Transformations in Brazilian Deforestation and Climate Policy Since 2005

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In the five-year period 2005-2009, Brazil dramatically reduced carbon emissions by about twenty-five percent and at the same time maintained a stable economic growth rate of 3.5% annually. This combination of economic growth and emissions reduction is unique in the world. It was driven by a dramatic reduction in deforestation in the Amazonian forest and the Cerrado Savannah. This shift empowered the sustainability social forces in Brazil to the point that in December 2009 Congress passed a very progressive law internalizing carbon constraints and promoting the transition to a low-carbon economy. The Article first analyzes the Brazilian position in the global carbon cycle and public policies since 2005, including the progressive shift in 2009 and the contradictory dynamic in 2010-2012. It then analyzes the potential for a transition to a low-carbon economy in Brazil and the impact on global climate governance.

I. Brazil in the Global Carbon Cycle and Public Policies Since 2005

Brazil is a key country in the world in terms of the carbon cycle and natural and environmental resources because it has[1]:

1. the most important carbon stock in forests in the world;

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1 Eduardo Viola, Matias Franchini & Thais Ribeiro, Sistema Internacional de Hegemonia Conservadora: Governança Global e Democracia na Era da Crise Climática (2012) (Braz.).

2. the largest stock of biodiversity in the world;
3. the largest reserve of agricultural land and the most competitive agribusiness in the world;
4. the third largest stock of fresh water in the world — after Russia and Canada;
5. the most efficient and second largest — after the United States — production of ethanol in the world;[2]
6. the largest reserve of hydropower in the world, which could be easily used because Brazil has a globally competitive industry in the field; and,
7. it accounted for four percent of the world's total carbon emissions in 2010 (the figure was five percent in 2005 before the dramatic reduction of deforestation in the Amazon).

Four dimensions of Brazilian participation in the global carbon cycle are unique and make the country's greenhouse gas (GHG) emission profile a singular phenomenon[3]: It is the only middle-income country in which a high proportion of emissions (about sixty-five percent in 2004 and about thirty-five percent in 2011) comes from deforestation; fully eighty-five percent of its electricity is derived from hydropower, in which Brazil is among the top three in the world; it has developed during the last four decades a huge production network of ethanol for transportation (about thirty percent of the total liquid fuel used in transportation in 2010); and emissions from cattle-raising have increased considerably in recent years.

According to the Second National Emissions Inventory Communication (SNEIC), in 2005 Brazil generated about 2,200,000,000 tons of CO_{2e} — methane and nitrous oxide.[4] In 2005 Brazil accounted for about five percent of global carbon emissions, distributed as follows: land use/land change — sixty-one percent; agriculture — nineteen percent; energy — fifteen percent; industry — three percent; and waste management — two percent. In 2005 Brazil was the fifth largest emitter in the world after the United States, China, the European Union and India. In terms of per capita emissions, in 2005 Brazil produced approximately 11.5 tons of CO_{2e}, which was sixty percent of the Americans, twenty percent more than the European Union, twice the Chinese, and seven

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2 José Goldemberg, *Ethanol for a Sustainable Energy Future*, 315 Sci. 808 (2007).

3 Eduardo Viola, *O regime internacional de mudança climatica e o Brasil* [*The International Regime of Climate Change and Brazil*], 50 Revista Brasileira de Ciências Sociais 25 (2002) (Braz.).

4 *Brazil's Second National Communication to the United Nations Framework Convention on Climate Change*, Ministry of Science and Technology, http://www.mct.gov.br/index.php/content/view/326751.html (last visited Nov. 10, 2012) (detailed information on emissions corresponding to 2005).

times the Indians. In 2005 the carbon intensity of the Brazilian economy was about 1.7 tons of carbon per thousand dollars of GDP, higher than the United States and the European Union, but lower than China and India.[5]

A. Brazil's Successful Mitigation of Deforestation

Between 2005 and 2009, Brazil broke the pattern described above and was able to reduce GHG emissions by approximately twenty-five percent. This reduction was accompanied by economic growth of 3.5% annually, making Brazil a unique case in the world. This dramatic decrease was caused by a remarkable fall in Amazonian deforestation: from an annual average of almost 21,000 km^2 in 2000-2004 to 6,200 km^2 in 2009-2011.[6] Several factors combined to drive the reduction of deforestation in the Amazon. First, there was a strong commitment to deforestation reduction by the Minister of the Environment (Marina Silva, Senator from Acre state) since the start of the Lula administration in January 2003. After almost two years of procrastination by the President — with deforestation increasing during 2003 and 2004 — the Minister garnered enough support to impose a shift in Amazonian policy. From 2005 until 2009, deforestation reduction in the Amazon was at the core of the federal government's agenda. Since 2010 the goal of the federal government has no longer been to reduce deforestation, but to avoid a new increase.

Second, there was a dramatic increase in law enforcement by the federal government once the President of the country ordered the Federal Police and other federal agencies to increase cooperation with the Minister of Environment in the suppression of illegal deforestation. In 1997 Brazil had passed a law strictly limiting deforestation to twenty percent of the private property in the Amazonian region. No capitalist country in world history ever interfered so severely in private property as Brazil did in the Amazon. However, resistance to the law was very strong, and until 2005 the federal state was unwilling to enforce it. In addition, the scientific and technological capabilities of the Institute of Space Research (INPE) were strengthened. The INPE is the institution in charge of satellite monitoring of deforestation, and it became a major global player in assessment of deforestation and regional climate modeling. Consequently, since 2007 the state's ability to monitor illegal

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5 In considering carbon intensity, current exchange rate dollars were used rather than purchased power parity, but the author recognizes there may be good reason to argue in favor of the latter.

6 *Desmatamento na Amazonia em 2010* [*Deforestation in the Brazilian Amazon in 2010*], Ministry of Environment, http://www.mma.gov.br/ (last visited Nov. 10, 2012) (Braz.).

deforestation in large areas has increased so dramatically that much of the remaining deforestation is being reduced to small areas more difficult to detect by satellite.

Moreover, multi-stakeholder coalitions were formed against the exportation and domestic consumption of soy and beef coming from deforested areas. These coalitions were formed by international, national and local NGOs, such as Greenpeace, WWF, Friends of the Earth, and Fundação Vitoria Amazonica, as well as some corporations such as Cargill, and supermarkets such as Carrefour, Wal-Mart, and Pao de Açucar. The coalitions were also joined by the scientific community, universities, and some local governments. There was an increased impact of NGOs and the scientific community on the media — and consequently on the federal government — through different reports and campaigns showing the irrationality of deforestation.

Finally, new National Parks and other conservation unities were created, and introduced some new constraints in areas where deforestation was advancing.

It is important to emphasize that this process was accomplished without any negative impact on economic growth.[7] The deforestation reductions also changed the carbon intensity of the Brazilian economy: It fell in the Amazonian states, but rose in the rest of the country. Nonetheless, it is still low compared to other middle-income economies that have low energy efficiency patterns.

However, in spite of Brazil's relatively better situation in the modern economy compared to the previous decade and the large progress made in emissions reduction at the national level, in some relevant economic sectors the GHG trajectory has deteriorated recently. Brazil is the only important economy in the world in which there was an increase in carbon intensiveness if the reduction in deforestation is not taken into consideration.[8] In the period 1994-2007 there was a fifty percent rise in emissions derived from production and consumption of energy out of GDP growth of thirty-eight percent. Three factors explain this trajectory: a large rise in diesel consumption — used mostly by trucks — because of a dramatic increase in traffic congestion in large cities and key roads; the increase in the proportion of electric power

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7 Paulo Moutinho, Desmatamento na Amazônia: desafios para reduzir as emissões de gases de efeito estufa do Brasil [Deforestation in the Amazon: Challenges for Greenhouse Gases Reduction in Brazil] (2009) (Braz.), *available at* http://www.ipam.org.br/biblioteca/livro/Desmatamento-na-Amazonia-desafios-para-reduzir-as-emissoes-de-gases-de-efeito-estufa-do-Brasil/254/.

8 United Nations Environment Program (UNEP), Global Green New Deal (2009), *available at* http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf.

coming from fossil fuels — from eleven percent to fifteen percent; and a significant increase in oil refining.[9]

In 2008-2009 a new relevant issue emerged that is interrelated with the climate change problem: the exploration of the recently discovered offshore deep-water oil reserves.[10] The so-called "Pre-salt" is a big oil deposit and has enormous potential since it is expected to quintuple Brazilian oil reserves. The realization of this promise, however, faces some important challenges, like the high cost of extraction and the potential environmental impacts. Reaction to the discovery within the Brazilian government at first was exaggerated. The vision was that oil would become a centerpiece of the economy as the country turned into a big exporter. This conception was later moderated, and it can now be said that the new oil reserves have had three major impacts on the Brazilian public debate so far. First, somehow, the issue has replaced deforestation as a potential liability for carbon emissions reduction. Particularly, it feeds the fears of the most conservative decision-makers and diplomats about strict commitments in terms of carbon emissions. Second, it has contributed to the Brazilian government's downplaying of ethanol diplomacy, since it implies the idea of a transition to a low-carbon economy in 2008-2012, compared with the intense use during 2005-2007. Third, it has created a new cleavage in the Brazilian elites and the top management of Petrobras regarding how to explore the new reserves: with conventional technology and at the lowest possible cost, or with more expensive cutting-edge technology, including carbon capture and storage (CCS). The latter sector is clearly a minority, but its existence is relevant for the future.

In sum, the remarkable and unique process of emissions reduction in Brazil reached its peak in 2009 (a reduction of twenty-five percent in relation to 2004), based on the successful progress of deforestation control and the stagnation of economic growth in 2009 due to the world recession. However, despite this great performance in deforestation, in the areas of energy, transportation, industry and cattle-ranching emissions are rising, as the economy expanded 7.5% in 2010, 2.7% in 2011, and is expanding about 1.5% in 2012. Gross estimations put emissions growth at five percent in 2010 and two percent in

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9 Sergio Abranches & Eduardo Viola, *Globalización y Cambio Climático* [*Globalization and Climate Change*], *in* A Medio Camino: Nuevos Desafíos de la Democracia y del Desarrollo en América Latina (F.H. Cardoso & A. Foxley eds., 2009) (Braz.).

10 Roberto Schaeffer et al., Redução de emissões: opções e perspectivas para as áreas de energia, industria e transporte no Brasil [Emissions Reduction: Options and Perspectives on Energy, Industry and Transportation in Brazil] (2009) (Braz.).

2011. Following this trend, Brazilian emissions will continue to grow at a rate between two and three percent a year, since it will be very difficult to maintain a significant decline in the rate of deforestation and emissions from the other relevant sectors of the economy, which will certainly rise because the rate of GDP growth is estimated at about 3.5% for the period 2013-2016.

B. Brazil Climate Policy in the International and National Arenas

In the international United Nations negotiations, Brazil has so far struck a general alliance with emerging countries with an energy matrix heavily dependent upon fossil fuels (China, India and South Africa). The advantage of the energy matrix was always subordinated to the disadvantage of Amazonian deforestation in the formulation of the Brazilian position.[11] However, at the Twelfth Conference of the Parties of the Climate Treaty in Nairobi (COP 12), in December 2006, Brazil shifted from its historical position, proposing the creation of a global fund to slow down deforestation. According to the Brazilian proposal, Annex 1 countries and corporations would contribute to a fund that would distribute financial resources according to the performance of countries in slowing down deforestation. This was the first time that Brazil accepted a linkage between curbing deforestation and global financial tools. On the other hand, the Brazilian proposal maintains a traditional reluctance to accept carbon markets. The new proposition was drafted by the Brazilian Ministry of the Environment and launched only after overcoming entrenched opposition in the diplomatic mindset. The Brazilian initiative came too late in terms of the global negotiations — when it was clear that a new post-Kyoto global architecture was badly needed — but it was a strong indication of the process of transformation in the Brazilian government and public opinion.

Brazil's role in the global politics of climate change mitigation and adaptation lagged behind its potential until 2009 because of two major driving forces. First, entrenched traditional ideas and attitudes toward the short-term use of natural resources remained strong in society as a whole, and prevailing in frontier society. Public opinion and economic agents have been changing, but the pace has picked up only recently. Second, a traditional conception of national sovereignty, poorly adapted to the challenges of the global information society, has remained very strong among vast sectors of decision-makers, particularly among the military and diplomats, and this approach has undermined most efforts to achieve the necessary convergence between the Brazilian national

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11 Eduardo Viola, *Brazil in the Politics of Climate Change and Global Governance 1989-2003* (Ctr. for Brazilian Stud., Univ. of Oxford, Working Paper No. CBS 56/04, 2004).

interest and the universal interest in relation to deforestation in the Amazon. In this matter there was also some progress, but very slow until 2009. It should be kept in mind that, as discussed above in the context of deforestation, until recently climate mitigation and adaptation policies were very limited in Brazil. Historically, the Ministry of Science and Technology and the Ministry of Environment have had minimal resources to deal with climate change.

It was only in 2007 that the office of Under-Secretary of Climate Change was created in the Ministry of Environment, although with limited capacities and a short budget. Following that, in 2009 there was a spike in public exposure to the climate agenda: media coverage, public events, scientific conferences, mobilization of NGOs, and corporate meetings.[12] More and more, the traditional Brazilian government position came under siege in Brazilian society, with two major changes of course proposed: the adoption of emissions goals for 2020, and the reduction of emissions from deforestation and degradation (REDD+).

In this regard, governments from the Amazon states, under the leadership of Amazon and Mato Grosso, created the Amazon Forum in July 2009 and demanded a change in the Brazilian international position in relation to forests. They wanted Brazil to accept the inclusion of REDD+ into the Clean Development Mechanism (CDM) or any other market mechanism. Also, three corporate coalitions issued documents in September 2009 asking the political authorities to modify the Brazilian climate stance — both domestic and international.[13]

In October 2009 Minister of the Environment Minc ratcheted up the pressure to change the Brazilian position in the Copenhagen COP 15. Finally, after stiff resistance from the Ministries of Foreign Affairs and of Science and Technology, the new position was announced by both Minister Minc and Minister Rousseff — the already designated future presidential candidate.

The following are the major planks of the Brazilian commitment announced on November 13, 2009[14]:

1. It is voluntary, meaning that Brazil decided to go beyond its obligations according to the Climate Convention and Kyoto Protocol.
2. It refers to the carbon emissions growth curve in relation to a Business As Usual (BAU) scenario and is not an obligatory target in reference to

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12 Eduardo Viola, *A política climática global e o Brasil, 2005-2010*, 1 Tempo do Mundo 80 (2010) (Braz.).

13 *Id.*

14 Eduardo Viola & H. Machado Filho, Centro de Estudos de Integração e Desenvolvimento, Rio de Janeiro, Os BICs (Brasil, Índia e China) e as negociações de mudança climática (2010) (Braz.).

a baseline year, like the commitments adopted by the European Union, Japan, South Korea, Switzerland, and Norway.

3. Brazil commits itself to reducing GHG emissions between thirty-six and thirty-nine percent, with 2005 as the baseline year, and with the projected emissions for the year 2020 within a BAU scenario as future reference. This scenario assumes that in 2020 Brazilian emissions will grow to 2,700,000,000 tons of CO_{2e}. The voluntary commitment will reduce the emissions to 1,800,000,000 tons.

In parallel to the developments in the executive power sphere, the Federal Congress also began to deliver measures regarding climate issues. In October 2009, the House of Representatives passed the Climate Change Bill, after significant lobbying efforts by the nonpartisan environmental bloc. Under the influence of the new pro-climate public atmosphere, the Senate debated and approved the bill in December 2009.

Another result of the same process that led to the sanction of the federal law was the creation of the Climate Change National Fund (CCNF), conceived as an instrument to ensure the necessary financial support for mitigation and adaptation projects. The Fund was afterwards specifically regulated by President Lula da Silva in October 2010. About $130,000,000 were approved for the CCNF to become operational in the year 2011. The resources will be applied in desertification control actions, climate adaptation, technology promotion and diffusion, stimulus to of sustainable productive chains, and payment for environmental services. The new body will be managed by the Ministry of Agriculture, with the participation of eleven other ministries, the BNDES, and representatives from the nongovernmental sector.

Finally, in order to correctly evaluate the growing awareness of climate in Brazilian society, it is important to highlight the fact that in the first round of the presidential elections on October 3, 2010, the Green's Party candidate Marina Silva won nineteen percent of the total valid vote, excluding abstentions and null votes.

II. Brazil's Transition to a Low-Carbon Economy: Commitments and Challenges

The adoption of commitments to emissions reductions by Brazil in November 2009 launched a debate inside the government on what position to assume in the Copenhagen COP 15. The conservative group wanted to preserve the strong alliance with China and India. The reformist group wanted to move away from those countries, which have adopted much less ambitious goals than the Brazilian. The conservative group prevailed during the conference,

since Brazil stated that the type of ambitious commitment it has adopted should not apply as a parameter to other emerging countries. Consequently, the Copenhagen arena didn't change significantly and only Brazil and South Korea exhibited a dramatic shift in their domestic policies. From Copenhagen to the present (September 2012) there are two discrepancies: The first is the gap between Brazil's new domestic climate policy and its stance in the international negotiations, showing mostly continuity with the past, though that dissonance is contested by vast sectors of Brazilian society based on a strong commitment to global climate governance. The second gap is between the new climate legislation and the effective climate policy under the new presidency of Dilma Rousseff (2011-2012).

During 2011 and 2012 a conservative coalition in the Congress approved a reform of the Forest Code that awarded partial amnesty to farmers who deforested beyond the legal limit until 2008. Many analysts fear that the new Forest Code could increase deforestation in the Amazon in the future. Even if that does not happen, it will certainly increase deforestation in the Cerrado Savannah, the key agricultural frontier of Brazil.

Prospects in agriculture are positive. Brazil is trying to disseminate the idea of a low-carbon agribusiness, where gains in productivity do not mean more GHG emissions. This discourse is based on the agricultural potential of degraded lands, more technological use of the land already exploited, and the progressive expansion of the no-till system.[15] In general terms, more capital-intensive farmers will be comfortable with these developments, but there will be resistance from less capital-intensive farmers. Credit for agriculture could work as a political strategy, since there are very favorable historical conditions in Brazil. In this way, some conditionality regarding carbon balance could be imposed. Agriculture is historically an area of confrontation between Brazil and the protectionist policies of the European Union, and this is likely to continue to be the case in the area of low-carbon agriculture.

In the energy sector, the pace and scale of pre-salt oil exploration is a source of uncertainty. Initially, there is some risk that the pre-salt will place some limits on Brazilian foreign policy in relation to the transition to a low-carbon economy.[16] In fact, a preview of this effect is already evident, with the moderation of ethanol diplomacy since late 2007. In relation to the potential consequences of pre-salt to the country's carbon emissions, the prospects are not good either, since it is already on a course of expanding refinement and

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15 Carlos Cerri, Management Practices for Greenhouse Gas Emission Reduction and Carbon Removal in Brazilian Agriculture, Livestock And Forestry (2010).

16 A.F.P. Lucena et al., *The Vulnerability of Renewable Energy to Climate Change in Brazil*, 37 Energy Pol'y 879 (2009).

the petrochemical industry. The key to overcoming this emissions expansion is to use carbon capture and storage in the extraction/refinement of oil and in the petrochemical industry. Five years after the announcement of the pre-salt discoveries, there is clearly a delay in exploration and some doubts about the future: A nationalist trend has limited the participation of foreign companies, and Petrobras has been badly managed in recent years and is missing the cash for the huge investments needed; and the shale gas and tight oil revolution in the United States and other recently discovered reserves in the world (like the huge reserves of shale gas in the Mozambique Channel) have diminished the attractiveness of the Brazilian pre-salt.

The future expansion of ethanol production in Brazil is tied in part to the commoditization of the good in the international market, in a way similar to oil. However, if Brazil again tries to promote ethanol the policy has to guarantee that the production of biofuels won't be accomplished through deforestation. That is easy with ethanol, but a little more complicated in the case of bio-diesel because its main raw material is soy, the growing of which could resume penetration of the Amazon as happened before 2005. Although some European leaders have argued that the ethanol production in the Centre-West and Southwest is pushing the soy and cattle-ranching frontier to the Amazon, the dramatic decline in the region's deforestation rate in recent years shows that Brazil is capable of producing sugar ethanol as a sustainable global commodity. An important challenge for ethanol is how fast the more backward sugar cane cultivation regions will move from labor-intensive production — primitive labor conditions — to mechanization. Ethanol could be certified according to the emissions of the production chain, requiring the backward sector of ethanol to change or disappear, and law enforcement could be stringent in relation to labor conditions. Due to the acceptance in large part of ethanol policies in Brazilian society, these measures could have strong support. However, in the last two years there has been a dramatic stagnation in the production of ethanol due to several factors: the government's signaling the priority of oil exploration; a freeze in gas and diesel prices that undermined the competitiveness of ethanol; and lack of development of new infrastructure for ethanol transportation (ethanol pipelines). A major paradox is that Brazil became an importer of corn ethanol from the United States in 2011 and this trend has been growing in 2012, with prospects of continuing until at least 2014.

The construction of new thermoelectric power plants based on oil or coal seems to have ceased for now, though there could be an increase in natural gas thermoelectric plants in the entire country, particularly in the Amazon, because of the exploration of significant gas reserves in the center-west Brazilian Amazon, relatively close to the city of Manaus — the most important city in the

world that is located in the middle of a tropical forest, with about two million inhabitants and a huge industrial sector. On the other hand, hydropower is back. Today, less than ten percent of the total hydropower production comes from the Amazon, but expansion of this activity will be concentrated in this region and should be accomplished with high efficiency in the conversion of forest. The plans — and already ongoing construction — of two large hydropower plants on the Madeira River — in the border area with Bolivia — are environmentally friendly, for the first time in Amazonian history. It remains to be seen how strong a shift takes place in the final outcome. A third large dam in Belo Monte (state of Para), whose construction began in 2011, has aroused bitter controversies related to the rights and level of compensation of the indigenous people and native population settled in the area, and to the small size of the reservoir, which will hamper the plant's productivity during several months of the year. More recently, the government decreased the size of national parks in the area in order to make some upstream damming of the Tocantins River viable.

Some challenges loom on the Amazonian hydroelectric horizon. Due to the resistance of the more radical environmental sectors, the new projects are being built with small reservoirs.[17] This makes them highly vulnerable to dry conditions and consequently reduces their potential. The deforestation issue is also closely linked to this matter, and the most important question is: Will strict law enforcement prevent thousands of construction workers from remaining in the area — deforesting the plant's adjacent lands — after the end of construction? To the environmental movement, rigorous law enforcement in the Madeira River hydropower plants — namely, zero deforestation in the surrounding areas —is a key to defusing resistance to new hydropower in the Amazon.

In solar photovoltaic power, there is no planning for future deployment even where huge potential exists, and among the decision-makers and infrastructure-building corporations there is a strong inertial lobby in favor of hydropower (cheaper), which has been blocking any advance.[18] Large subsidies would be needed for photovoltaic, and this is an area where the scientific community could play a key role, although it would be difficult to implement. In the case of wind power, on the contrary, a favorable trend has begun to take shape since

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17 World Bank, Estudo de baixo carbono para o Brasil [Low Carbon in Brazil] (2010).

18 Jacques Marcovitch et al., Economia da Mudança do Clima no Brasil: custos e oportunidades [Economy of Climate Change in Brazil: Cost and Opportunity] (2010) (Braz.), *available at* http://www.economiadoclima.org.br/files/biblioteca/Economia_do_clima.pdf.

2009.[19] There is strong potential for cooperation and convergence between the European Union and Brazil in the area of wind and solar. A kind of free trade area for biofuel, solar and wind power between the European Union and Brazil is always a significant possibility. Such a deal would imply concessions from Europe in biofuel and from Brazil in wind and solar.

In the critical area of transportation — cargo and public for passengers — the climate law and Brazilian adherence to the Copenhagen Accord[20] have been negligent, especially considering the sector's terrible performance in the last two decades. The options for reversing this trend include the upgrade of the road network and hubs; the replacement of old vehicles; the expansion of railroads; the integration of road and railroads; the introduction of hybrid electric cars and the improvement of conventional ones; and the establishment of fast bus systems, following the example of the city of Curitiba.[21] Some European public transportation systems (Dutch, Danish, and German) are an inspiration to and reference for Brazilian reformist forces. This is an area with significant potential for greater cooperation between both entities.

The transportation sector offers some remarkable and highly visible interdependent benefits between climate and quality of life, since the poor transportation infrastructure is crucial in degrading the everyday life of the majority of the urban population (traffic congestion, pollution, time wasted commuting). Besides that, transportation, together with public security, is the most important challenge to the successfully organization of the two coming sports mega-events: the 2014 Football World Cup and 2016 Rio Olympic Games. However, the enormous amount of investment needed and the prospect of positive results (and political gains), located only in the mid-term, conspire against a more rational management of the situation. The lobby of the automotive sector has also been an obstacle to the transition to a less carbon-intensive and less road-based paradigm. In 2010, for instance, within the Lula da Silva administration, pro-status quo interests were able to stop a project encouraging the use of electric cars. Although it may have only limited prospects, a political strategy focused on those interdependent benefits could be used to advance mitigation policies in the area.[22]

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19 Ricardo M. Dutra & Alexandre S. Szklo, *Assessing Long-Term Incentive Programs for Implementing Wind Power in Brazil Using GIS Rule-Based Methods*, 33 Renewable Energy 2507 (2008).

20 Report of the Conference of the Parties on Its Fifteenth Session Addendum, Part Two: Action Taken by the Conference of the Parties at Its Fifteenth Session, *Decision 2/CP.15: Copenhagen Accord*, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010).

21 Mckinsey & Co., Pathways to a Low-Carbon Economy for Brazil (2009).

22 Eduardo Viola & Franchini Matias, Centro de Estudos de Integração e

Since 2009, the increased importation of Chinese manufactures has been undermining many Brazilian industrial sectors. During 2011 and 2012, Brazilian industrialists successfully exerted pressure to promote a new industrial policy oriented to protecting Brazilian industry (particularly automobiles, capital equipment, shoes and textiles) from Chinese competition. Through tax incentives, this new automobile industrial policy rewards automakers that have a supply chain mostly based in Brazil. This is favorable to all the long-established American, European and Japanese automakers in Brazil and undermines the importation of Chinese and Korean cars and projects for establishing Chinese and Korean car production facilities in the country. This new industrial policy, which was passed in September 2011 and complemented during 2012, is not consistent with the Climate Law since there are no provisions in it promoting issues that would be compatible with the spirit of the law: public transportation, stricter standards of energy efficiency, moving from flex/hybrid cars to pure ethanol cars, and the creation of a strategic reserve of ethanol in order to avoid strong price oscillations and guarantee the supply. The industrial policy of the Brazilian government is clearly in contradiction to the promotion of public transportation. The automobile production chain (multinational corporations controlling the final production, Brazilian suppliers of parts, Petrobras and the whole oil industry, the ethanol complex, unions, dealers, etc.) has become stronger than ever before in Brazilian history, putting a clear limit to the implementation of the 2009 Climate Law.

Though they may not have a big impact in reducing carbon emissions, basic sanitation and waste disposal, including power plants fed by methane, are areas offering high interdependent benefits where big improvements are likely to happen, because there is low resistance to them. Another policy that may be easy to implement is promoting a cultural and organizational development of civil defense, an area in which Brazil is very poor and recent extreme climate events (flooding, droughts, severe storms, etc.) have raised awareness of the risks of climate change. The partnership with the military is very important because of its exceptional capabilities.

As in all countries, there is a very rational policy option in the area of taxation: the shift from capital and labor taxation to carbon taxation. The only way towards progress is related, in total, to the creation of less carbon taxes than the capital and labor taxes eliminated. In this way most taxpayers would be winners. Some European countries that have developed some system of carbon taxation could cooperate a lot with Brazilian reformers.

Desenvolvimento, Rio de Janeiro, A mudança climática em 2011: governança global estagnada e o novo perfil de emissões do Brasil (2011) (Braz.).

To summarize the prospects regarding the past and future GHG emissions reduction trajectory and policies in Brazil, I can say the following. First, the best mitigation prospects in the country are in deforestation control and the occupation of degraded lands, as well as in the energy sector: improving efficiency and the progress of ethanol. In the transportation sector, however, the scenario is pessimistic, where the consumption of diesel oil keeps growing expansively. Second, up to now, the advances made by Brazil in reducing GHG emissions have occurred in low-resistance sectors. As already reported, a large part of that mitigation effort came as a result of deforestation control, a sector that is irrelevant in terms of economic growth. The Brazilian government therefore has never had to invest heavily in strategies to reduce the political cost of mitigation actions. Third, but profoundly related to the previous point, in order to advance mitigation options in the more resistant areas, it will be necessary to build up more robust climate coalitions than in the past. A clear example of this situation is the poor state of the transportation system.

Conclusion

Brazil's role in the global politics of climate change mitigation and adaptation has lagged behind its potential so far, because of two major driving forces. First, entrenched traditional ideas and attitudes regarding the short-term use of natural resources remained strong in the society as a whole, prevailing in the frontier society. Public opinion and economic agents have been progressively moving away from this notion, but only recently at a fast pace. Second, a traditional conception of national sovereignty, poorly adapted to the challenges of the global information society, has remained very strong among vast sectors of decision-makers, particularly among the military and diplomats. In this trend there has also been some progress, but very modest until recently.

The successful reduction of deforestation between 2005 and 2009 and very relevant events of 2009 produced a significant change in Brazil's climate standing. In line with the developments in the international arena, this process has meant a crucial change in the history of the country's climate policy. The governors of the Amazon states created a coalition and pressured the federal government to change its position regarding forests in the climate regime. A number of important firms formed three coalitions and also asked the national authorities to change the climate policy. The presence of Marina Silva, as the Green Party presidential candidate, introduced the transition to a low-carbon economy as a topic in the electoral campaign, and her performance in the first round of the election almost ensures that the issue will remain on the public agenda for the coming years

The National Congress passed a climate change law that establishes a voluntary emissions reduction target and thereby partially internalized the issue into the country's legal structure. The Ministry of Environment progressively raised its profile during 2009 and finally defeated the powerful conservative sector of the federal government when the new plan for reduction targets was announced.

There are, of course, many doubts regarding the future implementation of the Brazilian commitment. However, this new legislation and the targets assumed by the country in the context of the Copenhagen Accord are fundamental steps in relation to the future trajectory of the foreign, economic, energy, agricultural, forest and climate policies. There are two new big questions from 2012 to the near future. The first is how big the new climate policy's implementation gap will be. The second is how long Brazil will maintain the recently created imbalance between the domestic climate policy with its reduction targets and the alliance with the more conservative emerging powers like China, Russia and India. Given the interests and relative power of the different economic sectors and the dynamics of public opinion, that imbalance probably will not last long and the Brazilian position will tend to converge with the more advanced European Union, Japan and South Korea.