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THE EFFECTS OF CLIMATE CHANGE GHG EMISSIONS**

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THE EFFECTS OF CLIMATE CHANGE

INTRODUCTION

Latin America is characterized by enormous ecological and cultural diversity. In this part of the continent and the Caribbean, it is more than 40% of the flora and fauna of the planet and eight countries in the region are considered megadiverse (UNEP 2007). Beginning in 1960, most Latin American countries experienced rapid economic growth, associated with the export of primary products, alongside a growing external debt, then in the 80s the fall in international oil prices. The increase in international interest rates, macroeconomic imbalances and inflationary pressures marked a period of economic stagnation.

The result of these periods is a livestock accelerated transformation of ecosystems and a profound environmental deterioration Latin America. In this deterioration is most evident in the rapid transformation of ecosystems, mainly forest (tropical and temperate) for conversion into agricultural areas and to meet both domestic demand and exports (UNEP 2007). The region lost about 50 million hectares of forests, representing the highest levels of deforestation in the world and has led to a huge loss of biodiversity associated (Pengue 2005, UNEP 2007). The deterioration is also reflected in other aspects, water pollution, over 80% of sewage is discharged untreated into rivers or oceans, besides oil extraction in the Greater Caribbean (near Brazil) and in the Gulf of Mexico results in a high pollution (UNEP 2007).

With regard to Brazil, it has ratified the voluntary commitment made at COP 15 to reduce GHG emissions between 36.1% and 38.9% by 2020.

"In some countries there are positive examples of achievements in improving the environment, such as the purification of some rivers have been polluted for decades, or recovery of native forests, or beautifying landscapes with environmental sanitation works or building projects of great aesthetic value, or advances in the production of clean energy,

improving public transport. These actions do not solve global problems, but confirm that
the man is still able to intervene positively. "¹

¹ SI' LAUDATO Encyclical Letter on the common home care. The Holy Father Francisco

ABSTRACT

CHAPTER I

In this section, the issue of greenhouse gas emissions in Argentina is. Agriculture and livestock production activities are more prevalent in the environment of the country, given the magnitude of areas involved and the changes brought about by the advance of the agricultural frontier, replacing wild ecosystems, degraded soils or contaminated with biocides .

The change in land use and forestry with 22% of emissions, is one of the elements to consider that it includes an environmental problem of deforestation.

A projection to 2030 which includes the following assumptions to reach for that year was outlined: Establish mitigation measures in energy through heat pumps, hot water economizers, solar heaters, economizers improve transport efficiency hot water heaters solar, improve the efficiency of freight transport and install automotive trade plan. Improve efficiency in industrial processes, implement strategies in agriculture crop rotation and application of new technologies in the use of fertilizers. Establish strategies source separation of waste, composting, landfill with biogas capture.

CHAPTER II

In this chapter the issue of GHG emissions in Brazil, the largest tropical country in the world, have developed a unique profile. Agriculture and livestock, which represent 25% of gross domestic product (GDP), have required a steady expansion of cropland and pasture has resulted in the transformation of natural vegetation.

At present, the land use change, including deforestation, is the main source of GHG emissions in the country. Abundant natural resources and vast territory of Brazil has allowed the development of renewable energy with low carbon emissions. Historically, large investments in renewable energy such as hydropower, which constitutes around 75% of installed generation capacity, and ethanol produced from sugar cane, which replaces 40% of fuel consumption, reduced the carbon content of the energy matrix Brasil1 and emissions from transport.

At the same time, it is important to recognize that Brazil is likely to be severely affected by climate change. A phenomenon known as Amazon dieback, together with short-term deforestation caused by fires could reduce rainfall in the central-western and northeastern regions of the country, which in turn could reduce crop yields and water needed to generate hydroelectric power. Solutions to reduce Brazil's vulnerability and to enable adaptation to climate change is urgently needed.

CHAPTER III

In this section we discussed the issue of GHG emissions in Chile, which currently has a comparatively good emission profile that places it in the bottom quartile of OECD countries in per capita emissions intensity. This level of emissions is in line with or slightly below its level of development, and recorded a lower intensity of CO₂ emissions than countries of similar per capita income in the region and the world. From this position, the country must ask itself how it can achieve its aspiration of clean development efficiently within an international context which targets a reorganization efforts. Mineral industry emissions and chemical industry showed the highest annual average growth of 4% and 6% respectively.

CHAPTER IV

This chapter covers the emissions generated in the different sectors of Peru. According to results of the inventory of greenhouse gases, Peru in 2000 generated only 0.4% of GHG as a contribution to the world.

In addition, Peru is considered among one of the countries with high vulnerability to the effects of climate change have more sensitive production systems to climate, ie climatic variations that affect agricultural production and food security of the population. Also, being more prone to natural disasters floods, droughts, landslides, frost, glacier melt, among others; the need to increase our responsiveness to their effects on land-use planning policies, prevention and adaptation to climate change is generated. The limited economic resources and low level of technology increases vulnerability. Peru, faced economic losses to the presence of El Niño, which is also linked to climate variations.

CHAPTER V

Uruguay has an increased climate variability manifested in increased rainfall and increased frequency of large storms. At the same time, in the last hundred years it has been increasing the number of consecutive days without rain. The variability of precipitation and frequency of extreme events are two examples of how climate change affects the economy, in this case to agricultural production and the energy sector.

Uruguay's energy sector is characterized by a poorly diversified, with heavy reliance on imported oil (55- 60% of energy supply), and significant participation (25-30% average hydropower depending on hydrological conditions annual). The sector that contributes to the emissions of greenhouse gases Uruguay, livestock remains responsible for over 90% of sectoral emissions.

CHAPTER I

ARGENTINIAN REPUBLIC² 2

Greenhouse Gas Emissions

Agriculture and livestock production activities are more prevalent in the environment of the country, given the magnitude of areas involved and the changes brought about by the advance of the agricultural frontier, replacing wild ecosystems, degraded soils or contaminated with biocides . The criteria governing land use is based on the international demand for agricultural products, therefore there is no land use that schedule an integrated ecosystem management.

The results of the third National Communication on Climate Change include the latest reports on the greenhouse gas inventory GHG.

The new inventory revealed that Argentina produces 0.88% of emissions of greenhouse gases worldwide, standing in the No. 21 position in relation to other countries. 43% of GHG emissions are energy industry including energy (32%), manufacturing and construction (12%), transport (30%) and other sectors (20%) and oil and natural gas (6%). The agriculture and livestock is in second place with 27% of emissions, particularly in regard to the cattle.

The change in land use and forestry with 22% is one of the elements to consider that it includes an environmental problem of deforestation.

Moreover, the food industry, accounting for 22%, 6% waste and industrial processes 3%.

A projection to 2030 which includes the following assumptions to reach for that year was outlined: Establish mitigation measures in energy through heat pumps, hot water economizers, solar heaters, improve the efficiency of freight transport and install a plan automotive trade. Improve efficiency in industrial processes, implement strategies in agriculture and crop rotation application new technologies in the use of fertilizers. Establish strategies source separation of waste, composting, landfill with biogas capture.

² Scenarios of Greenhouse Gas Emissions. 2012. Argentina Argentine Business Council for Sustainable Development

The Argentine Business Council for Sustainable Development issued a report on different scenarios of GHG emissions, which aims to develop a series of scenarios for Argentina describing possible futures in terms of GHG.

Total emissions of a particular activity will be given by the level of activity of it and the level of emissions that such activity entails.

The various sectors considered were:

Residential Sector

This chapter emissions from burning fossil fuels for energy purposes in households were computed.

Service sector

This chapter emissions from burning fossil fuels for energy purposes is computed in the service sector, including the public service.

Transportation Sector

Emissions from mobile sources were computed. The emissions from this sector for the use of fossil fuels (gasoline, diesel, fuel oil, jet fuel and CNG) in the different means of transport: road, rail, sea and air, both passenger and cargo.

Industry sector

The industrial sector has two distinct sources: on one side were computed emissions from burning fossil fuels for energy sector, and secondly, emissions from industrial processes of each branch of industry (classified according Groups ISIC).

³⁴

Agricultural Sector 3

Emissions from agricultural and animal husbandry practices are computed. Among the sources of emissions from the livestock sector are: methane emissions from enteric fermentation of cattle and emissions of methane and nitrous oxide by manure treatment.

Among the sources of emissions from the agricultural sector they were computed: nitrous oxide emissions from manure treatment and management of agricultural soils. The latter

³ Statistical information industry and some emission factors were taken from studies relating to the Secretariat of Agriculture, Livestock, Fisheries and Food, University of Buenos Aires (Faculty of Agriculture) and INTA

category includes emissions from nitrogen application to the soil through cultivation practices, the application of fertilizers and animal manure, and the production of nitrogen-fixing crops (legumes). Also, N₂O emissions produced from urine and manure of animals that are deposited on the fields were calculated. Finally, methane emissions generated by rice crops were computed.

Energy Sector

In this sector the emissions are recorded throughout the process of generation, storage, transport and distribution of energy products.

They can be grouped as follows:

Emissions from fuel combustion, that occur during thermal generation and own consumption of fuels in refineries, power plants, oil and gas wells and transmission stations to meet their energy requirements.

Fugitive emissions: occur along the entire production chain, from the wellhead vents, through losses in transportation and distribution as well as fugitive emissions at the refinery.

Waste Sector

Methane emissions from treatment of urban solid waste were calculated. For this, and on the basis of statistical data and reviews of businesses and government institutions they were estimated both the generation and the type of disposal of domestic waste. Therefore the emissions were calculated in sanitary landfills or equivalent, as well as those generated in open dumps.

Not those generated by treatment of industrial and hazardous waste as there is insufficient information on the generation of this waste or what type of treatment that they receive is calculated. However, based on the estimates made in the National Inventory, it can be concluded that the omission of such emission source does not significantly affect the overall result of the sector.

Diesel Oil and CNG. Diesel consumption represents 52% of total consumption of the sector, the GNC and 23%.

Agro-export model

Under this type of expansion, primary activities are those which expand at higher rate. They stand out not only in expanding the agro primary exporter but also mining. The almost nonexistent presence in the domestic market, however, does not allow the development of an associated industry that allows vertical integration with the primary sector. The economy is set is an exporter enclave without generating higher added value. Employment levels do not improve and infrastructure and services grow at the pace only needs the primary sector. The real exchange rate remains high although the lack of domestic absorption makes, throughout the decade, decrease faster than in the case of

Industrial export model

Grain production is favored by high prices thereof, while meat prices did not experience the same rise. The yields of grains grow at a rate that exceeds livestock production, consequently the process of agriculturalization that Argentina is experiencing the agricultural economy in recent decades. Both the agricultural and livestock production experienced in recent years, a considerable improvement in yields, which together with increased agricultural area, have led to high levels of current production. The area devoted to pastures decreases in favor of increased acreage. As for the levels of energy consumption in economic sectors, the economy experiences a slowdown, reaching 2.28% annually. This value is lower than during the decade 1991 to 2001. The two main fuels used for final consumption are natural gas (42%) and petroleum products (33%), followed by electricity (17%).

In the residential and industrial sectors, the most widely used fuel is natural gas, followed by electricity. Instead, the services sector mainly supplies electricity (68%) and secondly natural gas (30%).

Moreover, the amount of inputs used in agriculture (fuel and fertilizer) increase accompanying the growth of production. In determining fuel consumption however, play two variables acting in determining these values in a manner contrary: the increase in cultivated area under no-tillage which decreases fuel demand and increased mechanization

of the activity. Thus, the sector increases its share in the total consumption of fossil fuels in the country, being the primary fuel gas oil sector (94%).

As for the variable inputs (fertilizers and agrochemicals) has been registered in his continued employment (especially given the high agricultural prices), accompanied by a revolution in genetics and biotechnology increases.

In the transport sector, the most widely used fuels are Oil and Gas CNG, gasoline following at them.

Energy Model

The benefit of the availability of energy resources and infrastructure in this sector and the services in general, along with low domestic absorption, allow export growth of energy-intensive intermediate goods. This happens in many cases, with vertical integration of energy companies. Also, the recovery in Brazil and the US energy deficit, make new developments occur in the energy field as a sector in itself. The services sector that thrives in this context is that associated with these developments, such as pipelines, power transmission networks, ports and routes. In this context, foreign investment regains momentum in expanding these sectors.

The energy consumption of the overall economy grows at an average annual rate of 2.78%, a value that, although higher than in the decade from 1991 to 2001, is less than the increase recorded in the Industrial Model. The main energy source for final consumption consists of the natural gas, with 43.4% of total consumption. Followers petroleum products, with 31.5% and electricity with 17.25%.

The energy sector increases its share of final energy consumer in the country's energy matrix. The consumption of the sector for their activities is 7% compared to the base year.

In the transport sector, the most widely used fuels are Oil and Gas CNG, gasoline following at them. Services sector consumption of almost 100% in gas and electricity, as well as the Residential are based. But the latter also has a small stake liquefied petroleum gas. The gas is also the main energy source of the industrial sector (46%) followed by electricity (26%).

Institutional and Legal Framework 4

Issues related to climate change are directed since 2002 by the Ministry of Environment and Sustainable Development (SAyDS), which this year was designated Secretariat focal point to the UNFCCC (Decree 2213). In 2003 the Climate Change Unit (UCC) in the SAyDS was created to implement the responsibilities assigned to the Secretariat to the UNFCCC. Later, in 2007, the UCC became Address (DCC). The transition from SAyDS to orbit the Cabinet allowed significantly increase their participation in the coordination of sectoral policies including climate change (World Bank, 2010).

In December 2009, the Government Committee on Climate Change (CGCC) is created under the leadership of the DCC, with the participation of 24 sectoral government agencies. Provinces involved in this process through the Federal Environmental Council (COFEMA) and the Federal Water Council (COHIFE). The CGCC aims to carry out activities related to adaptation and mitigation of climate change in the planning of different sectors and / or systems, fulfilling the function of the Steering Committee of the TCN and promote the process of drafting the ENCC and "Action Plan for the short, medium and long term" associated with the ENCC.

Note also that in 2005 the Argentine Carbon Fund (FAC), which aims to encourage the development of projects under the Clean Development Mechanism (CDM) Within this UN framework was created, the Argentina Office Clean Development Mechanism (OAMD) is the governing body that evaluates and authorizes those projects submitted to the CDM. The OAMD has a team of representatives from the private sector and civil society (NGOs, public and private academic) Advisory Committee.

As for the national regulatory framework, in recent years, Argentina has advanced with the implementation of laws and regulations in key sectors of the economy that affect the climate change agenda. In the energy sector they include the Renewable Energy Law, the Law of Solar and Wind Energy (Law No. 25.019) and the Act Promoting the use of hydrogen as fuel and energy vector (Law No. 26,123). Biofuel, Law No. 26,093 / 06

4 Argentine Mitigation and Adaptation to Climate Change. IDB 2012

regulates and promotes the sustainable use and production of biofuels. For the forestry sector, the Forestry Promotion Law (Law 26,432, which is an extension and amendment of Law 25.080) is regulating the activities in this sector

As for instances of social participation to involve civil society in actions against climate change, there are instances, programs or forums for this purpose (SAyDS, 2007). Such is the case of the Foro del Buen Ayre, formed in July 1998, which brings together 96 groups of large and small NGOs with the aim of incorporating the issue of climate change on the agenda of environmental organizations and civil society in general. More academically NGOs have been involved in carrying out the National Communications. Also, at the level of provinces, they have implemented laws to promote renewable energy. For example, in Chubut Act to promote wind energy (4389 Act) and legislation to support renewable energy in the province of Buenos Aires (Law 12,603 / 2001) and Santa Cruz (Law 2279/2005) (SAyDS, 2007). In the case of forestry, Law 26,331 of "Minimum Standards for Environmental Protection of Forests" states that the provinces must perform their Native Land Management of Forests (OTBN). Until November 2010 only 9 of the 24 Argentine provinces have approved a OTBN.

At the level of the Province of Buenos Aires, there are two instances of collaboration and planning: The Consortium "Northern Metropolitan Region", created in April 2000 by the municipal mayors of San Fernando, San Isidro, Vicente Lopez and Tigre. The Consortium of Municipalities of South Suburbs (Comcosur), held in July 2004. The regionalization plan of the Province of Buenos Aires (see Appendix 1) proposes the installation of the criterion of government based on productive and socio-cultural regions under decentralization schemes and greater autonomy to municipalities.

Carbon Market

Argentina has a huge potential in the market for carbon credits, valued papers and certify emission reductions of greenhouse gases (GHGs).

However, despite the country it confirmed its participation in the Kyoto Protocol more than a decade, in Argentina there are only 15 projects approved at international level within the

Clean Development Mechanism, which gives emerging and less polluting Certified Emission Reduction (CER, for its acronym in English), traded on the international market. Another 11 projects are awaiting national approval and ratification of the global authority, the Framework Convention of the United Nations Climate Change.

Each tonne of carbon dioxide is reduced by, for example, improvements in energy generation system, grants a CER.

In those papers, the buyers-governments and international corporations polluting acquire a kind of right to pollute more, depending on the amount of carbon they buy. Countries that have ratified the Kyoto agreement committed themselves to reducing their emissions by 2012 greenhouse gases by 5.2% over 1990.

The delay in the implementation of clean development projects in Argentina lies, according to Sebastian Galbusera, Aacrea specialist in the subject, these investments do not escape the general situation of the economy, and while funding can be achieved through firms and governments interested in acquiring carbon credits, the amount of emission reduction is small in the case of Argentine projects, so that the benefit fails to be significant. 15 local projects represent only 1.3% of the reductions of greenhouse gases that together can achieve the 1,827 projects submitted.

In Argentina, the most important clean energy project belongs to General Deheza Oil exporting giant, which produces biogas from peanut shells and sunflower. By contrast, Chinese projects, participating together with 59% of reduction of polluting gases, get their CER, in many cases, production plants of refrigerant gases (whose family is known as HCFCs), which are highly polluting, "but simple conversion to an environmentally friendly system"

Progress and key problems to be solved

In Argentina, advances in management are significant, to integrate climate change dimension in its development agenda, both at federal and provincial level. Some of the most significant developments are highlighted below:

In 2007, GDA presented to the UN Framework Convention on Climate Change (UNFCCC), the Second National Communication (SCN), which summarizes the inventories of greenhouse gases and concrete actions on climate change in Argentina (Sayd, 2007). He is currently developing the Third National Communication (TCN) in Argentina, which will be presented in 2013. The TCN making progress in the SCN and expands in various subject areas. Annex 2 contains the main contributions of the TCN. The country has developed a set of measures, plans, programs and sectoral strategies for reducing greenhouse gas emissions and reduce their carbon footprint. The creation of the Argentine Carbon Fund in 2005 is highlighted to facilitate the development of CDM projects. In 2010, Argentina represented 4% of all CDM projects in the region and 8% of the total volume of certified emission reductions (CERs English). In December 2011 there are a total of 25 approved projects, which include projects landfill gas and methane capture, wind power, bioenergy and cogeneration, industrial restructuring and reduction of PFCs emissions (UNFCCC, 2011).

In terms of consumption and power generation it has implemented several programs to measures promoting energy efficiency and renewable energy under the leadership of Secretary of Energy.

Since 2003 it has developed the Energy Savings and Efficiency (payee) with the participation of the electricity distribution companies which includes changing lighting, appliance labeling, energy efficiency in public buildings. The payee followed in 2004 the Program for the Rational Use of Electric Power (PUREE) to encourage savings of electricity to residential customers through bonuses and fees. The program is ongoing and applies to all companies responsible for energy (Edenor, Ededur and Edelap).

In 2007, it launched a program of Rational and Efficient Use of Energy (PRONUREE) which focuses on energy efficiency in industry, energy efficiency labeling and public lighting and traffic lights. The implementation of this program has been done through the implementation of specific plans such as the Program to Increase Energy Efficiency and Production of Small and Medium Enterprises (PIEEP) facing companies in the sectors of

production of sugar, citrus and milk (World Bank, 2010). Other initiatives related to renewable energy include: the Renewable Energy Act (No. 26190, December 2006), which provides benefits and facilities for the installation of clean generation, and expects to reach these sources with an 8% of consumption 2016; Program Power Generation from Renewable Sources (GENREN); Project Renewable Energy in Rural Markets (PERMER) which provides renewable energy (eg solar panels) to small rural Chaco, Jujuy, Misiones, Neuquén, Salta, Santiago del Estero and Tucuman populations. The National System for Wind Energy and Solar guarantees economic incentives (AR \$ 0.03 / kWh) of energy supplied by wind and solar sources of energy and ensure fiscal stability for 15 years. As for biofuels, from 2010 is required to add biofuels to all liquid fuels used in transportation. It is expected that the percentage of the total mixture of liquid fuels pass of 5% mandatory blending in 2010 to reach 10% by 2020.

In the water sector, in 2006, and from an initiative of the Secretariat of Water Resources of the Nation, the Federal Water Council (COHIFE) began work on the formulation of a National Water Resources Plan (PNRH) . The management of water resources are developed in each provincial jurisdiction, but has the COHIFE as the coordinating inter-jurisdictional including the federal government. Among the programs proposed in the PNRH is that of management tools' and, within it, the sub arises' Management Tools for Climate Change '(Sayd, 2007) .As for waste management, the SAyDS developed since 2005 and in agreement with the provinces, a National Strategy for Integrated Management of Municipal Solid Waste (ENGIRSU). This is because 60% of municipal solid waste is disposed in open dumps. The aim of this strategy is the closure of these landfills, plus capture and disposal of methane (SAyDS, 2007).

In the agricultural sector, the Ministry of Agriculture, Livestock and Fisheries has developed several programs to better manage natural resources. For example, the component Support for Small Producers for Environmental Conservation (CAPPCA) promotes regeneration of degraded areas through sustainable production system and forestry with mitigation and adaptation approaches to climate change. Also noteworthy is

that the Agrifood Strategic Plan (PEA), recently presented by the Office of the President (September 2011) states among its goals: (A) Increasing the stock of carbon per hectare from 40 ton to 46 ton, where 5 ton / ha would be captured through reforestation and 1 ton / ha would recover through the expansion of "direct seeding" and crop rotation. (B) Increase by 45% the area covered by forests rising from the current coverage of 32% to 42% of the total area. (C) Pass protected 25.7 million to 30.7 million have been protected through increased areas administered by the Nation. (D) Reduce by 27% the areas of eroded land to reach the goal of 16% of the total eroded areas on the surface.

In forestry, Law 25,080 was extended for an additional period of 10 years by Law 26,432 (World Bank, 2010) and establishes an investment program in Forestry for forest enterprises in new areas and the expansion of existing forests from a subsidy scheme. However, in the Far North, the forests that still exist in the region, despite being the main rooms of CO₂ capture and storage in the country, suffer the highest rate of deforestation in Argentina under an extraordinary expansion intensive agriculture oilseeds (soya) and cereals. According to the SNA, in some provinces clearing permits are granted without due consideration of sustainable production.

The significant reduction in the forest area has its most obvious expression in the ecosystems of the Atlantic Forest, Chaco and Yungas, with estimated for the period 1956-2005 (Viglizzo et al in 9,058 km², 68,800 km² and 14,060 km² respectively losses., 2010). The deforested area equivalent to 4.4 times the area of the Republic of El Salvador at only 50 years of agricultural expansion in these three forest environments country. As for vulnerability reduction and adaptation, the SNA identifies a number of programs. The most important is the "Program of flood protection", which has protected and rehabilitated urban infrastructure, agricultural livestock areas and facilitate passive adaptation to rising rivers. On the other hand, the GoA has developed a National Adaptation Programme, with which Regional Adaptation Plans were created. However, in both cases it was possible only to establish a general framework for intervention without a more operational progress in the implementation of specific adaptation actions due to the

lack of an institutional process to coordinate the different actions of the players involved. Overall, Argentina has taken the first steps at the macro level and at the federal level to lay the foundations of a public management that integrates the concept of Climate Change. This is reflected in the development of laws, regulations and international agreements involving pilot small-scale investment programs. Despite the progress, there are still gaps and investment management to address comprehensively and effectively the challenges of climate change.

CHAPTER II

7

FEDERAL REPUBLIC OF BRAZIL ⁵

Greenhouse Gas Emissions

GHG emissions in Brazil, the largest tropical country in the world, has a unique profile. Agriculture and livestock, which represent 25% of gross domestic product (GDP), have required a steady expansion of cropland and pasture has resulted in the transformation of natural vegetation.

At present, the land use change, including deforestation, is the main source of GHG emissions in the country. Abundant natural resources and vast territory of Brazil has allowed the development of renewable energy with low carbon emissions. Historically, large investments in renewable energy such as hydropower, which constitutes around 75% of installed generation capacity, and ethanol produced from sugar cane, which replaces 40% of fuel consumption, reduced the carbon content of the energy matrix Brasil¹ and emissions from transport.

At the same time, it is important to recognize that Brazil is likely to be severely affected by climate change. A phenomenon known as Amazon dieback, together with short-term deforestation caused by fires could reduce rainfall in the west-central and northeastern regions of the country, which in turn could reduce crop yields and water needed to generate hydroelectric power. Solutions to reduce Brazil's vulnerability and to enable adaptation to climate change is urgently needed.

Land use and land use change

Deforestation is a major source of emissions (approximately 40% in 2008), which has reduced carbon stocks in Brazil in about 6000 million tonnes in the last fifteen years, equivalent to two thirds of the annual emissions mundial⁵ scale. No recent measures to protect forests, emissions would be very superiores.⁶ Deforestation in the Amazon and Cerrado regions is driven by the expansion of agriculture and livestock, construction of new roads and the consequent immigration, while that broader forces national and

⁵ ESMAP Assistance Program for the management of the energy sector. World Bank 2010

international markets affect demand for meat and crops, in turn, contributes to deforestation.

Agricultural and livestock production generates 25% of Brazil's gross emissions. Fertilizer use, the mineralization of nitrogen in the soil, growing rice in wetlands, burning sugarcane and the use of agricultural equipment that use fossil fuels contribute to increased emissions from agriculture. Livestock emissions come mainly from the digestive processes of cattle.

Patterns of land use, land use change and forestry activities

The future demand for land and land use, land use change and forestry projects through two models developed in this study: the Brazilian Land Use Model (BLUM, for its acronym in English), an econometric model estimated land allocations and measures changes in land use, and Simulate Brazil (Brazil SIM), a model of georeferenced spatialization estimating future land use in a given period for various scenarios.

Projected emissions in the baseline scenario

In the reference scenario 2010-30 is estimated that 17 million hectares of additional land will be needed. The land for productive uses increases by 7% (from 257 to 276 million hectares between 2008 and 2030), and a quarter of this growth takes place in the Amazon region. In 2030, as in 2008, the pasture land occupies most of the surface (passing from 205 to 207 million hectares). The natural vegetation is converted for production use especially in border regions such as the Amazon region of Maranhão, Piauí, Tocantins and

Bahia to accommodate this growth.

Emissions from land use, land use change and forestry sector will increase to about 895 MtCO_{2e} annually to 2030. The land use change due to deforestation cause the emission of 533 MtCO_{2e} per year by 2030. Direct emissions agriculture and livestock will increase during this period (an average of 346 MtCO_{2e} per year until 2030). Carbon capture offset less than 1% of gross emissions from activities in land use, land use change and forestry sector.

Emissions Management agriculture

A rapid spread of no-till farming can reduce net emissions from changes in carbon stock in the soil, and the use of equipment that use fossil fuels. Till farming also helps control soil temperature, improve its structure, to increase their ability to capture water, reducing soil loss and improve retention of nutrients by plants. In the scenario of low carbon, if 2015 no-till crop is achieved 100% in favorable areas could prevent the emission of 356 MtCO_{2e} in the period 2010-30.

Reduction of direct emissions of cattle

The adoption of more intensive systems for the production of meat, the use of genetic improvements and improved forages for grazing and breeding genetically superior cattle with shorter life cycle could reduce methane emissions from digestive processes cattle without reducing total meat production.

If these measures are adopted, the direct emissions of livestock would of 272-240 MtCO₂ per year for 2030, values corresponding to the baseline scenario and the scenario of low carbon, respectively.

Modeling for future land use and deforestation in Brazil

To explore options for reducing emissions from deforestation is necessary to make a projection of future deforestation. To simulate the future use of soil and future land use changes in Brazil, the study team Growth with Low Carbon used two models in an integrated manner:

1. Economic Model: the Brazilian Land Use Model (BLUM), developed by the Institute for International Trade Negotiations, is a process of economic modeling that considers the allocation of the country's surface and measures the change land use resulting from the dynamics of supply and demand for all major products competing for the floor, such as soybeans, corn, rice, beans, cotton, sugar cane, pasture and forests designated for production.
2. Model georeferenced spatialization: the model Simulate Brazil (SIM Brazil), developed by the Center for Remote Sensing Cartography Faculty of the

University of Minas Gerais, allows you to perform a spatial projection of future use soil over time for the whole country according to different scenarios.

Combating deforestation

Brazil has developed policies and projects for the protection of forests in order to counter the growing pressure these border expansion, and has experience in forest sustainability compatible with economic activities. However, moving to a scenario with low carbon to ensure the growth of agriculture and the meat sector, which are important for the Brazilian economy, it would be necessary to take measures against the main cause of deforestation, namely the increase the demand for land for agriculture and livestock. Reducing the demand for land by improving productivity

Livestock

On stage with low carbon 53 million hectares of land (including more than 44 million hectares of forest recovery) in order to absorb the demand for land for agriculture and livestock are required. This amount increases to a total of 70 million hectares, ie more than double the land cultivated with soy and sugar cane in 2008, taking into account the additional land requirements referred to in the reference scenario.

Energy

The production and consumption of energy, excluding the transport sector, generated approximately 20% of GHG emissions in Brazil in 2010, thanks to the large proportion of renewables (including hydropower) in the national energy mix. The intensity of GHG emissions in the energy sector is comparatively low by international standards, as the average annual per-capita emissions in the energy sector was 1.77 tCO₂ in 2005, compared to a global annual average per capita 4.22 tCO₂ and an average of 11.02 tCO₂ per capita among OECD member countries (Figure 3). As a result, it becomes difficult to reduce emissions from the energy sector in Brazil than in most other countries. Most of the emissions and potential mitigation depend on technology that uses industry still mostly using fossil fuels.

While the PNE 2030 assumes greater use of renewable energies in the period 2010-30, emissions from the energy sector increased by 97% to 458 MtCO₂ in 2030 (excluding fuels for industry transport).

Limited possibilities of reducing emissions in the emissions scenario

Low carbon

Brazil's energy sector could reduce annual emissions by 35% by 2030 compared to baseline, and industry would adopt most of the measures to this end, namely:

- Internal measures: increasing energy efficiency and fuel substitution in the industry, refining and liquefaction of gas, wind power generation, cogeneration from bagasse and high efficiency equipment. In the reference scenario, most of the great hydroelectric potential of Brazil will have been exploited by 2030, and the low carbon scenario does not take into consideration the opportunities for expansion of hydropower.
- Measures abroad: Hydroelectric complementarity to reduce CO₂ emissions from the energy sectors of Brazil and Venezuela, and large-scale export of ethanol to reduce emissions from fossil fuels in the transport sector worldwide.

Transport

In Brazil, the transport sector has a lower amount of carbon in most other countries because of the widespread use of ethanol as fuel for vehicles. As a result, the potential for reducing emissions seem relatively limited. For this reason, a simulation study of the emissions from this sector that would result from substituting biofuels for fossil fuels (mainly gasoline) was performed.

Despite the low intensity of the emissions from the transport sector in Brazil, this sector uses more than half of the fossil fuels consumed in the country. The emissions from the transport sector were 149 MtCO₂e in 2008 (12% of national emissions), and 51% was related to urban transport and increasing the use of private vehicles, traffic congestion and systems inefficient collective transport. However, it is expected that the increased use of vehicles capable of running on different fuels and the passage of gasoline with bioethanol

stabilize GHG emissions from light-duty vehicles in the next 25 years, despite the expected increase in the number of kilometers.

Public and private investment will be needed to actually stage with low carbon emissions.

Legal framework 6

The Brazilian Federal Constitution (1988) states that the federal union, states and federal district are entitled to concurrently legislate on matters of forest, nature conservation, environmental protection and defense of the land and natural resources (Article 24), competition Concurrent extending the issue of climate change, both mitigation and adaptation.

Legislation relevant to climate change policy and strategy tools

From the creation of the Interministerial Commission on Global Climate Change-CIMGC in 1999, which then was followed by the Interministerial Committee on Climate-CIM Change, in 2007, and the Brazilian Forum on Climate Change in 2000, Brazil began to develop climate change policies at the national level to develop a National Plan on Climate Change, which was subject to consultations and identify mitigation opportunities in different sectors of the economy, and includes a chapter on identifying impacts , mapping vulnerability and adaptation possibilities. The Plan was completed in 2008, and in 2009 the National Policy on Climate Change and its regulations (Law No. 12,187 / 2009 and Regulatory Decree No. 7390/2010) was adopted which includes the voluntary commitment to emission reductions of greenhouse gases and guidelines for mainstreaming adaptation at all levels of government and planning for the development of a low carbon economy.

International agreements and actions

Brazil ratified the United Nations Framework Convention on Climate Change (UNFCCC, 1994) and the Kyoto Protocol (2002) and the Convention on Biological Diversity (CBD, 1994) and the UN Convention on Combating Desertification (UNCCD, 1997). Brazil has five national reports to the UNCCD. The fifth, submitted in 2012 reports on specific indicators referred to desertification and soil management. He has also presented four national reports to the CBD (fourth in 2010), and its national biodiversity strategy in 2008.

Within the UNFCCC, Brazil submitted its second national communication. The national communication, in terms of adaptation, emphasizes the development of mechanisms and models to carry out future scenarios, mapping the vulnerability of different sectors, and identify possible courses of action to address them.

Also, it based on the goals adopted in the framework of the National Policy mitigation (NAMA) Climate Change Brazil has submitted to the UNFCCC national actions which quantified targets to achieve voluntary commitment to reduce emissions of this country, efforts sectors of reducing deforestation, restoration of natural pastures, integrated forest grazing systems, direct seeding, biological nitrogen fixation, energy efficiency, use of biofuels, hydropower, alternative energy sources and use of charcoal plantations (not native forest) .

CHAPTER III

THE REPUBLIC OF CHILE

Greenhouse Gas Emissions

Climate change is an issue of national interest, which affects all economic sectors in Chile. In late August 2010, under the agreement reached in Copenhagen during the course of COP 15 Framework Convention on Climate Change, the Chilean government voluntarily committed to reducing emissions of greenhouse gases (GHGs) through the implementation of national appropriate mitigation actions (NAMAs by its acronym in English) that allow you to achieve a deviation of 20% below the rising trend of baseline emissions by 2020, projected from 2007. In addition, in the context of future negotiations and being member of the OECD Chile, the country must further strengthen their efforts to reduce emissions.

Chile currently has a comparatively good emission profile that places it in the bottom quartile of OECD countries in per capita emissions intensity. This level of emissions is in line with or slightly below its level of development, and recorded a lower intensity of CO₂ emissions that countries of similar per capita income in the region and the world. From this position, the country must ask itself how it can achieve its aspiration of clean development efficiently within an international context which targets a reorganization efforts. The IPCC provides the identification of GHG emissions from generating sources of these gases. Following this methodology, there are 4 large emitting sectors: Energy, Industrial Processes, Agriculture, forestry and land use, and waste. Each of these sectors is divided into categories and sub-categories to identify sources of emissions. In turn, the main activities within each category or sub-category is identified. The emission estimate is from the volume of activity and the corresponding emission factor. The volume correlates with a characteristic variable specific activity and the product between this variable and the emission factor results in the volume of emissions. For example, one of the categories of the Energy sector is "Emissions from fossil combustion" which includes the sub-category Transportation. Within this last cabotage air transport is identified as one of the main

activities. The characteristic variable is the volume of fuel consumed. The emission factor is expressed in tons of CO₂ per unit of volume consumed, and the product of these two values will result in emissions of the activity.

According to the IPCC, the energy sector accounts for emissions from fossil fuel combustion and fugitive emissions from fuel extraction, such as combustion in energy production, industrial and non-industrial combustion and transportation or fuel extraction fossils.

Within this sector are the following categories:

Energy industry: Emissions from combustion of fuels in power generation, refining and the production of fuels derived Industry and Construction: Emissions from fuel combustion in industrial processes and construction, including transportation within the factory.

Transportation: Emissions from fuel combustion in air, road, rail and sea Residential, commercial and public: Emissions from fuel combustion in the residential, public and commercial sectors Fugitive emissions: Emissions from chemical reactions in processes of extraction and transportation or fossil fuel transport and storage of CO₂.

Industrial processes sector recorded the product of chemical reactions in industrial processes emissions, such as production processes (excluding combustion processes listed in the Energy sector) or the use of solvents and other products. For example, the product of the burning of the fuel used in trucks involved in the operations of the cement industry emissions are accounted for in the Energy sector while the emissions product of the chemical reactions that occur in the mixture of lime and clinker are recorded in the sector of industrial processes. Within this sector are the following categories:

Mineral industry: Emissions from chemical reaction of minerals, generate products whose inputs are carbon-rich chemical industry: Emissions from the production of chemicals

Metal Industry: Emissions from chemical reaction in metalworking Other productions: Emissions from production and use of products not categorized above. For example, emissions from solvent use in paper production Consumption of HFCs, PFCs and SF₆: potential for the direct use of these emissions, since they are themselves GHGs.

The sector of agriculture, forestry and land use accounts for the product of agroforestry production activities and changes in land use emissions. It also applies to situations in which "catches", ie, a reduction in atmospheric CO₂ product of photosynthesis and other processes occur. Within this sector are the following categories:

Livestock: Emissions from the decomposition of manure (enteric fermentation and manure management) Land use and land use change (LULUCF15): Catch and emissions into the biosphere as soil type (forest, agricultural, pasture and others). For example, carbon capture through photosynthesis or disturbance emissions, removals of wood and added degradation of CO₂ and other gases Sources: is separate account other relevant sources of CO₂ and other GHG emission sources, mainly from agriculture. For example, CO₂ in the cultivation of rice, or in application of urea or lime in soils and N₂O emitted in the exploitation of soils with fertilizer or nitrogen-fixing crops, or in situ biomass burning. Finally, the industry considers the product Waste treatment emissions and waste disposal. Within this sector it is considered only the solid waste (emissions from the decomposition of solid waste in both managed and weather sites) as being the most significant.

Chile emissions inventory for 1990-2010

The results show that Chile is in a good relative and absolute position in terms of GHG emissions. The country's emissions are underweight globally as they represent only 0.2% of global emissions. Comparatively, Chile has a profile of emissions below their level of development. Per capita emissions place Chile in the bottom quartile of the OECD. Their peers, emissions per capita in Latin America are below countries with similar income per capita, and these have evolved in line with the growth of wealth, having almost zero variation in intensity measured as emissions per unit GDP (0.6 GgCO₂eq / US \$ GDP). Following the methodology described in the previous section, emissions between 1990 and 2010 for Chile were inventoried. These amount to 17,700 GgCO₂eq in 1990, 32,200 in 1995 GgCO₂eq, GgCO₂eq 43,600 in 2000, 56,200 in 2005 and 64,300 GgCO₂eq GgCO₂eq in 2010. Emissions grew on average at a rate of 7% and showed two periods of high growth: 1990 1997 and 2001-2008. The Government of Chile published in the

"Second National Communication of Chile" to the Framework Convention of the United Nations its latest national inventory for the period 1984-2006, being therefore update these values for subsequent years an additional contribution of This section of the work. Emissions from the energy sector, which reached 67,985 GgCO₂eq to 2010, emissions consist of five categories, representing the following interests: 40% Energy industry 21% Industry and construction 30% Transportation 8% Residential, commercial and public and 1% fugitive emissions. Also, the categories that showed a higher annual average growth during the period 1990-2010 are the energy industry, which grew 5% annually and Transport, with an increase of 4% annually. The other grew less than 2% annual average. Interestingly, the impact they had two events in particular: changes in Argentine gas imports and the financial crisis between 2008 and 2010.

Emissions from energy Industry category correspond to about 90% of the thermal power generation base. This category grew during the period at an average of 8% annually, mainly due to an increase in electricity generation of 6% during the same period. Industrial emissions category, manufacturing and construction are mainly to emissions from mining (non-ferrous metals), iron and steel. The first sub-category grew 7% annual average between 1990 and 2010, while the second (iron and steel) decreased by 1%. Therefore, the participation of the mining sub-category has won participation in the Industrial category emissions in the period analyzed. Emissions of Transportation category are about 90% to road transport emissions. These emissions grew 5% on average in the period and are mainly due to the increase in the number of private vehicles. Emissions category residential, commercial and public Combustion 68% correspond to residential emissions, which grew 2% annual average, 30% to trade emissions, which grew at 4% and 2% the public sector.

Emissions from industrial processes sector reached the 4,802 GgCO₂eq to 2010 and are composed of emissions from three main categories with the following holdings: 59% mineral industry (cement and lime), 33% Metal Industry (iron and steel) and 8% Chemical industry. Mineral industry emissions and chemical industry showed the highest annual

average growth of 4% and 6% respectively. Meanwhile, emissions from the metal industry grew by 1% annually. For this sector the global crisis between 2007 and 2010 had a significant impact due to the high correlation between the activities of construction and mining and economic cycles.

The sector of agriculture, forestry and land use had net catches for all years between 1990 and 2010, which had a positive impact by reducing the concentration of greenhouse gases in the atmosphere. Catches in 2010 totaled 11,004 GgCO₂eq, and were the result of the balance of emissions and capture categories Livestock, Land use and land use change (LULUCF), and Fuentes added CO₂ and other gases (mainly agriculture). The first category has 10,584 GgCO₂eq emissions to 2010, the second a net capture of 26,447 GgCO₂eq and the third 4,860 GgCO₂eq emissions. The evolution of the sector's emissions is mainly explained by changes in catch per Land use and change in land use, since emissions from livestock were virtually unchanged and the emissions of the latter category represents a small proportion of the total of sector emissions.

Emissions from Waste sector accounted for emissions from municipal solid waste, which showed a steady growth of 5% annually over the period 1990 to 2010 and reached 2,494 in 2010 GgCO₂eq.

Legal framework

The May 9, 1992 Chile subscribes to the United Nations Framework Convention on Climate Change (UNFCCC) and December 15, 1994, the National Congress ratified. The instrument of ratification was deposited with the Secretariat of the UNFCCC on 22 December 1994. Decree No. 123 of the Ministry of Foreign Affairs (MINREL), promulgates and orders its publication in the Official Journal, which takes place on 13 April 1995, which it is incorporated full way the legal system.

Product accession to this multilateral treaty, Chile agrees to comply with the general objectives of stabilizing emissions and adaptation to climate change contained in Article 2 of the UNFCCC; according to the principle of common but differentiated responsibilities and respective capabilities.

Kyoto Protocol

Chile in its condition as non-Annex I could only participate in the Clean Development Mechanism which "was conceived as an instrument of flexibility, (MDL) 31, by which GHG reductions that are generated due to the development of a project , carried out in a country that has no obligations to reduce greenhouse gases, they can be transferred by the holder, to be used as a means of compensation for those countries or companies that have commitments to reduce their GHG emissions.

Chile promoted the creation of an interim CDM implementation phase, the station contained a rule which conditioned its entry into force, the signing of a certain number of countries representing a significant percentage of GHG, which allowed applying the MDL from Morocco agreements of 2001.

First National Communication

According to the provisions of the UNFCCC and the guidelines developed in the framework of international negotiations, discussed above, Chile presents its First National Communication to the Conference of the Parties to the UNFCCC in 1999. It was developed by CONAMA, advised by CNACG and financed with international resources. In presentation made by Chile to the Conference of the Parties it emphasizes that the goal of sending the First National Communication is not only comply with the obligations arising from the UNFCCC for signatory countries, but also report on the needs we have as a country Developing.

National Advisory Committee on Global Change (CNACG) (1996- 2014) and the Interministerial Committee on Climate Change (CISCC) (2009)

By Decree No. 466 of 1996 of the Ministry of Foreign Affairs, the National Advisory Committee on Global Change (CNACG) is created. The considerations that led to the establishment of this body, are related to the need to increase the levels of information (to promote research), implement national commitments and coordinate foreign policy. Among the functions entrusted to the Committee are: "a) To advise the Ministry of Foreign Affairs in what is related to the national position on the Framework Convention on Climate

Change, the Inter-American Institute for Global Change Research, the Conventions deterioration of the ozone layer, and any climate and global change that prompted the Ministry of Foreign Affairs; b) To advise the National Environment Commission in all matters that relate to the overall change in the Chilean territory and national implementation of plans and programs to be established; c) Advise institutions dedicated to global change research and to all those who require and / or request; d) Serve as a mechanism of coordination between all entities involved in issues relating to climate and global changes ".

Second National Communication to the UNFCCC COP (2011)

The Second National Communication, adopted by the Council of Ministers for Sustainability, as No. 6 2011 agreement, is to update the information submitted to the Secretariat of the Convention on the First National Communication, made in 1999. This document contains as its executive report : Results of the national inventory of emissions and removals of greenhouse gases, exposure of the main country's progress in the areas of mitigation, vulnerability and adaptation to climate change. "In addition, other information considered relevant at the national level, also in the light of developments in international negotiations, embodied primarily in the conferences of the parties of the years 2007, 2009 and 2010. Finally some obstacles include detailed, gaps and financial, technical and capacity building for the country identified during the preparation of this report "

Development Biennial Report Update (2014)

In October 2014 the Council of Ministers for Sustainability approved by Decision No. 17 of 2014, the first biennial update report of Chile to the UNFCCC (IBA). The preparation of this report responds to the commitment made at the 2nd Decision of the 17th Conference of the Parties in Durban, in 2011. On that occasion the Parties decide that non-Annex I countries must submit, in accordance with their respective capabilities and support, their first biennial update report no later than December 2014. The minimum content, said the decision should address the GHG inventory within a year for the past four years period. The process for the preparation of the National Contribution attempt (INDC) (2015)

Contributions Nationally Determined (INDC, for its acronym in English) arise in the context of the Conference of the Parties held in Warsaw in which he invited Parties to "initiate or intensify internal preparations in respect of contributions determined to national level (...) and to communicate these contributions in time for the 21st session of the Conference of the Parties (in the first quarter of 2015, in the case of Parties that are prepared to do so) in a way that promotes clarity , transparency and understanding of these contributions, without prejudice to their legal status. " This invitation is repeated in the so-called "Lima Appeal for Climate Action", which also provides some guidelines on matters that each contribution has to address: "quantifiable information on the reference point (indicating a base year, where appropriate), deadlines and / or periods of application, scope and coverage planning processes, assumptions and methodological approaches, including those for estimating and accounting for emissions and, where appropriate, anthropogenic removals of greenhouse gases, and an indication of the reasons why they consider your expected contribution determined nationally is fair and ambitious, in the light of their national circumstances, and how it contributes to achieving the objective of the Convention, as set out in Article 2"

CHAPTER IV

REPUBLIC OF PERU

Greenhouse Gas Emissions

Since 1992, Peru is an integral part of the Framework Convention of the United Nations on climate change and since 2002 part of the Kyoto Protocol, through which industrialized countries agree to stabilize emissions of greenhouse gases by 2012 . Peru, through the Ministry of Environment, has developed the First and Second National Communication which aims to have an inventory of greenhouse gases, which aims to provide information on levels of emissions and capture of greenhouse gases (GHG) and national measures and policies to address climate change. For the preparation of the reports, it takes into account the guidelines of the Intergovernmental Panel on Climate Change (IPCC), where anthropogenic and removal by sinks of greenhouse gases emissions is calculated.

Inventory of greenhouse gases (GHGs)

According to results of the inventory of greenhouse gases, Peru in 2000 generated only 0.4% of GHG as a contribution to the world.

In addition, Peru is considered among one of the countries with high vulnerability to the effects of climate change have more sensitive production systems to climate, ie climatic variations that affect agricultural production and food security of the population. Also, being more prone to natural disasters floods, droughts, landslides, frost, glacier melt, among others; the need to increase our responsiveness to their effects on land-use planning policies, prevention and adaptation to climate change is generated. The limited economic resources and low level of technology increases vulnerability. Peru, faced economic losses to the presence of El Niño, which is also linked to climate variations. In June 2010, was presented the Second National Communication of Peru, the results indicate that the main source of emissions of greenhouse gases (GHGs) nationwide is the conversion of forests and pastures, attributed to deforestation of the Amazon and by the change in land use for agricultural purposes. Also, shifting cultivation and animal

husbandry are the main direct cause of deforestation in Peru. Other factors that increase deforestation are urban development, communications infrastructure, mining and oil exploitation, and illegal coca plantations.

In 2009, the national inventory of greenhouse gases, estimated that GHG emissions amounted to 146 782.54 Gg CO₂e. When analyzing the sources that generate it, it was determined that change land use generated 38.4% of GHG gases, agriculture 24.9%, energy 16.4%, transport 10.1%, 6.1 wastes % and 4.1% industrial processes.

Consumption of substances that deplete the ozone layer

Ozone is a gas that occurs naturally in the atmosphere. While the amount of ozone represents a small percentage of all the gases that comprise the atmosphere, its existence is vital to protect life on Earth from harmful ultraviolet solar radiation. Human activity has been generating exponentially chemical ozone depleting substances (ODS), substances such as chlorofluorocarbons - which cause the deterioration of the ozone layer - triggering a series of harmful effects on health and the environment.

Since 1920, they have been carried out isolated observations of ozone. In 1975, the World Meteorological Organization (WMO) issued its first scientific statement: "Modification of the ozone layer due to human activities and some possible geophysical consequences." In 1985 the Convention for the Protection of the Ozone Layer and the 1987 Montreal Protocol was given. They have signed two amendments to the Protocol (London, 1990 Copenhagen, 1992) where drastic measures are specified in the use of chlorofluorocarbons (CFCs) and other substances.

The Montreal Protocol sets goals to reduce the use of other harmful substances, such as freeze-called halons, the average level achieved between 1995 and 1997; in addition to stabilizing the use of methyl bromide to the average figure obtained in the period 1995 to 1998. The UNDP within the Montreal Protocol has supported the countries of Latin America and the Caribbean since 1992 and to date they have developed projects in more than 30 countries in the region. These projects have helped countries in assessing their needs, in the selection of alternative technologies and the implementation of necessary

industrial restructuring to become free countries SAO, and contributed to the successful implementation of the Montreal Protocol elimination of 176.788 tonnes of ODS. This result also results in the elimination of emissions of greenhouse gases from 1.13 million tonnes of CO₂ equivalent.

The current focus of the Montreal Protocol focuses on the elimination of hydrochlorofluorocarbon compounds called (HCFCs), UNDP has assisted 15 countries in the region with the implementation of the Management Plan for the Elimination of HCFCs, in order that they are prepared for the first control measures for the 2013-2015. Peru has managed to stabilize consumption of CFCs at the average level obtained between 1995 and 1997 (TM 425). Thus, the first step established control materialize. Modern refrigeration systems produced worldwide do not use CFCs. The data provided by the Ministry of Industry show that in 2012, Peru had a consumption of 575 metric tonnes of substances that deplete the ozone layer, a figure that fell by 26.8% over the previous year.

National GHG Inventory – 1994

This inventory was conducted by the National Environment Council (CONAM) with support from the National Engineering University and the Center for Conservation Data Agrarian University La Molina (UNALM), which received funding from the government of Denmark. The methodology used was based on the identification of the institutions responsible for collecting all the data (activity level) required for the development of inventories which was found in the national statistics of the Peruvian government agencies. The calculation process is carried out following the "IPCC Guidelines for national inventories of greenhouse gases" - Revised 1996 using the default emission factors contained in these guides version. It is unknown if there was quality control of the data worked only it mentioned that there is some uncertainty about the absence of certain national statistics. Nor is a process of review of the results by expert (s) mentioned. The results indicate that by 1994 a total of 98 816.30 Gg of CO₂ equivalent were issued with a percentage composition of 68.7% CO₂, 17.3% and 14.1% CH₄ N₂O, expressed as terms of CO₂ equivalent.

National GHG Inventory – 2000

This inventory was also developed by the CONAM through the initiative: Strengthening Programme National Capacity to Manage the Impact of Climate Change and Air Pollution - PROCLIM. In the program also they attended the following institutions: National Institute of Natural Resources (INRENA), Ministry of Transport and Communications (MTC), Ministry of Energy and Mines (MEM), Ministry of Production (PRODUCE) and the Directorate General for Environmental Health (DIGESA) of the Ministry of Health. This inventory had agreements and institutional arrangements so that the relevant public institutions in each sector were responsible for gathering the necessary information, and the measurement of emissions in the sector in this regard were trained for that purpose institutions PROCLIM. For the preparation of this inventory were considered the IPCC Guidelines revised version in 1996 and its default emission factors, plus the recommendations of the Guide to Good Practice IPCC Inventories 2000 were included (for the sectors energy, industrial processes, agriculture and waste) and the Guide to Good Practice for USCUS\$1 IPCC (2003) report that recommends flows according to changes between different types of land use: forest, pastures and crops. An estimate of the uncertainty was not performed despite the recognized but became a quality control level of activity raised through additional research, surveys and expert opinions, there was also a process of reviewing the calculations for inventory specialist. The national GHG inventories for 2000 estimated a total of 120.023 Gg of CO₂ equivalent and percentage composition was as follows: 73.8% CO₂, 16.9% and 9.3% CH₄ N₂O, expressed in terms of CO₂ equivalent.

2010 national GHG inventory

The INGEI 2010 indicates that the total emissions / removals of GHG has been GgCO₂ 124,109.14 e.

The contribution of emissions / removals of GHG identifying the different categories USCUS\$, energy and agriculture sectors are the three main sectors generating higher percentage of emissions. emissions per capita amounted considering the population

indicated by INEI35 to 2.74 tonnes of CO₂ e per / year excluding the LULUCF sector. The main source of GHG emissions is national land use sectors, land use change and forestry (LULUCF) [5] with GgCO₂ and 43518.14. In this category, the main source of emissions is the conversion of forests and pastures [5B] (42500.69 GgCO₂ e) attributed to deforestation of the Amazon to change the use of forest land for farming or pasture; while the main source of GHG removals consists of changes in forest and other woody biomass stocks [5A] (- 31,061.41GgCO₂ e) caused by increases in biomass.

The second category is Energy [1] (40605.24 GgCO₂ e), whose main source of emissions is the transport [1A3] (15205.69 GgCO₂ e), which includes as its main source for land transport with 14,447.61 GgCO₂ e. The third category is represented by Agriculture [4] (26051.37 GgCO₂ e), with two major sources of emissions: enteric fermentation [4A] and agricultural lands [4D] emission of N₂ O.

The fourth category is represented by Industrial Processes [2] (6274.04 GgCO₂ e), whose main source of emission is the subcategory of production of mineral products [2A] emissions coming from cement production, reaching 3661.68 GgCO₂ e. The fifth and final category is that of Waste [6] (7660.35 GgCO₂ e), and its main source of emission of solid waste [6A] with GgCO₂ and 6043.42.

Legal framework

The new Forestry and Wildlife Law and the Bill of Compensation for Ecosystem Services
The Peruvian legal framework on climate change and ecosystem services is progressing. In 2011, Congress approved a new Forestry and Wildlife Law, Law No. 29763, and is currently discussing its rules. While this regulation is not approved remain effective forestry legal framework of the law that we used to analyze the previous paragraph. The new Forestry and Wildlife Law has several references to forest ecosystem services. On the other hand, for some time discussed in Congress a bill Promotion Compensation Mechanisms for Ecosystem Services (Bill No. 786/2011-CR). This project seeks to clarify the legal framework of ecosystem services and promote CSR, including REDD +. The new Forestry and Wildlife Law regulates forest ecosystem services with greater clarity and

detail. Article 3, for example, mentions that "contribute to the provision of services of forest ecosystems and other wild vegetation systems" is a "forestry" and therefore explicitly subject to this legal framework. In addition, as the Forestry and Wildlife Law still in force, the new law also establishes different categories of forest zoning; However, unlike the current law still, the new Forestry and Wildlife Law explicitly recognizes that most of them do "economic use of services [ecosystem]" (Article 27). Also, the new law clarifies the ownership of ecosystem services. This standard requires that all forest rights give the right to "the economic benefits derived from ecosystem services that emerge from the (...) management [of forest resources]" (Article 60). Likewise, the Act specifies that forest concessionaires of any kind "constitute holders of rights provision of ecosystem services" (Article 52).

In addition, the latest version of the Bill of Compensation for Ecosystem Services also gives clues about the legal concept of ecosystem services. Article 3 provides interesting definitions. For example, this article explains that those who "through actions contribute to the conservation, recovery and sustainable management of the sources of ecosystem services" are "contributing to the ecosystem" and, therefore, are the active subjects of remuneration schemes for ecosystem services. That is, it is those who should be giving back.

These new and future Peruvian rules establish a better legal framework that will clarify who is entitled on ecosystem services and benefits and what are the basic conditions for establishing CSR schemes such as REDD + around them.

CHAPTER V

REPUBLIC OF URUGUAY

Greenhouse Gas Emissions

Uruguay has an increased climate variability manifested in increased rainfall and increased frequency of large storms. At the same time, in the last hundred years it has been increasing the number of consecutive days without rain. The variability of precipitation and frequency of extreme events are two examples of how climate change affects the economy, in this case to agricultural production and the energy sector. When many days without rain, even if they fall 70 mm water will not fail, because if it rains more than it is able to absorb the ground, the water is lost through runoff and can end up overflowing rivers, which also affects the production hydro -energética. According to a recently completed investment flows and financial (FI & F) evaluation, the net present value deemed necessary, by 2030, to address climate change in these two key sectors-energy and agriculture of US \$ 2.80 miles of millions. Evaluation of investment and financing flows (FI & F) is a component of UNDP Global Project "Strengthening the capacities of those responsible for the formulation of policies to address climate change." Uruguay is one of the 20 countries participating in the project worldwide. The project is funded by the governments of Norway, Switzerland, Spain, Finland, UNDP and the United Nations Foundation.

Selecting sectors

The assessment of investment and financial flows needed to address climate change in Uruguay were selected two sectors that are considered of strategic importance for Uruguay: energy and agriculture / forestry. Energy is a strategic sector from the economic point of view in terms of the obvious link between the availability of energy and economic development. Uruguay's energy sector is characterized by a poorly diversified, with heavy reliance on imported oil (55- 60% of energy supply), and significant participation (25-30% average hydropower depending on hydrological conditions annual). This sector was analyzed from the perspective of their mitigation potential. The high importance of the

agricultural sector for the operation and development of Uruguay is indisputable, although the primary activity is responsible for only 10% of GDP (including forestry). When considering the agribusiness sector participation in the national GDP ranged between 20 and 37% (Source: MGAP-DIEA), constituting the value of agricultural and agro-industrial products to 65% of the total exported by the country. The sector that contributes to the emissions of greenhouse gases Uruguay, livestock remains responsible for over 90% of sector emissions (DINAMA, 2009). The sector has great potential to mitigate and adapt to climate change.

Energy sector (mitigation of emissions of greenhouse gases)

During the period 2007-2030, the sector will invest approximately US \$ 1,868.32 million 3 mitigation measures raised, while the fourth measure generates a net savings of US \$ 1,662.84 million, leading to a total need of US \$ 205.48 million for the four measures. 4 measures selected were:

- **Energy efficiency:** The mitigation scenario incorporates the impact of measures for efficient use of energy (US \$ 35.54 million);
- **Wind power:** a goal of incorporation of 300MW of wind power was assumed during the period 2010-2014 and additional 300MW during the period 2016-2030 (US \$ 1,105.35 million);
- **Generation Biomass:** a goal of incorporating additional 200MW of installed capacity by 2015 (US \$ 727.43 million) was assumed;
- **Generation of coal vs. Natural gas:** It was assumed that the expansion of thermal plants is done through the installation of combined natural gas module 180 MW (net savings of US \$ 1,662.84 million) cycle. In these calculations, the national resources of corporations will have to increase the amount of US \$ 62.92 million, while external resources corporations get savings of US \$ 910.63 million. The national government funds know a savings of US \$ 1,492.36 million, while external government funds should be increased to US \$ 545.55 million.

Agriculture / forestry (mitigation of emissions and adaptation to the impacts of climate change)

During the period 2006-2030, the sector will invest in measures an estimated value of US \$ 4,597.98 million. 3 measures selected were:

- **Forestry:** Carbon sequestration in forests comprises mainly grassland afforestation on forest soils declared priority species and replacement of existing planted forests (US \$ 1,320.48 million);

Intensification: Intensification of livestock production includes extensive livestock meat and milk production (US \$ 1,837.66 million);

- **Agriculture:** Carbon sequestration in agricultural soils includes the increase in crop rotation systems with pastures and rainfed rice (US \$ 1,439.84 million). In these calculations, the national resources of corporations will have to increase the amount of US \$ 2,741.82 million, while external resources required by US corporations will be \$ 1,773.52 million. The national government resources need additional US \$ 82.66 million, while external government funds do not require additional funding.

Legal framework

National Environmental Forecasting

The Ministry of Housing, Spatial Planning and Environment, created by Law No. 16,112 dated May 30, 1990 Uruguay defined in the policy on environmental management, considering this element as a regulator of economic and social development in the concept of growth Country sustainable.

UTE Electric Company has developed environmental policies that have marked national guidelines for environmental performance and generated an environmental commitment to the people to turn electric service customers.

This environmental commitment the company has made a management optimization and allowed to articulate the structural element of Corporate Social Responsibility.

The same is collected basically UTE Environmental Policy, as approved by its Board Resolution No.38 of 21 January 1999.

Thus, with this framework and through a corporate environmental management, joint venture projects, are inserted into the environment, in accordance with the relevant environmental requirements, thus achieving minimize negative environmental impacts.

Combining a national perspective and commitment to Environmental Management UTE, it has managed to define an improvement in the quality of electrical products.

The Constitution of the Republic, Article 47 provides: "Protection of the environment is of general interest. People should refrain from any act that causes degradation, destruction or serious environmental pollution. The law shall regulate this provision and may provide penalties for offenders. "

National Environmental foresight is complemented by the decree law No.14.859, Water Code (Quality and Gaza Coastal Defense) and Decree No.52 of 2005 regulating Act No. 17,234 of creating protected areas.

This legislation is complemented by departmental macro municipal regulations, which then frames the activity of the Uruguayan electrical industry.

In this regard and in addition, UTE Uruguay in general and in particular has acceded to the international agreements and conventions related to sustainable development.

The legal and institutional framework Uruguay in environmental management supports global trends of sustainable development, a concept formalized in the "Rio Summit" in 1992 and reiterated on numerous agreements to which acceded the country, among which are:

- Rio Declaration on Environment and Development which aims to establish an equitable global partnership through the creation of new levels of cooperation among States, key sectors of societies and people, Working towards international agreements which respect the interests and integrity of the environmental system is protected.
- UN Framework Convention on Climate Change which aims for the stabilization of concentrations of greenhouse gases in the atmosphere at a level that would prevent

dangerous anthropogenic interference with the climate system.

- Vienna Convention for the Protection of the Ozone Layer, which seeks to avoid the potentially harmful impacts of changing ozone on human health and the environment, and aims for further research in order to increase the level scientific knowledge about it.
- Convention on Biological Diversity whose objectives are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the utilization of genetic resources.
- Stockholm Convention to protect human health and the environment from persistent organic substances.
- Kyoto Protocol, whose fundamental purpose is to stabilize greenhouse gases and set emission reduction obligations for Annex B countries, or developed countries. The protocol provides "clean development mechanisms" for countries to non-Annex B (developing) assist countries in Annex B to reduce the atmospheric stock of greenhouse gas (GHG) emissions to the levels set by the Protocol .

Regional Framework

Key aspects of the regional regulatory framework given by Law 17,712, Framework Agreement on the Environment of MERCOSUR.

With this regulatory framework, the members of MERCOSUR countries, Argentina, the Federative Republic of Brazil, the Republic of Paraguay and the Oriental Republic of Uruguay, hereinafter referred to States Parties; Stressing the need for cooperation in environmental protection and sustainable use of natural resources, with a view to achieving a better quality of life and sustainable economic, social and environmental development; Convinced of the benefits of the participation of civil society in environmental protection and the sustainable use of natural resources;

Recognizing the importance of cooperation among States Parties in order to support and promote the implementation of international commitments on environmental issues, noting the legislation and existing national policies;

Reaffirming the principles of sustainable development contained in Agenda 21, adopted at the United Nations Conference on Environment and Development in 1992;

Whereas the trade and environmental policies should be supplemented to ensure sustainable development in MERCOSUR;

Convinced of the importance of a legal framework to facilitate effective environmental protection and sustainable use of natural resources of States Parties.

AGREE: States Parties reaffirm their commitment to the principles in the Rio Declaration on Environment and Development in 1992.

CONCLUSION

The proposed and which up to now conclude aim it is that the behavior of the countries under the influence of climate change and the greenhouse effect, with particular reference to agriculture and livestock industry causes environmental outcomes with obvious negative trend in aggravated future.

The countries of the Mercosur region, leading to COP 21 proposals to be evaluated to reach a binding agreement to replace the Kyoto Protocol.

Argentina, meanwhile, includes the country's commitment to reduce emissions of greenhouse gases (GHG) from the "Business as Usual" (BAU) 2030, ie about GHG emissions 30% projected 2030 compared to the pace and current trend of national emissions.

The country will make every effort to responsibly comply with the stated commitment to the UN Framework Convention on Climate Change (UNFCCC) and its member countries, the main issues to be worked as measures within the INDC and allow the country you get to the 15% reduction will concern the promotion of renewable energies, water heaters with electronic ignition, nuclear, hydroelectric plants, cargo preference to rail, energy efficient appliances, efficient boilers, efficient engines, solar heaters, economizers Water, alternative fuels (biodiesel, ethanol), distributed power generation, cogeneration with fossil fuels, crop rotation, recovery of native forests, industrial wastewater treatment, modernization of the fleet. The goals set are also limited to the agriculture and forestry, causing almost half of emissions from Argentina sector. While an important step with the sanction of the Forest Act, the measure is insufficient to reduce the rate of deforestation with about 8 million hectares that could be converted to other land uses. In this sense, greater investment in promoting responsible forest grazing systems, as well as a more aggressive policy of economic incentives to promote good farming practices in the territory, allow further reduce emissions in the sector promoting, at the same time , the conservation of other ecosystem services such as the provision of fresh water, soil protection or biodiversity.

With regard to Brazil's proposals for the Paris Conference (COP 21) on climate indicate that undertake to reduce pollution of greenhouse gases by 37% by 2025 and 43% in 2030. Brazil also commit to the recovery of degraded pastures and integration of five million hectares for livestock and forests.

At the same time, the country continues to diversify the renewable energy mix, one of the cleanest in the world.

The preservation of the Amazon forest in Brazil-more than 5 million km² of extension-is considered both its key role as moderator of climate change on biodiversity conservative as the country with the largest number of species on the planet.

Brazil's goal also includes replant at least 12 million hectares of forests, 15 million others recover degraded pastures and integrate 5 million agricultural areas. "In 2005, deforestation accounted for 57% of Brazilian emissions and this percentage fell to 15% last year, there is a legal logging in some areas of the Amazon, which is estimated at about 1 500 km² per year.

With reference to Chile, the proposal not only includes emissions mitigation, but also adaptation, capacity building and financing.

In its Action Plan on Climate Change, Chile agrees to protect the glaciers as water reserves to accommodate the narrowness of water that brings global warming. Holding a contrary position in national law is a double standard that exposes the country to domestic and international disrepute.

In the case of Chile the electricity, transport, pulp, cement and residential were reviewed, being the sectors with the greatest reduction transport and electricity generation.

The emission abatement costs for Chile in the generation sector are estimated at around 0.05% of GDP, which exceeds Australia, Brazil, Korea and Japan. The OECD estimates that Chile has killed an average of 10% (5.6% to 14.4%) of the emissions that would have been incurred with respect to the BAU (business as usual), through policies in the power sector, being the most relevant NCRE Law 10/24, which the study is equivalent to a cost of abatement 13-65 Eur / ton of CO₂.

In the transport sector, the study estimates that reducing emissions has averaged 15% (8% to 22%) of BAU, calculated policies from fuel taxes and the reduction of induced demand, equivalent to an abatement cost of EUR 36-38 / t CO₂.

Mechanisms should prioritize cost-effective abatement, avoiding measures such as carbon taxes that have proven to be the most expensive measures, low effectiveness and regressive effects to mitigate carbon emissions. In the electricity sector, the most effective measures are the development of the hydroelectric potential of the south of the country with new efficient thermal generation. To this must be added the encourage research and development applied in conventional generation technologies with lower carbon emissions where thermoelectricity has a very important role, as a way of adaptation to climate change in the long term

Moreover Peru, as part of mitigation, the proposal proposes a 30% reduction for emissions of greenhouse gases that would have the Peru in 2030 if the current pace and trend of national emissions. Of this total, 20% will be implemented through public and private domestic resources (unconditional proposal), and the remaining 10%, conditional upon obtaining cooperation and financing facilities of the international community (conditional proposal). The proposed mitigation actions cover the sectors of land use, land use change and forestry (LULUCF), agriculture, energy, industrial processes and solid waste. In its component of adaptation to climate change objectives they are presented to reduce levels of vulnerability in the subject areas that the country needs to address as a priority: water (water resources), agriculture, fisheries, forestry and health. Additionally, planned work in five cross-cutting areas that will contribute to achieving the objectives adaptation: disaster risk management, resilient public infrastructure, poor and vulnerable populations, gender and multiculturalism and promoting private investment.

To formulate the proposal in both components, the participation of relevant sectors in industrial production, energy, forestry, agriculture, transportation, solid waste and wastewater was convened; cross sectors and civil society. Thus, the INDC is built from a solid information base, aligned to plans, programs and instruments; and is the result of an

intense participatory process that included a public consultation at the national level with representatives of civil society, NGOs, private sector, academia, youth, trade unions, associations, and regional and local governments.

In the case of Uruguay, it is a very rare case in the world, since 75% of emissions come from the agricultural sector and the energy sector. Uruguay arises contribute to reducing emissions by 2030.

It is committed to making wealth creation increasingly efficient and emit as little greenhouse gas as possible. In the meat sector (primary sector emissions), the target refers to reducing 31% of greenhouse gas emissions produced. Uruguay pose that is responsible for only 0.04% of global emissions and that the contribution of developed countries to continue to invest in adaptation to climate change is necessary.

At the same time, submit to the political level, a proposal that is considered refutable, because "the rich countries to finance adaptation States in developing a more sustainable production model", this position is politically controversial because, in several respects decide how much to pay and who will open a debate, as in any agreement. The expectations that Latin America with respect to the meeting of the cop21, is it scenario forefront of making bold decisions that go beyond what is traditionally seen in such meetings, where industrialized countries and polluting approving utopian statements assume responsibilities without the political will of compliance. The main objective of the Summit will reach a legally binding climate agreement, valid worldwide. Parties should protect the climate system for the benefit of present and future generations on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.

ACRONYMS

BLUM	Brazilian model of land use
CAPPCA	Component support for small farmers for conservation environmental
CDM	Clean Development Mechanism
CRC	Convention on Biological Diversity
CER	Certified emission reduction
CFC	Chlorofluorocarbons
CICC	Interministerial Commission on Global Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
CNACG	National Advisory Committee on Global Change
COFEMA	Federal Environment Council
COHIFE	Federal Water Council
CONAM	National Environmental Council
CONAMA	National Environment Commission
CONCOSUR	Consortium of Municipalities of South Suburbs
DCC	Address Climate Change
DIGESA	General Directorate of Environmental Health
ENCC	National Climate Change Strategy
ENGIRSU	National Strategy for integrated management of municipal solid waste
FAC	Argentine Carbon Fund
INRENA	National Institute of Natural Resources
CDM	Clean Development Mechanism
MEM	Ministry of Energy and Mines
MINREL	Ministry of Foreign Affairs
MTC	Ministry of Transport and Communication

Argentina

OAMD Office of Clean Development Mechanism

OECD Organisation for Economic Co-operation and Development

PEA Agrifood Strategic Plan

SAYDS Secretary of Environment and Sustainable Development

SCN Second National Communication

TCN Third National Communication

UCC Climate Change Unit

UNALM University Agraria La Molina

UNCCD United Nations Convention to combat desertification

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