

Brazil

The World's Carbon Markets: A Case Study Guide to Emissions Trading

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Environmental Policy Overview:

Brazil adopted Law 12.187, the law that established the country's *National Climate Change Policy (NCCP)*, on December 29, 2009. By setting a voluntary national *GHG reduction target of between 36.1 and 38.9 percent by 2020 relative to BAU*—or 6 to 10 percent relative to 2005 levels—in Article 12 of the NCCP, the country effectively made a domestic law of what became its Copenhagen Accord pledge in January 2010.^{i, ii} According to Article 3, Section II of the NCCP, one of the law's stated purposes is the implementation of measures “to prevent, avoid or minimize identified causes of climate change with anthropogenic origin within the national territory.”ⁱⁱⁱ In a subsequent communication on NAMAs to the UNFCCC Secretariat, Brazil detailed its *official emissions reduction commitment* as follows:^{iv}

- LULUCF: 668 MtCO₂e/year mitigation in 2020 from deforestation reductions in the Amazon Region and the Cerrado; 83 to 104 MtCO₂e/year mitigation in 2020 from recovery of degraded pastures; 22 MtCO₂e/year mitigation in 2020 from reduced livestock emissions; 20 MtCO₂e/year mitigation in 2020 from zero tillage; and 16-22 MtCO₂e/year mitigation in 2020 from biological fixing.
- Energy: 12-15 MtCO₂e/year mitigation in 2020 from energy efficiency measures; 28-60 MtCO₂e/year mitigation in 2020 from the biofuels usage; 79-99 MtCO₂e/year mitigation in 2020 from increased hydropower generation.
- Industry: 12-15 MtCO₂e/year mitigation in 2020 from the substitution of native forest-based charcoal by planted forest-based charcoal in the steel industry.

According to Article 5 of Decree No. 7390, which was signed in December 2010 with the purpose of regulating Articles 6, 11, and 12 of the NCCP, Brazil's *projected 2020 BAU* emissions are 3.236 GtCO₂e, and the sectoral composition is as follows: land-use change (1.404 GtCO₂e); energy (868 MtCO₂e); agriculture (730 MtCO₂e); and waste (234 MtCO₂e). To achieve its 36.1-38.9% reduction target, Brazil must reduce 2020 emissions by 1.168-1.259 GtCO₂e relative to BAU. The following ten measures, which may make use of the CDM or other UN mechanisms, have been outlined in Article 6 of Decree No. 7390 as *means for achieving the country's emissions target*:^v

1. 80% reduction of annual Amazonian deforestation relative to the 1996-2005 average by 2020;
2. 40% reduction of annual Bioma Cerrado deforestation relative to the 1999-2008 average by 2020;
3. Expansion of renewable energy supply from wind, small-scale hydro and bioelectricity, biofuels supply, and energy efficiency;
4. Recovery of 15 million hectares of degraded pastures;
5. Extension of livestock-crop-forest integration projects by 4 million hectares;
6. Expansion of direct planting by 8 million hectares;
7. Expansion of nitrogen fixation by 5.5 million hectares, substituting the use of nitrogen-based fertilizers;

8. Expansion of forest planting by 3 million hectares; and
9. Extension of technologies used for the treatment of 4.4 million cubic meters of animal waste.
10. For steel, the increased usage of charcoal that originates from planted forests, as well as improvement of the efficiency of the carbonization process.

According to Article 11, the NCCP aims for emissions reductions from the following sectors: generation and distribution of electric power, urban public transportation, interstate transport of cargo and passengers, the manufacturing industry, the durable consumer goods industry, chemical industries, the pulp and paper industries, mining, the civil construction industry, health services, and agriculture and cattle farming.^{vi} The sectoral breakdown of the 36.1-38.9% reduction targets were not defined by the NCCP, but the correspondence between Brazil and the UN for the Copenhagen Accord yielded the following estimates: deforestation reduction (63.5% of reductions); energy (19.8%); agriculture and cattle raising (15.7%); and other sectors (1%).^{vii}

In June 2012, Brazil adopted national targets for its heavy industrial, transportation, and mining sectors of 5%, 2%, and 4% emissions reductions, respectively, relative to BAU by 2020. Beyond national policies, there is **sub-national climate action** in Brazilian states and cities. The state of Sao Paulo established a 20% emissions reduction target relative to 2005 levels for 2020 beginning in November 2009. Until early 2011, Sao Paulo was the only state with such a policy. At a more local level, a few Brazilian cities have implemented climate change policies, and Rio de Janeiro and Sao Paulo are the two most influential ones to have set mandatory climate targets. The city of Sao Paulo aimed to reduce emissions by 30% relative to average 2005-2010 levels by 2012 (see Table 1). The city of Rio de Janeiro has pledged to reduce emissions by 8% relative to 2005 levels by 2012, 16% by 2016, and 20% by 2020.^{viii}

Policies	National Policy on Climate Change	State Policy on Climate Change of Sao Paulo	Municipal Policy on Climate Change of Sao Paulo
Law	Number 12,187/2009	Number 13,798/2009	Number 14,933/2009
Targets	36.1% - 38.9% by 2020	20% by 2020	30% by 2012
Baseline	BAU 2020 projections	2005 inventory figures	2005 inventory figures

Table 1—National and Sao Paulo (state and city) climate change policy.^{ix}

Domestic Markets:

National Activity

Article 6, Section XI of Brazil’s National Climate Change Plan (NCCP) mentions “financial and economic mechanisms that are national in scope and referring to mitigation and adaptation to climate change” as **instruments to achieve the country’s mitigation targets**. In addition, Article 5, Section VII of the NCCP mandates the use of “financial and economic mechanisms to promote action to mitigate and adapt to climate change” as a directive of the NCCP.^x This language indirectly impacts potential Brazilian ETS activity; and, in 2011, Climate Secretary of Brazil, Eduard Assad, said “Brazil has not yet created the cap and trade system, but many sectors, both public and private, are working on proposals which imply its possible future adoption.”^{xi} Apart from the NCCP, there are no national laws in force in Brazil with respect to carbon markets.^{xii} According to the World Bank, FINEP, and BM&F Bovespa (November 2010), the prospect of a national level ETS has been discussed by Brazilian policymakers, and capacity-development requirements remain for such a system.^{xiii}

Recently, in March 2013, there has been **promising activity regarding national-level cap-and-trade development in Brazil**. According the Brazilian Development Bank’s (BNDES) website (March 2013), BNDES has

signed a technical cooperation agreement with the state of Rio de Janeiro and the Acre Institute for Climate Change and Regulation of Environmental Services “aimed at stimulating the development of a market for environmental assets in Brazil,” and which “paves the way to develop a carbon market in Brazil.” Potential results from this agreement include: (1) A knowledge network/exchange of experiences and training to provide support for companies to measure, manage, and reduce emissions; (2) the creation of corporate carbon inventories; and (3) the specification of emissions targets, as well as allowance distribution mechanisms. BNDES has chosen to partner with Rio and Acre due to the two states’ experience with carbon market development. Rio’s ETS history is summarized below, and Acre’s progress in developing legal framework for reducing emissions from deforestation and forest degradation (REDD) is at a more advanced stage than anywhere else in the world. However, according to the BNDES (March 2013), “the agreement is open for other agencies and entities of Direct and Indirect Public Administration to adhere, and the BNDES is committed to incorporating new signatories.”^{xiv}

Sub-national Activity

On the state level, 19 states have climate change laws, and at least seven include provisions for the creation of markets for carbon credits.^{xv} Rio de Janeiro could have become the first Latin American government to pass an emissions trading system if the state governor had signed the decree in June 2012. The state was studying an ETS proposal and had planned an announcement at Rio +20. While such an announcement did not occur, the state continues to analyze its options. The **suggested Rio ETS** was designed by the state government in collaboration with officials from Thomson Reuters Point Carbon, and, if it had been signed, it would have launched in January 2013.^{xvi} The proposed Rio ETS included the state’s major emitters, such as oil giant Petrobras, mining giant Vale, and steel makers CSN and ThyssenKrupp. The **major covered industries** were cement, ceramics, chemicals, and petrochemicals, all of which belong to the industrial sector. The system’s target, as well as its rules on offsets, were to be revealed after the signing of the decree. The proposed system was broken into **three phase**: Phase 1 (2013-2015), Phase II (2016-2020), and Phase III (2021-2030). According to the state’s GHG inventory, Rio emitted 72 MtCO₂e in 2008, and industry accounted for almost one-third of the state’s emissions.^{xvii} According to a study from Rio’s Federal University, the Rio ETS proposed to reduce emissions from the state’s carbon intensive sectors by a total of 209 MtCO₂e by 2030 relative to BAU.^{xviii}

In Phase I, billed as the ‘pilot phase,’ the government would have distributed the majority of **allowances**, at least 90%, free of charge to covered entities, but, beginning in Phase II, the quantity of freely distributed allowances would have gradually reduced annually. At the beginning of Phase III, **free distribution** was to be completely phased out and replaced by **annual auctions**. Fines would have **penalized participants** that failed to comply. Authorized **credit types** for the Rio ETS included CERs and voluntary credits validated by the Verified Carbon Standard (VCS).^{xix}

In addition, in June 2012 **Sao Paulo** announced plans to launch an emissions trading system (SP ETS). When the signing of the Rio ETS seemed inevitable, Sao Paulo’s plan was to link the eventual SP ETS with the Rio ETS.^{xx} The Rio ETS decree, however, was not signed at Rio+20. The opposition claimed that the cement, ceramics, chemical, and petrochemical sectors would have incurred unwanted additional costs from such a system.^{xxi} At present, the state government of Rio is continuing discussions with the private sector about cutting emissions. One plan is to reduce emissions intensity by 10% by 2030.^{xxii} According to Thomas Reuters Point Carbon (2014), as of February 2014, there still remains to be an agreement on an emissions cap in Rio. Similarly, Sao Paulo has delayed the implementation of their carbon market due to inability to find ways to cap emissions, particularly in the energy sector.^{xxiii}

Forestry

In 2007, Brazil passed its Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAM), in which it dedicated itself to greatly reducing domestic deforestation.^{xxiv} One of Brazil’s deforestation

goals is to **eliminate net loss of forest coverage by 2015**, and then double forest coverage from 5.5 million ha to 11 million ha in 2020. In 2008, the Brazilian government established **the Amazon Fund**, which aims to monetarily compensate landowners for each ton of CO₂ not emitted.^{xxv} As depicted in Figure 1, between 2006 and 2017, the country aims to reduce emissions from deforestation by 4.8 GtCO₂e, assuming a biomass carbon stock of 100 tC/ha.^{xxvi} According to Environmental Defense Fund (January 2013), **Brazil has reduced its deforestation about 76%**, or 2.2 GtCO₂ and thus more emissions reductions than any other country, below the 1996-2005 average by 2012. This achievement “came very close to the national target Brazil adopted – 80% reduction by 2020 – making it the world leader in emissions reductions.”^{xxvii}

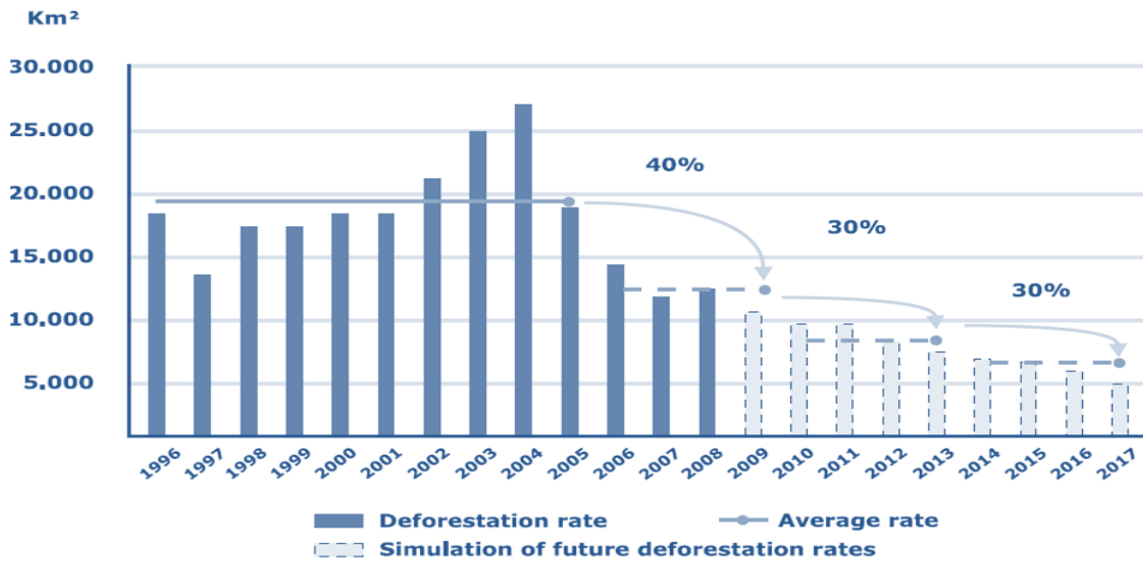


Figure 1—Trends in Deforestation Rate in the Amazon^{xxviii}

An offset program that could compliment national- or state-level ETS programs, as well as ETSs internationally, whose development has gained steam in Brazil is REDD. According to EPRI (2010), “Brazil could supply 300-500 million tons CO₂ of offsets annually to the international community by 2020 if current REDD negotiations and design processes come to fruition.” Several Brazilian states, namely Acre, Mato Grosso, Para, and Amazonas, have made **substantial progress towards REDD program development**. EPRI (2010) states that Mato Grosso’s achievement of its state deforestation target over the period 2010-2020 “could yield 600 MtCO₂e of emissions reductions beyond the federal target, and 2.4 GtCO₂e of emissions reductions below the federal baseline for Mato Grosso.”^{xxix} In addition, Acre could produce up to 69 MtCO₂e of emissions reductions from REDD activity over the next eight years.^{xxx} In the state of Para, the Cikel Project was issued 100,000 credits for REDD supply in June 2012. Project proponents expect further credits and to eventually receive 370,000 Voluntary Carbon Units (VCUs) annually over the next ten years. Recently, a project, which was led by Bunge Environmental Markets and Florestal Santa Maria, in Mato Grosso was validated by VCS and was to receive nearly a million credits in August 2012.^{xxxi} This project was launched in June 2012, and the aim is to preserve 70,000 hectares of native forest in the Amazon and generate about 30 MtCO₂e of carbon credits, or 1 MtCO₂/year over 30 years.^{xxxii}

Six Brazilian states – Acre, Amapa, Amazonas, Mato Grosso, Para, and Tocantins – participate in the **Governors’ Climate and Forests Task Force (GCF)**, which is a multi-jurisdictional collaborative effort between 19 states and provinces from Brazil, Indonesia, Mexico, Nigeria, Peru, Spain, and the United States that was established in 2009. GCF focuses on,

“developing the technical, legal, and institutional frameworks for comprehensive jurisdiction-wide programs to reduce emissions from deforestation and land use; support strategies for low-emissions rural development; and serve

as pathways to and pillars of robust national and international efforts to include forests and land use in climate policy.”^{xxxiii}

In addition, in 2010, the Brazilian state of *Acre signed a memorandum of understanding (MOU)* with the states of California, USA and Chiapas, Mexico to work towards the establishment of sectoral offset programs from REDD.^{xxxiv} The three states have created a *REDD Offsets Working Group (ROW)* in order to determine: (1) the legal and institutional mechanisms necessary for a sub-national compliance program, such as California’s, to recognize international emission reduction credits from state-level sectoral REDD programs, such as in Chiapas and/or Acre; and (2) the key policy and technical elements that a sectoral REDD program should achieve in order for REDD credits to be recognized in a compliance program.^{xxxv}

In December 2012, Acre signed an agreement with the German Development Bank (KfW) to cut greenhouse gas emissions from deforestation in exchange for up to EU\$19 million over four years. This funding will support Acre’s system of incentives for environmental services (SISA), which rewards local landowners for protecting the forest. According to World Wildlife Fund (2013), this funding “will help Acre to roll out its SISA program, generating important lessons for the socially-inclusive implementation of REDD+.”^{xxxvi}

International Markets:

As of yet, the majority of Brazilian carbon market activity has occurred through the *Clean Development Mechanism (CDM)*.^{xxxvii} According to February 2013 data, Brazil hosts 269 CDM projects, or 4.1% of the world’s total. Behind China (53.1%) and India (18.3%), Brazil hosts the third most CDM projects. The BMF/Bovespa environmental assets exchange (described below) accepts valid projects from Designated Operational Entities, as well as projects from independent entities that receive official verification.^{xxxviii} CERs are traded on commodities and futures exchanges authorized by the Brazilian Securities and Exchange Commission (CVM).^{xxxix}

Regulation and Oversight:

The major Brazilian environmental asset exchanges are Bolsa Verde do Rio de Janeiro (BVRio) and the BMF/Bovespa environmental assets exchange. The initial purpose of the *BMF/Bovespa environmental assets exchange* derives from Article 9 of the NCCP, which states that,

“The Brazilian Emissions Reduction Market shall be operated in commodities, futures and stock exchanges, and in over-the-counter trading companies authorized by the Securities and Exchange Commission of Brazil – CVM, where negotiations for securities representing certified avoided greenhouse gas emissions shall take place.”^{xl}

While the Brazilian Emissions Reduction Market, as defined by the NCCP, has yet to be implemented, the development of such a market is contemplated in the law. In the meantime, an exchange for environmental assets in Brazil, through BMF/Bovespa, operates as a stock exchange for voluntary reduction permits, and it holds auctions for CERs and for voluntary carbon units. This resulted from a joint initiative by the Ministry of Development, Industry and Foreign Trade (MDIC), and the Commodities and Futures Exchange (BM & F). The market was launched in Sao Paulo in December 2004, and it was the first market of its kind in a developing country. It became operational in September 2005 with the Project Bank, which aims to improve visibility and facilitate the commercialization of CDM projects. Its economic function is to attract direct investments that contribute to economic development, encourage clean technology projects, and bolster the international appeal of Brazil’s environmental market instruments.^{xli}

According to the Wuppertal Institute (2011), BMF/Bovespa environmental assets exchange “serves to create the basis for a Brazilian domestic carbon market by installing a secure trading environment for carbon credits.” Private actors

have been the primary operators of this exchange.^{xiii} Regarding regulation, the BMF/Bovespa environmental assets exchange includes a **registry system**, and one of its goals is to enable price transparency. Projects at any stage of development may be registered in the Project Bank, and CDM projects are the most common type.^{xiii} While its initial purpose was to lay the foundation for a national ETS, the lack of such a policy has produced a different outcome in practice. In order to gain credibility and provide transparency in negotiations, the BMF/Bovespa environmental assets exchange is connected to the Stock Exchange of Rio de Janeiro.^{xiv}

At the state level, BVRio, which was launched in December 2011, is an electronic exchange that would have been a major trading platform for Rio ETS allowances.^{xv} BVRio was created via a partnership between Rio's Environment Ministry and the municipality's Department of Finance as a non-profit association with the mission of promoting an active market for a green economy through facilitating the implementation of policies that benefit both the business sector and the environment. The association that comprises BVRio has three categories of participants: (1) The business sector; (2) NGOs; and (3) the academic sector. Specifically, BVRio aims to facilitate the commercialization of environmental activities that stem from legal obligations, such as restoration of forest areas, waste management, and GHG emissions reductions.^{xvi} At present, BVRio has two main activities: (1) Develop market mechanisms for environmental services and assets; and (2) Provide and operate a trading platform for these assets.^{xvii} Recently, BVRio has signed cooperation agreements with the state of Amazonas, the Green Cities Program in Para, and the municipality of Paragominas to develop eco-friendly market mechanisms.^{xviii}

Recent Environmental History:

Brazil's National Climate Change Plan (NCCP) discusses the potential implementation of **non-ETS mechanisms to achieve the country's 36.1-38.9% emissions reduction target** relative to BAU by 2020. Energy efficiency improvement, renewable energy support, and deforestation reduction are ways Brazil intends to reduce GHGs. Actions towards forwarding the efficiency of natural, scientific, technological, and human resources include:^{xix}

- (1) The *National Policy for Energy Efficiency* aims to save up to 106 TWh/year by 2030, and, for 2030, avoid around 30 MtCO₂e of emissions.
- (2) The gradual replacement of coal in steel plants by sustainable charcoal.
- (3) The replacement of 1 million old fridges per year over the next ten years. This plan would lead to the avoidance of 3 MtCO₂e/year from CFCs.
- (4) Reduction of 2,200 GWh/year of electricity consumption by 2015 by instead using water solar power heating systems.
- (5) Avoidance of 1,078 GtCO₂e/year from HCFCs for 2008-2040 from the replacement of refrigerant gases.
- (6) 20% increase in recycling by 2015.
- (7) The phase out of the usage of fires to clear sugarcane fields when harvesting is possible.
- (8) More sustainable land-use practices, including the recovery of 100 million ha of degraded pastures, the improvement of carbon sinks via livestock integration, agro-forestry, the adaptation of zero-tillage systems and reduced usage of nitrogenous fertilizers, and measures to reduce methane production from grazing cattle.

Brazil has a relatively high share of **renewable energy in its electricity and energy matrices**. As of December 2008, 45.8% of the country's energy matrix derived from renewables, a percentage that is over three times greater than the global average of 12.9%. In the electricity matrix, the share held by renewables is 89.0%. The country's primary actions for furthering its already impressive renewable energy performance include:¹

- (1) Increase of electricity supply from cogeneration, primarily from sugarcane bagasse, to 11.4% of total supply by 2030.

- (2) Over the next ten years, reduce non-technical losses in electricity by 1,000 GWh/year, thereby reducing the waste of energy by 400 GWh/year.
- (3) As part of the Ten Year Energy Plan (2007-2016), add 34,460 MW from new hydropower plants.
- (4) Promote efforts to increase energy from wind, sugarcane, and photovoltaics.

Significant **sub-national climate action** is also occurring in Brazil, as exemplified by Rio de Janeiro. In 2010, the state passed its Policy on Global Climate Change and Sustainable Development (PEMC), a policy that sets emissions reduction targets and adaptation goals through 2030. This policy identifies the waste, transportation, energy, and industrial sectors as crucial for emissions reductions, and it states a target for improving carbon intensity to below 2005 levels by 2030. The city of Rio passed a separate climate law, which enumerates a GHG reduction goal of 20% by 2020, in 2011. Both the city and state of Rio de Janeiro have established reliable greenhouse gas inventories.^{li}

CHALLENGES:

1. Deforestation appears to be going up in 2013, at least in part because of failure to create positive incentives and political push-back against increased environmental law enforcement. Brazil's Environment Ministry (MMA) has launched a process to establish a National REDD+ Policy, and several other policies are also contemplated.

UNIQUE ISSUES:

1. More so than any other country, GHGs from deforestation dominate Brazil's emissions profile. As a result, the **development of REDD would impact Brazil more than any other country.**

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Disclaimer: The authors encourage readers to please contact the EDF and IETA contacts with any corrections, additions, revisions, or any other comments, including any relevant citations. This will be invaluable in strengthening and updating the case studies and ensuring they are as correct and informative as possible

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- ² United States Environmental Protection Agency (EPA) (2012). "U.S.-Brazil Joint Initiative on Urban Sustainability: Sub-National Climate Change Policies". Available at http://www.epa.gov/jius/policy/rio_de_janeiro/sub_national_climate_change_policies.html