opportunities* (Margulis and Dubeux, 2010).<sup>11</sup> Subsequently, between 2011 and 2012, the Ministry of Finance coordinated the Interministerial Working Group on Carbon Market, created by the Interministerial Committee on Climate Change (CIM) on September 20, 2011, whose final report was presented in May in 2012.<sup>12</sup> In addition, the Ministry has established partnerships and coordinated several studies on issues related to carbon pricing in recent years.<sup>13</sup>

As per the procedures for participation in the PMR, Brazil's manifestation of interest in integrating the partnership was presented in October 2011, presenting a diagnosis of the country context in terms of mitigation policies and use of market-based instruments for this purpose, and indicating as a focal point the Secretariat of International Affairs and the Secretariat of Economic Policy of the Ministry of Finance. The next step was the presentation and approval, in May 2012, of the organizing framework, which established the scope of activities to be developed in Brazil. This began the preparation phase of the Brazilian project within the PMR, which was concluded in 2014, and consisted of two studies, as described below.

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10. Between 2008 and 2010, the then Deputy Executive Secretary of the Ministry of Finance (MF), Francisco de Assis Leme Franco, carried out systematic internal meetings to deepen economic aspects related to climate change – including carbon pricing – with representatives of the various Ministry of Finance units (the Executive Secretariat, the National Treasury Secretariat, the Federal Revenue Secretariat of Brazil, the Secretariat of International Affairs, the Secretariat of Economic Policy, Secretariat of Economic Monitoring and the Attorney General of the National Treasury, as well as external guests).

11. The MF was represented on the Orientation Board by Francisco de Assis Leme Franco, Deputy Executive Secretary.

12. According to Decree No. 6,263 of November 21<sup>st</sup>, 2007, the Interministerial Committee on Climate Change (CIM) is the body that guides the preparation of the National Plan on Climate Change and makes other provisions. Upon approval by the CIM, the Interministerial Working Group on Carbon Market was established by an Ordinance of the Ministry of Finance dated November 29<sup>th</sup>, 2011, which also established the internal WG to the Ministry, with a view to supporting the functioning of the Interministerial Working Group on Carbon Market. The creation of this Interministerial Working Group had as objectives: to analyze the feasibility of the requirements for the implementation of the Brazilian Emission Reduction Market (MBRE) – provided for Art. 9 of Law No. 12<sup>th</sup>, 187/2009; study the possible instruments and analyze the design alternatives of the MBRE, in articulation with those involved; and to support decision-making on the preparation and implementation of the MBRE. The Final Report was presented to the Executive Group of the CIM in May 2012; however, it was not analysed by the CIM, and the document has been kept under secrecy since then.

13. The studies carried out by the Center for Sustainability Studies of the São Paulo Business School of the Getulio Vargas Foundation (GVces/EAESP/FGV) in 2012 and 2013, focusing on: emission reporting systems; corporate emission inventories; emissions trading system (ETS); incentives to reduce emissions; carbon intensity indicators – reports available at: [goo.gl/umfkMe](http://goo.gl/umfkMe); and the two phases of the Green Fiscal Policy project, in partnership with the British Embassy in Brazil are worthy of note.



- 1) Evaluation of the macroeconomic impacts of the goal to reduce GHG emissions through instruments (emissions tax, emission trading and command and control), through the General Equilibrium Model of Energy and Brazilian GHG Emissions (Brazilian Energy and GHG Emissions General Equilibrium Model – BeGreen).<sup>14</sup>
- 2) Review of the economic literature and analysis of the international experience in taxation of GHG emissions; and analysis of the possibilities of introducing a tax of this nature in Brazil, considering the legal framework of the Brazilian tax system.<sup>15</sup>

Based on the subsidies generated by these works, the Brazilian Market Readiness Proposal (PMR) was prepared and submitted to the Partnership Assembly in May 2014, being approved in September this year, with allocation of the corresponding resources.<sup>16</sup>

The PMR Brazil Project, as it is now called, aims to implement a robust analytical set capable of providing evidence and supporting the decision-making process regarding the adoption of GHG emissions pricing instruments in Brazil, giving transparency to related costs and benefits. Thus, the project was structured to answer two questions: whether it would be convenient and feasible to add instruments aimed at creating price signals for GHG emissions to the National Policy on Climate Change after 2020; and, if possible, what is the best instrument (price regulation via tax, quantity regulation via ETS or a combination of both).

Thus, the PMR Brazil Project was structured in three components, as described below.

- 1) Component 1: sectoral studies and instrument design: sector's organization analysis, GHG emissions profile and mitigation options in the electric, fuel, agricultural and industrial sectors (cement, iron and steel, aluminum, chemical, glass, lime, paper and cellulose); analysis of sectoral policies and their potential interaction with GHG pricing; and, finally, proposals for alternative designs of pricing instruments – and adjustments to existing policies.
- 2) Component 2: evaluation of the impacts of proposed instrument designs – and adjustments in existing policies – in two complementary approaches: economic modeling, with a view to capture macroeconomic, sectoral and social impacts; and regulatory impact analysis, with the objective of

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14. The model developed by the Center for Regional Development and Planning of the Faculty of Economic Sciences of the Federal University of Minas Gerais (Cedeplar/UFMG). Study commissioned by the consortium formed by Cedeplar/UFMG, WayCarbon and South Pole.

15. Study commissioned by the consortium formed by Climate Focus, Ludovino Lopes Advogados and WayCarbon.

16. Via Resolution No. PA/IP/2014-1, which has allocated US\$ 3 million for its implementation.

aggregating the estimated impacts on modeling and other dimensions of costs and benefits, including qualitative ones, in order to order regulatory options.

- 3) Component 3: engagement and participation of actors, with:
- four technical workshops, with a view to deepening methodological issues of impact assessment and other relevant issues for the project; and
  - three seminars, with a view to disseminating the outcomes of the project, as well as knowledge and experience on the subject.

The Secretariat of International Affairs and the Secretariat of Economic Policy of the Ministry of Finance were the Executive Coordinators of the PMR Brazil Project, together with the World Bank office in Brazil. A PMR Brazil Project Advisory Committee was established in order to provide transparency and allow the monitoring of the activities of the Project with the participation of representatives of the federal government, the private sector and civil society.<sup>17</sup>

Parallel to the institutional arrangements for the implementation of the PMR Brazil Project, the Brazilian government submitted its Brazilian contribution to the PA in September 2015, the preparation of which was conducted by the Ministry of the Environment (MMA). An absolute goal of “reducing greenhouse gas emissions by 37% below 2005 levels by 2025” was established, with the subsequent indicative contribution “to reduce greenhouse gas emissions by 43% below levels of 2005, in 2030” (Brazil, [n.d.]).

Given this definition, the analytical framework of the PMR Brazil Project was guided to take as reference these results and to verify to what extent the incorporation of emission pricing instruments, combined or not with the policy review, will reduce the aggregate costs to reach them.

It is therefore a question of comparing the costs of achieving the same environmental outcome through different “policy packages”: the first, considered as the policy-base scenario, composed of the list of measures and actions through which it is intended to achieve the goals, taking into account the best information available at the time of analysis – according to the institutional definition stage of the NDC implementation strategy; and two or more alternative “packages”, which include different approaches to the pricing of emissions, by means of ETS, of emissions tax(es) or combinations thereof. This work therefore embodies the challenge of identifying and quantifying public and private costs associated with the implementation of mitigation measures in each of the scenarios, in a context where this strategy may still have significant degrees of uncertainty.

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17. Ministry of Finance Ordinance No. 853, dated October 19<sup>th</sup>, 2015, established the Executive Committee of the PMR Brazil Project and authorized the installation, at its discretion, of the PMR Brazil Project Advisory Committee.

If we consider as a reference the annex of the Brazilian contribution to the PA, the policy-base scenario will tend to require the continuity of the policy, with expansion of targets and measures similar to those defined in the first phase of the National Policy on Climate Change – especially in the agricultural sector – in addition to the incorporation of other quite challenging ones – particularly in the forestry and land use change sector. In addition, it is assumed that new standards of clean technologies will be promoted and measures of energy efficiency and low-carbon infrastructure will be expanded.

This must occur in the context of a strong restriction of public spending, both by the containment of expenses in progress since 2015, and by the New Tax Regime.<sup>18</sup> Thus, actions whose costs are borne by the federal government may be affected by such measures, as in the case of deforestation control, subsidies in the financing of low emission technologies, tax incentives or diffusion and promotion programs.

In addition, in the absence of new regulatory measures, the policy-base scenario tends to assume that the various sectoral bodies will direct their policies and programs – and will allocate available resources – for the implementation of the recommended measures, which often compete with others that are more viable or attractive in technical, economic or political terms. The policy-base scenario also tends to consider that private agents from different sectors will, by voluntary decision – maintained the absence of regulations on GHG emissions – and in a timely manner, the investments required to adopt the identified low carbon technologies, including bearing the associated financial costs.

Thus, a challenge for the PMR Brazil Project is to consider a policy-base scenario that demonstrates minimum feasibility conditions, given the fiscal context and the political-institutional conditions for its implementation. In the case of the scenarios for the adoption of pricing instruments, the challenges are to identify *ex ante* potential interactions between these instruments and existing policies, which can embed implicit price signals for GHG emissions, or render ineffective the intended induction by the attribution of explicit prices to these emissions.

In addition to the technical complexity of identifying such interactions, it is necessary to consider possible political resistance to the revision of previous policies motivated by other objectives. Another challenge is to capture – through regulatory impact analysis – the costs and benefits associated with the new policies, both for the public sector (databases on GHG emissions at the economic agent level, as well as capacity to establish and control regulations), as well as private ones (MRV of emissions and carbon asset management).

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18. Constitutional Amendment No. 95, dated December 15<sup>th</sup>, 2016, established that the limit of primary expenditures will be given by the limit value referring to the immediately preceding year, corrected by the variation of the National Consumer Price Index or another index that replaces it – for the twelve-month period ended in June of the previous fiscal year referred to in the Annual Budget Law.

Another challenge is to capture – through regulatory impact analysis – the costs and benefits associated with the new policies, both for the public authority (databases on GHG emissions at the economic agent level, as well as capacity to establish and control regulations), as well as private ones (MRV of emissions and carbon asset management).

Finally, there is a set of challenges related to economic modeling: to capture the differentiation of results – between ETS and CTax, and between different designs of ETS; to represent important aspects of instrument design (scope of sectors/agents covered, use of offsets, form of allocation of permissions, temporal flexibility such as banking/borrowing and stabilization of prices); to explore the potential advantages of offsets in the forestry sector – both through incentives to the sector and reduction of compliance costs in the regulated sectors; to capture the effects of connecting one domestic ETS with other ETSs; to simulate adjustments in relevant policies; to endogenize technological change; and to obtain possible distributive effects, among others.

Given the variety of challenges of the PMR Brazil Project, some pertinent to the relationship between ETS and baseline and credit instruments have also been identified. Because they identify more with the discussion of this chapter, such issues will be discussed and explored in the next section.

#### **4 ALTERNATIVE DESIGNS FOR EMISSION PRECISION INSTRUMENTS: IDENTIFIED ISSUES**

One of the first issues involving the adoption of an emission pricing mechanism in Brazil is a legal one. The National Policy on Climate Change establishes the operation of the Brazilian Emission Reduction Market in commodities and futures exchanges, stock exchanges and organized over-the-counter entities, authorized by the Brazilian Securities and Exchange Commission; which would be the *locus* to trade securities representing certified GHG reductions. It is observed, therefore, that Art. 9 of Law No. 12,187/2009 seems to have as its objective only to better organize the transaction of securities related to the reduction of emissions; assets generated through the adoption of baseline and credit mechanisms, as well as the carbon credits resulting from the implementation of the CDM project activities.

The ambition of the PMR Brazil Project, however, is to analyze the possibility of adopting an ETS in the country, in which both supply and demand of emission quotas (allowances) would be defined; and license securities would be issued. Therefore, a legal definition would be necessary for this asset, including its nature – whether it is a financial asset, securities, etc. – obligations and liabilities for issuance, custody and withdrawal, among other definitions.

In addition, an ETS involves the definition of the competence of a governmental body to establish emission limits, mechanisms for monitoring and controlling obligations and penalties for non-compliance with emission reduction obligations, among other examples. It is understood, therefore, that any proposal to create a national ETS would mean the need to review Art. 9 of Law No. 12,187/2009, considering that the Brazilian Emission Reduction Market does not establish an adequate design for the adoption of the mechanism that is being analyzed by the Ministry of Finance, based on the transaction of emission quotas.

Another important aspect to consider is the learning and knowledge accumulated in the country with the realization of projects of CDM activities, especially with regard to MRV emissions stage. Thanks to Brazil's successful participation in the mechanism, a good part of the companies potentially regulated by a national emissions-pricing instrument have some knowledge about emissions accounting, and are even familiar with the mechanisms of credit transactions in the Kyoto carbon market, which also involves the registration procedures of CERs through systems of control of issuance, custody and the chain of transactions of these assets.

On the other hand, it should be borne in mind that the experience of the CDM in Brazil has waived legal or normative definitions regarding the nature of these assets, their attributes, taxation on transactions, or procedures and criteria for their issuance, custody and trading.<sup>19</sup>

This experience should be harnessed and expanded in the eventual adoption of an instrument for the pricing of emissions in Brazil, so as not to miss the lessons already learned regarding the application of methodologies, the carrying out of corporate inventories and the structuring of specialized services for the accounting and verification of emissions and reduction of GHG emissions.

An interesting example of how the learning and infrastructure created by the CDM could be dynamized is that of China, which has been using its seven regional ETS pilots as a demand vector for its certified emissions reduction compensation program called China Certificated Emissions Reductions – CCER. The seven ETSs pilots were formally announced in October 2011 and – as the Kyoto carbon markets – slowly declined, China continued to mobilize investors and service providers involved in the functioning of the carbon market with the promise of implementing other instruments that would recognize and value the reduction efforts undertaken.

In this sense, the measures adopted with the introduction of the CCERs eventually offered a compensation mechanism in addition to the respective allowances, capable of maintaining interest and investment in projects to reduce emissions on Chinese soil.

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19. For a detailed legal analysis of the CDM in Brazil, see Chapter 11 (note from the editors).

Because it had been engaged for a number of years in actively participating in the CDM, the Chinese government was aware of the concepts and advantages of a market system to reduce emissions. According to Swartz (2016), this direct experience with the CDM by China's leading industrial enterprises probably had a major influence on policy making by the National Development and Reform Commission (NDRC), the body responsible for designing and implementing national ETS. The NDRC officially launched the national ETS in December 2017.<sup>20</sup>

The process of incorporating CCERs into regional pilot designs was led by the NDRC and took place as follows: initially, some two hundred types of CDM project activity already approved by the CDM Executive Board and its Methodological Panel (Swartz, 2016) were assessed. Using criteria based on the frequency of use of the methodology, its applicability in China and its complexity, 52 methodologies of interest were identified, which were then converted into voluntary types of CCER projects (Swartz, 2016).

Therefore, there are four types of CCER projects that can be registered and issued by the NDRC: *i*) CDM projects registered by the UNFCCC with CERs that have not been issued; *ii*) CDM projects approved by the NDRC but not yet registered by the UNFCCC; *iii*) CDM projects approved by the NDRC, with emission reductions produced prior to registration in the UNFCCC ("pre-CDM" projects); and *iv*) projects that adopt the methodologies approved by the NDRC.

By March 2016, more than 330 CCER projects had already been approved by the NDRC. For compliance with obligations on the seven Chinese pilots, 2015 was the first year in which these certificates could be delivered. All pilots allow compensations with CCER in their respective systems, but the limits on the use of this compensation differ between the ETSs.

China's progress with MRV in the seven pilot projects can also be credited to the NDRC, which, through PMR resources, has been helping to develop domestic emission and MRV data collection processes in anticipation of the national ETS. In this sense, it is emphasized that the structuring of a national emission data-collection system at the facility level could be an important instrument for maintaining the MRV learning of emissions achieved with the CDM, as well as having great potential to dynamize the sector of emission accounting services provision in Brazil.

The third important aspect to be considered in the analysis of a possible ETS in the country refers to how such an instrument could – or not – be related to the mechanisms to be regulated under Art. 6 of the PA.

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20. National Development and Reform Commission, National Development and Reform Commission Issues National Carbon Emissions Trading Market Construction Plan, December 18<sup>th</sup>, 2017. Available at: <http://goo.gl/muiQ7x>.

An open question is still the lack of clarity as to how the MRV will be made of the emissions subject to the commitments made under the PA and, consequently, how the scope of NDC by the countries will be proven. This issue is fundamental to discuss some implications for the adoption of a national ETS and its interrelationship with the mechanisms defined in Art. 6 of PA.

By establishing a carbon budget and operating it through allocated quantities units (AAUs) and removal units (RMUs), the Kyoto Protocol allows that flexibility mechanisms, based not only on the marketing of AAUs and RMUs, but also on CERs and Emission Reduction Units (ERUs), are closely related to the accounting of national emissions and to verification of compliance with targets assumed under KP by each signatory country.<sup>21</sup>

In the case of PA, however, it is not clear how the mechanisms defined in Art. 6 would be used to prove compliance with the NDC, especially those based on the international transfer of mitigation results (paragraphs 2.6 and 6.3) and in the SDM (paragraphs 6.4 to 6.7). In theory, such mechanisms have the potential both to generate emissions/removal units that could be transferred internationally – what is being called ITMOs – as ERUs – in the case of SDM – but there is still no clarity in the regulations about how such units could be used to comply with the NDC.

Such uncertainty creates even more complexity when one thinks of the possibility of linking a domestic ETS with other international and regional ETSs, which may or may not have their emissions accounted for individually in UNFCCC processes. The emissions covered by California's ETS, for example, are embedded in the US national accounting, but from this do not follow naturally that emission quotas eventually transacted between a hypothetical Brazilian ETS and the California ETS would be recognized as ITMOs, accounting in the US, or in Brazil.

For the purposes of verifying compliance with the NDCs, paragraphs 6 and 6.3 would need to be regulated in order to ensure not only the recognition of the connection between domestic markets, but also the correct accounting of their transactions within the UNFCCC. If unit transfers between countries with connected markets are beyond the scope of the convention accounting, verification of compliance with the NDC will most certainly be flawed and will not reflect the actual volume of emissions undertaken jointly by PA signatory countries during the assessed compliance period.

In this sense, it is also understood that the units resulting from the implementation of the SDM should be discounted from the NDC of the host country, in cases where it was transferred to other countries that may use

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21. For further information on the Kyoto Protocol, see Chapter 1 (note from the editors).

such units to comply with their NDC. This is the case with ERUs transacted between Annex I countries as a result of the adoption of joint implementation (JI) project activities.<sup>22</sup>

Unlike CERs, emission reduction units issued in countries that have a pre-defined carbon budget are considered units already accounted for in AAUs, which means that such reductions are not considered additional to the pre-defined budget and therefore cannot increase these countries' emission cap. Thus, according to UNFCCC rules, before being transferred to the country that acquired them, ERUs are issued in the national registry of the host country by converting AAUs or RMUs previously issued and maintaining them in their national registry. An AAU or RMU must be converted to ERU by adding a design identifier to the units' serial number and changing the type indicator to the serial number to indicate an ERU (UN, 2005).

In order to guarantee the environmental integrity of the NDCs, it must be recognized that only what is (well) measured can be managed, and in the current scenario – where all countries have a defined goal in the PA – an eventual ERU transaction not accounted for by a given host country could represent double counting, which could have serious consequences for achieving the ultimate objective of the UNFCCC to stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

In general, the idea of emission or reduction units of tradable emissions is related to the definition of a carbon budget (cap), that transformed into transactional units can be managed at an extremely accurate level – as much as the processes and the methodologies for conducting emission inventories. Thus, mitigation objectives can be accounted for and monitored over time, and a kind of accountability of the assumed commitments is defined.

In this scenario of complexities, and while more precise definitions are not created about how proof of compliance with the NDCs and the role to be played by the mechanisms defined in the PA, it is necessary that the country reflects on how much of its commitments could be achieved through the adoption of the different instruments available and how they could be better combined, so that it can achieve its commitments in the most transparent and cost-effective manner.

Finally, a more practical and immediate last issue concerns the treatment to be given to CERs already issued by companies that could be regulated in a national cap-and-trade market after 2020. As the period for obtaining credits for

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22. Joint implementation (JI) is one of the flexibility mechanisms provided for in the Kyoto Protocol in addition to the CDM and emissions trading (note from the editors).



a project activity ranges from 7 to 21 years, it is possible that after 2020 there are still Brazilian projects generating CERs, which, somehow, would need to be accommodated in the emissions cap defined for the national ETS, since the energy and industry coincide with those who participated most in the development of CDM projects in Brazil.

In these cases, there would be some alternatives. If they are credits not yet transacted by project proponents, a viable alternative would be to consider CERs held by these companies as early actions, which could be canceled in the CDM registry and converted into emission quotas in the national ETS registry. Thus, the unit conversion flow between AAUs/RMUs and ERUs in KP would be reversed. In this case, companies that still had CERs not traded for the post-2020 period could be rewarded for investments made when they were not yet subject to national regulation.

Another option would be to do as in China and create a national compensatory credits program, in which some Brazilian body would establish its own rules – possibly based on internationally approved methodologies, as in the Chinese case – and be responsible for the generation of emission reduction credits Brazilian Certified Emissions Reductions (BCERs).

In this case, such a program could be used in the case of adoption of a ETS type instrument. On the other hand, in the case of the creation of a tax on emissions, it would be necessary to analyze the feasibility – both from a legal and public financial point of view – of accepting BCERs as payment of the tax.

It is also important to consider that companies to be regulated in a national ETS should not be eligible to participate in compensatory programs – including the SDM. This is because in the system any reduction of emissions from regulated sources is reflected in excess of emission quotas for the holder of these sources, which can then sell them in the market.

In the case of a ETS internationally linked to other international/regional ETS, the sale of these quotas to other countries could be accounted for as ITMOs, and there is no need for the regulator to design a project – and comply with all rites and regulations and bear additional costs of project development and certification – because, as mentioned, any and all emission reductions are automatically reflected in your corporate inventory, which results in “free” emission quotas to be sold.

However, if – in addition to these free quotas – the regulator also gained emission reduction units in a compensatory program, there would clearly be a double counting problem, which is why it is not recommended to overlap emission-based mechanisms and ERUs that addressed to the same sources.

## 5 CONCLUSIONS

Project PMR Brazil, carried out by the Ministry of Finance with the support of the World Bank, is analyzing the possibility of adopting an emissions trading system as part of the National Policy on Climate Change package of instruments after 2020. By adopting an innovative approach, the Ministry of Finance has been commissioning studies that better guide decision-making on the issue, not only with regard to the appropriateness and timeliness of the creation of a domestic ETS in Brazil, but also with regard to the best design of an instrument given the national circumstances.

In addition to the conclusion of this broad process of analysis of cost-effective alternatives for the mitigation of GHG emissions, the PMR Brazil Project poses the challenge of thinking of a new paradigm for National Policy on Climate Change: the explicit regulation of GHG emissions. Thus, the prospect of using a ETS or CTax involves going beyond the current policy framework, based on preexisting sectoral policies and measures.

The future adoption of an instrument for pricing of emissions in Brazil cannot do without the experience of the CDM. Particularly in terms of learning – especially in the private sector – on the application of methodologies, the conduct of corporate inventories and the structuring of specialized services in the accounting and verification of emissions, as well as in activities to reduce GHG emissions.

In this sense, it is important to bear in mind that the analysis of the adoption of pricing instruments in Brazil must take into account possibilities for harmonization between different available instruments (ETS/CTax and CDM/SDM), ideally from the definition of objectives that the country would expect to achieve with the adoption of each of these. In order to do so, it will be necessary to rethink the role of CERs and see the CDM experience in a new light, considering the development of a national strategy to promote a low-carbon economy capable of generating dynamic effects of innovation and investment, as well as materialize potential advantage comparisons of national products and processes.

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