Second National Communication of Brazil to the United Nations Framework Convention on Climate Change

Brasília 2010

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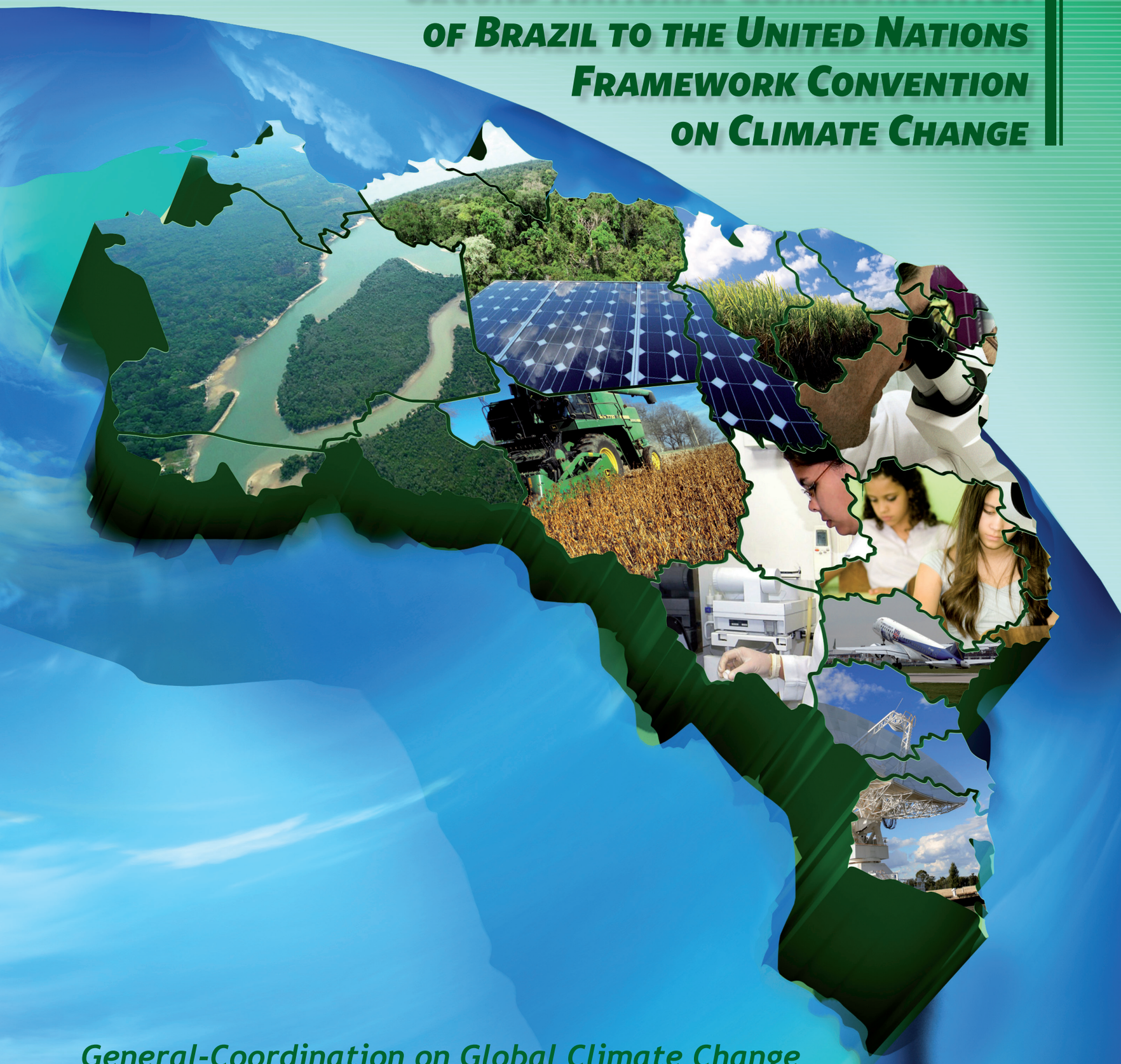

General-Coordination on Global Climate Change
Ministry of Science and Technology
Brasília, 2010

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Foreword

This Second National Communication to the United Nations Framework Convention on Climate Change describes initiatives and government programs that are helping to reduce greenhouse gas emissions in a consistent manner. As a result of some of these programs and initiatives, Brazil has a comparatively "clean" energy mix, with low greenhouse gas emission levels per energy unit produced or consumed. Other initiatives, such as the fight against deforestation, as well as the case for biofuels and energy efficiency, also help to achieve development goals, with a sharp deviation in the trend of greenhouse gas emissions curve in Brazil.

Brazil has historically been doing its fair share in combating climate change, and is prepared to sustain its leading role in the context of the global effort to tackle the problem. Brazil was the first country to sign the United Nations Framework Convention Climate Change, resulting from the United Nations Conference on Environment and Development - Rio-92, held in Rio de Janeiro, in June 1992. The Framework Convention is considered to be one of the most balanced, universal and relevant multilateral instruments of our time. It was ratified by the Brazilian National Congress in 1994.

The latest and one of the most effective initiatives by Brazil in this arena was the establishment of the National Policy on Climate Change - PNMC, by means of Law no 12,187/09. The voluntary mitigation actions at national level included in it had been announced by the President of the Republic, Mr. Luiz Inácio Lula da Silva, in Copenhagen, in December 2009, during the High Level Segment of the 15th Conference of the Parties to the Convention on Climate Change - COP-15 and the 5th Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol - CMP-5. In accordance with this law, Brazil will pursue voluntary actions for the mitigation of greenhouse gas emissions with a view to reducing its projected emissions by 36.1%-38.9% by 2020. This law also provides that this projection, as well as the detailed actions to achieve the voluntary reduction objective mentioned above, will be based on the Second Brazilian Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not Controlled by the Montreal Protocol, which is an integral part of this Second National Communication.

The necessary actions to achieve the national voluntary mitigation actions undertaken by Brazil will derive from the effort to be made by federal and state government bodies, as well as the society as a whole.

As it is known, the responsibility for coordinating implementation of commitments resulting from the Convention was assigned to the Ministry of Science and Technology - MCT soon after Rio-92, which reflects the importance that Brazil attaches to the science and the technologies associated to climate change. The issue of global climate change is of an eminently scientific and technological nature in the short and medium term. It is a scientific issue as it involves defining climate change, its causes, intensity, vulnerabilities, impacts and reduction of inherent uncertainties. It is a technological issue because the measures to combat global warming lead to actions that aim at promoting development, application, diffusion and transfer of technologies and processes to prevent the problem and its adverse effects.

The 2007-2010 Action Plan of Science, Technology and Innovation for National Development - PACTI includes a specific program on climate change in its strategic component entitled Research, Development and Innovation in Strategic Areas. The program has been called the "National Climate Change Program," and its purpose is to expand Brazil's scientific, technological and institutional capacity in the field of climate change so as to increase knowledge on the issue, identify the impacts on the country, and support public policies to address the problem both at national and international level. Specific actions have been designed to be implemented throughout the duration of the Plan. These include an action to support preparation of the Second National Communication of Brazil.

Just like Brazil's Initial National Communication, the work on the Second National Communication was guided by the principles of commitment, scientific rigor, decentralization, and transparency. The experience gained in the development of the first document allowed significant improvements, which are reflected in this document.

The MCT engaged a broad-based network of partners to prepare the Second National Communication. This network started taking shape in the mid-1990s and became stronger since then. Over 600 institutions and 1,200 experts with recognized competence in their respective areas of expertise from a variety of sectors (energy, industry, forestry, agriculture/livestock, waste treatment, etc.) were involved, coming from the public and private sectors, as well as from the academia.

The Second Brazilian Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not Controlled by the Montreal Protocol is an integral part of this Communication, and it required intense work and significant human, technical and financial resources. It shows significant achievements, especially because it is based on a complex and detailed methodology. For example, the information on Brazil's land-use change and forestry sector relied heavily on satellite imagery and a sophisticated digital information processing system. Considerable progress has been made in this assessment in the country, although it is recognized that some challenges are yet to be solved. It is necessary to keep moving forward in terms of ensuring information quality and maintaining the structure for the preparation of the national inventory on sustainable bases.

A detailed review of the contents of the Second National Communication, and the results of the Inventory in particular, was sought to ensure reliability and transparency of information. The reference reports were made available on the worldwide web. A broad review process was undertaken by experts from various fields and through a comprehensive public consultation process from April to September 2010.

One of the pillars of the Convention is the principle of common but differentiated responsibilities. Although Brazil does not have – according to the international regime on climate change – any quantified emission limitation or reduction obligations, the country is playing a critical role and making tangible contributions to the combat against climate change.

Submission of this document is yet another decisive institutional step made by President Lula's administration in order to honor one of the country's most important commitments under the Convention, contributing for a better understanding of the global problem and advancing the science of climate change, taking into consideration the national reality, described through national programs and actions developed in the country.

Brazil's Second National Communication to the Convention reaffirms the country's commitment to strengthening the role of multilateral institutions that are the adequate framework for solving problems of a global nature that will affect the international community.

The contents of this document illustrate how Brazil has been making a relevant contribution for the achievement of the objective of the Convention on Climate Change, thus showing that mitigation of this phenomenon and adaptation to its effects are possible without compromising those actions aimed at addressing socioeconomic growth and poverty eradication, which are the first and overriding priorities of developing countries.

Sergio Machado Rezende
Minister of Science and Technology
Brasília, October 2010

Introduction

The commitments undertaken by Brazil under the United Nations Framework Convention on Climate Change - UNFCCC include development and periodical update of national inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol; submission of a general description of steps taken or envisaged to implement the Convention; and submission of any other information that the Party considers relevant for achieving the objective of the Convention. The document containing such information is called National Communication in the jargon of the Convention.

The format of the National Communication of Brazil follows the guidelines contained in Decision 17 of the 8th Conference of Parties to the Convention (document FCCC/CP/2002/7/Add.2, of March 28, 2003) – Guidelines for the preparation of national communications of the Parties not included in Annex I to the Convention. The structure of each chapter was based on this decision, and this structure was obviously adapted to the national circumstances and to the programs and actions developed in the country.

The Second National Communication of Brazil now being submitted to the Convention by the Brazilian government is composed of five parts. The first part introduces the national circumstances and special arrangements of Brazil, and is intended to provide an overall picture, taking into account the complexity of this vast country, as well as its development priorities. The second part comprises the Brazilian Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not Controlled by the Montreal Protocol, covering the period 1990-2005. This is the result of the consolidation of 18 sectoral reference reports developed by institutions recognized for their excellence in the country, as well as by experts with recognized competence on climate change, and additional information obtained from various organizations. The third part presents the measures taken or envisaged to implement the Convention in the country, and is divided into two subparts: A) Programmes that include Measures relating to Climate Change Mitigation, and B) Programmes containing Measures to Facilitate Adequate Adaptation to Climate Change. These measures contribute directly or indirectly to the achievement of the objectives of the Convention. The fourth part provides other information deemed relevant to the achievement of the objective of the Convention, including transfer of technology; research and systematic observation; education; training and public awareness; capacity building at national and regional level; and information and networking. Finally, the fifth part describes the constraints and gaps, as well as related financial, technical and capacity building needs involved in the preparation of the Second National Communication.

In spite of the fact that the various institutions in Brazil had acquired some experience with the process of preparation of the Initial National Communication of Brazil, the preparation of a National Communication is extremely complex in a continent-sized country such as Brazil, and requires considerable effort. An ongoing challenge is to increase the number of experts on the subject in Brazil. Although the issue of climate change has gained increasing importance, especially after the release of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change - IPCC, the number of publications available in Portuguese in the relevant areas is still limited, and the human and financial resources to develop more comprehensive studies are still scarce.

In order for Brazil to fulfill its commitments under the Convention, an institutional framework in the form of a program was established, under the coordination of the Ministry of Science and Technology, with funds provided by UNDP/GEF. It is important to point out, however, that these resources were instrumental in leveraging contributions from several partner institutions participating directly in the achievement of each project outcome. The budget originally available was only sufficient for the achievement of the core expected results, without any expansion of its content or further details, which often proved to be necessary in view of the highly complex nature of the technical studies involved, for which the expansion of content and further detailing contribute greatly to the quality of the final result.

Because of its scope and specificity, during the preparation of the inventory an effort was made to engage various entities from different sectors and specialists from a number of ministries; federal and state institutions; industry associations; public and private companies; non-governmental organizations; universities; and research centers.

As it was the case in the Initial National Communication of Brazil, considering that in many cases IPCC's default emission factors for estimating anthropogenic greenhouse gas emissions are not suitable for developing countries, a great effort was made to obtain relevant information that would reflect national conditions, such as in the case of the Land-Use Change and Forestry sector. Particularly for this sector in Brazil, preparation of the Inventory is always an exercise that entails considerable effort, given the complexity of the methodology, which involves the interpretation of a very large number of satellite images. As a result of the decision to use parts of previous works, also due to fund limitations, there was a delay in the timetable after ascertaining the need to

correct and adapt these works. There was also an unexpected delay in the Agriculture Sector due to the fact that the 2006 Agriculture and Livestock Census results – a source of essential information for the detailed methodologies adopted in the Inventory – had not been published until October 2009.

Pioneering studies were conducted as part of the Inventory in order to increase scientific knowledge on emissions from the conversion of forest lands to other uses. To this end, a complex, sophisticated and detailed method was developed for the assessment of land use change and forestry, which is expected to be replicated in other countries around the world.

The Brazilian government objects to the use of the Global Warming Potential - GWP for the comparison of greenhouse gases. The option for aggregating the reported emissions into carbon dioxide equivalent units using the GWP for a period of 100 years was not adopted by Brazil, which reported its emissions just in units of mass for the individual greenhouse gases, as presented in its Initial National Inventory. In Brazil's view, the GWP does not adequately represent the relative contribution of the various greenhouse gases to climate change. Its use would overemphasize and erroneously stress the importance of greenhouse gases that remain in the atmosphere for only short periods of time, such as methane.

In this Inventory, a decision was made to continue reporting the anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol simply in units of mass for each greenhouse gas. However, in order to make it clear that using the GWP leads to an overestimation of the share of methane, the results of the Inventory using different CO_2 equivalent conversion metrics are described in a box, just for information purposes. This box provides the net anthropogenic emissions of greenhouse gases using the GWP, but emissions based on another metric – the Global Temperature Potential - GTP – are also reported. The GTP compares greenhouse gases through their contributions to the change in the average temperature of the Earth surface in a given future time period and better reflects the real contribution of the various greenhouse gases to climate change. Despite greater uncertainty in its calculation due to the need to use climate system sensitivity, the use of GTP allows for more appropriate mitigation policies.

It is worth recalling that while the assessment of annual emissions for the individual countries is important for quantifying global emissions and understanding the evolution of climate change (current and future evolution), annual emissions of greenhouse gases do not represent adequately and fairly the responsibility of a country in causing global warming, since the temperature increase is due to the accumulation of the countries' historical emissions, which in turn increase concentrations of greenhouse gases in the atmosphere. For every different level of concentration of each greenhouse gas, there is an accumulation of energy on the Earth's surface over the years. As mentioned in Brazil's proposal submitted during the negotiations of the Kyoto Protocol (document FCCC/AGBM/1997/MISC.1/Add.3), the responsibility of a country can only be correctly assessed from the perspective of double accumulation, which entails taking all of its historical emissions in a comprehensive manner, and the resulting accumulation of greenhouse gases in the atmosphere and increase in the average surface temperature resulting therefrom. Hence, the industrialized countries, which started emitting greenhouse gases from the Industrial Revolution, have a greater responsibility for climate change. In addition to the responsibility for climate change mentioned earlier, historic emissions data indicate that these countries will continue to be the primary responsible for a few more decades.

Although developing countries – such as Brazil – have no quantified emission limitation or reduction commitments for their anthropogenic greenhouse gas emissions, as established under the international regime of global climate change, the Second National Communication also highlights that several programs and actions that result in a significant reduction in these emissions are developed in the country. Some of these initiatives are responsible for the fact that renewable resources account for a relevant share of Brazil's energy mix, resulting in lower greenhouse gas emissions per unit of energy produced or consumed. In comparison with the Initial National Communication, the Second National Communication clearly reflects the increased number of initiatives in various stages of implementation that contribute and/or will contribute to the inflection in the growth rate of the greenhouse gas emissions curve in the country.

Another important factor to be noted in relation to this Second National Communication is the large number of institutions and authors and/or contributors involved in its preparation. In addition, all texts have been made available online as part of a policy of transparency and public participation that characterizes the administration of the Hon. Minister of Science and Technology, Dr. Sergio Rezende.

The Second National Communication presents the "state of the art" of the implementation of the Convention in the country, in relation to the Inventory of greenhouse gases by the end of 2005, and in relation to the numerous programs and actions that Brazil undertook by 2010, which reflect its commitment to combating climate change.

José Domingos Gonzalez Miguez
General-Coordinator on Global Climate Change

Executive Summary

Submission of this Second National Communication of Brazil to the United Nations Framework Convention on Climate Change - UNFCCC (hereinafter Convention on Climate Change, or simply the Convention) confirms the importance Brazil attaches to the commitments it undertook under this treaty, which is the adequate institutional framework through which the international community should combat climate change. Moreover, it is a clear signal that Brazil will make every effort to enhance understanding of the global problem and to advance the science of climate change based on the national circumstances described in this Communication by means of the actions and programs developed in the country.

Even with the lessons learned with the Initial Communication, the preparation of a National Communication is extremely complex in a continent-sized country such as Brazil, and requires considerable effort. An ongoing challenge is to increase the number of experts on the subject in Brazil. Despite the paucity of human and financial resources to develop more comprehensive studies, an extensive network of partnerships was put in place for the completion of this work. A significant number of institutions and authors and/or contributors with recognized competence in their respective areas of expertise were engaged in its preparation in a wide range of sectors (energy, industry, forestry, agriculture/livestock, waste treatment, etc.) from both the public and private sectors.

Following the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention" (Decision 17/CP. 8), the Second National Communication of Brazil to the UNFCCC is comprised of five parts. The first part introduces the national circumstances and special arrangements of Brazil, and it is intended to provide an overall picture, taking into account the complexity of this vast country, as well as its development priorities. The second part comprises the Brazilian Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not Controlled by the Montreal Protocol, which covers the period 1990-2005, although according to the guidelines contained in Decision 17/CP. 8 and to the GEF project signed by the Brazilian government the Inventory should only cover the period 1990-2000. Nevertheless, it has sought to present the preliminary data for 2005, which will be reviewed in the next National Communication. The Inventory is the culmination of the consolidation of 18 reference reports from different sectors developed by institutions renowned for their excellence in the country, as well as by experts of great distinction, and additional information obtained from various organizations. The third part presents the steps taken or envisaged to implement the Convention in the country, and it is divided into two subparts: A) Programmes containing measures to mitigate climate change, and B) Programmes containing measures to facilitate adequate adaptation to climate change. These measures contribute directly or indirectly to the achievement of the objectives of the Convention. The fourth part provides other information considered relevant to the achievement of the objective of the Convention, including transfer of technologies; research and systematic observation; education, training and public awareness; capacity building at national and regional level; and information and networking. Finally, the fifth part describes the financial, technical and capacity needs associated with the implementation of activities related to the elaboration of the Second National Communication.

National Circumstances

The Federative Republic of Brazil is divided into 26 states, 5,565 municipalities – according to the Brazilian Institute of Geography and Statistics (IBGE, 2009a) – and the Federal District, where the capital of the Republic, Brasília, seat of the government and the Executive, Legislative and Judicial Branches, is located. The country has a Presidential system and is governed under the 1988 Federal Constitution.

With an area of 8,514,876.6 km^2, Brazil is the largest country in South America. It has 186 million inhabitants, according to data from the 2008 Demographic Census. The country had an average population growth of 1.15% per year over the 2000-2008 period. In 2008, most of the population (84.4%) lived in urban centers.

Brazil is also home to an extremely rich flora and fauna. In addition to harboring over a third of the Earth's tropical forests – the Amazon Forest –, there are ecological regions of great extent in the country, such as the Cerrado, the Atlantic Forest, the Caatinga, and the Pantanal wetlands. The country has extremely varied vegetation and flora resources, and contains one of the richest flora in the world with 41,123 known and registered species (FORZZA *e t al.*, 2010). The Brazilian fauna is also quite rich, although knowledge about its diversity is still incomplete. It is estimated that less than 10% of the existing total is actually known.

Since Brazil is a country with large territorial extensions, it has differentiated rainfall and temperature regimes. From north to south, a great variety of climates with distinct regional characteristics can be found, which has shaped the occupation of its territory and partly justifies socioeconomic differences.

Brazil has abundant water resources. Endowed with a vast and dense river watershed network, many of its rivers stand out due to their extension, width or depth. As a result of the nature of the relief, plateau rivers predominate, whose characteristics give them high potential for electric power generation, although these very characteristics, however, make navigation difficult. Although only 36% of the country's estimated hydroelectric power has been harnessed, 84% of Brazil's power was generated by hydroelectric power plants in 2009.

Brazil is a developing country with a complex and dynamic economy, which is ranked eighth in the world. It is an urban-industrial country, with food exports as its main connection to global capitalism. Brazil is the main exporter of several agricultural products: sugarcane, beef, chicken, coffee, orange juice, tobacco, and alcohol. Also, it comes second in soy bean and corn exports, and is ranked as the fourth largest exporter of pork. However, it is not the biggest food exporter in the world, as is widely believed. Brazil is also among the largest and most efficient producers of various manufactured products, including cement, aluminum, chemicals, petrochemical feedstock, and oil.

Regarding the share of economic sectors in the Gross Domestic Product - GDP, in 2006, the distribution was as follows: 65.8% for the service business, 28.8% for industry and 5.5% for agriculture.

In 2008, Brazil's GDP was US$ 1,406.5 billion, and the GDP *per capita* was US$ 7,420.00. Between 1990 and 2005, Brazil's economic growth exceeded population growth, and the population grew at an annual rate of 1.5% during this period, while GDP reported an annual growth rate of 2.6% during the same period.

It should be recognized that a significant portion of its population (about 30 million people) is still in poverty, lacking access to quality healthcare services, water supply and education, despite efforts by the government and society to reverse this situation. Great regional disparities still exist. Thus, the national priorities are to meet the pressing social and economic needs, such as eradicating poverty, improving health conditions, combating hunger, ensuring decent housing, among others. These elements are fully consistent with the Convention on Climate Change, which recognizes that mitigation of global climate change and adaptation to its effects are possible without compromising those actions to address socioeconomic growth and poverty eradication, which remain as first and overriding priorities for developing countries.

Despite improved social and economic indicators, especially over the past decade, the country still has a long way to go. Brazil is a country with a growing population, where most of the population's basic needs have yet to be met, infrastructure is still incipient and substantial improvements are required. All this justifies the fact that Brazil is still a developing country.

National Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not Controlled by the Montreal Protocol

Estimates for 1990-2005

Brazil, as a Party to the Convention on Climate Change, assumed, based on its Article 4, paragraph 1 (a), the commitment to "develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties."

This inventory covers carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). The emissions of so-called indirect greenhouse gases such as nitrogen oxides (NO_x), carbon monoxide (CO) and other non-methane volatile organic compounds (NMVOC) have also been estimated. The emissions or removals of above gases were estimated according to the sources, which are called sectors: Energy; Industrial Processes; Use of Solvents and Other Products; Agriculture; Land-Use Change and Forestry; and Waste.

The preparation of the Inventory was based on the following technical guidelines of the Intergovernmental Panel on Climate Change (IPCC): "Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories", published in 1997; "Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories", published in 2000; and "Good Practice Guidance for Land Use, Land-Use Change and Forestry", published in 2003. Some of these estimates already take into account information found in "2006 IPCC Guidelines for National Greenhouse Gas Inventories", published in 2006.

Preparation of the inventory involved a significant portion of the Brazilian business and scientific community, and various government sectors. The results of this effort are shown in Table I, which summarizes the estimates of anthropogenic greenhouse gas emissions, for four years – 1990, 1994, 2000, and 2005 –, thus covering the year 2000, as required by Decision 17/CP.8 for the Second National Communication. With regard to 1990 to 1994, this Inventory updates the information presented in the Inventory of Anthropogenic Emissions and Removals of Greenhouse Gases not Controlled by the Montreal Protocol (BRASIL, 2004) - the Initial National Inventory.

Table I - Estimates for greenhouse gas emissions in Brazil – 1990, 1994, 2000, and 2005

Sector	Year	Unit	CO_2	CH_4	N_2O	HFC-23	HFC-125	HFC-134a	HFC-143a	HFC-152a	CF_4	C_2F_6	SF_6	NO_x	CO	NMVOC
Energy	1990	Gg	179,948	427	8.5									1,781	14,919	1,022
	1994		206,250	382	9.0									1,996	14,438	974
	2000		289,958	388	9.6									2,334	11,415	860
	2005		313,695	541	12.1									2,388	11,282	958
	Var. 90 / 00	%	61	-9	14									31	-23	-16
	Var. 90 / 05		74	27	43									34	-24	-6
Industrial Processes	1990	Gg	45,265	5.1	10.7	0.120	-	0.0004	-	-	0.302	0.026	0.010	8	365	322
	1994		48,703	6.5	16.3	0.157	-	0.0685	-	-	0.323	0.028	0.014	11	510	382
	2000		63,220	8.9	19.9	-	0.0071	0.4713	0.0075	0.0001	0.147	0.012	0.015	14	542	474
	2005		65,474	9.2	22.8	-	0.1249	2.2819	0.0929	0.1748	0.124	0.010	0.025	18	626	599
	Var. 90 / 00	%	40	73	87	-100	NA	108,876	NA	NA	-52	-56	54	69	48	47
	Var. 90 / 05		45	79	114	-100	NA	527,498	NA	NA	-59	-61	153	128	71	86
Solvent and Other Product Use	1990	Gg														350
	1994															435
	2000															473
	2005															595
	Var. 90 / 00	%														35
	Var. 90 / 05															70
Agriculture	1990	Gg		9,539	334									219	2,543	NE
	1994			10,237	369									233	2,741	NE
	2000			10,772	393									181	2,131	NE
	2005			12,768	476									237	2,791	NE
	Var. 90 / 00	%		12.9	17.6									-17		
	Var. 90 / 05			33.9	42.7									8		
Land-Use Change and Forestry	1990	Gg	766,493	1,996	13.7									496	17,468	NE
	1994		830,910	2,238	15.4									556	19,584	NE
	2000		1,258,345	3,026	20.8									752	26,476	NE
	2005		1,258,626	3,045	20.9									757	26,641	NE
	Var. 90 / 00	%	64	52	52									52	52	
	Var. 90 / 05		64	53	53									53	53	
Waste	1990	Gg	24	1,227	9.0											
	1994		63	1,369	10.8											
	2000		92	1,658	12.4											
	2005		110	1,743	14.0											
	Var. 90 / 00	%	276	35	37											
	Var. 90 / 05		349	42	54											
TOTAL	1990	Gg	991,731	13,195	376	0.120	-	0.000	-	-	0.302	0.026	0.010	2,504	35,296	1,693
	1994		1,085,925	14,233	421	0.157	-	0.068	-	-	0.323	0.028	0.014	2,797	37,273	1,791
	2000		1,611,615	15,852	455	-	0.007	0.471	0.007	0.0001	0.147	0.012	0.015	3,280	40,563	1,807
	2005		1,637,905	18,107	546	-	0.125	2.282	0.093	0.175	0.124	0.010	0.025	3,399	41,339	2,152
	Var. 90 / 00	%	63	20	21	-100	NA	108,876	NA	NA	-52	-56	54	31	15	7
	Var. 90 / 05		65	37	45	-100	NA	527,498	NA	NA	-59	-61	153	36	17	27
Memo Items (for information only – emissions not included in the inventory)																
International Bunkers	1990	Gg	5,231	0.01	0.15									23	NE	NE
	1994		4,339	0.01	0.12									19	NE	NE
	2000		14,627	0.60	0.23									201	118	24
	2005		15,759	0.66	0.24									221	132	26
	Var. 90 / 00	%	NA	NA	NA									NA	NA	NA
	Var. 90 / 05		NA	NA	NA									NA	NA	NA
CO_2 Emissions from Biomass	1990	Gg	187,962													
	1994		190,896													
	2000		180,471													
	2005		243,606													
	Var. 90 / 00	%	-4													
	Var. 90 / 05		30													

Emissions of the Main Greenhouse Gases

Brazil's emissions profile is different from that of developed countries, where emissions from fossil fuel combustion are the most significant. In most relevant sectors in Brazil, such as agriculture and land-use change and forestry, there are no methodologies that could be straightforwardly applied to the country, given that IPCC's default emission factors largely reflect the conditions of developed countries and countries with a temperate climate and do not necessarily fit Brazilian reality. Therefore, a great effort has been undertaken to collect data corresponding to Brazilian circumstances, making possible to apply higher tier IPCC methodologies and obtain more accurate and precise results.

Year 2000

The analysis of results is presented in two sections: the first one covers the year 2000, pursuant to the guidelines of the Convention on Climate Change for the Second National Communication; the second covers 2005, where the most up-to-date data for all sectors are considered.

In 2000, CO_2 emissions were estimated at 1,612 Tg, with the Land-Use Change and Forestry sector as the major contributor, accounting for 78% of emissions, followed by the Energy sector, with a share of 18% of total emissions.

Also in 2000, CH_4 emissions were estimated at 15.9 Tg, with the Agriculture sector accounting for 68% of total emissions, followed by the Land-Use Change and Forestry sector, with 19% of emissions, and the Waste sector, with 10%. The two most important sub-sectors were enteric fermentation in livestock, accounting for 61%, and forest conversion to other uses in the Amazon biome, accounting for 13%.

N_2O emissions were estimated at 455 Gg, basically because of the Agriculture sector, which accounted for 86% of total emissions. Within this sector, emissions from soils contributed with 83%, including, among others, grazing animal manure emissions, which accounted alone for 40% of the total.

Estimates by sector are analyzed below.

Energy Sector

This sector encompasses estimates of anthropogenic emissions caused by energy production, transformation, transportation, and consumption. It includes both emissions resulting from fuel combustion and fugitive emissions resulting from leaks in the production, transformation, distribution, and consumption chain.

The most relevant emissions refer to CO_2, with 290 Tg, driven by the road transport (38%) and the industrial sub-sector (24%). CH_4 emissions totaled 388 Gg, and were primarily released by the energy sub-sector (32%), which includes charcoal plants, and by fugitive emissions from oil and natural gas activities (27%). N_2O emissions were estimated at 9.6 Gg, primarily due to the road transport (23%) and the food and beverage sub-sector (19%).

Industrial Processes Sector

This sector entails estimates of anthropogenic emissions resulting from production processes in industries that do not result from fuel combustion.

The most relevant emissions also refer to CO_2, totaling 63 Tg, basically as a result of pig iron and steel (56%), cement (25%) and lime production (8%). N_2O emissions were estimated at 20 Gg, primarily due to adipic acid production (88%). CH_4 emissions were estimated at 8.9 Gg, caused by the chemical industry.

Solvent and Other Product Use Sector

For this sector, direct greenhouse gas emissions were not estimated.

Agriculture Sector

In this sector, CH_4 emissions totaled 10.8 Tg, driven by the enteric fermentation of ruminant herds (89%), which includes cattle herd, the second largest in the world. N_2O emissions totaled 393 Gg and derived from various sources, especially grazing animal manure (46%) and indirect soil emissions (32%).

Burning of sugarcane was responsible for indirect greenhouse gas emissions in this sector, given that the burning of cotton crop residues was virtually suspended in 1995.

Land-Use Change and Forestry Sector

Because of Brazil's vast territory, estimating figures for this sector was one of the most complex tasks in preparing the Inventory; it involved extensive survey and processing of remote sensing, statistical and forest inventory data.

The entire national territory was subdivided into spatial units in the form of polygons that resulted from the integration of various data sources: biome, municipal boundaries, vegetation profile, type of soil, land use in 1994, and land use

in 2002. 75 possible transitions and their corresponding changes to carbon stock were analyzed, with changes being observed in 14.2% of the country's surface between 1994 and 2002. Based on the results of anthropogenic emissions and removals for 1994-2002, the emission factors for the Initial Inventory were updated for the years 1990 to 1994 and a preliminary estimation for the years 2003 to 2005 was conducted, based on activity data for *Prodes* and *PPCerrado*.

According to IPCC's latest guidelines, and in order to improve comparability between the various countries, only the emissions and removals occuring in managed areas were considered, i.e., the areas included in the planning process and where implementation of land-use management practices, with a view to performing important ecological, economic and social functions, is undertaken. In Brazil, these managed areas include all forest and native non-forest vegetation areas (Grassland) contained in Indigenous Lands and in the National System of Protected Areas - SNUC (Law nº 9,985/2000). Private Reserves of Natural Heritage – RPPNs were not considered due to insufficient adequate information. This option is different from the one used for Brazil's Initial Inventory, where all areas under natural forests (primary forests) were not considered to estimate average CO_2 removals.

Net emissions for this sector totaled 1,258 Tg CO_2, driven by the Amazon biome (65%) and *Cerrado* biome (24%). Emissions related to application of limestone to soils, which was responsible for 8.7 Tg CO_2, were also accounted for in this sector total emissions. CH_4 emissions were estimated at 3.0 Tg, and N_2O emissions were estimated at 21 Gg. In both cases, emissions derived from burning of the biomass left in the field after forest conversion. 68% of which were produced in the Amazon biome and 22% in the *Cerrado* biome.

Waste Sector

Waste disposal in landfills or open dumps generates CH_4. The emission potential for this gas increases the better the landfill control conditions are and the greater the depth of open dumps. Waste incineration, like every combustion, generates CO_2 and N_2O emissions, depending on the composition of the waste. However, this practice is not widespread in Brazil.

Treatment of wastewater with high degree of organic content, such as those from the residential and commercial sectors, from the food and beverage industries and those from the pulp and paper industry have significant potential for CH_4 emissions.

CH_4 emissions for this sector were estimated at 1.7 Tg. The majority of CH_4 emissions is generated by waste disposal (64%). CO_2 emissions in this sector were estimated at 92 Gg, due to the incineration of non renewable waste.

In the case of household sewage, as a result of nitrogen content in human food, N_2O emissions also occur, which were estimated at 12 Gg.

Year 2005

The analysis for 2005 emissions presented below takes into account the explanations previously provided in the analysis for the year 2000, except for the figures.

In 2005, CO_2 emissions were estimated at 1,638 Tg, with the Land- Use Change and Forestry sector as the main contributor, accounting for 77% of emissions, followed by the Energy sector, which was responsible for 19% of total emissions.

Also in 2005, CH_4 emissions were estimated at 18.1 Tg, driven by the Agriculture sector, accounting for 70% of total emissions, followed by the Land-Use Change and Forestry sector, accounting for 17% of emissions, and the Waste sector, accounting for 10% of emissions. The two most important sub-sectors were enteric fermentation in livestock, accounting for 63%, and forest conversion to other uses in the Amazon biome, which accounted for 12% of emissions.

N_2O emissions were estimated at 546 Gg, basically because of the Agriculture sector, which accounted for 87% of total emissions. Within this sector, emissions from soils were responsible for 84%, including, among others, grazing animal emissions, which accounted alone for 40% of the total.

Estimates by sector are analyzed below.

Energy Sector

The most relevant emissions refer to CO_2, which accounted for 314 Tg, mainly due to road transport (39%) and the industrial sub-sector (27%). CH_4 emissions totaled 541 Gg, and were primarily released by fugitive emissions from oil and natural gas activities (24%) and by the energy sub-sector (31%), which includes charcoal plants. N_2O emissions were estimated at 12.1 Gg, primarily due to road transport (22%) and food and beverage sub-sector (22%).

Industrial Processes Sector

The most relevant emissions refer to CO_2, which accounted for 65 Tg, basically as a result of pig iron and steel (58%), cement (22%) and lime production (8%). N_2O emissions accounted for 23 Gg, mainly due to adipic acid production (89%). CH_4 emissions were estimated at 9.2 Gg, generated by the chemical industry.

Solvent and other Product Use Sector

For this sector, direct greenhouse gas emissions were not estimated.

Agriculture Sector

In this sector, CH_4 emissions totaled 12.8 Tg, driven by the enteric fermentation of ruminant herds (90%), which includes cattle herd, the second largest in the world. N_2O emissions totaled 476 Gg and derived from various sources, especially grazing animal manure (46%) and indirect soil emissions (32%).

Land-Use Change and Forestry Sector

Net emissions for this sector totaled 1,259 Tg CO_2, driven by the Amazon biome (67%) and *Cerrado* biome (22%). Emissions related to application of limestone to soils, which was responsible for 7.5 Tg CO_2, were accounted for in this sector total emissions. CH_4 emissions were estimated at 3.0 Tg, and N_2O emissions were estimated at 21 Gg. In both cases, emissions derived from the burning of biomass left in the field after forest conversion, 70% of which being produced in the Amazon biome and 20% in the *Cerrado* biome.

Waste Sector

CH_4 emissions for this sector were estimated at 1.7 Tg. The majority of CH_4 emissions is generated by waste disposal (63%). CO_2 emissions in this sector were estimated at 110 Gg, due to the incineration of non renewable waste.

In the case of household sewage, as a result of nitrogen content in human food, N_2O emissions also occur, which were estimated at 14 Gg.

Box 2. For Information only

Greenhouse Gas Emissions in CO_2eq

In this Inventory, a decision was made to continue reporting the anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol simply in units of mass for each greenhouse gas. However, the results of the inventory using different CO_2 equivalent conversion metrics for the conversion of emissions of the various greenhouse gases are described in a box, just for information purposes. Thus, this Box describes net anthropogenic emissions of greenhouse gases using the GWP metric, as suggested by the guidelines, but also reports emissions using another metric, the Global Temperature Potential - GTP, which Brazil considers to be a more appropriate indicator of the relative importance of different greenhouse gases in terms of their contribution to global warming. The GTP compares greenhouse gas emissions by means of their contributions to the change in the average temperature of the Earth surface in a given future time period and better reflects the real contribution of the various greenhouse gases to climate change. GTP would, thus, allow for more appropriate mitigation policies.

GWP does not appropriately represent the relative contribution of the different greenhouse gases to climate change. Its use would overemphasize and erroneously stress the importance of greenhouse gases that remain in the atmosphere for only short periods of time, such as methane, leading to erroneous and inappropriate mitigation strategies in the short and long terms and erroneously driving mitigation priorities. Exaggerated importance has been assigned to methane emission reduction and to some industrial gases that remain in the atmosphere for a short period of time, thus shifting the focus away from the need to reduce CO_2 emissions from fossil fuels and to control some of the industrial gases that remain in the atmosphere for a long period of time.

A summary of greenhouse gas emissions in CO_2 equivalents using GWP and GTP metrics is provided in Figure I and Table I.

Table II compares the growth of net anthropogenic emissions of greenhouse gases with the growth of population and GDP in Brazil for the period 1990-2005.

Figure I - Differences between two possible metrics for estimating Brazilian greenhouse gas emissions in CO_2e in 2005

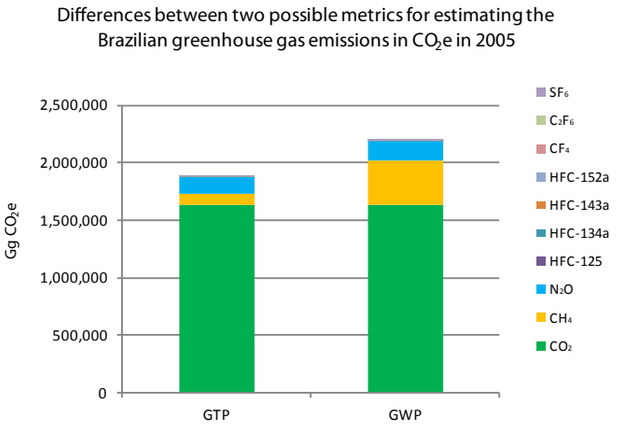

Table I - Anthropogenic emissions by sources and removals by sinks of greenhouse gases in CO_2e using GWP and GTP metrics, in 2005 and by gas

Gas	GTP		GWP	
	2005	Share 2005	2005	Share in 2005
	Gg	%	Gg	%
CO_2	1,637,905	87.2	1,637,905	74.7
CH_4	90,534	4.8	380,241	17.3
N_2O	147,419	7.8	169,259	7.7
HFC-125	139	0.0	350	0.0
HFC-134a	126	0.0	2,966	0.1
HFC-143a	398	0.0	353	0.0
HFC-152a	0.0175	0.0	24	0.0
CF_4	1,245	0.1	805	0.0
C_2F_6	233	0.0	95	0.0
SF_6	1,031	0.1	602	0.0
Total	**1,879,029**	**100**	**2,192,601**	**100**

Table II - Net anthropogenic greenhouse gas emissions, population and GDP growth in Brazil in the period 1990-2005

Item	Unit	1990	2005	Variation 1990-2005 %
GDP	Billion US$ 2007/year	830.5	1,218.3	46.69
Population	Million of inhab.	144.8	179.9	24.24
Emission	Gg CO_2e GWP	1,389,123	2,192,601	57.84
Emission	Gg CO_2e GTP	1,163,166	1,879,029	61.54

Description of Steps Taken or Envisaged to Implement the Convention in Brazil

Each non-Annex I Party shall, pursuant to Article 12, paragraph 1(b) of the UNFCCC, submit to the Conference of the Parties a general description of the steps taken or envisaged by the Party to implement the Convention, taking into account its common but differentiated responsibilities and its development priorities, its objectives and specific national and regional circumstances.

Decision 17/CP.8 divided this part into two large subsections. Non-Annex I Parties may provide information about programs containing measures to mitigate climate change, either by reducing anthropogenic emissions by sources or by increasing removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, in addition to measures to facilitate adequate adaptation to climate change, including information on specific concerns arising from adverse effects.

Programs Containing Measures to Mitigate Climate Change

According to the principle of common but differentiated responsibilities, only countries included in Annex I to the United Nations Framework Convention on Climate Change have undertaken quantified commitments for reducing or limiting their anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol.Under the Convention, countries not included in that group (Parties not included in Annex I), including Brazil, have no quantified emission limitation or reduction commitments for these emissions. After all, the Convention reflects the recognition that the relative contribution of these countries to global emissions of these gases will grow to meet their social and development needs.

Despite the fact that Brazil is a developing country, however, there is an array of programs in the country that promote a significant reduction in such emissions. Some of these programs are responsible for the fact that Brazil has a relatively "clean" energy mix, specifically in terms of low levels of greenhouse gas emissions per unit of energy produced or consumed. Many other initiatives that are being implemented also contribute to the inflection in the growth rate of the greenhouse gas emissions curve in the country.

Programs and Actions Related to Sustainable Development

Some of the programs and actions related to sustainable development are related to the use of renewable energy and energy conservation and/or efficiency. These programs contribute towards Brazil having a "clean" energy mix, with low greenhouse gas emissions in the energy sector, to stabilize the concentrations of these gases in the atmosphere and for long-term sustainable development.

Major programs related to sustainable development include use of ethanol as vehicle fuel. The National Alcohol Program - Proálcool was originally developed to avoid increasing dependence on foreign oil and foreign currency evasion during the oil price shocks. Although the program had great success in the 1970s and 1980s, the ethanol supply crisis in the late 1980s, together with the reduction of incentives for its production and use in the following years, led to a significant decrease in demand and, therefore, a drop in the sales of cars running on this fuel. Over the past few years, the technology for flex fuel motors has breathed new energy into domestic ethanol production. Vehicles running on gasoline, ethanol or any mixture of the two fuels were introduced in the country in March 2003, and they quickly attracted consumers. Their sales took over the sales for vehicles running on gasoline in the domestic market. It is important to point out that reduction of direct emissions from ethanol fuel use in Brazil has been approximately 600 million tons of CO_2 since 1975.

In the beginning of the 2000s, the Federal Government started viewing incorporation of biodiesel to Brazil's energy mix as strategic since this fuel was proving to be an alternative for reducing dependence on oil products and as a driving force for a new market for oilseeds. In addition, the intention was to add it to the domestic offer of fuels in a sustainable manner (socially, environmentally and economically), in order to make production of this feedstock a development driver, generating jobs and income, especially in the neediest regions of the country. Thanks to Probiodiesel, a program supported by the government, Brazil is among the largest producers and consumers of biodiesel in the world, with an annual production of 1.6 billion liters in 2009, and an installed capacity for nearly 4.7 billion liters in January 2010 (ANP, 2010a), thus increasing its share in Brazil's renewable energies.

Other important programs aim at reducing losses and eliminating wastage in energy production and use, in addition to adoption of enhanced energy-efficient technologies, and

they help postpone investments in new power plants or oil refineries. Major programs include the National Electric Energy Conservation Program - Procel, a government program that has been developing a series of activities to combat electricity wastage since 1985. Moreover, the National Program on the Rationalization of the Use of Oil and Natural Gas Products - Conpet was established in 1991 in order to develop and bring together actions to rationalize the use of oil and natural gas products.

In Brazil, it is always important to bear in mind the contribution of hydroelectric power generation for the reduction of GHG emissions. In 2009, the Brazilian electric energy market required production of 466.2 TWh in public service and self-producing electric power plants. Of this production, 391 TWh, or 84%, was from hydroelectric sources. As a result of these figures, the Brazilian electrical sector takes on special characteristics, not only as one of the largest hydroelectric power producers in the world, but also for the exceptional participation of hydroelectric power in meeting its electric power needs. If the electricity generated by the non CO_2 emitting sources were produced by fossil fuel sources, emissions in the electrical sector would be much higher.

Significant growth is expected for the share of new renewable energy sources in Brazil's energy mix in the coming years. The new sources of renewable energy include the "modern use of biomass," small hydroelectric plants - SHPs, wind energy, solar energy (including photovoltaic energy), tidal power, and geothermal power. The "modern use of biomass" excludes the traditional uses of biomass, such as wood, and includes the use of agricultural and forest residues, as well as solid waste (garbage), for generating electricity, producing heat and liquid fuels for transportation. There is a great expectation especially in relation to cogeneration and use of agricultural residues. For example, it is estimated that agricultural residues – not including those from sugarcane – accounts for an energy availability of around 37.5 million toe per year, which is equivalent to 747 thousand barrels of oil per day, and this is virtually untapped.

Brazil is one of the few countries in the world that maintain the use of charcoal from planted forests in the metallurgical sector's production process, especially in the steel industry, with a focus on pig iron and steel. It is important to highlight the environmental gain resulting from mitigation of greenhouse gas emissions through emission reductions and net removals (during the 2001-2006 period, emission reductions of approximately 100 thousand tons of CO_2e were reported), as it creates a buffer that prevents pressure to deforest native forests.

Programs and actions that contain measures to mitigate climate change and its adverse effects

Brazil's demand for electricity has been growing much faster than the production of primary energy and the country's economy, a trend that should persist over coming years, thus calling for new energy planning strategies. While emissions tend to grow, because of the priority the country places on its development, several programs are underway in Brazil that seek to replace fossil fuel-based energy sources, with high carbon content per unit of energy generated, by other sources with a lower content, or by sources that generate greenhouse gas emissions with lower global warming potential. These programs and activities are designed to assist climate change mitigation and contribute towards achieving the Convention's ultimate objective. This is the case of natural gas, whose conversion efficiency is better than that for other fossil fuels. This results in lower CO_2 emissions per unit of energy generated. Compared to burning fuel oil, the option for natural gas enables a 27% reduction in total CO_2 emissions in plants designed with generation technology based on the conventional steam cycle, a 31% reduction in gas-powered turbines, and a 28% reduction in thermal power generation from combined cycle.

With regard to nuclear energy, from 1984 (the year the first nuclear power plant in operation in the country began to generate electricity) to 2009, 152 TWh were generated, which is equivalent to 32.7 million toe, considering a thermal efficiency of 40%. If this energy had been generated by coal, the use of nuclear energy in Brazil would have avoided the emission of 127 million tons of CO_2, which corresponds to 37% of total emissions for 2009 from energy use.

Integration of Climate Change Issues to Mid- and Long-Term Planning

Raising awareness of environmental issues in the medium and long terms is essential to sustainable development. Cognizant of this, in the process of preparing the national Agenda 21 the Brazilian government sought to establish strategies to ensure sustainable development in the country, recommending actions, partnerships, methodologies and institutional mechanisms for its implementation and monitoring.

Recently, several official measures have been pursued, which is an indication of the importance of the combat against climate change in Brazil. Early in this process, in 2008, the National Plan on Climate Change was approved with a view to identifying, planning and coordinating actions and measures that can be undertaken to mitigate green-

house gas emissions generated in the country, as well as those necessary for the adaptation of society to the impacts arising from climate change.

On December 29, 2009, the National Policy on Climate Change was put in place, which established its own principles, objectives, guidelines, and instruments. The National Policy aims, inter alia, at the reconciliation of social and economic development with protection of the climate system; reduction of anthropogenic greenhouse gas emissions in relation to their various sources; strengthening of anthropogenic removals by sinks of greenhouse gases in the country; and implementation of measures to promote adaptation to climate change by the three levels of government, with the participation and collaboration of the economic and social stakeholders, particularly those especially vulnerable to its adverse effects.

As announced by the President of the Republic during the High Level Segment of the 15th Conference of the Parties to the Convention - COP-15 and the 5th Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol - CMP-5, held in Copenhagen, the text of the law that established the National Policy on Climate Change provides that the country will adopt voluntary actions to mitigate greenhouse gas emissions at national level with a view to reducing its projected emissions by 36.1%-38.9% by 2020. The measures to implement the Policy have been launched, with a view to establishing sectoral plans to achieve the goal expressed in the Policy regarding mitigation actions. This is one of the most ambitious national voluntary mitigation actions in the world.

The Policy on Science, Technology and Innovation - ST&I is also being strengthened with regard to climate change. Examples include the fact that the 2007-2010 Action Plan (entitled Science, Technology and Innovation for National Development) has encompassed the National Program on Climate Change, and the fact that there is a program entitled Meteorology and Climate Change under the Federal Government's 2008-2011 Multi-Annual Plan with a view to providing insight into the mechanisms that determine global climate change and to improving weather, climate, hydrological, and environmental forecasting capacities.

Many of the programs implemented in the country do not directly intend to reduce greenhouse gas emissions, but they will have impacts on emissions originating from different sources. One of the most important factors is the finding that not only the federal government is involved, but also states and municipalities.

At the federal level, the National Air Quality Control Program – Pronar seeks to control air quality by establishing national emission limits. There is also the Motor Vehicle Air Pollution Control Program – Proconve, which has the same goal, but covers specifically air pollution by automotive vehicles. This is certainly one of the most successful environmental programs ever implemented in Brazil.

Article 4.1 (d) of the United Nations Framework Convention on Climate Change provides that the Parties shall "(p)romote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems."

Much progress has been made in recent years regarding the combat against deforestation, particularly in the Amazon. Administrative, economic and legal measures have been adopted, according to a political action strategy (among such instruments is the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon - PPCDAM). With the series of measures adopted, the deforestation area was significantly reduced by 73%, from 27,772 km^2 in 2004 to 7,464 km^2 in 2009.

Much of the success in the implementation of these measures is due to the fact that Brazil has one of the most modern systems for monitoring forest areas in the world, such as is the case of the remote sensing-based monitoring system for the Amazon by the National Institute for Space Research - INPE, which has four operating and complementary systems: Prodes, Queimadas, Deter, and Degrad.

Brazil has also been a pioneer in the use of meteorological satellite data to monitor burning in the country, which culminated in the creation of the Program for the Prevention and Control of Burnings and Forest Fires – Proarco, implemented by the Brazilian Institute of the Environment and Natural Resources – Ibama in collaboration with the National Institute for Space Research - INPE, with a view to preventing and controlling fires burnings in the country, thus avoiding forest fires.

In addition, there is a large number of Federally Protected Areas - PAs in the country to protect and conserve the existing flora and fauna. These PAs cover 44,835,960.84 hectares (448.35 thousand km^2) in total. Adding up all Protected Areas in Brazil – federal and state PAs, full protection and sustainable use PAs, in addition to indigenous lands –, the total is 238,627,268 ha, which accounts for 27.98% of the

country's territory. This figure does not include Municipally Protected Areas; Permanent Preservation Areas; Private Natural Heritage Reserves and military areas, plus a large area of native forest (mainly in the Amazon) that is not included as protected areas.

Financial and tax measures (the Green Protocol, environmental responsibility of banks, rural credit restrictions on environmental offenders, ecological ICMS, among others) have also proven to be of great importance in promoting sustainable development.

The National Fund on Climate Change and the Amazon Fund are recent examples of attempts to find financial resources in innovative ways to address challenges posed by climate change.

Clean Development Mechanism Project Activities in Brazil

The success of Clean Development Mechanism - CDM – which is an instrument under the Kyoto Protocol – in Brazil is unquestionable and it has undoubtedly contributed to mitigating greenhouse gas emissions in the country. In August 2010, the potential of annual greenhouse gas emission reduction from 460 CDM project activities in Brazil under validation or in a subsequent stage in the CDM pipeline represented 8% of emissions from sectors other than land use, land use change and forestry - LULUCF (only afforestation and reforestation are eligible for CDM as LULUCF activities), which accounted for about 59% of Brazil's emissions in 1994. Two relevant examples of significant results from CDM in terms of reducing greenhouse gas emissions in Brazil are the following: five CDM project activities related to the production of adipic acid and nitric acid alone have reduced N_2O emissions virtually to zero in the Brazilian industrial sector, and 25 registered CDM project activities accounted for a reduction of approximately 47% of methane emissions in landfills in 1994.

Regarding CDM Programme of Activities - PoA, the first Brazilian PoA is another relevant example in terms of greenhouse gas emission reduction. This programme promotes CH_4 capture and combustion from Animal Waste Management System in swine farms in Brazil. 961 small-scale CDM programme activities have been included in the registered PoA by the coordinating/managing entity. The inclusion of these small swine farms in this PoA clearly indicates the relevance of the CDM to make feasible initiatives that would not occur in the absence of the Kyoto Protocol.

In terms of number of CDM project activities, Brazil ranks third, corresponding to 7% of the worldwide total. In terms of expected greenhouse gas emission reduction, CDM project activities in Brazil are responsible for a reduction of 393 million tons of carbon dioxide equivalent during the first crediting period. This period could vary between 7 and 10 years. On an annual basis, the expected greenhouse gas emission reduction is around 50 million tons of carbon dioxide equivalent. Considering US$ 15/tCO_2e, the amount of external financial resources to flow into the country during the first crediting period is approximately US$ 5.8 billion or US$ 750 million per year. In 2009, Certified Emission Reductions - CERs (known as "carbon credits") from CDM project activities would be ranked 16th if considered as part of the Brazilian export portfolio.

Programs Containing Measures to Facilitate Adequate Adaptation to Climate Change

One of the main objectives of the Second National Communication project was to "elaborate a methodological approach regarding vulnerability assessment and adaptation measures," which contained two results: elaboration of regional modeling of the climate and climate change scenarios; and vulnerability and adaptation research and studies concerning strategic sectors that are vulnerable to the impacts associated with climate change in Brazil.

The first result is related to the need for downscaling methods (scale reduction, that is, improved resolution) for Brazil, applicable to global climate change impact studies that require more detailed climatic projections, i.e., with better spatial resolution than that provided by a global climate model.

Hence, the Regional Climate Model - RCM, which is called Eta-CPTEC, was validated and then used to produce regional scenarios for future climate change for the Second National Communication of Brazil to the Convention. The Eta-CPTEC regional model featured new lateral conditions of the coupled ocean-atmosphere global model HadCM3 kindly provided by the Hadley Centre, UK. The study related to downscaling methods for Brazil was applied to climate change scenarios from the global model HadCM3 to obtain more detailed climate projections (2010-2040, 2040-2070, 2070-2100) with improved spatial resolution under scenario A1B. According to the model runs, the annual projections for 2010-2100 for temperature and rainfall derived from the Eta-CPTEC model for South America show increases in rainfall in Brazil's South region, and reductions in rainfall in the Northeast region and the Amazon, while temperatures rise throughout Brazil, and they are higher in the mainland area (MARENGO *et al.*, 2010).

The second result aims at developing a preliminary analysis of the impacts associated with climate change in the main areas in accordance with Brazil's national circumstances, especially in those areas where vulnerability is influenced by physical, social and economic factors. The initial goal was to analyze the areas considered to be strategically relevant, where impacts associated with climate change may be important for Brazil, and which could be studied in an independent manner, while future climate scenarios for Brazil had not yet been concluded. However, additional development of some studies from this result would depend on future results obtained from regional climate models, which would provide more reliable scenarios for South America in relation to the impacts of climate change on average surface temperature or on rainfall patterns.

Thus, studies were conducted on the semi-arid region, urban areas, coastal zones, human health, energy and water resources, forests, agriculture and livestock, and prevention of disasters, under the coordination of the Center for Strategic Studies and Management in Science, Technology and Innovation - CGEE, in collaboration with the Ministry of Science and Technology - MCT. Renowned Brazilian scientists in the area were mobilized for this task, each responsible for addressing specific issues. These studies were comprised of papers and debated by representatives from public and private organizations, in workshops for each of the thematic areas held in 2008 and 2009.

Additionally, with the runs of the regional model and with the availability of regionalized climate change scenarios until 2100, it was possible to conduct in-depth studies in the areas of health, energy and water resources, agriculture, and coral bleaching.

Other Information Considered Relevant to the Achievement of the Objective of the Convention

Transfer of Technologies

It must be recognized that a quick and effective reduction in greenhouse gas emissions and the need to adapt to the adverse effects of climate change require access to and diffusion and transfer of environmentally sound technologies.

Brazil considers the expression "transfer of technology" to have a more comprehensive meaning, encompassing the different stages of the technological cycle, including research and development - R&D, demonstration, increase in scale (deployment), diffusion and the transfer of technology *per se*, in relation to both mitigation and adaptation.

Brazil believes that the development and transfer of technologies related to global climate change should support mitigation and adaptation actions in order to achieve the Convention's ultimate objective. In the quest for this objective, identification of technological needs must be determined at national level, based on national circumstances and priorities.

Brazil has been seeking to identify the country's technological needs in relation to energy in a manner that reconciles meeting growing demands with the use of sources that emit fewer greenhouse gases. However, the intention is not merely to seek to identify the technologies the country needs to receive, but also the great potential for endogenous technologies that could be diffused and/or transferred to other countries, especially developing countries, through South-South (especially with Portuguese-speaking and/or African countries) or triangular cooperation. Ethanol produced from sugarcane is one of these examples, as well as technological advances achieved in the agriculture sector.

Research and Systematic Observation

Various research studies and systematic observation activities related to the global climate change problem have been carried out in the country. In this context, teams of Brazilian researchers are participating in the international effort of research programs related to global climate change, such as the Global Climate Observation System - GCOS, Global Oceanic Observation System - GOOS and the Pilot Research Moored Array in the Tropical Atlantic - Pirata, among others.

Among the research initiatives led by Brazil, the Large Scale Biosphere-Atmosphere Experiment in Amazonia - LBA deserves special mention. It aims at expanding understanding of the climatological, ecological, biogeochemical and hydrological functioning of the Amazon region; of the impact of land use changes on this functioning; and of the interactions between the Amazonia and the global biogeophysical system of the Earth. In 2007, the LBA became a government program and refreshed the research agenda launched in 1998, when it was under international cooperation agreements.

A major scientific contribution by Brazil to the negotiations of the international regime on global climate change was the so-called "Brazilian Proposal", put forward by the country in response to the "Berlin Mandate", and submitted in May 1997. The proposal intends to promote a change in paradigm by defining objective criteria to evaluate each

country's responsibility for global climate change. It is based on each country's historical and differentiated contributions towards the increase in global mean surface temperatures caused by the accumulation of anthropogenic greenhouse gases since the Industrial Revolution.

Thus, the country is promoting and cooperating in scientific research and in systematic observations aimed at explaining, reducing or eliminating uncertainties that still exist regarding the causes, the effects, the magnitude and the evolution of climate change over time.

Education, Training and Public Awareness

Although the issues related to climate change are complex and difficult to be understood by lay persons, and in the light of the limited reading material on the subject available in Portuguese, an effort has being made to expand education, public awareness and training on issues related to climate change.

Several educational programs implemented in Brazil are in accordance with the Convention's objectives. In particular, the following should be highlighted:

- The Brazilian Internet site on climate change of the Ministry of Science and Technology - MCT (http://www.mct.gov.br/clima) has contributed towards an increase in public awareness on the matter, as it provides information about the entire negotiation process under the Convention, the main references about climate science and the preparation of the National Communication. On September 27, 2010, the total number of pages available exceeded the figure for 2000 more than tenfold, since the website had 35,363 pages online, in four languages (Portuguese, English, Spanish, and French). Furthermore, it is worth noting that, according to Google, the Ministry homepage's PageRank is 8, i.e., every ten searches conducted on the Internet on the topic of global climate change, eight are directed to the Brazilian homepage. Also, publications in Portuguese (such as the official version of the Convention and Kyoto Protocol), articles from newspapers, magazines and journals, radio and TV shows, as well as the organization of seminars and debates, have helped in generating awareness of an issue that was relatively unknown in the country in 1994.

- Established in 2000 and chaired by the President of the Republic, the Brazilian Climate Change Forum - FBMC has helped to promote awareness and engagement of the society regarding the issue of global climate change, together with numerous other public and private organizations.

- The *Procel nas Escolas* (Procel at Schools) and Conpet *nas Escolas* (Conpet at Schools) programs are especially geared towards children and adolescents through partnerships with learning institutions, and they are also of great importance. They aim at expanding teacher and student awareness about the importance of using electric energy, oil byproducts and natural gas in the most sustainable way possible and to broadly promote such attitudes. It is estimated that between 1990 and 2008, thanks to the achievements by the Procel project, an accumulated savings of energy of 2,841,912 MWh was achieved.

National and Regional Capacity Building

Brazil has special needs related to the institutional structure required to deal with climate change related issues. Building national and regional capacity is one of the primary objectives of developing countries, considering that climate change is a new field of study and there are few specialized courses on the subject.

At regional level, the work of the Inter-American Institute for Global Climate Change Research - IAI, an intergovernmental organization dedicated to research, deserves special mention. In relation to research at national level, activities by the Brazilian Research Network on Global Climate Change - Climate Network, established at the end of 2007, and the National Institute of Science and Technology for Climate Change are to be highlighted. Another aspect to be pointed out is the increasing participation of Brazilian scientists in the IPCC process, as well as the recent creation of the Brazilian Panel on Climate Change, based on the IPCC. Efforts are being made in the country in relation to the improvement of future climate change scenarios on the part of the Center for Weather Forecasting and Climate Studies - CPTEC/INPE and the newly created Earth System Science Center - CCST/INPE.

There are also cooperation initiatives in relation to national and regional capacity building with other developing countries (South-South cooperation) and triangular cooperation initiatives, involving both developed and developing countries (North-South-South cooperation). Training on modeling future regional scenarios of climate change for Latin American and Caribbean countries is reported as an example of regional capacity building. As far as national capacity building is concerned, Brazil has also collaborated with other developing countries in building capacity related to the Clean Development Mechanism and the preparation of National Communications.

Financial, Technical and Capacity Needs Difficulties Associated with the Preparation of the National Communication

The appreciation of Brazil's currency – the *real* – was a major concern in executing the project of the Second National Communication of Brazil. The dollar exchange rate at the time the project was negotiated with the GEF was R$ 3.15. Under those circumstances, the approved budget for the project (US$ 3,400,000 from GEF plus the original national contribution of US$ 4,175,600) would certainly be sufficient for carrying out all the planned basic studies, and the expansions and details, that is, the additional activities that would be implemented, at the expense of the contributions that would be negotiated during the project execution, with each partner.

However, the dollar exchange rate, according to the official United Nations exchange rate for October 2010, was at R$ 1.71, having oscillated throughout execution of the project (2006-2010) at rates lower than those considered when the project was proposed. This caused several financial difficulties for the project to comply with its basic commitments, since all of its expense commitments were paid in *reais*.

In the specific case of the Second National Communication of Brazil, the executing agency of this project, i.e., the MCT, had to make additional efforts in relation to financial execution of the project, since besides those contributions that are normally expected for expanding and detailing results, additional funds were necessary to make it possible to carry out some studies, given the *real*'s appreciation in relation to the dollar.

The efficient completion of the Second National Communication of Brazil, with the proper expansions and details of those studies deemed necessary by the technical area, as well as the solution of the difficulties faced with the exchange appreciation, demanded funds worth US$ 10,604,222.

Of these funds, US$ 3,400,000 were provided by GEF and US$ 7,204,222 came from national contributions. Initially, this contribution was US$ 4,175,600. However, given the exchange rate appreciation and the determined need for additional activities during the execution of the project, this contribution was not sufficient, which forced the MCT to work with several of the Ministry's institutions and entities in order to obtain additional funds, without which the work would not be finalized.

Through active participation and thanks to a solid construction of partnerships by the MCT, it was possible to leverage additional contribution funds of US$ 3,028,622 to complete the project in an efficient manner, maintaining the expected quality of the results.

In addition, another major concern in relation to the permanent arrangements for the preparation of National Communications is the lack of a stable team with expertise in global climate change, dedicated to the planning and supervision of actions that is not outsourced or hired as consultants for the delivery of products.

The acquisition of sophisticated equipment for processing data derived from interpretation of satellite imagery and auxiliary data (cartographic maps, etc.) was a concern in the project due to the delay in hiring and lack of experience in the preparation of this type of bidding by the United Nations agency.

Summing up, the contents of this document are an indication that Brazil has been doing its fair share to combat climate change, and is prepared to sustain this leading role in the context of the overall effort needed to address the problem, pursuant to the Convention's objective and principles.

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Josué F. C. Filho
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Jovelino G. Cerqueira Filho
Jucivan Ribeiro Lopes
Judson Ferreira Valentim
Júlia Navarrette
Juliano de Carvalho Filho
Juliano Mota Lazaro
Júlio Noronha
Júlio Palhares
Jurandir Falas Berbel
Jussara Haruco Miaira
Jussara Starling de Medeiros
K. P. G. Alekseev
Karen Suassuna
Kelma Maria Nobre Vitoriano
Kênio Franklin de Freitas
Kennedy Gomes de Souza
Kleber Covas Martinez
Konnie Peuker
Laércio de S. Campos
Laís Roberta Galdino de Oliveira
Laline Ramirez Nunes
Lani Tardin
Leda Christiane de F. Lopes Lucena
Larissa Schmidt
Laryssa Lilian Lopes Sbruzzi
Laura Kikue Kumazawa
Laura Maria Regina Tétti
Laura Porto
Laura Silvia Valente de Macedo
Laura Tetti
Lauro Eduardo de Souza Pinto
Lauro José Scholer
Lázaro de Godoy Neto
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Leandro do Prado Wildner
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Leandro Waldvogel
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Lidia Harue Hanada,
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Luciana Medeiros de Carvalho Brant
Luciana O. Queiroz Ribeiro
Luciana Omena dos Santos
Luciana Spinneli Araújo
Luciane Garavaglia
Luciane R. dos Anjos
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Luciano dos Santos Martins
Luciano Fonseca Coppola
Luciano Freire Maia
Luciano Lellis Miranda
Luciano Nobre Varella
Luciano Quintans
Luciano Rodrigues
Lucila Maria Teixeira Caselato
Ludmila de Oliveira Ferreira
Luís Antônio Martinelli
Luis Carlos Leonardelli
Luís Fernando Stone
Luis Gustavo Moraes Ferraz
Luis Henrique Sartorlli
Luis Salazar
Luiz Alberto Figueiredo Machado
Luiz Alberto Oliva Monte
Luiz Antônio Antunes de Oliveira
Luiz Augusto Horta Nogueira
Luiz Augusto S. de Azevedo
Luiz Carlos B. Biasi
Luiz Carlos Hermes
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Luiz Claudio Lima Costa
Luiz Cláudio Padiar
Luiz Fernando do Amaral
Luiz Fernando dos Santos
Luiz Gylvan Meira Filho
Luiz Kazuiko Maebara
Luiz Machado
Luiz Mário Baccarin
Luiz Pereira Ramos
Luiz Pinguelli Rosa
Luiz R. A. Cunha
Luiz Renha
Luiz Soares
Luiz Soresini
Luiz Varela Guimarães
Luzia de Sousa Silva
Magda Aparecida de Lima
Maiara Silva Luz
Manoel Alonso Gan
Manoel dos Santos
Manoel Fernandes Martins Nogueira
Manoel Régis Lima Verde Leal
Manuel Eduardo Ferreira
Manuel Jerez Orozco
Manuella Santos Barbosa
Manyu Chang
Mara Lorena Maia Fares

Marçal José Rodrigo Pires
Marcela Cardoso Guilles da Conceição
Marcela Ohira Schwarz
Marcelo Consiglio
Marcelo Drügg Barreto Vianna
Marcelo Francisco Sestini
Marcelo Khaled Poppe
Marcelo Meirinho Caetano
Marcelo Pisetta
Marcelo Rodolfo Siqueira
Marcelo Teixeira Pinto
Marcelo Theoto Rocha
Márcia Amorim Soares Amaral
Marcia Andréa Dias Santos
Marcia Chame
Márcia Cristina Pessoa Fonseca
Márcia Drachmann
Márcia Janeiro Pereira
Márcia Macul
Márcia Simão Macul
Márcia Valéria Ferraro Gomes
Márcia Valle Real
Marcia Zenobia de Lima Oleari
Marcio Guimarães
Márcio M. Santos
Márcio Nogueira Barbosa
Márcio Schetinni
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Marco Antônio Machado
Marco Antonio Sanchez Artuzo
Marco Antônio Veiga
Marco Aurélio de Sousa Martins
Marco Aurélio dos Santos Bernardes
Marco Aurélio Freitas
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Marco Ziliotto
Marcos Antonio Vieira Ligo
Marcos Aurélio Vasconcelos de Freitas
Marcos Buckeridge
Marcos Corrêa Neves
Marcos Eduardo de Souza
Marcos Escaldelai
Marcos Freitas
Marcos Jank
Marcos Otávio Prates
Marcos Pellegrini Bandini
Marcos Sampol
Marcos Santos Ferreira
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Margareth Watanabe
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Maria Assunção Dias
Maria Clara Tavares Cerqueira
María Cleofé Valverde Brambila
Maria Conceição Peres Young Pessoa
Maria Cristina Maciel Lourenço
Maria Cristina Yuan
Maria da Conceição Peres Young
Maria da Conceição Santana Carvalho
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Maria I.S. Escada
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Maria Isabel Sobral Escada
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Maria Luíza de Andrade Gatto
Maria Luiza de Araújo Gastal
Maria Netto
Maria Rita Fontes
Maria Sílvia Muylaert
Maria Teresa Roza
Mariana Cheade
Mariana Regina Zechin
Mariana Sigrist
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Marilene Tozin Gabardo
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Mario Saffer
Mário Tachimi
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Maurício D'Agostini Silva
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Maurício Reis
Maurício Silva Andrade
Maurício Tiomno Tolmasquim
Maurik Jehee
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Mauro Garcia Carvalho Rico
Mauro Gebrim
Mauro Kazuo Sato
Mauro Luiz Brasil
Mauro Mansur
Mauro Noburu Okuda
Mauro Rodrigues Mello
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Miguel Peta
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Milton Cezar Ribeiro
Milton Eduardo Giancoli
Milton Marques
Milton Nogueira
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Mirlene Méis Aboni
Miuzael Frazão Freire
Moacir Marcolin
Mohamed E. E. Habib
Moisés Antonio dos Santos
Mônica de Queiroz Santos
Moyzés dos Reis Amaral
Myrthes Marcelle Santos
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Nádima de Macedo Paiva Nascimento
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Nazaré Lima Soares
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Nelson Jesus Ferreira
Nelson João Bissato
Nelson Luiz da Silva
Nelson Machado Guerreiro

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Nicolás Masuelli
Nilson Clementino Ferreira
Niro Higushi
Nivaldo Silveira Ferreira
Nuri Oyamburo de Calbete
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Odemar Rosa Pereira
Odo Primavesi
Odório Carneiro
Olavo Pereira de Souza
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Oliveira Santos
Olívia Felício Pereira
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Omar Campos Ferreira
Orivaldo Brunini
Orlando Cristiano da Silva
Osman Fernandes da Silva
Osvaldo Soliano Pereira
Oswaldo Cabral
Oswaldo dos Santos Lucon
Oswaldo M. Albino Neto
Oswaldo Polizio Júnior
Oswaldo Velinho
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Paulo Artaxo
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Paulo Henrique Cunha Soares
Paulo Hilário Nascimento Saldiva
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Pedro Santaro Shioga
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Rafael Duarte Kramer
Rafael Fonseca da Cruz
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Raimundo Nonato Moraes Andrade
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Regina Simea Sbruzzi
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Renato Rossetto
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Rita de Cássia Vieira Martins
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Roberto Bertelli
Roberto da Rocha Brito
Roberto de Aguiar Peixoto
Roberto de Moura Campos
Roberto dos Santos Vieira (*in memoriam*)
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Roberto Godinho
Roberto Moreira
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Roberto Schaeffer
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Rodolfo Nicastro
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Rodrigo de Matos Moreira
Rodrigo Hemerhy
Rodrigo Martins Vieira Coelho Ferreira
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Rogério Mundin
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Ronaldo Kanopf de Araújo
Ronaldo Kohlmann
Ronaldo Sérgio M. Lourenço
Ronaldo Seroa da Motta
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Rosana Cérgoli Barbosa
Rosana Cristina de Souza Giuliano
Rosana Faria Vieira
Rosana Tiyomi Kirihara
Rosane Castiglioni Pereira
Rosangela Silva
Rosaura Garcia Zucolo
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Roselice Duarte de Medeiros
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Rubens N. B. Grimaldi
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Rubens Silva Filho
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Rui da Silva Verneque
Rui Feijão
Rui Machado
Rui Maurício Gregório
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Sebastião Costa Guedes
Sebastião Renato O. Fortes
Sebastião Sérgio Faria
Segen Farid
Semida Silveira
Sérgio Antônio da Silva Almeida
Sérgio Antônio Perassa
Sérgio Besserman Vianna
Sérgio Calbete
Sérgio Lopes Dousseau
Sérgio Maia
Sérgio Peres Ramos da Silva
Sérgio Raposo de Medeiros
Sérgio Serra
Sheila da Silva Souza
Shinsho Takara
Sidnei J.S. Sant'Anna
Sidney Abreu
Silvana Bassi
Silvia Maiolino
Silvia Martarello Astolpho
Sílvio Arfeli
Silvio Manoel Silva Gonçalves
Silvio Pereira Coimbra
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Simone Claude Raymond
Simone Georges El Khouri Miraglia
Simone Sehnem
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Sizuo Matsuoka
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Sofia Nicoletti Shellard
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Sônia Maria Manso Vieira
Sônia Seger P. Mercedes
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Sourak Aranha Borralho
Suani Teixeira Coelho
Suleima Santos
Suzana Kahn Ribeiro
Taiana Brito
Taiana Nunes dos Santos
Tamara Van Kaicr
Tamara Vigolo Trindade
Tania Maria Mascarenhas Pinto
Tassiana Yeda Faria Segantine
Tatyane Souza N. Rodrigues
Tércio Ambrizzi
Tereza Cristina de M. Romero Teixeira
Tereza Cristina Pinto
Thaís Linhares Juvenal
Thaylini Cristine Luz Belino Bonfin
Tsutomu Morimoto
Thelma Krug
Themis Piazzetta Marques
Thiago de Araújo Mendes
Tiago Massao Matsumoto
Tomás Caetano Rípoli
Torello Redi Neto
Túlio César Mourthé de A. Andrade
Ubirajara Moura de Freitas
Ulf Walter Palme
Ulisses Eugenio Cavalcanti Confalonieri
Vagner Cruz
Valdete Duarte
Valdo da Silva Marques
Valéria B. Lima
Valquíria Barbosa Lunardeli
Valquíria Pereira Cabral da Silva
Vanderlei Francisco de Oliveira
Vanderlei Perez Canhos
Vania Elisabete Schneider
Vanildes Oliveira Ribeiro
Vera Lúcia Castro
Vera Lúcia de Abreu Vilela
Vicente Schmall
Victor Bonesso Júnior
Victor Ferreira de Souza
Victorio L. Furlani Neto
Vilma de Jesus Rodrigues
Vilson Fontana Bastos
Vilson Rodrigues Aguiar
Virgílio Bandeira
Volker Walter Johann Heinrich Kirchhoff
Volnei Peruchi
Wadih Scandar Neto
Wagner Costa Ribeiro
Wagner Fisher
Wagner Moreira
Wagner Soares

Waldir B. Silva
Waldir Stumpf
Waldomiro Paes
Walmir Costa da Roda
Walmir Fernando G. da Rocha
Walnir Ferro de Souza
Warwick Manfrinato
Weber Amaral
Wellington B. C. Delitti
Wellington Costa Freitas
Werner Eugênio Zulauf (*in memoriam*)
Werner Kornexl
William Frasson
Wilson Roberto Soares Mattos
Wolmir Pereira Andrade
Yara Campos Almeida
Yuri Andres de Jesus Moraes
Yushiro Kihara
Zelinda Leão
Zilmar de Souza
Zulcy Souza

Participating Institutions

3M do Brasil - Regional de Meio Ambiente, Segurança e Higiene Industrial - América Latina
ABAL - Associação Brasileira do Alumínio
ABCM – Associação Brasileira do Carvão Mineral
ABCP - Associação Brasileira de Cimento Portland
ABEMA - RN – Associação Brasileira de Entidades Estaduais de Meio Ambiente
ABES - Associação Brasileira de Engenharia Sanitária e Ambiental
ABESCO - Associação das Empresas de Serviços de Conservação de Energia
ABETRE - Associação Brasileira de Empresas de Tratamento de Resíduos
ABIA - Associação Brasileira das Industrias Alimentícias
ABIQUIM - Associação Brasileira da Indústria Química
ABL - Incinerador de Antibióticos do Brasil
ABLP - Associação Brasileira de Resíduos Sólidos e Limpeza Pública
ABNT - Associação Brasileira de Normas Técnicas
Aborgama do Brasil Ltda
ABPC - Associação Brasileira de Cimento Portland
ABRELPE - Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais
ABS Quality Evaluations
Açúcar e Álcool Oswaldo Ribeiro de Mendonça Ltda
Açúcar Guarani S/A.
Açucareira Quatá S/A
Açucareira Zillo Lorenzetti S/A.
ADEMA - Administração Estadual do Meio Ambiente SE
AES Sul Distribuidora Gaúcha de Energia S/A
AES Uruguaiana Empreendimentos S/A
Afluente Geração e Transmissão de E.E. S/A
Agência Goiana de Meio Ambiente
Agência Nacional de Energia Elétrica - ANEEL
AGESPISA - Águas e Esgotos do Piauí S/A
AIDIS - Associação Interamericana de Engenharia Sanitária e Ambiental
AINEP - Assessoria e Intermediação de Negócios Especiais e Participação
ALBRAS - Alumínio Brasileiro S/A
ALCOA
ALLMA - Gestão em Agronegócios
Alpina Ambiental S/A
ALSTOM POWER - Sistemas de Controle Ambiental
ALUMAR - Consórcio de Alumínio do Maranhão
Alves & Trancho – Assessoria e Consultoria em Informática Ltda.
Amapari Energia S.A
Amazonas Distribuidora de Energia S/A
Amazônia Eletronorte Transmissora de Energia S/A
AmBev - Companhia de Bebidas das Américas
Ambiental ECOPAM
Ambiental Saneamento e Concessões Ltda
AMESC - Associação dos Municípios do Extremo Sul Catarinense
Ampla Energia e Serviços S/A
ANAC - Agência Nacional de Aviação Civil
Anaconda Ambiental e Empreendimentos Ltda.
Antonio Ruette Agroindustrial Ltda
APETRES - Associação Paulista das Empresas de Tratamento e Destinação de Resíduos Urbanos
Araputanga Centrais Elétricas S/A
ArcellorMittal
ArcelorMittal Cariacica
ArcelorMittal Itaúna
ArcelorMittal Juiz de Fora
ArcelorMittal Monlevade
ArcelorMittal Piracicaba
ArcelorMittal Sabará
Artemis Transmissora de Energia S/A
ASEMG – Associação Suinocultores do Estado de Minas Gerais
Associação Mineira de Silvicultura - AMS
ATE II Transmissora de Energia S/A
ATE III Transmissora de Energia S/A
ATE Transmissora de Energia S/A
ATT Ambiental Tecnologia e Tratamento Ltda
BAESA - Energética Barra Grande S/A
Bahia Pulp S/A
Baixada Santista Energia S/A
Banco Nacional de Desenvolvimento Econômico e Social – BNDES
Bandeirante Energia S/A
Belgo Bekaert Arames Contagem
Belgo Bekaert Arames Hortolândia
Belgo Bekaert Arames Osasco
Belgo Bekaert Arames Sabará
Biogás Energia Ambiental S/A.
BIOTECS - Águas e Efluentes - Engenharia de Sistemas de Tratamento
Boa Hora Central de Tratamento de Resíduos
Boa Hora Central de Tratamento de Resíduos Ltda
Boa Sorte Energética S/A
Boa Vista Energia S/A
Bonfante Energética S/A
Bons Ventos Geradora de Energia
Brascanenergética Minas Gerais S/A
BRASECO - Tratando do Lixo, Cuidando de Você
Brasil Central Energia S/A

Breitener Jaraqui S/A
Breitener Tambaqui S/A
Brentech Energia S/A
BT Geradora de Energia Elétrica S/A
Bunge Fertilizantes S/A
Caçador Energética S/A
CAEMA - Companhia de Águas e Esgoto do Maranhão
CAER - Companhia de Águas e Esgotos de Roraima
CAERD - Companhia de Águas e Esgotos de Rondônia
CAERN - Companhia de Águas e Esgotos do Rio Grande do Norte
CAESA - Companhia de Água e Esgotos do Amapá
CAESB - Companhia de Saneamento Ambiental do Distrito Federal
CAGECE - Companhia de Água e Esgoto do Ceará
CAGEPA - Companhia de Água e Esgoto da Paraíba
Caiuá Distribuidora de Energia S/A
Calheiros Energia S/A
Capuava Energy
Carangola Energia S/A
Casa Civil da Presidência da República
CASAL - Companhia de Saneamento de Alagoas
CASAN - Companhia Catarinense de Águas e Saneamento
Cavo-Serviços e Meio Ambiente S/A
CBA – Companhia Brasileira de Alumínio
CDSA - Centrais Elétricas Cachoeira Dourada S/A
CEAL – Companhia Energética de Alagoas
CECLIMA - Centro Estadual de Mudanças Climáticas/AM
CEDAE - Companhia Estadual de Águas e Esgotos
CEEE-GT – Companhia Estadual de Energia Elétrica
CEESAM Geradora S/A
CELESC Distribuição S/A
CELG Distribuição S/A
CELG Geração e Transmissão
Celulose Nipo-Brasileira S/A
CEMAR – Companhia Energética do Maranhão
CEMIG Companhia de Energia de Minas Gerais
CEMIG Geração e Transmissão S/A
CEMPRE - Compromisso Empresarial para Reciclagem
CENBIO - Centro Nacional de Referência em Biomassa
Censtroeste Construtora e Participações Ltda
Centrais Elétricas Brasileiras S.A. - ELETROBRÁS
Centrais Elétricas do Pará S/A
Centrais Elétricas Matogrossenses S/A
Centrais Hidrelétricas Grapon S/A
Centro de Ciência do Sistema Terrestre – CCST/INPE
Centro de Estudos em Sustentabilidade _ Centro de Gestão e Estudos Estratégicos - CGEE
Centro de Previsão do Tempo e Estudos Climáticos do INPE – CPTEC/INPE
Centro Nacional de Referência de Biomassa – CENBIO
CEPEA - Center for Advanced Studies on Applied Economics - ESALQ/USP
CERAN - Companhia Energética Rio das Antas
CERPA - Central Energética Rio Pardo Ltda
CES - Centro de Estudos em Sustentabilidade da FGV - EAESP
CESA - Castelo Energética S/A. CE
CESAN - Companhia Espírito Santense de Saneamento
CESP - Companhia Energética de São Paulo
CETESB - Companhia Ambiental do Estado de São Paulo
Cetrel - Camaçari - BA
Cetrel Lumina Com. E Adm.
Cetrel Lumina Comercial em São Paulo
CETREL S/A. - Empresa de Proteção Ambiental
CGEE - Centro de Gestão e Estudos Estratégicos
CGTF - Central Geradora Termelétrica Fortaleza S/A
CIEN – Companhia de Interconexão Energética
CJ Energética S/A
Clariant - Blumenau/SC
Clean CTTR (Central de Tratamento Térmico de Resíduos) - Belém - PA
Clean Service Serviços Gerais Ltda
CNPGL - Embrapa Gado de Leite
CNPSA - Embrapa Suínos e Aves
CODEMA Campinas - Conselho Municipal de Meio Ambiente
CODESP - Companhia Docas do Estado de São Paulo
COELBA – Companhia de Eletricidade do Estado da Bahia
COGEN - SP - Associação Paulista de Cogeração de Energia
Columbian Chemicals Brasil Ltda.
COMGAS - Companhia de Gás de São Paulo
Companhia Ambiental do Estado de São Paulo - CETESB
Companhia Brasileira de Estireno
Companhia Cervejaria Brahma - Cervejarias Reunidas Skol Caracu S/A - Sub -Produtos
Companhia de Energia Elétrica do Estado de Tocantins
Companhia de Gás de São Paulo
Companhia Energética Chapecó
Companhia Energética de Brasília
Companhia Energética de Pernambuco
Companhia Energética de Petrolina
Companhia Energética do Ceará
Companhia Energética Santa Clara
Companhia Estadual de Distribuição de Energia Elétrica
Companhia Força e Luz do Oeste
Companhia Hidrelétrica do São Francisco
Companhia Hidroelétrica São Patrício
Companhia Jaguari de Energia
Companhia Luz e Força Santa Cruz
Companhia Nacional de Energia Elétrica
Companhia Nitro Química Brasileira
Companhia Paulista e força e Luz

Companhia Siderúrgica Nacional
Companhia Transirapé de Transmissão
Companhia Transleste de Transmissão
Companhia Transudeste de Transmissão
COMPESA - Companhia Pernambucana de Saneamento
Compromisso Empresarial para a Reciclagem – CEMPRE
Concessionária Mosquitão
Conselho Nacional da Pecuária de Corte
Consórcio Aproveitamento Hidrelétrico Porto Estrela
Consórcio Capim Branco Energia -UHE AmadorAguiar I
Consórcio Capim Branco Energia -UHE AmadorAguiar II
Consórcio Dona Francisca (CEEE-GT e DFESA)
Consórcio Ecocamp
Consórcio Itá
Consórcio Machadinho
Construtora Marquise S/A
Coordenação dos Programas de Pós Graduação em Engenharia/Universidade Federal do Rio de Janeiro - COPPE/UFRJ
COPASA - Companhia de Saneamento de Minas Gerais
COPEL – HOLDING – Companhia Paranaense de Energia
COPERSUCAR - Centro Tecnológico Copersucar
COPPE/UFRJ – Instituto Alberto Luiz Coimbra de Pós-Graduação e Pesquisa de Engenharia
Corpus Saneamento e O Brasileiro Ltda
CORSAN - Companhia Riograndense de Saneamento
Corumbá Concessões S/A
COSAN Alimentos S.A FILIAL TARUMÃ
COSAN Alimentos S.A UNIDADE MARACAÍ
COSAN Centro Oeste S.A Açúcar e Álcool Filial Jataí
COSAN S.A Bionergia Filial UTE Costa Pinto
COSAN S.A Bionergia Filial UTE GASA
COSAN S/A Bionergia Filial UTE RAFARD
COSANPA - Companhia de Saneamento do Pará
COSE - Companhia Energética do Rio Grande do Norte
Costa Rica Energética Ltda
Cotiporã Energética S/A
CPFL Piratininga
CPPSE - Embrapa Pecuária Sudeste
CPPSUL - Embrapa Pecuária Sul
CPRH - Agência Estadual de Meio Ambiental e Recursos Hídricos/PE
CRA - Centro de Recursos Ambientais/BA
CSN - Cia. Siderúrgica Nacional
CST - Companhia Siderúrgica de Tubarão
CTEEP
Curuá Energia S/A.
CVRD - Companhia Vale do Rio Doce - Departamento de Gestão Ambiental e Territorial
Da Ilha Energética S/A
DAE S/A. - Água é Esgoto
Dambiental
Dana Indústrias Ltda.
DANONE Ltda.
Dedini S/A Indústria de Base
Departamento Municipal de Energia de Ijui
DESO - Companhia de Saneamento de Sergipe
Destilaria Água Bonita Ltda
DME Energética Ltda.
DMEPC
DNA Consultoria, Planejamento, Gestão Urbana e Ambiental
e&e Economia e Energia
ECO - PROCESSA Arcos/MG
ECO - PROCESSA Cimpor - Cajati/SP
ECO - PROCESSA Cimpor - Campo Formoso/BA
ECO - PROCESSA Cimpor - Candiota/RS
ECO - PROCESSA Cimpor - Cezarina/GO
ECO - PROCESSA Cimpor - João Pessoa/PB
ECO - PROCESSA Cimpor - São Miguel dos Campos/AL
ECO - PROCESSA Lafarge Cantagalo
ECO - PROCESSA Matosinhos/MG
Economia e Energia - e&e
ECTE – Empresa Catarinense de Transmissão de Energia
ELEKTRO – Eletricidade e Serviços S/A
ELETRAM - Eletricidade da Amazônia S.A.
Eletro Primavera Ltda
ELETROCAR Centrais Elétricas de Carazinho S/A
ELETRONORTE _ Centrais Elétricas do Norte do Brasil S/A
ELETROSUL - Centrais Elétricas S/A
EMAE - Empresa Metropolitana de Águas e Energia S/A
EMBASA - Empresa Baiana de Águas e Saneamento S/A.
Embralixo Empresa Bragantina de Varrição e Coleta de Lixo Ltda
Empreiteira Pajoan - Central de Tratamento de Resíduos (Associada APETRES)
Empresa Amazonense de Transmissão de Energia S/A
Empresa Brasileira de Pesquisa Agropecuária - Embrapa
Empresa de Distribuição de Energia Vale Paranapanema S/A
Empresa de Transmissão de Energia de Santa Catarina
Empresa de Transmissão de Energia do Rio Grande do Sul
Empresa de Transmissão do Alto Uruguai S/A
Empresa de Transmissão do Espírito Santo S/A
Empresa Elétrica Bragantina S/A
Empresa Energética de Mato Grosso do Sul S/A
Empresa Energética Porto das Pedras S/A
Empresa Luz e Força Santa Maria S/A
Empresa Norte de transmissão de energia S/A
Empresa Tejofran de Saneamento e Serviços Ltda
ENERCAN- Campos Novos Energia S/A
Energética Campos de Cima da Serra
Energética Ponte Alta S/A
Energética Salto Natal S.AENERGISA Borborema
ENERGISA Minas Gerais Distribuidora de Energia S/A
ENERGISA Nova Friburgo Distribuidora de Energia S/A

ENERGISA Paraíba
ENERGISA Sergipe Distribuidora de Energia S/A
Energyworks do Brasil Ltda
Enerpeixe S.A
Enge - Aplic Montagens Industriais Ltda
ENGEPASA Ambiental Ltda
Engetécnica Ltda
Enob Ambiental Ltda
ENTERPA Ambiental S/A.
Eólica Formosa Geração e Comércio de Energia S/A
Eólica Icaraizinho Geração e comércio de Energia S/A
Eólica Paracuru Geração e Comércio de Energia S/A
EPAGRI - Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina
EPE – Empresa de Pesquisa Energética
EPESA – Centrais Elétricas de Pernambuco S/A
Eppo Ambiental Ltda
Equipav S/A - Açúcar e Álcool
ERM Brasil Ltda.
ERTE - Empresa Regional de Transmissão de Energia
Espírito Santo Centrais Elétricas S/A
Espora Energética S/A
Essencis Administração
Essencis Co - Processamento
Essencis CTR Betim
Essencis CTR Caieiras
Essencis CTR Curitiba
Essencis CTR Itaberaba
Essencis CTR Joinville
ESSENCIS Incineração - (Fonte:Abetre e Cenbio)
Essencis Soluções Ambientais S/A.
ESTRE - Empresa de Saneamento e Tratamento de Resíduos Ltda.
ESTRE CDR Pedreira
ESTRE CGR Guatapará
ESTRE CGR Itapevi
ESTRE CGR Paulínia
ESTRE CGR Piaçaguera
ESTRE CGR Romeiros
ETEO - Empresa de Transmissão de Energia do Oeste
ETEP - Empresa Paraense de Transmissão de Energia S/A
Eucatex S/A Indústria e Comércio
Evrecy Participações Ltda
Faculdade SENAI de Tecnologia Ambiental
FATMA - Fundação do Meio Ambiente/SC
FBOMS - Fórum Brasileiro de ONG's e Movimentos Sociais para o Meio Ambiente e Desenvolvimento
FEAM - Fundação Estadual de Meio Ambiente/MG
Federação das Indústrias do Estado de Minas Gerais - Gestão e Tecnologia - Gerência de Meio Ambiente
FEEMA - Fundação Estadual de Engenharia do Meio Ambiente/RJ
FEMACT - Fundação do Meio Ambiental, Ciência & Tecnologia/RR
FEPAM - Fundação Estadual de Proteção Ambiental/RS
Ferrari Termoelétrica S/A
FIESP - Federação das Indústrias do Estado de São Paulo
FIRJAN - Federação das Indústrias do Rio de Janeiro
Forty Construções e Engenharia LTDA
Fórum Baiano de Mudanças Climáticas Globais e de Biodiversidade
Fórum Brasileiro de Mudanças Climáticas
Fórum Capixaba de Mudanças Climáticas
Fórum Catarinense de Mudanças Climáticas Globais e de Biodiversidade
Fórum Cearense de Mudanças Climáticas
Fórum Estadual de Mudanças Climáticas e Biodiversidade Tocantins
Fórum Gaúcho de Mudanças Climáticas
Fórum Mineiro de Mudanças Climáticas Globais
Fórum Paranaense de Mudanças Climáticas
Fórum Paulista de Mudanças Climáticas e Biodiversidade
Fórum Rio de Mudanças Climáticas Globais
FOSFERTIL – Fertilizantes Fosfatados S/A
Foz do Chopim Energética Ltda.
FUNCATE - Fundação para a Ciência Aeroespacial, Aplicações e Tecnologia
Fundação Oswaldo Cruz - Fiocruz
Fundação Getúlio Vargas - FGV
Funil Energia S.A.
FURNAS Centrais Elétricas S/A
GALERA Centrais Elétricas S/A
GEOKLOCK - Consultoria e Engenharia Ambiental Ltda. - Departamento de Engenharia Ambiental
Geomap Ltda.
GERA - Geradora de Energia do Amazonas S/A
Geraoeste Usinas Elétricas do Oeste S/A
Gerdau Aço Minas
Global Defense Systems Ltda
Goiasa Goiatuba Álcool Ltda
Governo do Estado da Bahia- Secretaria de Meio Ambiente e Recursos Hídricos
Governo do Estado de Minas Gerais - Fundação Estadual do Meio Ambiente
Governo do Estado do Espírito Santo- Secretaria do Meio Ambiente e Recursos Hídricos - Instituto Estadual de Meio Ambiente e Recursos Hídricos - IEMA
Governo do Estado do Paraná-secretaria de Estado do Meio Ambiente e Recursos Hídricos
Governo do Estado do Rio de Janeiro-secretaria de Estado do Ambiente - Fundação Estadual de Engenharia do Meio Ambiente - Grupo Leão & Leão
Grupo Plantar
Guarantã Energética Ltda

Hidroluz Centrais Elétricas Ltda
Hidropower Energia S/A
HIDROSSOL – Hidroelétricas Cassol Ltda.
HOLCIM
HPT - Torres de Resfriamento - Tratamento de Água e Efluentes
IABr - Instituto Aço Brasil
IAP - Instituto Ambiental do Paraná/PR
IBAM - Instituto Brasileiro de Administração Municipal - Área de Desenvolvimento Urbano e Meio Ambiente
IBGE - Instituto Brasileiro de Geografia e Estatística
IDEMA - Instituto de Defesa do Meio Ambiente/RN
IEA - Instituto de Estudos Avançados da Universidade de São Paulo
IEE - Instituto de Eletrotécnica e Energia
IEF - Instituto Estadual de Florestas/RJ
IEF – Instituto Estadual de Florestas/MG
IEMA - Instituto de Energia e Meio Ambiente
Iguaçu Energia
IMA - Instituto do Meio Ambiente/AL
IMASUL - Instituto de Meio Ambiente do Mato Grosso do Sul
Inidiavai Energética S/A
Instituto Alberto Luiz Coimbra de Pós - graduação e Pesquisa de Engenharia - Universidade Federal do Rio de Janeiro - Programa de Planejamento Energético – PPE/COPPE/UFRJ
Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis - Ibama
Instituto de Eletrotécnica e Energia - IEE/USP
Instituto de Energia e Meio Ambiente - IEMA
Instituto de Estudos Avançados - IEA/USP
Instituto de Física - IF/USP
Instituto de Pesquisa Econômica Aplicada – IPEA
Instituto de Zootecnia – APTA (Centro de Pesquisa e Desenvolvimento em Nutrição Animal e Pastagens)
Instituto Estadual de Meio Ambiente e Recursos Hídricos - IEMA
Instituto Interamericano para Pesquisas em Mudanças Globais - IAI
Instituto Nacional de Ciência e Tecnologia para Mudanças Climáticas – INCT/Clima
Instituto Nacional de Meteorologia - INMET
Instituto Nacional de Pesquisas da Amazônia - INPA
Instituto Nacional de Pesquisas Espaciais - INPE
Instituto Virtual de Mudanças Globais - IVIG/UFRJ
Interligação Elétrica de Minas Gerais S/A
International Council for Local Environmental Initiatives - ICLEI Brasil
International Paper do Brasil Ltda
INVESTCO S/A
IPAAM - Instituto de Proteção Ambiental do Amazonas
IPT - Instituto de Pesquisa Tecnológica
Irara Energética S/A
Isamu Ikeda Energia S/A
Itaipu Binacional
Itamarati Norte S/A Agropecuária
ITAMBÉ - Cia. de Cimento Itambé
Itapebi Geração de Energia S/A
Itiquira Energética S/A
Jaguari Energética S/A
Jataí Energética S/A.
Jotagê Engenharia Comércio e Incorporações Ltda
Klabin S/A
Konus Icesa S/A
LACTEC - Instituto de Tecnologia para o Desenvolvimento
LDC Bioenergia S/A., Unidade Giasa
LDC Bioenergia S/A., Unidade Lagoa da Prata
LDC Bioenergia S/A., Unidade Leme
LDC Bioenergia S/A., Unidade Rio Brilhante
Light Energia
Light Serviços de Eletricidade S/A.
LIMPEC - Limpeza Pública de Corações
Limpel Limpeza e Engenharia Ltda
Linha Emília Energética S/A
Litucera Limpeza e Engenharia Ltda
Locanty Com. Serviços Ltda
Locavargem Ltda
Logos Engenharia S/A.
Ludesa Energética S/A.
Luftech - Soluções Ambientais
Lumbrás Energética S/A
LUMITRANS Companhia de Transmissão de Energia Elétrica
Lwarcel Celulose Ltda
Macedo Passos Consultoria em Informática Ltda.- ME
Maqbrit Comércio e Indústria de Máquinas Ltda
Marca Ambiental Ltda. - Gerenciamento e Tratamento de Resíduos
MAUÊ S/A Geradora e Fornecedora de Insumos
MB Engenharia e Meio Ambinete Ltda
Mega Automação Industrial Ltda
Millennium Central Geradora Eólica S/A
Ministério da Agricultura, Pecuária e Abastecimento - MAPA
Ministéio de Minas e Energia - MME
Ministério da Ciência e Tecnologia – MCT
Ministério da Defesa - MD
Ministério da Fazenda - MFaz
Ministério da Integração Nacinal – MI
Ministério da Saúde - MS
Ministério das Cidades - MCid
Ministério das Relações Exteriores – MRE
Ministério do Desenvolvimento, Indústria e Comércio Exterior - MDIC

Ministério do Meio Ambiente – MMA
Ministério do Planejamento, Orçamento e Gestão - MPOG
Ministério dos Transportes – MT
Miranda & Miranda – Assessoria e Consultoria em Informática Ltda.
MIZUME - Tecnologia de Tratamento de Esgoto
Monte Serrat Energética S/A.
Mosca Grupo Nacional de Serviços Ltda
Multi Serviços Tecnologia Ambiental Ltda
NATURATINS - Instituto Natureza do Tocantins
NEPA/UNICAMP - Núcleo de Estudos em Proteção Ambiental
Nordeste Transmissora de Energia
Novatrans Energia S/A.
NOVELIS DO BRASIL LTDA
Novo Mundo Energética SA
OMBREIRAS Energética S/A
Ônix Geração de Energia S/A
Ouro Energética S/A
P&D Consultoria
Pampeana Energética S/A
Pantanal Energética Ltda.
Paranatinga Energia S/A
PePeC Ambiental - Consultoria em Meio Ambiente
Petróleo Brasileiro S.A. – PETROBRAS
Pilkington Brasil Ltda.
Pioneira Saneamento e Limpeza Urbana Ltda
Pioneiros Termoelétrica Sud Mennucci S.A.
Planalto Energética S/A
Plena Transmissoras
Ponta Grossa Ambiental Ltda
PRANA - Assessoria e Gestão Ambiental
Prefeitura da Cidade de Nova Iguaçu - EMLURB - Empresa Municipal de Limpeza Urbana
Prefeitura da Estância Turística de Ibiúna
Prefeitura da Estância Turística de Salto-Secretaria da Indústria, Comércio e Agricultura
Prefeitura Municipal de Marília-secretaria Municipal do Verde e do Meio Ambiente
Prefeitura Municipal de Saltinho
Prefeitura Municipal de São Paulo-Secretaria Municipal do Verde e do Meio Ambiente
Prefeitura Municipal de Volta Redonda - Coordenadoria de Defesa do Meio Ambiente
Primaverda Energia S/A
PROCLIMA RN
Programa Nacional de Conservação de Energia Elétrica - PROCEL/ELETROBRÁS
Programa Nacional do Uso Racional de Derivados de Petróleo e do Gás Natural - CONPET/PETROBRAS
PROGUIMA Processamento de dados Ltda. – ME
PROSAB - Programa de Pesquisas em Saneamento Básico (Instituição FINEP)
PUC-RS Pontifícia Universidade Católica do Rio Grande do Sul
QUALIX - Aterro Sanitário Sítio São João
QUALIX Serviços Ambientais Ltda.
Queiroz Galvão Energética SA
Quimatec Produtos Químicos
Quitaúna-Serviços S/C Ltda
Raia & Coelho Ltda. - Consultoria em Tratamento de Lixo
Rede Brasileira de Pesquisa sobre Mudanças Climáticas Globais - Rede Clima
REFAP S.A
RENOVA Soluções - Centro de Tratamento de Resíduos de Nova Iguaçu
Retiro Velho Energética S.A.
RGE - Rio Grande Energia S/A
Riachão Energética S/A
Riacho Preto Energética S.A
Rialma Companhia Energética III S/A
Rialma Companhia Energética S/A
RIMA Industrial S.A
Rio do Sangue Energia S/A
Rio Glória Energética S/A
Rio Manhuaçu Energética S/A
Rio PCH – Neoenergia
Rio Pomba Energética S/A
Rio Sucuriu Energia S/A
Rio Verde Energia S/A
Rodnei Cassiano Todorow – ME
S/A
SABESP - Companhia de Saneamento Básico do Estado de São Paulo
SADIA S/A. - Sustentabilidade
Salto Jauru Energética S/A
Samarco Mineração
SANEAGO - Saneamento de Goiás S/A.
SANEATINS - Companhia de Saneamento do Tocantins
SANEPAR - Companhia de Saneamento do Paraná
Sanepav Engenharia, Saneamento e Pavimentação Ltda
SANESUL - Empresa de Saneamento do Mato Grosso do Sul S/A.
SANSUY S/A. Indústria de Plásticos
Santa Candida Açúcar e Alcool Ltda.
Santa Cruz Geração de Energia S/A.
Santa Cruz Power Corporation Usinas Hidroelétricas
Santa Cruz S.A. Açúcar e Álcool
Santa Fé Energética S/A.
Santa Gabriela Energética S/A
São Joaquim Energia S/A
São Pedro Energia S/A
São Simão Energia S/A
SAR - Superintendência de Aeronavegabilidade
Sarpi - Sistemas Ambientais Comercial Ltda

SASA - Sistemas Ambientais - ONYX
SATC - Associação Beneficente da Indústria Carbonífera de Santa Catarina
Scheide & Costa Ltda.
SDS - Secretaria de Estado de Desenvolvimento Sustentável/SC
SDS - Secretaria de Meio Ambiente e Desenvolvimento Sustentável/AM
SEA - Secretaria de Estado do Ambiente/RJ
SEAMA - Secretaria de Estado de Meio Ambiente e Recursos Hídricos/ES
Secretaria de Meio Ambiente e Recursos Hídricos
Secretaria de Meio Ambiente, Cidades, Planejamento e Tecnologia MS
Secretaria do Meio Ambiente do Estado de São Paulo - Instituto Geológico
SECTMA - Secretaria Ciência& Tecnologia e Meio Ambiente/PE
SECTMA - Secretaria de Ciência & Tecnologia e do Meio Ambiente/ PB
SEDAM - Secretaria de Desenvolvimento Ambiental/RO
SELURB - Sindicato Nacional das Empresas de Limpeza Urbana
SEMA - Secretaria de Estado de Meio Ambiente e Recursos Naturais/AC
SEMA - Secretaria de Meio Ambiente e Recursos Naturais MA
SEMA - Secretaria Estado de Meio Ambiental e Recursos Hídricos/PR
SEMA - Secretaria Estadual de Meio Ambiente/AP
SEMA - Secretaria Estadual de Meio Ambiente/MT
SEMA - Secretaria Estadual do Meio Ambiente/RS
SEMA - Secretaria Executiva Ciência & Tecnologia e Meio Ambiental/PA
SEMACE - Superintendência do Meio Ambiente/CE
SEMAD - Secretaria de Meio Ambiente e Desenvolvimento Sustentável/MG
SEMAR - Secretaria Meio Ambiental e Recursos Hídricos/PI
SEMARH - Secretaria de Estado do Meio Ambiente/SE
SEMARH - Secretaria de Meio Ambiente e Recursos Hídricos/BA
SEMARH - Secretaria de Meio Ambiente e Recursos Hídricos/GO
SEMARHN - Secretaria de Meio Ambiente Recursos Hídricos/AL
SEMASA-Serviço Municipal de Saneamento Ambiental de Santo André - Departamento de Resíduos Sólidos
SENAI CIC/CETSAM PR (Centro de Tecnologia em Saneamento e Meio Ambiente)
SEPLAN - Secretaria Recursos Hídricos e Meio Ambiente/TO
SERQUIP Serviços, Construções e Equipamentos Ltda
Serra Negra Energética S/A
Sestini & Sestini Ltda. – ME
Siderúrgica Barra Mansa S/A
SIECESC - Sindicato da Indústria da Extração do Carvão de Santa Catarina
SIIF Cinco Geração e Comércio de Energia S/A
Silcon Ambiental Ltda
SILCON Comercial em Santos
SILCON PTR Comércio e Administração
SILCON PTR Esprírito Santo
SILCON PTR Juquiá
SILCON PTR Mauá
SILCON PTR Paulínia
SILCON PTR Santos
SIR - Sindicato Nacional da Indústria de Refratários
Sistema de Transmissão Nordeste
SMA - Secretaria Estadual de Meio Ambiente/ SP
SNIC – Sindicato Nacional da Indústria do Cimento
SNIS - Sistema Nacional de Informações sobre Saneamento
SOMA - Secretaria da Ouvidoria - Geral e do Meio Ambiental/CE
SPE Alto Irani Energia S/A
SPE Plano Alto Energia S/A
STC - Sistema de Transmissão Catarinense S/A.
Stemag Engenharia e Construções Ltda
STERLIX Ambiental Tratamento de Resíduos Ltda
SUDEMA - Superintendência de Administração do Meio Ambiente/PB
SUEZ AMBIENTAL
Sul Transmissora de Energia
Suzano Papel e Celulose
Tangará Energia S/A.
TB Serviços, Transporte, Limpeza, Gerenciamento e Recursos Humanos Ltda
TECIPAR
TECIPAR Com. e Adm.
Tecipar Engenharia e Meio Ambiente Ltda
Tecna Sistemas Ltda.- ME
Tecno Lara Tratamento de Efluentes
Tecnometal Engenharia e Construções Mecânica Ltda
Termocabo S/A.
Termoelétrica Itaenga Ltda
Termopernambuco S/A
Terraplena Ltda
The Nature Conservancy - TNC
Tocantins Energética S/A
Torre Empreendimento Ltda
Tractebel Energia S/A
TRANSFORMA - Engenharia do Meio Ambiente
Trans-lix Transportes e Serviços Ltda
Transmissora Sudeste Nordeste S/A.
Transresíduos Transportes de Resíduos Industriais Ltda
TRIBEL
TRIBEL Comercial em São Paulo

Tribel Tratamento de Resíduos Industriais de Belford Roxo Ltda
Tupan Energia Elétrica S/A
UGMC-Unidade Gestora de Mudanças Climáticas e Unidades de Conservação
Uirapuru Transmissora de Energia S/A.
UNESP - Universidade Estadual Paulista (Faculdade de Ciências Agrárias e Veterinárias)
União da Indústria de Cana-de-açúcar – Única
UNICAMP - Universidade Estadual de Campinas
UNICAMP - Universidade Estadual de Campinas - Instituto de Geociências - Departamento de Geografia - LECLIG - Laboratório de Estudos Climáticos IG/UNICAMP
UNIFACS - Universidade Salvador - Bahia
Unileste Engenharia S/A
Universidade de Campinas – Unicamp
Universidade de São Paulo – Pirassununga
Universidade de São Paulo - USP
Universidade Federal de Minas Gerais – UFMG
Universidade Federal do Rio de Janeiro – UFRJ
Universidade Federal do Rio Grande do Sul – UFRGS
URBAM - Urbanizadora Municipal S/A.
Usian Barralcool S/A
Usian Cururipe açúcar e Álcool S/A
Usian de Açúcar Santa Terezinha – Tapejara
USIMINAS-Usinas Siderúrgicas de Minas Gerais S/A
Usina Alta Mogiana S/A Açúcar e Álcool
Usina Alto Alegre S/A
Usina Barra Grande de Lençóis S.A.
Usina Boa Vista
Usina Cerradinho Açúcar e Álcool
Usina Colombo S/A Açúcar e Álcool
Usina Mandu S/A
Usina Petribú S/A
Usina Santa Adélia S/A
Usina Santa Isabel
Usina São Domingos-Açúcar e Álcool S/A
Usina São Luiz S/A.
Usina São Martinho
Usina Termelétrica Norte Fluminense S/A.
Usina Termo Elétrica Iolando Leite Ltda
USP - Faculdade de Saúde Pública
USP - Universidade de São Paulo (Escola Superior de Agronomia "Luiz de Queiroz" – ESALQ - Departamento de Produção Animal)
UTE Termocabo
V&M -Vallourec e Mannesmann Tubes
Vale dos Ventos Geradora Eólica S/A
VALE SUL
Várzea do Juba Energética S/A
Vega Engenharia Ambiental S/A
Vêneto Energética S/A
VEOLIA Administração
VEOLIA Resicontrol
VEOLIA Sasa
Veracel Celulose S/A
Viasolo Engenharia Ambiental S/A
Vista Alegre Açúcar e Álcool Ltda
Vital Engenharia Ambiental S/A
Viva Ambiental e Serviços Ltda
Votorantim Cimentos Brasil
Votorantim Cimentos N/NE S.A.
Votorantim MetaisVotorantim Metais Zinco S.A.
VSB -Vallourec & Sumitomo Tubos do Brasil
WHITE MARTINS/PRAXAIR
Zona da Mata Geração S.A.

Symbols, acronysms and abbreviatons

AAE – Energy Application Agency (*Agência para Aplicação de Energia*)
ABAL – Brazilian Aluminum Association (*Associação Brasileira do Alumínio*)
ABC – Brazilian Academy of Sciences (*Academia Brasileira de Ciências)*
ABC – Brazilian Cooperation Agency (*Agência Brasileira de Cooperação*)
ABCM – Brazilian Coal Association (*Associação Brasileira do Carvão Mineral*)
ABCP – Brazilian Association of Portland Cement (*Associação Brasileira de Cimento Portland)*
ABEER – Brazilian Association of Renewable Energy Companies and Energy Efficiency (*Associação Brasileira de Energia Renovável e Eficiência Energética*)
ABEGÁS – Brazilian Gas Distribution Companies Association (*Associação Brasileira das Empresas Distribuidoras de Gás Canalizado*)
ABEMA - Brazilian Association of Environmental Entities (*Associação Brasileira das Entidades de Meio Ambiente)*
ABETRE - Brazilian Association of Waste Treatment Companies (*Associação Brasileira de Empresas de Tratamento de Resíduos*)
ABIA - Brazilian Food Industry Association (*Associação Brasileira das Indústrias de Alimentação*)
ABIC - Brazilian Association of Coffee Industry (*Associação Brasileira da Indústria do Café*)
ABIOVE – Brazilian Association of Vegetable Oil Industries (Associação Brasileira das Indústrias de Óleos Vegetais)
ABIP – Brazilian Association of the Bakery and Confectionery Industry (*Associação Brasileira da Indústria de Panificação e Confeitaria*)
ABIQUIM – Brazilian Chemical Industry Association (*Associação Brasileira da Indústria Química*)
Abn Amro Real - Algemene Bank Nederland; Amsterdam-Rotterdam Bank (*Banco Geral dos Países Baixos*)
ABNT - Brazilian Association of Technical Standards (*Associação Brasileira de Normas Técnicas*)
ABPC – Brazilian Lime Producers Association (*Associação Brasileira dos Produtores de Cal*)
ABRABE – Brazilian Association of Beverages (*Associação Brasileira de Bebidas*)
ABRAFE - Brazilian Association for Iron-Alloys Producers (*Associação Brasileira dos Produtores de Ferroligas e de Silício Metálico*)
ABRASCO – Brazilian Graduate Association for Collective Health (*Associação Brasileira de Pós-Graduação em Saúde Coletiva*)
ABRELPE - Brazilian Association of Public Cleaning and Special Waste Companies (*Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais*)
AC – state of Acre
ACSYS - Arctic Climate System Study *(Estudo do Sistema do Clima Ártico)*
AEG - applied intersectoral overall balance model
AIA – Environmental Impact Assessment/EIA (*Avaliação de Impacto Ambiental*)
AIACC - Assessment of Impacts and Adaptation to Climate Change *(Avalição de Impactos e Adaptação à Mudança do Clima)*
AIDS - Acquired Immune Deficiency Syndrome *(Síndrome da Imunodeficiência Adquirida)*
AL – state of Alagoas
Al_2O_3 - alumina or aluminium oxide
ALADI – Latin American Integration Association *(Associação Latino-Americana de Integração)*
ALALC – Latin American Free Trade Association *(Associação Latino-Americana de Livre Comércio)*
Albras – Brazilian Aluminum (*Alumínio Brasileiro S.A*)
Alumar – Aluminum Consorcium of the state of Maranhão (*Consórcio de Alumínio do Maranhão*)
AM - Amanã Sustained Development Reserve
AM – state of Amazonas
AMC - Atmospheric Mesoscale Campaign
AMS – Medical-Health Assistance Survey (*Assitência Médico Sanitarista*)
ANA – National Waters Agency (*Agência Nacional de Águas*)
ANAC - National Civil Aviation Agency (*Agência Nacional de Aviação Civil*)
ANAMMA - National Association of Municipalities and Environment (*Associação Nacional de Municípios e Meio Ambiente*)
ANEEL – National Electrical Energy Agency (*Agência Nacional de Energia Elétrica*)
Anfavea – National Association of Motor Vehicle Manufacturers (*Associação Nacional de Fabricantes de Veículos Automotores*)
ANP - National Agency of Petroleum, Natural Gas and Biofuels (*Agência Nacional do Petróleo, Gás e Biocombustíveis*)
ANTAQ – National Water Transport Agency (*Agência Nacional de Transportes Aquaviários*)
ANTP - National Public Transport Association (*Associação Nacional de Transportes Públicos)*
ANTT - National Ground Transport Agency (*Agência Nacional de Transportes Terrestres*)
AP – state of Amapá

APAs – Environmental Protection Areas (*Áreas de Proteção Ambiental*)
AR4 – IPCC Fourth Assessment Report
Arebop – National Association of Tire and Rubber Artifact Recycling Companies (*Associação Nacional das Empresas de Reciclagem de Pneus e Artefatos de Borrachas*)
ARGOS - Advanced Research and Global Observation Satellite (*Satélite de Pesquisa Avançada e Observação Global*)
ARIEs – Areas of Relevant Ecological Interest (*Áreas de Relevante Interesse Ecológico*)
ARPA – Amazon Region Protected Areas (*Áreas Protegidas da Região Amazônica*)
ASTM - American Society for Testing Materials (*Sociedade Americana para Ensaio de Materiais*)
Atlas - Autonomous Temperature Line Aquisition System
B2 – Biodiesel 2% (concentration)
B5 – Biodiesel 5% (concentration)
B100 – Pure biodiesel
BA – state of Bahia
BAMS - Bulletin of the American Meteorological Society (*Boletim da Sociedade Americana de Meteorologia*)
BANIF – Funchal International Bank (*Banco Internacional do Funchal*)
BASA – Bank of Amazônia (*Banco da Amazônia S.A.)*
BB – Bank of Brazil (*Banco do Brasil S.A.*)
bbl – barrel of oil (*barril de petróleo*)
BCCF - Brazilian Climate Change Forum
BEN – National Energy Balance (*Balanço Energético Nacional*)
bep – barrel of oil equivalent (*barril equivalente de petróleo*)
BEU – Useful Energy Balance (*Balanço de Energia Útil*)
BHC – Breast Height Circumference
BIG - Generation Information Database (*Banco de Informações de Geração*)
BIG-GT - Biomass Integrated Gasification - Gas Turbine (*Gaseificação Integrada de Biomassa - Turbina a Gás*)
BM – World Bank (*Banco Mundial*)
BM&F – Brazilian Mercantile & Futures Exchange (*Bolsa de Mercadorias & Futuros*)
BNB – Bank of the Northeast of Brazil (*Banco do Nordeste do Brasil S. A.*)
BNDES – Brazilian Development Bank (*Banco Nacional de Desenvolvimento Econômico e Social*)
BOD - biochemical oxygen demand (*demanda bioquímica de oxigênio*)
Bovespa – São Paulo Stock Exchange (*Bolsa de Valores de São Paulo*)
BPCC – Brazilian Panel on Climate Change
BR – Brazil
BRACELPA – Brazilian Association of Pulp and Paper (*Associação Brasileira de Celulose e Papel*)
Bradesco – a Brazilian Bank (*Banco Brasileiro de Descontos*)
BRAMS - Brazilian Regional Atmospheric Modelling System (*Sistema Brasileiro de Modelagem Atmosférica Regional*)
BTU - British Thermal Unit (*Unidade térmica Britânica*)
C – carbon
C_2F_6 – hexafluoroethane
C40 – Group of large cities in the world committed to combat climate change (*Grupo de grandes cidades mundiais comprometidas a combater a mudança do clima*)
CaC_2 - calcium carbide (*carbureto de cálcio*)
$CaCO_3$ – calcium carbonate (*carbonato de cálcio*)
CAF – Andean Promotion Corporation (*Corporação Andina de Fomento)*
CAN – Andean Community (*Comunidade Andina)*
CANAMBRA - Consortium of Canadian, American and Brazilian consultants (*Consórcio de Consultores Canadenses, Norte-americanos e Brasileiros*)
$Ca(OH)_2$ – hydrated lime
CAPES – Coordinating Foundation of Personnel Improvement for Higher Education (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*)
CAR - Rural Environmental Registry (*Cadastramento Ambiental Rural*)
CARBONCYCLE - Brazilian-European Study of the Carbon Cycle of Amazônia
CATHALAC - Water Center for the Humid Tropics of Latin America and The Caribbean *(Centro del Agua del Trópico Húmedo para América Latina y el Caribe)*
CATIE – Tropical Agricultural Research and Higher Education (*Centro Agronômico Tropical de Investigación y Enseñanza*)
CATT - Coupled Aerosol and Tracer Transport model
CBA – Aluminum Brazilian Company (*Companhia Brasileira de Alumínio*)
CBD – circumference at breast height
CBERS - China-Brazil Earth Resources Satellite
cc – cubic centimeter
CC – Scientific Committee (*Comitê Científico*)
CCC – Fuel Consumption Bill (*Conta de Consumo de Combustíveis*)
CCD - charge-coupled device
CCD - INPE CBERS satellites
CCIR - Rural Property Registry Certificate (*Certificado de Cadastro de Imóvel Rural*)
CC-LBA – Large Scale Biosphere-Atmosphere Program in the Amazon Scientific Committee (*Comitê Científico do LBA)*
CCP - Cities for Climate Protection (*Cidades pela Proteção do Clima*)
CCS - Carbon Capture and Storage (*Captura e armazenamento de carbono*)
CCST – Earth System Science Center (*Centro de Ciência do Sistema Terrestre*)
CDB – Bank Deposit Certificate (*Certificado de Depósito Bancário*)
CDE – Energy Development Bill (*Conta de Desenvolvimento Energético*)

CDM - Clean Development Mechanism
CE – state of Ceará
CEBDS - Brazilian Business Council of Sustainable Development (*Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável*)
CEF – a Brazilian Bank (*Caixa Econômica Federal*)
CEFET – Federal Centers of Technological Education (*Centro Federal de Educação Tecnológica)*
CEMIG – Minas Gerais Electrical Utility (*Centrais Elétricas de Minas Gerais*)
CEMPRE – Business Commitment for Recycling (*Compromisso Empresarial para a Reciclagem*)
CENAL - National Executive Commission on Alcohol (*Comissão Nacional do Álcool*)
CENBIO – Reference Center on Biomass (*Centro de Referência em Biomassa*)
CENPES – Petrobras' Leopoldo Américo Miguez Research and Development Center (*Centro de Pesquisas e Desenvolvimento Leopoldo Américo Miguez*)
CEPAC – Thematic Network for Sequestering Carbon and Climate Change and set up the Carbon Storage Research Center (*Centro de Pesquisas sobre Armazenamento do Carbono)*
CEPED – Center for Research and Development (*Centro de Pesquisas e Desenvolvimento)*
CEPEL – Center for Electrical Energy Research (*Centro de Pesquisas de Energia Elétrica*)
CERPCH – Reference Center on Small Hydroelectric Plants (*Centro de Referência em Pequenas Centrais Hidrelétricas*)
CERs - Certified Emission Reductions
CESP – São Paulo Electrical Company (*Companhia Energética de São Paulo*)
CET - Common External Tariff
CET - Traffic Engineering Company (*Companhia de Engenharia de Tráfego*)
CETESB – Environmental Sanitation Technology Company of the state of São Paulo (*Companhia de Tecnologia de Saneamento Ambiental do Estado de São Paulo*)
CF_4 – tetrafluormethane
CFCs – chlorofluorocarbons
CFE – Final Energy Consumption (*Consumo Final de Energia*)
CFL - compact fluorescent lamp
CGEE – Center for Strategic Studies and Management in Science, Technology and Innovation (*Centro de Gestão e Estudos Estratégicos*)
CGMC – General Coordination on Global Climate Change (*Coordenação Geral de Mudanças Globais de Clima*)
CH_4 – methane
CHO – aldehydes
CI – Conservation International (*Conservação Internacional*)
CICE - Internal Committee for Energy Conservation (*Comitê Interno de Conservação de Energia*)
CIDE – Contribution for Intervention in the Economic Domain (*Contribuição de Intervenção no Domínio Econômico*)
CIDES – Interministerial Comission on Sustainable Development (*Comissão Interministerial para o Desenvolvimento Sustentável)*
CIIFEN – International Research Center on the *El Niño* Phenomenon *(Centro Internacional para la Investigación del Fenómeno de El Niño – Centro Internacional para a Investigação do Fenômeno El Niño*)
CIM – Interministerial Committee on Climate Change (*Comitê Interministerial de Mudança Global do Clima*)
CIMA – Interministerial Sugar and Alcohol Council (*Conselho Interministerial do Açúcar e do Álcool*)
CIMGC – Interministerial Commission on Global Climate Change (*Comissão Interministerial de Mudança Global do Clima)*
CIRM – Interministerial Commission for Sea Resources (*Comissão Interministerial para os Recursos do Mar*)
CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora (*Convenção sobre o Comércio Internacional de Espécies Ameaçadas da Fauna selvagem e Flora*)
CLAIRE - Cooperative LBA Airborne Regional Experiment
CLIMAPEST – Global Climate Change Impacts on Phytosanitary Problems (*Impactos das Mudanças Climáticas Globais sobre Problemas Fitossanitários*)
Climate Network - Brazilian Research Network on Global Climate Change (*Rede Brasileira de Pesquisas sobre Mudanças Climáticas Globais – Rede Clima*)
CLIVAR - Research Program on Climate Variability and Predicability for 21st Century – (*Programa de Pesquisa sobre Variabilidade e Previsibilidade Climática para o Século 21*)
cm - centimeter
CMN – National Monetary Council (*Conselho Monetário Nacional*)
CMP - Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol – (*Conferênica das Partes na qualidade de Reunião das Partes no Protocolo de Quioto*)
CNAL – National Alcohol Council (*Conselho Nacional do Álcool*)
CNEN - National Nuclear Power Commission (*Comissão Nacional de Energia Nuclear*)
CNFP - National Registry of Public Forests (*Cadastro Nacional de Florestas Públicas*)
CNIJMA – National Conference on Children and Youth for the Environment (*Conferência Nacional Infanto-juvenil pelo Meio Ambiente*)
CNMA – National Conference on the Environment (*Conferência Nacional de Meio Ambiente*)
CNP – National Petroleum Council (*Conselho Nacional do Petróleo*)
CNPE - National Energy Policy Council (*Conselho Nacional de Política Energética*)
CNPE – National Committee on Energy Policy (*Conselho Nacional de Política Energética*)

CNPq – Council of Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico*)
CNT - National Transport Confederation (*Confederação Nacional do Transporte*)
CO – carbon monoxide
CO_2 – carbon dioxide
CO_2e - CO_2 equivalent
COELBA – Bahia Electrical Company (*Companhia Elétrica da Bahia*)
COELCE – Ceará Electrical Company (*Companhia Elétrica do Ceará*)
COFA – Amazon Fund Steering Committee (*Comitê Orientador do Fundo Amazônia*)
Cofins – Tax for Social Security Financing (*Contribuição para o Financiamento da Seguridade Social*)
COGEN – Energy Co-generation Industry Association (*Associação da Indústria de Cogeração de Energia*)
COIAB – Coordination of Indigenous Organizations of the Brazilian Amazon (*Coordenação das Organizações Indígenas da Amazônia Brasileira*)
Comar – Metropolitan Clean Air Committee (*Comitê Metropolitano do Ar Limpo*)
Comgas – São Paulo Gas Company (*Companhia de Gás de São Paulo*)
CONAB – National Supply Company (*Companhia Nacional de Abastecimento*)
CONAMA – National Environmental Council (*Conselho Nacional de Meio Ambiente*)
Conapa – National Committee on Antartic Research (Comitê Nacional de Pesquisas Antárticas)
Confea – Federal Council of Engineering, Architecture and Agronomy (*Conselho Federal de Engenharia, Arquitetura e Agronomia*)
CONPET – National Program on the Rationalization of the Use of Oil and Natural Gas Products (*Programa Nacional da Racionalização do Uso dos Derivados do Petróleo e do Gás Natural*)
CONSERVE – Program for the Efficient Use of Energy (*Programa de Uso Eficiente da Energia*)
CONTRAN – National Traffic Council (*Conselho Nacional de Trânsito)*
COP - Conference of the Parties (*Conferência das Partes da Convenção-Quadro das Nações Unidas sobre Mudança do Clima*)
COPEL – Paraná Electrical Company (Companhia Elétrica do Paraná)
Copersucar – Sugarcane, Sugar and Alcohol Producers Cooperative of the State of São Paulo (*Cooperativa dos Produtores de Cana, Açúcar e Álcool do Estado de São Paulo*)
COPPE/UFRJ – Alberto Luiz Coimbra Institute of Graduate Studies and Research in Engineering at the Federal University of Rio de Janeiro (*Instituto Alberto Luiz Coimbra de Pós-Graduação e Pesquisa em Engenharia - UFRJ*)
COPPETEC – Project Coordination, Research and Technological Studies (*Coordenação de Projetos, Pesquisas e Estudos Tecnológicos*)
COr – revised carbon monoxide (*monóxido de carbono corrigido*)
CORINAIR – Core Inventory of Air Emissions
CP - Conference of the Parties (*Conferência das Partes*)
CPC – Polar and Climate Center (*Centro Polar e Climático*)
CPDS - Commission on Sustainable Development Policies and the National Agenda 21 (*Comissão de Políticas de Desenvolvimento Sustentável da Agenda 21 Nacional*)
CPFL – São Paulo Power and Light Company (*Companhia Paulista de Força e Luz*)
CPLP – Community of Portuguese-Speaking Countries (*Comunidade de Países de Língua Portuguesa*)
CPTEC – Center for Weather Forecasting and Climate Studies (*Centro de Previsão do Tempo e Estudos Climáticos*)
CREA - Regional Council of Engineering, Architecture and Agronomy (*Conselho Regional de Engenharia, Arquitetura e Agronomia*)
CRESESB – Reference Center on Solar and Wind Energy (*Centro de Referência em Energia Solar e Eólica*)
CRN - Collaborative Research Network Program (*Rede Colaborativa de Pesquisa*)
CSI - Cement Sustainability Initiative
CSIR - Council for Scientific and Industrial Research (*Conselho para a Pesquisa Científica e Industrial*)
CSP - Concentrated Solar Power – (*Energia Solar Concentrada*)
CTA - Technical Aerospace Center (*Centro Técnico Aeroespacial*)
CTB - Brazilian Traffic Code (*Código de Trânsito Brasileiro*)
CTBE – Center for Bioethanol Science and Technology (*Centro de Ciência e Tecnologia do Bioetanol*)
CTC – Center of Sugarcane Technology (*Centro de Tecnologia Copersucar*)
CTFA – Amazon Fund Technical Committee (*Comitê Técnico do Fundo Amazônia*)
CTL - Coal-to-liquid
CT-Petro - Oil and Natural Gas Sector Fund (*Fundo Setorial de Petróleo e Gás Natural*)
CVI - Climatic Vulnerability Index
CW - Curb Weight
d – day
DBH – diameter at breast height
DBMS - Database Management Systems
DEA - diethanolamine
Degrad - Mapping of forest degradation in the Brazilian Amazon (*Mapeamento de Áreas Degradadas*)
DEPV – Airforce's Department of Air Space Control (*Departamento de Controle do Espaço Aéreo*)
DETER – Real Time Deforestation Detection System (Sistema de Detecção de Desmatamento em Tempo Real)

DETEX – Mapping Project of Selective Logging Activities (*Projeto de Mapeamento de Ocorrências de Exploração Seletiva de Madeira*)
DETRAN – State Transit Department (*Departamento Estadual de Trânsito*)
DF – Federal District (*Distrito Federal*)
DHN – Navy's Directorate of Hydrography and Navigation
DIS - Data and Information Sytem (*Sistema de Dados e Informações*)
DMC - Disaster Monitoring Constellation satellites
DNA - Designated National Authority
DNAEE – National Department of Waters and Electrical Energy (*Departamento Nacional de Águas e Energia Elétrica*)
DNPM – National Department of Mineral Production (*Departamento Nacional de Produção Mineral*)
DOE - Designated Operational Entity
DPA – Political/Administrative Division of Brazil (*Divisão Político-Administrativa do Brasil*)
DVI - Desertification Vulnerability Index
DSS – decision support system
e&e – Economy and Energy (*Economia e Energia*)
E&P – Exploitation and Production (Exploração e Produção)
E.L.R. - European Load Response Cycle (*Ciclo Europeu de Resposta em Carga*)
E.S.C - European Stationary Cycle (*Ciclo Europeu em Regime Constante*)
E.T.C. - European Transient Cycle (*Ciclo Europeu em Regime Transiente*)
E22 - 22% ethanol and 78% gasoline
EAP - Economically Active Population
EC – European Community
ECLAC - Economic Commission for Latin America and the Caribbean (*Comissão Econômica para América Latina e Caribe*)
ECMWF - European Centre for Medium-Range Weather Forecasts
ECO – LBA-ECO Module (*Módulo LBA-ECO*)
EIA – Environmental Impact Assessment (*Estudo de Impacto Ambiental*)
EIRD – International Disaster Reduction Strategy (*Estratégia Internacional de Redução de Desastres*)
EJA – Teen and Adult Education (*Educação de Jovens e Adultos*)
ELETROBRAS – Brazil's Electrical Utility (*Centrais Elétricas do Brasil S.A.*)
ELETRONORTE – Electrical Utility of the North of Brazil (*Centrais Elétricas do Norte do Brasil S.A.*)
Eletronuclear - Eletrobras Termonuclear S.A.
ELETROPAULO – São Paulo Electricity S.A. (*Eletricidade de São Paulo S.A.*)
EMBC - Economy of Climate Change in Brazil (*Economia da Mudança do Clima no Brasil*)
EMBRAPA – Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuári*a)
EMTU/SP - São Paulo Metropolitan Urban Transport Company (*Empresa Metropolitana de Transporte Urbano de São Paulo*)
ENSO - El Niño Southern Oscilation (*El Niño Oscilação Sul/ ENOS*)
EOD – Designated Operational Entity/DOE (*Entidade Operacional Designada*)
EPAGRI – Santa Catarina Agriculture Research and Rural Extension Company (*Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina*)
EPE – Energy Research Company (*Empresa de Pesquisa Energética*)
EPS – expandable polystyrene foam
ES – state of Espírito Santo
ESCO's - Energy Saving Companies (*Empresas de Serviços de Conservação de Energia*)
EsEc – Ecological Stations (*Estações Ecológicas*)
ESF - Family Health Strategy (*Estratégia Saúde da Família*)
ESSP - Earth System Science Partnership (*Parceria do Sistema de Ciências da Terra*)
ETA – η (greek letter)
Ethanol E100 - 100% Hydrated Ethanol
EU – European Union
EUSTACH - European Studies on Trace Gases and Atmospheric Chemistry
EVAP - Evaporative Emission Control
FAB – Brazilian Air Force (*Força Aérea Brasileira*)
FAO - Food and Agriculture Organisation (*Organização das Nações Unidas para a Agricultura e a Alimentação*)
FAPERJ – Rio de Janeiro Research Foundation (*Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro*)
FAPESP – São Paulo Research Foundation (*Fundação de Amparo à Pesquisa do Estado de São Paulo*)
FAPESPA – Pará Research Foundation (*Fundação de Amparo à Pesquisa do Estado do Pará*)
FAPEX – Foundation for Research and Extension Support (*Fundação de Apoio à Pesquisa e Extensão*)
FBDS – Brazilian Sustainable Development Foundation (*Fundação Brasileira para o Desenvolvimento Sustentável*)
FBMC - Brazilian Forum on Climate Change (*Fórum Brasileiro de Mudanças Climáticas*)
FBOMS - Brazilian Forum of NGOs and Social Movements for the Environment and the Development (*Fórum Brasileiro de ONG's e Movimentos Sociais*)
FBPN – "O Boticário" Nature Protection Foundation (*Fundação O Boticário de Proteção à Natureza*)
FCCC - Framework Convention on Climate Change (*Convenção-Quadro sobre Mudança do Clima*)
FEALQ – Luiz de Queiroz Agrarian Studies Foundation (*Fundação de Estudos Agrários Luiz de Queiroz*)
Febraban – Brazil's Federation of Banks (*Federação Brasileira de Bancos*)

FEEMA - State Environmental Engineering Foundation (*Fundação Estadual de Engenharia do Meio Ambiente*)
Fetranspor – Urban Passenger Transportation Federation of the state of Rio de Janeiro (*Federação de Transportes de Passageiros Urbanos do Estado do Rio de Janeiro*)
FGV/SP – Getulio Vargas Foundation/Sao Paulo (*Fundação Getulio Vargas/São Paulo*)
FIESP - Federation of Industries of the State of São Paulo (*Federação das Indústrias do Estado de Sao Paulo)*
FIFA - Fédération Internationale de Football Association (*Federação Internacional de Futebol*)
FINEP - Financing Agency for Studies and Projects (*Financiadora de Estudos e Projetos*)
FIOCRUZ – Oswaldo Cruz Foundation (*Fundação Oswaldo Cruz*)
Flonas – National Forests (*Florestas Nacionais*)
FNDE – National Fund for the Development of Education (*Fundo Nacional de Desenvolvimento da Educação*)
FNDF - National Fund for Forest Development (*Fundo Nacional de Desenvolvimento Florestal*)
FNMA – National Environment Fund (*Fundo Nacional do Meio Ambiente*)
FNMC – National Fund for Climate Change (*Fundo Nacional sobre Mudança do Clima*)
FOB - Free on Board (*Livre a Bordo*)
FPSO - Floating Production Storage and Offloading
Funai – National Indian Foundation (*Fundação Nacional do Índio*)
Funasa - National Health Foundation (*Fundação Nacional de Saúde*)
Funatura - Pro–Nature Foundation (*Fundação Pró-Natureza*)
Funbio - Brazilian Biodiversity Fund (*Fundo Brasileiro para a Biodiversidade*)
Funcate – Foundation for Space Science, Technology and Applications (*Fundação de Ciência, Aplicações e Tecnologia Espaciais*)
FUNCEME – Cearense Meteorology Foundation (*Fundação Cearense de Meteorologia)*
Fundo InfraBrasil – Fund for investment in infrastructure with an environmental management system (*Fundo de investimento em infra-estrutura com sistema de gestão ambiental*)
FURNAS – Furnas Electrical Utility (*Furnas Centrais Elétricas S.A.*)
g – gram
G7 – Group of the Seven
G77 – Group of Seventy-seven
GAIM - Global Analysis, Integration and Modelling (*Análise Global, Interpretação e Modelagem*)
Gasoline E22 - Gasoline mixed with 22% of ethanol
GCD - greatest common divisor
GCE – Electrical Energy Crisis Management Chamber (*Câmara de Gestão da Crise de Energia Elétrica*)
GCM - General Circulation Models (*modelos de circulação geral*)
GCOS - Global Climate Observing System (*Sistema Mundial de Observação do Clima*)
GCTE – Global Change and Terrestrial Ecosystems (*Mudança Global e Ecossistemas Terrestres*)
GDP – Gross Domestic Product
GDP/Capita – Gross Domestic Product *per capita*
GEF - Global Environment Facility (*Fundo Global para o Meio Ambiente*)
GESis - Strategic Management of Agribusiness Systems (*Gestão Estratégica de Sistemas Agroindustriais*)
GEWEX - Global Energy and Water Cycle Experiment (*Experimento dos Ciclos Globais de Água e Energia*)
GEx – Executive Group on Climate Change (*Grupo Executivo sobre Mudança do Clima*)
Gg – gigagram (10^9 g or a thousand tonnes)
GHG - greenhouse gas
GISS - Goddard Institute for Space Studies (*Instituto Goddard de Estudos Espaciais*)
Gj – Gigajoule
GNP – Gross National Product
GO – state of Goiás
GOALS – Global Ocean-Atmosphere-Land System (*Sistema Global Oceano-Terra-Atmosfera*)
GOES - Geostationary Operational Environmental Satellite
GOF-UK – British Government
GOOS - Global Ocean Observing System (*Sistema de Observação Oceânica Global*)
GPC - Global Producing Center (*Centro Produtor Global*)
GPM - Global Precipitation Measurement (*Mensuração de Precipitação*)
GPMC - Climate Change Research Group (*Grupo de Pesquisa em Mudanças Climáticas*)
GT – Working Group (*Grupo de Trabalho*)
GTA – Amazonian Working Group (*Grupo de Trabalho Amazônico*)
GTI - Interministerial Work Group (*Grupo de Trabalho Interministerial*)
GTL - Gas-to-Liquid
GTP - Global Temperature Potential
GTZ - German Agency for Technical Cooperation (*Deutsche Gesellschaft für Technische Zusammenarbeit*)
GW – gigawatt
GWh – gigawatt hour
GWP - Global Warming Potential (*Potencial de Aquecimento Global*)
GWSP - Global Water System Project (*Projeto sobre o Sistema Global da Água*)
h – hour
H_2SO_4 - sulphuric acid (*ácido sulfúrico*)
ha – hectare

HadCM3 - Hadley Centre Global Model (*Modelo global do Hadley Center*)
H-Bio – Petrobras Technology for the Production of Renewable Diesel (*Tecnologia Petrobrás para Produção de Óleo Diesel Renovável*)
HC – hydrocarbons
HCFC – hydrochlorofluorocarbon
HCFC-22 – hydrochlorofluorocarbon-22
HDI - Human Development Index
HDT - Hydrotreatment Units (*Unidades de Hidrotratamento*)
HEAT - Harmonized Emissions Assessment Tool
HFC-134a - hydrofluorocarbon-134a
HFC-23 – hydrofluorocarbon-23
HFCs – hydrofluorocarbons
HNO_3 - nitric acid (*ácido nítrico*)
HRC - High Resolution Camera
HS – Southern Hemisphere (*Hemisféro Sul*)
HSBC - Hong Kong and Shangai Banking Corporation (*Corporação Bancária de Hong Kong e Xangai*)
HVI - Health Vulnerability Index
I/M – Inspection and Maintenance Program for Vehicles in Use (*Inspeção e Manutenção de Veículos*)
IABr – Brazilian Steel Institute (*Instituto Aço Brasil*)
IAC - Agronomy Institute of Campinas (*Instituto Agronômico de Campinas*)
IAEA - International Atomic Energy Agency
IAG – Institute of Astronomy, Geophysics and Atmospheric Sciences (*Instituto de Astronomia, Geofísica e Ciências Atmosféricas*)
IAI – Inter-American Institute for Global Change Research (*Instituto Interamericano para Pesquisas em Mudanças Globais*)
IAP - Independent Autonomous Producers
IAPAR – Agricultural Research Institute of the state of Paraná (*Instituto Agronômico do Paraná*)
IBAMA – Brazilian Institute for the Environment and Renewable Nature Resources (*Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis*)
IBAS – India, Brazil and South Africa/ IBSA (*Índia, Brasil e África do Sul*)
IBDF – Brazilian Institute for Forestry Development (*Instituto Brasileiro de Desenvolvimento Florestal*)
IBGE – Brazilian Institute for Geography and Statistics (*Fundação Instituto Brasileiro de Geografia e Estatística*)
IBIS - Integrated Biosphere Simulator
IBSA - India, Brazil and South Africa
ICLEI - International Council for Local Environmental Initiatives (*Conselho Internacional para as Iniciativas Ambientais Locais*)
ICMBio - Chico Mendes Institute on Biodiversity Conservation (*Instituto Chico Mendes de Conservação da Biodiversidade*)
ICMS – Value Added Tax on Sales and Services (*Imposto sobre Circulação de Mercadorias e Serviços*)
ICP – International Comparison Programme
ICSU – International Council of Scientific Unions
IDB – Brazilian Basic Data and Indicators (*Indicadores e Dados Básicos do Brasil*)
IDB - Inter-American Development Bank (*Banco Interamericano de Desenvolvimento*)
IDB/SUS - Single Health System Database (*Indicadores e Dados Básicos do Sistema Único de Saúde*)
IDH – Human Development Index/ HDI (*Índice de Desenvolvimento Humano*)
IEA - International Energy Agency (*Agência Internacional de Energia*)
IEA/USP – Institute for Advanced Studies of the University of São Paulo (*Instituto de Estudos Avançados da Universidade de São Paulo*)
IES – Institutions of Higher Education (*Instituições de Ensino Superior*)
IFC - International Finance Corporation (*Coorporação Financeira Internacional*)
IGAC - International Global Atmospheric Chemistry (*Química Atmosférica Global Internacional*)
IGBP - International Geosphere-Biosphere Programme
IGCC - Integrated Gasification Combined Cycle
inhab. – inhabitants
ILAFA –Latin American Institute of Iron and Steel (*Instituto Latinoamericano del Fierro y el Acero*)
IMAZON – Amazon Human and Environmental Institute (*Instituto do Homem e Meio Ambiente da Amazônia*)
INB - Nuclear Industries of Brazil (*Indústrias Nucleares do Brasil*)
INCRA – National Institute of Colonization and Agrarian Reform (*Instituto Nacional de Colonização e Reforma Agrária*)
INCT – National Institute of Science and Technology (*Instituto Nacional de Ciência e Tecnologia*)
INEA - State Institute for the Environment (*Instituto Estadual do Ambiente*)
INEP – Anísio Teixeira National Institute of Educational Studies and Research (*Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira*)
INLAND - Integrated Land Model (*Modelo componente de superfície*)
INMET – National Institute of Meteorology (*Instituto Nacional de Meteorologia*)
Inmetro - National Institute of Metrology, Standardization and Industrial Quality (*Instituto Nacional de Metrologia, Normalização e Qualidade Industrial*)
INPA – National Institute for Research in Amazonia (*Instituto Nacional de Pesquisa na Amazônia*)
INPE – National Institute on Space Research (*Instituto Nacional de Pesquisas Espaciais*)
IOS – South Oscillation Index (*Índice de Oscilação Sul*)
IOUSP – Oceanographic Institute of the University of São Paulo (*Instituto Oceanográfico da Universidade de São Paulo*)

IPAM – Amazon Environmental Research Institute (*Instituto de Pesquisa Ambiental da Amazônia*)
IPCC - Intergovernmental Panel on Climate Change
IPEA – Institute for Applied Economic Research (*Instituto de Pesquisa Econômica Aplicada*)
IPEN - Institute of Energy and Nuclear Research (*Instituto de Pesquisas Energéticas e Nucleares*)
IPI – Tax on Industrialized Products (*Imposto sobre Produtos Industrializados*)
IQE – Municipal Index on Educational Quality (*Índice Municipal de Qualidade Educacional*)
IQM - Municipal Index on Environmental Quality (*Índice Municipal de Qualidade do Meio Ambiente*)
IQS - Municipal Index on Health Quality (*Índice Municipal de Qualidade da Saúde*)
IRD - French Research Institute for Development *(Institut de recherche pour le développement)*
ISA – Socio-Environmental Institute (*Instituto Sócio Ambiental*)
ISE – Business Sustainability Index (*Índice de Sustentabilidade Empresarial*)
ITCZ - Intertropical Convergence Zone
ITR – Rural Property Tax (*Imposto Territorial Rural*)
IVC – Climate Vulnerability Index (*Índice de Vulnerabilidade Climática*)
IVD – Desertification Index (*Índice de Desertificação*)
IVED – Econono-Demographic Vulnerability Index (*Índice de Vulnerabilidade Econômico-Demográfico*)
IVG – General Vulnerability Index (*Índice de Vulnerabilidade Geral*)
IVS – Health Vulnerability Index (*Índice de Vulnerabilidade de Saúde*)
IVSE – Socioeconomic Vulnerability Index/SEVI (*Índice de Vulnerabilidade Socioeconômica*)
JBIC - Japan Bank for International Cooperation (*Banco Japonês para Cooperação Internacional*)
JMA - Japan Meteorological Agency (*Agência Meteorológica Japonesa*)
kcal – kilocalorie
KfW - German Bank for Reconstruction and Development (*Kreditanstalt für Wiederaufbau*)
kg – kilogram
km – kilometer
km^2 – square kilometers
kmLC – kilometer of coast line (*quilômetro de linha de costa*)
kW – kilowatt
kWh – kilowatt-hour
kWp – kilowatt-peak
KWU - Kraftwerk Union A.G.
l. or L. – liter
LAMEPE – Pernambuco Meteorology Laboratory (*Laboratório de Meteorologia de Pernambuco*)
LANDSAT – Land Remote Sensing Satellite
lb - pound
LBA – Large Scale Biosphere-Atmosphere Experiment in Amazonia (*Programa de Grande Escala da Biosfera-Atmosfera na Amazônia*)
LC – coast line (*linha de costa*)
LDB - National Education Guidelines and Bases Law (*Lei de Diretrizes e Bases da Educação Nacional*)
LDCs - Least Developed Countries (*Países de Menor Desenvolvimento Relativo*)
LDPE - low-density polyethylene (*Polietileno de Baixa Densidade*)
LFC – compact fluorescent lamp (*lâmpadas fluorescentes compactas*)
LGN – liquefied natural gas (*líquido de gás natural*)
LHV - lower heating value
LLDPE - linear low-density polyethylene
LNG - liquefied natural gas
LPB - La Plata watershed (*Bacia do Prata*)
LPG - Liquefied Petroleum Gas
LVH - Loaded Vehicle Weight (*Massa do Veículo para Ensaio [= CW+136 kg]*)
LUCF - Land-use change and forestry
LULUCF – Land use, Land-use change and forestry
m – meter
M – million
m^2 – square meter
m^3 – cubic meter
MA – state of Maranhão
MAA – annual arithmetic average (*média aritmética anual*)
MAPA – Ministry of Agriculture, Livestock and Food Supply (*Ministério da Agricultura, Pecuária e Abastecimento*)
MBSCG – Brazilian Global Climate System Model (*Modelo Brasileiro do Sistema Climático Global*)
MCid – Ministry of Cities (*Ministério das Cidades*)
MCR – Regional Climate Model (*Modelo Climático Regional*)
MCT – Ministry of Science and Technology (*Ministério da Ciência e Tecnologia*)
MDA – Ministry of Agrarian Development (*Ministério do Desenvolvimento Agrário*)
mdc – greatest common divisor/gcd (*máximo divisor comum*)
MDIC – Ministry of Development, Industry and Foreign Trade (*Ministério do Desenvolvimento, Indústria e Comércio Exterior*)
MDG - Millenium Development Goal
MDL – Clean Development Mechanism/ CDM (*Mecanismo de Desenvolvimento Limpo*)
MDT – Digital Land Model (*Modelo Digital de Terreno*)
MEA – monoethanolamine
MEC – Ministry of Education (*Ministério da Educação*)
MERCOSUR - Southern Common Market (*Mercado Común del Sur*)

METEOSAT – Geostationary Meteorological Satellites operated by EUMETSAT (*Satélites Meteorológicos Geoestacionários Operados por EUMETSAT*)
MF – Ministry of Finance (*Ministério da Fazenda*)
mg – miligram
MG – state of Minas Gerais
MGA – annual geometric average (*média geométrica anual*)
$MgCO_3$ - magnesium carbonate
MI – Ministry of National Integration (*Ministério da Integração Nacional*)
MIC – Ministry of Industry and Commerce (*Ministério da Indústria e Comércio*)
MICT - Ministry of Industry, Commerce and Tourism (*Ministério da Indústria, do Comércio e do Turismo*)
MJ – megajoules
MJ – Ministry of Justice (*Ministério da Justiça*)
mm – millimeter
mm/day – millimeters per day (milímetros por dia)
MMA – Ministry of Environment (*Ministério do Meio Ambiente*)
MME – Ministry of Mines and Energy (*Ministério de Minas e Energia*)
MN - Natural Monuments (*Monumentos Naturais*)
MODIS - Moderate Resolution Imaging Spectroradiometer
MPEG – Emilio Goeldi Museum of Pará state (*Museo Paraense Emílio Goeldi*)
MPOG – Ministry of Planning, Budget and Management (*Ministério do Planejamento, Orçamento e Gestão*)
MRE – Ministry of Foreign Relations (*Ministério das Relações Exteriores*)
MS – dried matter (*matéria seca*)
MS – state of Mato Grosso do Sul
MT – state of Mato Grosso
MT – Ministry of Transportation (*Ministério dos Transportes*)
MVC - monomeric vinyl chloride (*cloreto de vinila*)
MW – megawatt
MWh – megawatt hour
N - nitrogen
N – North
n.a. - not available (*não disponível*)
nº - number
N_2O – nitrous oxide
Na_2CO_3 – neutral carbonate of soda or soda ash
Na_3AlF_6 – cryolite
NAE - Nucleus of Strategic Affairs of the Presidency of the Republic (*Núcleo de Assuntos Estratégicos da Presidência da República*)
NAMAs - Nationally Appropriate Mitigation Actions (*Ações de Mitigação Nacionalmente Apropriadas*)
NASA - National Aeronautics & Space Administration
NBR – Brazilian Norm (*Norma brasileira*)
NE – Northeast
NGO – Non-governmental organization
NGV - Natural Gas Vehicle
NH_3 – ammonia
Nm3 - normal cubic meter (metro cúbico normal)
NMVOC – Non-Methane Volatile Organic Compounds (*Compostos Orgânicos Voláteis Não Metânicos*)
NNW – North-northwest (*norte-noroeste*)
NO – nitrogen oxide (*óxido de nitrogênio*)
NO_2 - nitrogen dioxide (*dióxido de nitrogênio*)
NOAA - National Oceanic and Atmospheric Administration (*Administração Nacional Atmosférica e Oceânica dos EUA*)
NO_x – nitrogen oxides
Nuclen – Nuclebras Engineering (*Nuclebras Engenharia*)
NUCLEP – a Brazilian manufacturer of heavy components (*Nuclebras Equipamentos Pesados S.A.*)
NV - Normative Values
NW - Northwest
O_3 - ozone
ºC – Celsius degrees (*graus Celsius*)
ODM – Millenium Development Goal/ MDG (*Objetivo de Desenvolvimento do Milênio*)
OECD - Organisation for Economic Co-operation and Development (*Organização para Cooperação e Desenvolvimento Econômico*)
OEG - Government's Strategic Guidelines (*Orientações Estratégicas do Governo*)
OEMA – State and Municipal Environmental Agencies (*Órgãos Executivos Estaduais e Municipais de Meio Ambiente*)
OIE – Domestic Energy Supply (*Oferta Interna de Energia*)
OIEE – Domestic Electric Energy Supply (*Oferta Interna de Energia Elétrica*)
OMM – World Meteorological Organization/ WMO (*Organização Meteorológica Mundial*)
OMS – World Health Organization/ WHO (*Organização Mundial da Saúde*)
ONG – non-governmental organization/ NGO (*organização não-governamental*)
ONS – National Electrical System Operator (*Operador Nacional do Sistema*)
ONU – United Nations/UN (*Organização das Nações Unidas*)
OOCP - Oceans Observations Climate Panel
OVEG Project – National Program for Vegetable Oil Energy (*Programa Nacional de Energia de Óleos Vegetais*)
P & D – research and development/R & D (*Pesquisa e Desenvolvimento*)
P, D & I - research, development and innovation/ R, D & I (*pesquisa, desenvolvimento e inovação*)
P.E.A. – economically active population/EAP (*população economicamente ativa*)
PA – state of Pará
PA – Protected Area
PAC - Growth Acceleration Program (*Programa de Aceleração do Crescimento*)

PACD – Plan of Action to Combat Desertification (*Plano de Ação e Combate à Desertificação)*
PAGES - Past Global Changes (*Mudanças Globais Passadas*)
PAN-Brasil - National Action Program to Combat Desertification and Mitigate the Effects of Drought (*Programa Nacional de Combate à Desertificação e Mitigação dos Efeitos da Seca*)
PARNAs – National Parks (*Parques Nacionais*)
PB – lead
PB – state of Paraíba
PBE - Brazil's Labeling Program (*Programa Brasileiro de Etiquetagem)*
PBMC – Brazilian Panel on Climate Change (*Painel Brasileiro de Mudanças Climáticas*)
PCD – Data Collection Platform (*Plataforma de Coletas de Dados*)
PCH – small hydroelectric plant (*Pequena Central Hidrelétrica*)
PCPV – Vehicle Pollution Control Plans (*Planos de Controle da Poluição Veicular*)
PCS - higher calorie power (*poder calorífico superior)*
PD – Demonstration Projects (*Projetos Demonstrativos*)
PD/A – Type A Demonstration Projects (*Projetos Demonstrativos Tipo A*)
PD/I – Indigenous Demonstration Projects (*Projetos Demonstrativos Indígenas*)
PDE – Education Development Plan (*Plano de Desenvolvimento da Educação*)
PDEE – Expansion Decennial Plan for Electric Power Systems (*Plano Decenal de Expansão de Energia Elétrica*)
PE – state of Pernambuco
PEAD – polyethylene (*polietileno*)
PEBD – low-density polyethylene (*Polietileno de Baixa Densidade*)
PELBD - linear low-density polyethylene/ LLDPE (*Polietilenos lineares de baixa densidade*)
PEM - Proton Exchange Membrane (*Membrana para Troca de Prótons*)
PEMFC - Proton Exchange Fuel Cell (*Célula a Combustível tipo Membrana Condutora de Prótons*)
PER - perchloroethylene
PET – polyethylene terephthalate
PETROBRAS – Brazilian Petroleum S.A. (*Petróleo Brasileiro S.A.*)
PFC – perfluorocarbons
PFMCG – Program for Global Climate Change Research (*Programa da Fapesp de Pesquisas em Mudanças Climáticas Globais*
pH - potentia hydrogenii
PI – state of Piauí
PIA – Annual Industrial Research (*Pesquisa Industrial Anual)*
PIA – Independent Autonomous Producers (*Produtores Independentes Autônomos*)
PIB – Gross Domestic Product (*Produto Interno Bruto*)
PIB/Capita – Gross Domestic Product *per capita* (*Produto Interno Bruto per capita*)
PICE – Program for Integration and Economic Cooperation (*Programa de Integração e Cooperação Econômica*)
PIN - Program for National Integration (*Programa de Integração Nacional*)
PIRATA - Pilot Research Moored Array in the Tropical Atlantic (*Rede Piloto de Pesquisa no Atlântico Tropical*)
PIS – Social Integration Program Tax (*Programa de Integração Social*)
PLC - Population per Length of Coastline (*Comprimento da Linha da Costa*)
PM - particulate matter (*material particulado*)
PMEL - Pacific Marine Environmental Laboratory (*Laboratório Ambiental Marinho do Pacífico*)
PNA - Pacific North America (*América do Norte/Pacífico*)
PNAD – National Household Sample Survey (*Pesquisa Nacional por Amostra de Domicílios*)
PNE – National Energy Plan (*Plano Nacional de Energia*)
PNEA – National Environmental Education Policy (*Política Nacional de Educação Ambiental*)
PNGC – National Plan of Coastal Management (*Plano Nacional de Gerenciamento Costeiro*)
PNLT - National Logistics and Transportation Plan (*Plano Nacional de Logística de Transportes*)
PNMC - National Policy on Climate Change (*Política Nacional sobre Mudança do Clima*)
PNPB - National Biodiesel Production and Use Program (*Programa Nacional de Produção e Uso de Biodiesel*)
PNQA – National Air Quality Assessment Program (*Plano Nacional da Qualidade do Ar)*
PNSB – National Survey of Basic Sanitation Study (*Pesquisa Nacional de Saneamento Básico*)
PNUD – United Nations Development Programme/ UNDP (*Programa das Nações Unidas para o Desenvolvimento)*
PoA - Program of Activities
POAG – Plan for the Optimization of Natural Gas Use in the Campos Basin (*Plano de Otimização de Gás*)
Poloamazônia - Programs for Agriculture, Livestock and Agromineral Hubs in the Amazon (*Programas de Pólos Agropecuários e Agrominerais na Amazônia*)
PPA – Multi-Annual Plan (*Plano Plurianual*)
PPC – Purchasing Power Parity/ PPP (*Paridade de Poder de Compra*)
PPCDAM - Action Plan for the Prevention and Control of Deforestation in Legal Amazon (*Plano de Ação para a Prevenção e Controle do Desmatamento na Amazônia Legal*)
PPCerrado – Action Plan for the Prevention and Control of Deforestation and Burning in *Cerrado* (*Plano de Ação para a Prevenção e Controle do Desmatamento e das Queimadas no Cerrado*)

PPDC - Civil Defense Preventive Plan
PPG7 – Pilot Program for the Protection of Tropical Forests of Brazil (*Programa Piloto para a Proteção das Florestas Tropicais do Brasil*)
ppm – parts per million (*partes por milhão)*
ppmv – parts per million in volume (*partes por milhão em volume)*
PPP - Purchasing Power Parity
PPT – Priority Thermoelectric Generation Plan (*Plano Prioritário de Geração Termelétrica*)
PQZ - Zero Burning Project
PR – state of Paraná
PRECIS - Providing REgional Climates for Impacts Studies
PREVFOGO - National System for Preventing and Combating Forest Fires (*Sistema Nacional de Prevenção e Combate aos Incêndios Florestais*)
PRI - Principles for Responsible Investment (*Princípios do Investimento Responsável*)
Proalcool – National Alcohol Program (*Programa Nacional do Álcool*)
PROANTAR – Brazilian Antarctic Program (*Programa Antártico Brasileiro*)
Proarco – Program for the Prevention and Control of Burning and Forest Fires in the Arc of Deforestation (*Programa de Prevenção e Controle de Queimadas e Incêndios Florestais no Arco do Desflorestamento)*
PROBIO – Conservation and Sustainable Use of Biological Diversity Project (*Projeto de Conservação e Utilização Sustentável da Diversidade Biológica*)
PROBIOAMAZON – Program for Production of Biomass for Energy in INCRA Settlements in Amazonia, Clean Energy and Integrated Local Development (*Programa de Produção de Biomassa Energética em Assentamentos do Incra na Amazônia, Energia Limpa e Desenvolvimento Local Integrado*)
Pro-Biodiesel – Brazilian Biofuels Program (*Programa Brasileiro de Biocombustíveis*)
ProCaC - Brazilian Hydrogen and Fuel Cell Systems Program (*Programa Brasileiro de Hidrogênio e Sistemas de Células a Combustível)*
PROCEL – National Program of Electric Energy Conservation (*Programa Nacional de Conservação de Energia Elétrica*)
Proclima - Real Time Climatic Monitoring Program in the Northeast region (*Programa de Monitoramento Climático em Tempo Real da Região Nordeste*)
Proclima-SP – Global Climate Change Program of the State of São Paulo (*Programa Estadual de Mudanças Climáticas Globais de São Paulo*)
PROCONVE - Motor Vehicle Air Pollution Control Program (*Programa de Controle da Poluição do Ar por Veículos Automotores*)
PRODEEM – Program for State and Municipal Energy Development (*Programa de Desenvolvimento Energético de Estados e Municípios*)
PRODES - Project for Estimating Gross Deforestation of the Brazilian Amazon (*Projeto de Estimativa do Desflorestamento Bruto da Amazônia Brasileira*)
PROEÓLICA – Emergency Wind Energy Program (*Programa de Incentivo às Fontes Alternativas de Energia Elétrica*)
ProH_2 - Science, Technology and Innovation Program for Hydrogen Economy (*Programa de Ciência, Tecnologia e Inovação para a Economia do Hidrogênio*)
Proinfra - Incentive of Alternative Sources of Electric Energy (*Programa de Incentivo às Fontes Alternativas de Energia Elétrica*)
Promot - Program for Controlling Air Pollution from Motorcycles and Similar Vehicles (*Programa de Controle da Poluição do Ar por Motociclos e Veículos Similares)*
Pronacop - National Industrial Pollution Control Program (*Programa Nacional de Controle da Poluição Industrial*)
Pronaf - National Program for the Strengthening of Family Agriculture (*Programa Nacional de Agricultura Familiar)*
Pronar – National Air Quality Control Program (*Programa Nacional de Controle da Qualidade do Ar*)
Pronea – National Environmental Education Program (*Programa Nacional de Educação Ambiental*)
Pro-Renova – Structured Program to Support other Emerging Countries in the Area of Renewable Energies (*Programa Estruturado de Apoio aos demais Países em Desenvolvimento na Área de Energias Renováveis*)
Proterra - Program for Land Redistribution and Incentives for Agroindustry in the North and Northeast regions (*Programa de Redistribuição de Terras e Estímulos à Agroindústria do Norte e Nordeste*)
PROZON – Brazilian Program for the Elimination of Substances that Deplete the Ozone Layer (*Programa Brasileiro de Eliminação das Substâncias que Destroem a Camada de Ozônio*)
PTS – Total Suspended Particulates/TSP (*partículas totais em suspensão*)
PUC/MG – Pontifical Catholic University of Minas Gerais (*Pontifícia Universidade Católica de Minas Gerais*)
PY – Paraguay
R & D – research and development (*Pesquisa e Desenvolvimento*)
R$ - real (Brazilian national currency)
RAINFOR – Amazon Network of Forestry Inventories (Rede Amazônica de Inventários Florestais)
RAL – Mining Annual Report (Relatório Anual de Lavra)
RCCS - Renewable Carbon Capture and Storage (*Captura e armazenamento de carbono renovável*)
RCEs – Certified Emission Reductions/ CERs (*Redução Certificada de Emissões)*
RCM - Regional Climate Model (*Modelo Climático Regional*)
RD&I - research, development and innovation
REBIO – Biological Reserves (*Reservas Biológicas*)

REDD - Reduction of Emissions from Degradation and Deforestation (*Redução de Emissões de Degradação e Desmatamento*)
Rede Elo – Local Renewables Model Communities Network in Brazil (*Rede de Cidades e Comunidades Modelo em Energias Renováveis Locais no Brasil*)
RegCM3 – a regional climate model
Rejuma – Youth Network for Environment and Sustainability (*Rede da Juventude pelo Meio Ambiente e Sustentabilidade*)
RELAC – Portuguese-Speaking Network of Specialists in Climate Change (*Rede Lusofônica de Especialistas em Alterações Climáticas)*
Reluz - National Program for Efficient Public Lighting (*Programa Nacional de Iluminação Pública Eficiente*)
Res - reservoirs (managed area)
Resex - Extractivist Reserves (*Reservas Extrativistas*)
Reuni – Support Program for the Restructuring and Expansion of Federal Universities (*Programa de Apoio a Planos de Reestruturação e Expansão das Universidades Federais*)
ReViS - Wildlife Refuges (*Refúgios da Vida Silvestre*)
RGR – Global Reversion Reserve (*Reserva Global de Reversão*)
RIMA – Environmental Impact Report (*Relatório de Impacto do Meio Ambiente*)
Rio-92 – United Nations Conference on Environment and Development (*Conferência das Nações Unidas sobre Meio Ambiente e Desenvolvimento*)
RIOCC – Ibero-American Network on Climate Change (*Red Iberoamericana de Oficinas de Cambio Climático / Rede Iberoamericana de Mudança do Clima*)
RJ - state of Rio de Janeiro
RL – Legal Reserve (*Reserva Legal*)
RN – state of Rio Grande do Norte
RO – state of Rondônia
RPPN – Private Reserve of Natural Heritage (*Reserva Particular de Patrimônio Natural*)
RR – state of Roraima
RS – state of Rio Grande do Sul
RTF - Rain Forest Trust Fund (*Fundo Fiduciário para Florestas Tropicais*)
s – second
S – South
SACC – International Consortium for the Study of Oceanic Related Global and Climate Changes in South America (*Consórcio internacional para o estudo das mudanças globais dos oceanos e do clima na América do Sul*)
SACZ - South Atlantic Convergence Zone
SAE – Secretariat of Strategic Affairs (*Secretaria de Assuntos Estratégicos da Presidência da República*)
SAEMC - South American Emissions, Megacities and Climate (*Emissões, Megacidades e Clima da América do Sul*)
SBF - Brazilian Forest Service
SBI - Subsidiary Body for Implementation (*Órgão Subsidiário de Implementação*)
SBPC – Brazilian Society for the Progress of Science (*Sociedade Brasileira para o Progresso da Ciência*)
SBR - styrene-butadiene-rubber (*borracha de butadieno estireno*)
SBSTA - Subsidiary Body for Scientific and Technological Advice (*Órgão Subsidiário de Assessoramento Científico e Tecnológico da Convenção*)
SC – state of Santa Catarina
SC – connective systems (*sistemas conectivos*)
SCAF – Simulation of Future Agricultural Scenarios based on Regional Climate Change Projections (*Simulação de Cenários Agrícolas Futuros a partir de Projeções de Mudanças Climáticas Regionalizadas*)
SCAR - Scientific Committee on Antarctic Research (*Comitê Científico de Pesquisa Antártica*)
SCD – Data Collecting Satellite (*Satélite de Coleta de Dados*)
SCOPE - Scientific Committee on Problems of the Environment (*Comitê Científico sobre Problemas do Meio-Ambiente*)
SE – state of Sergipe
SE – Southeast
SECAD – Secretariat of Continuing Education Literacy, and Diversity (*Secretaria de Educação Continuada, Alfabetização e Diversidade*)
SECIRM – Secretary of the Interministerial Commission for Sea Resources (*Secretaria da Comissão Interministerial para os Recursos do Mar*)
SEMA – Special Environment Secretariat (*Secretaria Especial do Meio Ambiente*)
SENAC – National Service for Commercial Apprenticeship (*Serviço Nacional de Aprendizagem Comercial*)
SENAI – National Service for Industrial Apprenticeship (*Serviço Nacional de Aprendizagem Industrial*)
SEVI - Socioeconomic Vulnerability Index
SF_6 – sulfur hexafluoride
SFB - Brazilian Forest Service (*Serviço Florestal Brasileiro)*
SGBD – Database Management Systems/ DBMS (*Sistemas Gerenciadores de Bancos de Dados*)
SHP - Small Hydroelectric Plant
Si – silicon (*silício*)
SIDRA – IBGE's Automatic Recovery System of Aggregated Databases (*Sistema IBGE de Recuperação Automática*)
SIG – Geographic Information System/GIS (*Sistema de Informações Geográficas*)
SIGEA – Computerized System for Air Emissions Management (*Sistema Informatizado de Gestão de Emissões Atmosféricas*)
Silviminas - Silviculture Association of Minas Gerais (*Associação Mineira de Silvicultura*)
SIN - National Integrated System (*Sistema Integrado Nacional*)
SINDIFER – Iron Industry Union of the state of Minas Gerais (*Sindicato da Indústria do Ferro no Estado de Minas Gerais*)

SINDIPAN – São Paulo Bakery and Confectionery Industry Union (*Sindicato da Indústria de Panificação e Confeitaria de São Paulo*)
SIPOT – Brazilian Hydroelectric Potential Information System (*Sistema de Informações do Potencial Hidrelétrico Brasileiro*)
SisFogo - National System for Information on Fires (*Sistema Nacional de Informações Sobre Fogo*)
SISMADEN – Natural Disaster Monitoring and Warning System (*Sistema de Monitoramento e Alerta de Desastres Naturais)*
SISNAMA – National Environmental System (*Sistema Nacional do Meio Ambiente*)
SLAPR – Environmental Licensing System for Rural Properties (*Sistema de Licenciamento Ambiental de Propriedades Rurais*)
SNIC – National Cement Industry Union (*Sindicato Nacional da Indústria do Cimento*)
SNIS - National Sanitation Information System (*Sistema Nacional de Informações sobre Saneamento*)
SNUC – National System of Protected Areas (*Sistema Nacional de Unidades de Conservação*)
SO_2 – sulfur dioxide
SO_3 - sulfur trioxide
SOFC - Solid Oxide Fuel Cell (*Células a Combustível de Óxidos Sólidos*)
SOSMA – SOS Mata Atlântica
SO_X – sulphur dioxides
SP – state of Sao Paulo
SPARC - Stratospheric Processes and their Role in Climate (*Processos Estratosféricos e seu Papel no Clima*)
SPC&T – Subprogram on Science and Technology (Subprograma Ciência e Tecnologia)
SPE/WSP - Society of Petroleum Engineers/ World Petroleum Congress
SREX - Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (*Relatório de Extremos Climáticos e Gerenciamento de Riscos*)
SRHU - Secretariat of Water Resources and Urban Environment (*Secretaria de Recursos Hídricos e Ambiente Urbano*)
SSE – South-Southeast
ssp – species (*espécies*)
ST – science and technology
ST&I - science, technology and innovation
START – Analysis, Research and Training (*Sistema de Mudança Global para Análise, Pesquisa e Treinamento*)
SUDAM – Superintendent of Amazon Development (*Superintendência de Desenvolvimento da Amazônia*)
Sudene – Northeast Development Superintendence (*Superintendência do Desenvolvimento do Nordeste*)
SUS – Single Health System (*Sistema Único de Saúde*)
SW – southwest
t – tonne
T&D – Transmission & Distribution (*Transmissão e Distribuição*)
TCA - Amazon Cooperation Treaty (*Tratado de Cooperação Amazônica*)
tCO_2e/year – tonnes of CO_2 equivalent per year
TERRA - Satellilte from The Earth Observing System (*Satélite do Sistema de Observação da Terra*)
Tg – teragram (10^{12} g or one million tonnes)
TGW - Total Gross Weight
Tj – Terajoule
TM/Landsat – Thematic mapping sensor of the Landsat satellite (*Sensor de mapeamento temático do satélite Landsat*)
TNC - The Nature Conservancy (an NGO)
TO – state of Tocantins
toe – tonne of oil equivalent
TOGA - Tropical Ocean Global Atmosphere (*Experimento Oceano Tropical e Atmosfera Global*)
ton - tonne
TRMM - Tropical Rainfall Measuring Mission
TWh – terawatt-hour
U_3O_8 – uranium (urânio)
UAM - Unibanco Asset Management
UE – European Union/EU (União Européia)
UF – Unity of Federation (state)
UFES – Federal University of the state of Espirito Santo (*Universidade Federal do Espírito Santo)*
UFF – Federal Fluminense University (*Universidade Federal Fluminense)*
UFJF – Federal University of Juiz de Fora (*Universidade Federal de Juiz de Fora)*
UFMG – Federal University of the state of Minas Gerais (*Universidade Federal de Minas Gerais*)
UFPB - Federal University of the state of Paraíba (*Universidade Federal da Paraíba*)
UFPE – Federal University of the state of Pernambuco (*Universidade Federal de Pernambuco)*
UFPR – Federal University of the state of Paraná (*Universidade Federal do Paraná*)
UFRGS – Federal University of the state of Rio Grande do Sul (*Universidade Federal do Rio Grande do Sul*)
UFRJ – Federal University of the state of Rio de Janeiro (*Universidade Federal do Rio de Janeiro*)
UFRRJ – Federal Rural University of Rio de Janeiro (*Universidade Federal Rural do Rio de Janeiro)*
UFSC – Federal University of the state Santa Catarina (*Universidade de Santa Catarina*)
UFSCar - Federal University of São Carlos (*Universidade Federal de São Carlos)*
UGH – Hydrogen Generation Units (*Unidades de Geração de Hidrogênio*)
UHE – Hydroelectric Power Plant (*Usina Hidrelétrica de Energia*)

UN – United Nations
UnB – University of Brasilia (*Universidade de Brasília*)
UNCED - United Nations Conference on Environment and Development (*Conferência das Nações Unidas sobre Meio Ambiente e Desenvolvimento*)
UNDP - United Nations Development Programme
UNEP - United Nations Environment Programme (*Programa das Nações Unidas para o Meio Ambiente*)
UNESCO - United Nations Educational, Scientific and Cultural Organization (*Organização das Nações Unidas para a Educação, a Ciência e a Cultura*)
UNFCCC - United Nations Framework Convention on Climate Change (*Convenção-Quadro das Nações Unidas sobre Mudança do Clima*)
Unibanco – a Brazilian Bank (*União de Bancos Brasileiros S/A*)
Unica – Sugarcane Industry Union (*União da Indústria de Cana-de-Açúcar*)
UNICAMP – University of Campinas (*Universidade de Campinas*)
UNIFEI – Federal University of Itajubá (Universidade Federal de Itajubá)
UPE – State University of Pernambuco (*Universidade do Estado de Pernambuco*)
UPGN - Natural Gas Processing Unit (*Unidade de Processamento de Gás Natural*)
US - United States (*Estados Unidos da América*)
USA - United States of America (*Estados Unidos da América*)
US$ – US Dollar (*dólar norte-americano*)
USP – University of São Paulo (*Universidade de São Paulo*)
UTE – Thermoelectric plant (Usina Termo Elétrica)
UVIBRA - Brazilian Vitiviniculture Union (*União Brasileira de Vitivinicultura*)
VIA – vulnerabilities, impacts and adaptation (Vulnerabilidade, Impactos e Adaptação)
VOC – Volatile organic compound (*Composto Organico Volátil*)
VS – volatile solids (sólidos voláteis)
VSE – Socioeconomic Vulnerability (Vulnerabilidade Socioeconômica)
W – West (Oeste)
WB – World Bank
WCRP - World Climate Research Program
WG - Working Group
WIFI - Wireless Fidelity
WMO – World Meteorological Organization
WHO - World Health Organization
WSA – World Steel Association
WSP - World Petroleum Congress (Congresso Mundial de Petróleo)
ZEE – Ecological and Economic Zoning (*Zoneamento Econômico Ecológico)*
μ – micro

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