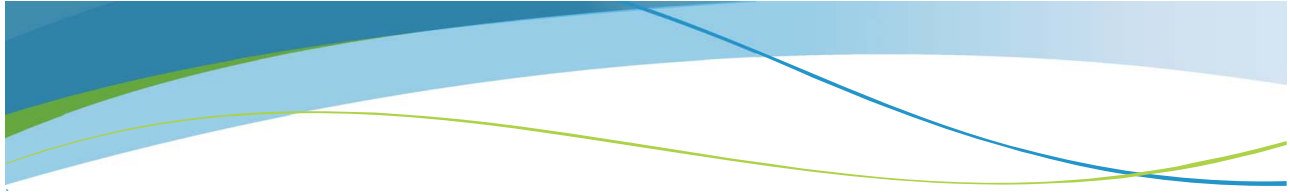




Eletrobras

Inventory of GHG Emissions from Eletrobras Companies

Year of reference 2014 | June 2015



Superior Council of Eletrobras Sistem Companies – Consise

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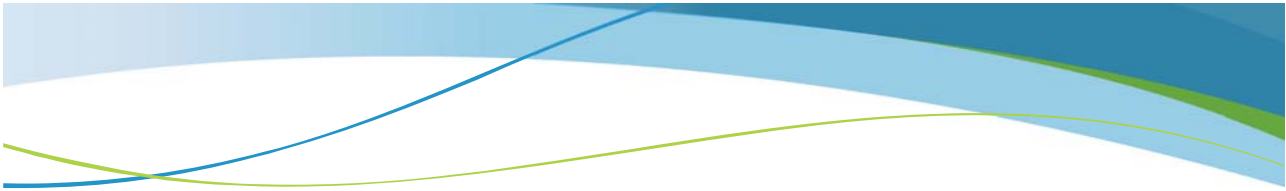
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1 | PRESENTATION/FOREWORDS

In a year surrounded by expectations regarding the definition of a future global climate agreement at the 21st UN Conference of the parties (COP 21), which will take place in December 2015 in Paris, Eletrobras publishes another yearly inventory of greenhouse gas emissions, underscoring its commitment to the treatment of the theme of climate change.

This document presents the greenhouse gas emissions inventory regarding the 15 Eletrobras subsidiary companies related to the base year of 2014.

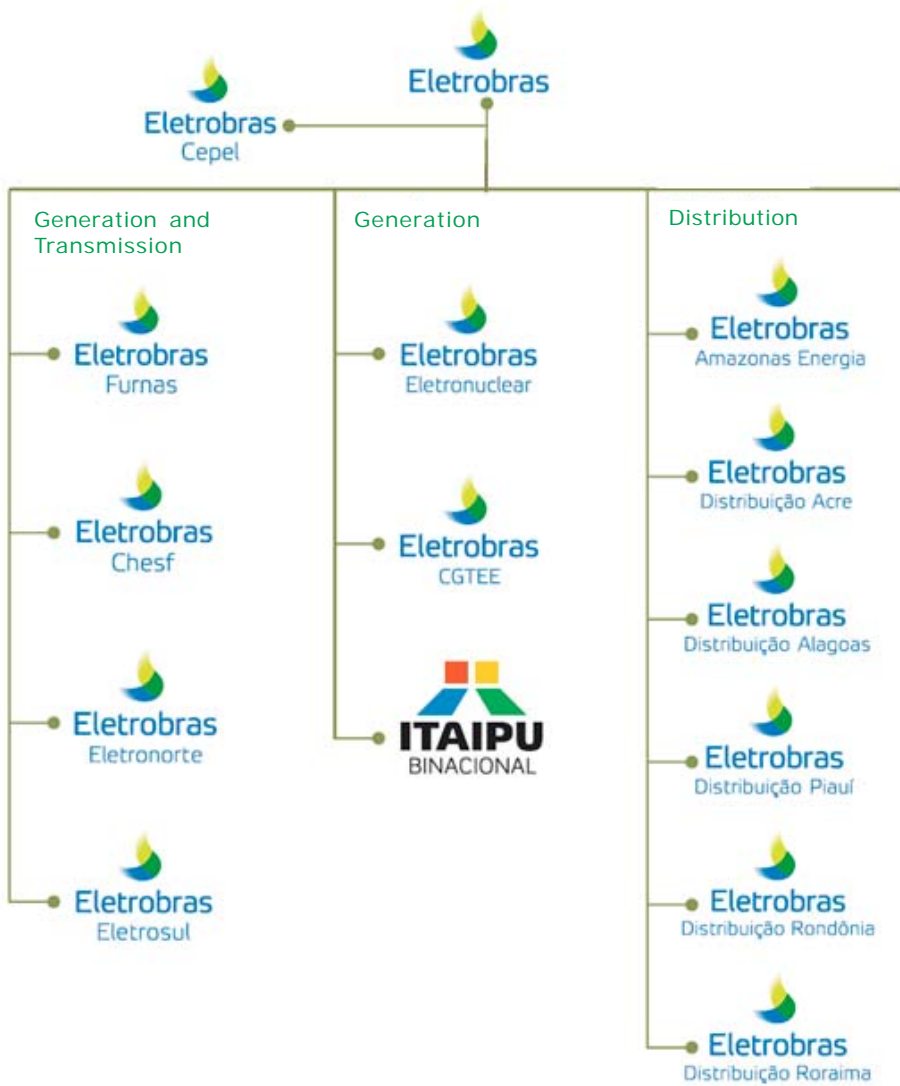


Figure 1 - Eletrobras subsidiary companies organogram



2 | ASSUMPTIONS AND PROCESS OF PREPARATION OF THE GHG INVENTORY

The GHG emissions inventory of companies Eletrobras follows the IPCC methodology (2006) and the guidelines of the Greenhouse Gas Protocol - GHG Protocol (WRI, 2004), having the organizational limit those companies in which Eletrobras holds the operational control¹.

The necessary information for the preparation of this Inventory were raised in each of the companies through their representatives in the GT3 - Climate Strategy Working Group, established under the SCMA - Subcommittee on Environment of Eletrobras companies.

Figure 2 presents the process of preparation of the GHG inventory of Eletrobras companies, its scope, the general structure and sources listed.

The emissions corresponding to the losses in the transmission of electrical energy were calculated on the basis of the information provided by the Department of Operation of Transmission Assets belonging to Eletrobras holding company. The result of emissions of these losses is reported for each transmission company separately.

For the calculation of emissions from electricity consumption and losses in transmission and distribution were used emission factors for the transmission grid (National Interconnected System - SIN), which are calculated and published by the Ministry of Science, Technology and Innovation-MCTI.

In Brazil, as there is the addition of a fraction of sugar cane ethanol in gasoline, and biodiesel in the diesel as well, oil derived fuels present less potential of pollution as those used internationally. Thus, the CO₂ emissions from the consumption of biofuels (biodiesel, ethanol added to gasoline and ethanol in vehicles) are reported separately from the calculations of this inventory, because these emissions are reabsorbed through photosynthesis (in crops of sugar cane and soybeans, among other vegetables used in the production of these biofuels).

¹ In the operational control approach, an organization is responsible for 100% of the GHG emissions of the units over which it has operational control, not accounting for those emissions coming from operations in which the organization has only corporate participation.

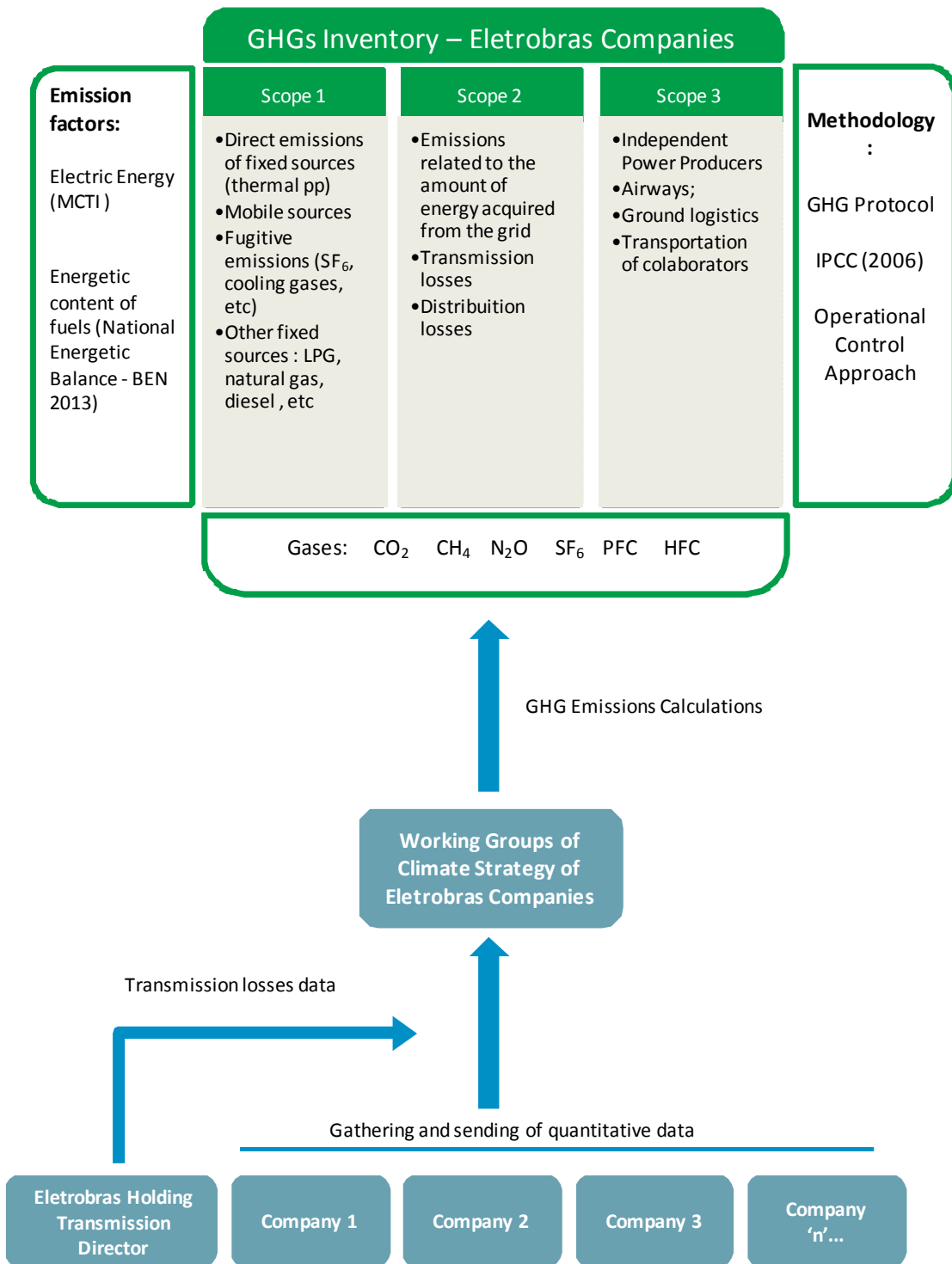


Figure 2 - Processes for Elaboration/Production of GHG Emissions Inventory related to Eletrobras companies.



Due to this reason, since the last Eletrobras companies GHG inventory (base year 2013), for the fuel consumption of road mobile sources (ethanol, natural gas, gasoline and diesel), emission factors published in the first National Inventory of Atmospheric Emissions by Road Vehicles (MMA, 2011) are used replacing the IPCC factors.

Due to the small participation of fugitive emissions from fire extinguishers in relation to the total emissions, the account of this contribution of fire extinguishers was excluded from this Inventory.

Emissions resulting from the conventional thermoelectric generation from independent power producers of energy (PIE), whose energy is used by the distribution utilities and resold to their final consumer (e.g., Eletrobras Amazonas energia, Eletrobras Distribuição Rondônia, Eletroacre and Eletrobras Distribuição Roraima), are quantified in the scope 3 and therefore they are presented separated from emissions related to the Eletrobras companies' own thermoelectric park, which are considered in scope 1.

The value of consumed fuels energy content was calculated on the basis of the conversion factors set out by the BEN - National Energy Balance report (base year 2013).

For the calculation of the GHG emissions intensity were considered the scopes 1 and 2 (direct and indirect emissions related to purchase of energy), as defined by the Carbon Disclosure Project (CDP) and other GHG emission reporting.

GHG emissions from hydroelectric reservoirs belonging to Eletrobras companies were not considered because there is, so far, no international scientific consensus methodology that allows to estimate these emissions and calculate the emissions balance (or net emissions) of water bodies.

In addition to the GHG emissions, are also estimated the emissions of sulphur oxides (SO_x) and nitrogen oxides (NO_x) according to indirect calculation methodology², which is based on the information on consumption of fossil fuels by the thermoelectric powerplants of Eletrobras companies .

This inventory was verified by independent third party and all the information and memories, in addition to identification of data sources, are archived. The independent auditor assurance letter was issued in May 28, 2015 by KPMG Risk Advisory Services Ltd³ (Annex).

² Source: European Environmental Agency. Air pollutant emission inventory guidebook: Technical guidance to prepare national emission inventories (2009).

³ The KPMG Risk Advisory Services Ltd is a simple Brazilian society, a limited liability company, and member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), Switzerland.



3 | GHG EMISSIONS OF ELETROBRAS COMPANIES [GRI EN 16 EEN 17]

In 2014, Eletrobras companies issued an overall amount of 13.888.615 tCO₂e, considering their direct emissions (scope 1) and indirect (scope 2 and 3). Of this total, 67% correspond to emissions from scope 1, 19% are from the scope 2, and 14% of scope 3 (Figure 3).

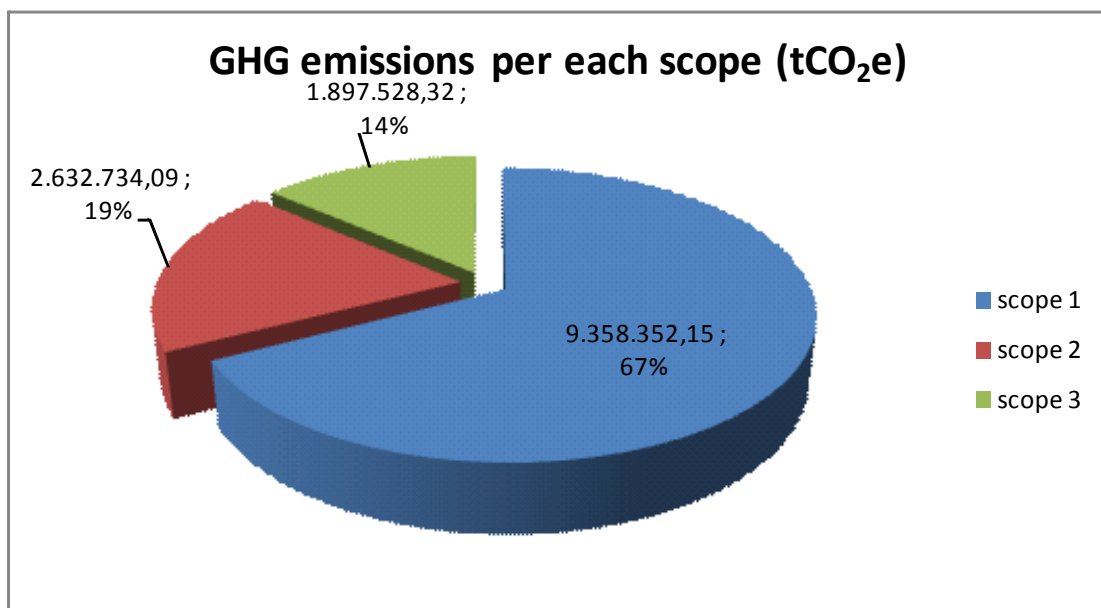


Figure 3 - Absolute emissions and GHG percents per scope

Four sources were responsible for 88% of the total emission of Eletrobras Companies in 2014: thermal powerplants (67%), independent power producers (13%), losses in the transmission networks (10%) and losses in distribution networks (8%). The other 12% corresponded to emissions from other sources, which issued individually less than 1% of the total (Table 1).

Table 1 - Eletrobras Companies GHG Emissions - base Year of 2014(tCO₂e)

Eletrobras Companies	Scope 1										Scope 2			Scope 3					SUBTOTAL PER EACH COMPANY
	Fixed			Mobile			Other (Fugitive)				Electricity Consumption	Losses in Distribution	Losses in Transmission	Transporte de Combustíveis	Independent Power Producers	Non-energetic products transportation	Air Tickets	Transportation of Collaborators	
	Thermal powerplants	Generators groups	Other types	Road	Waterways	Airways	SF6	Cooling gases	Liquid Effluents										
CGTEE	2.860.432	n.a.	0	197	n.a.	n.a.	0	n.d.	769	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4.991	78	643	2.875.018
Chesf	404.679	110	15	3.949	n.a.	410	n.d.	n.d.	n.a.	n.a.	315.599	n.a.	n.a.	n.a.	n.a.	n.d.	2.019	n.a.	727.302
Furnas	1.778.685	333	101	4.599	3	n.a.	25.525	665	356	n.a.	735.223	n.a.	n.a.	n.a.	n.a.	n.a.	1.478	86	2.550.238
Eletro norte	491.532	18	76	2.644	76	n.d.	n.d.	n.d.	15	n.a.	164.248	n.a.	n.a.	n.a.	n.a.	n.d.	2.273	140	661.338
Eletro nuclear	n.a.	2.611	54	1.161	13	n.a.	n.a.	1.411	33	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	253	469	2.188	21.090
Eletrosul	n.a.	24	26	1.469	n.a.	102	20.898	98	n.d.	n.a.	235.626	n.a.	n.a.	n.a.	n.a.	2	721	310	260.200
Amazonas Energia	3.740.866	n.a.	n.a.	1.209	7	n.a.	n.d.	n.d.	n.a.	n.a.	544.004	n.a.	n.a.	1.410.540	n.a.	n.a.	378	n.a.	5.785.771
Itaipu	n.a.	n.d.	43	393	13	n.a.	6.840	5	102	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	41	969	627	9.315
Cepel	n.a.	2	32	18	n.a.	n.a.	n.d.	0	23	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	173	611	1.755
Eletrobras Holding	n.a.	n.a.	n.a.	6	n.a.	n.a.	n.a.	n.d.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.376	n.a.	2.153
Distribuição Acre	n.d.	n.d.	1	265	n.a.	n.a.	0	n.d.	n.a.	n.a.	n.a.	n.a.	n.a.	0	136.601	n.d.	170	n.a.	175.295
Distribuição Alagoas	n.a.	3	1	1.646	n.a.	n.a.	n.d.	n.d.	n.a.	n.a.	157.790	n.a.	n.a.	n.a.	n.a.	n.a.	127	n.a.	159.567
Distribuição Rondônia	n.a.	3	13	1.057	n.a.	n.a.	0	n.d.	n.a.	n.a.	125.415	n.a.	n.a.	n.a.	n.a.	n.a.	264	n.a.	338.627
Distribuição Roraima	n.a.	n.a.	n.a.	216	n.a.	n.a.	0	n.a.	n.a.	n.a.	15.821	n.a.	n.a.	n.a.	n.a.	n.a.	n.d.	n.a.	134.644
Distribuição Piauí	n.a.	4	n.a.	1.951	n.a.	n.a.	547	n.d.	n.a.	n.a.	183.285	n.a.	n.a.	n.a.	n.a.	n.a.	n.d.	n.a.	186.300
Subtotal sources	9.276.193	3.107	362	20.779	113	512	53.810	2.179	1.297	117.753	1.064.285	1.450.696	18	1.877.126	5.287	10.494	4.604	TOTAL	
Subtotal Source Types	9.279.663			21.404			57.286			117.753	1.064.285	1.450.696	18	1.877.126	5.287	10.494	4.604	TOTAL	
Subtotal Scopes	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

Legend: 'na' – meaning not applicable; 'nd' – meaning data not available



In 2014, the emissions that are directly under the operational control of the Eletrobras companies (scopes 1 and 2) totaled 11,991,086 tCO₂e. While the emissions from sources not owned or not controlled by Eletrobras companies (scope 3), which are the responsibility of suppliers of products and services, were 1.897.528 tCO₂e.

Of the total direct emissions (scope 1), 99% originate from thermal generation (owned thermal powerplants), while fugitive emissions represent 0.6% and the other sources add up 0.4% (Figure 4).

In scope 2, 55% of the emissions are derived from the transmission losses, 40% of losses in distribution and 5% are emissions from electricity consumption (Figure 4).

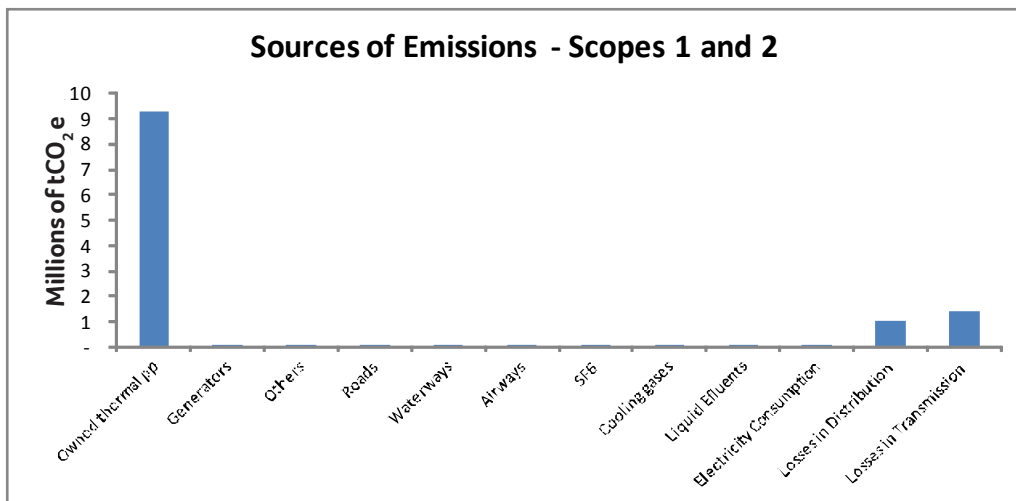


Figure 4 – Sources of GHG emissions from scopes 1 and 2 – Year of reference: 2014 (tCO₂e)

In scope 3, Independent power producers (PIE) represent the largest portion of emissions (99%). The sum of the parcels “air travel”, “transportation of collaborators”, “fuels transport” and “transport of non-energy products” added approximately 1% of this scope.

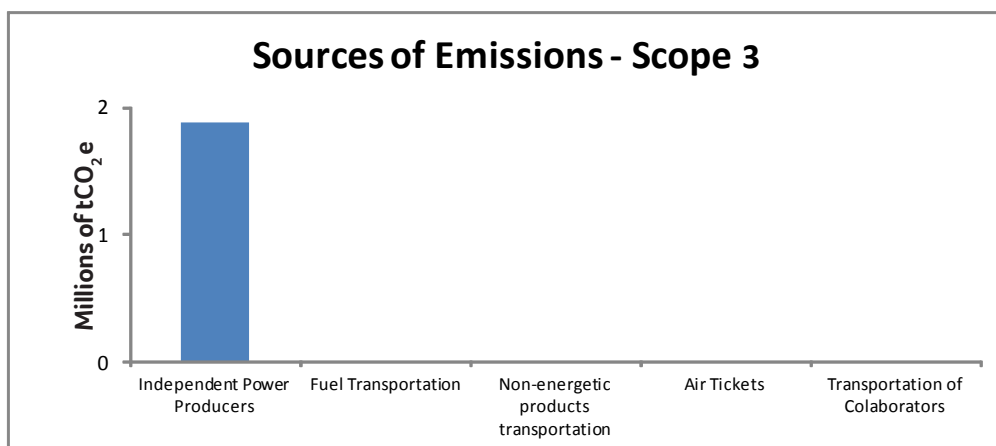


Figure 5 – Sources of GHG emissions from scope 3 – Year of reference 2014 (tCO₂e)



The carbon dioxide (CO₂) accounts for approximately 99% of the total emission of the Eletrobras companies. The sulphur hexafluoride (SF₆) accounts for only 0.4% of emissions, followed by nitrous oxide-N₂O (0.2%), methane-CH₄ (0.1%) and cooling gases – HFCs and PFCs, which represent less than 0.1% of the total emission (Table 2).

Table 2 - Greenhouse gas emissions of Eletrobras companies by gas type (tCO₂e) – year of reference: 2014

Eletrobras Company	CO ₂ (tCO ₂ e)	CH ₄ (tCO ₂ e)	N ₂ O (tCO ₂ e)	SF ₆ (tCO ₂ e)	HFCs and PFCs (tCO ₂ e)	SUBTOTAL (tCO ₂ e)
CGTEE	2.860.126,35	1.603,93	13.287,82	-	-	2.875.018,10
Chesf	726.091,87	363,55	846,14	-	n.d.	727.301,56
Furnas	2.521.804,07	1.173,90	1.070,11	25.524,60	665,24	2.550.237,92
Eletronorte	659.471,79	546,01	1.320,48	-	-	661.338,28
Eletronuclear	19.557,56	45,93	75,91	n.a.	1.410,57	21.089,98
Eletrósul	239.147,07	9,14	47,74	20.897,80	97,93	260.199,67
Amazonas Energia	5.770.882,95	4.596,77	10.291,69	-	-	5.785.771,41
Itaipu	2.338,07	106,47	26,28	6.840,00	4,65	9.315,46
Cepel	1.717,90	25,56	11,58	n.d.	0,43	1.755,47
Eletrobras Holding	2.139,41	0,58	13,11	n.a.	-	2.153,10
Distribuição Acre	174.795,63	146,17	353,13	-	-	175.294,93
Distribuição Alagoas	159.525,39	6,54	35,06	n.d.	-	159.567,00
Distribuição Rondônia	337.839,61	228,43	559,11	-	-	338.627,16
Distribuição Roraima	134.211,03	127,31	305,91	-	n.a.	134.644,24
Distribuição Piauí	185.713,73	4,91	34,46	547,20	-	186.300,30
SUBTOTAL (tCO ₂ e)	13.795.362,44	8.985,20	28.278,52	53.809,60	2.178,81	13.888.614,57
(%)	99,33	0,06	0,20	0,39	0,02	

Legend: 'na' – meaning not applicable; 'nd' – meaning data not available

The total GHG emissions of Eletrobras companies in 2014 remained stable compared to the total emission of 2013 (just 0.13% of increase). While emissions from scope 1 had a 10% reduction, emissions from scopes 2 and 3 increased by 33% and 4%, respectively (Table 3 and Figure 6).



Table3 - Interannual variation of GHG emissions of Eletrobras companies (tCO₂e)

	2013	2014	Absolut Variation tCO ₂ e	Variation in percentage %
Scope 1	10.270.407	9.358.352	- 912.054	-9,75
Scope 2	1.771.779	2.632.734	860.955	32,70
Scope 3	1.828.086	1.897.528	69.442	3,66
Total	13.870.272	13.888.615	18.342	0,13

Note: the percentage variation indicates the contribution of each scope to increase the total verified emissions.

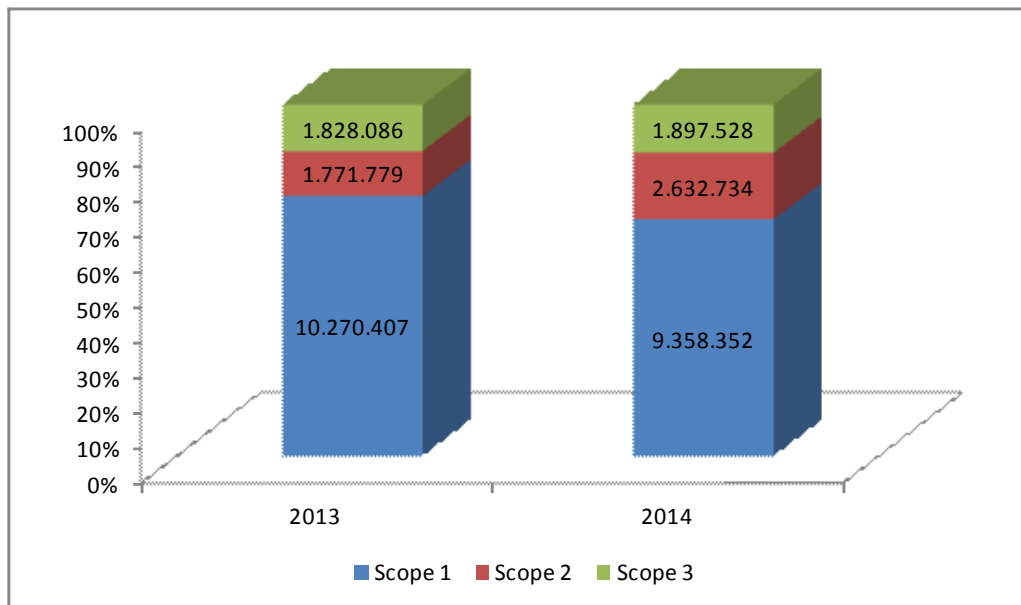


Figure 6 - Comparison of percentage and absolute emissions for each scope of Eletrobras companies between the years of reference 2013 and 2014

The reduction of GHG emissions of scope 1 occurred due to the decrease in consumption of fossil fuels in thermal power plants of Eletrobras Amazonas energia and Eletrobras CGTEE. At Eletrobras Amazonas Energia five of its plants were disabled, in addition to having been replacement of diesel oil by natural gas in four other plants in the municipalities of Anamã, Anori, Caapiranga and Codajás, and disabling the 7 block of the thermal powerplant Maua, in Manaus. At Eletrobras CGTEE, the generating units of UTE President Médici phase B presented low availability due to maintenance problems in the turbine and the generator of the Group III and Group IV, causing low consumption



of coal. The units of phase A were not used for power generation, also due to problems in turbine of Group II and in the generator of Group I. However their boilers were used in the generation of steam for the President Médici phase B and Candiota III phase C powerplants.

Scope 2 emissions had increased 32 percent between 2013 and 2014. This result is explained mainly by the increase in the emission factor of the transmission grid, which grew 29% in this same period, going from 0.0960 tCO₂e/MWh in 2013 to 0.1355 tCO₂e/MWh in 2014. This factor is sensitive to the operational rules of the National Electric System Operator (ONS), which since 2012 is increasing the dispatch of thermoelectric power plants due to the decrease in the volume of water stored in reservoirs of hydroelectric plants, due to one of the largest droughts already occurring in Central and South-Eastern regions of the country.

Scope 3 emissions have had a small increase of approximately 4%, being mainly a result of increased emissions of the share related to “Independent Power Producers”.

The following table shows the emissions history of Eletrobras companies over the past three years (Table 4).

Table 4 - Evolution in time of GHG emissions of Eletrobras Companies for the last three years (tCO₂e)

Eletrobras Company	2012	2013	2014
CGTEE	3.322.914	3.519.925	2.875.018
CHESF	300.080	1.017.385	727.302
FURNAS	1.150.036	2.007.326	2.550.238
ELETRONORTE	990.191	587.134	661.338
ELETRONUCLEAR	7.587	9.650	21.090
ELETROSUL	190.890	196.940	260.200
AMAZONAS ENERGIA	5.210.824	5.748.568	5.785.771
ITAIPU	10.494	9.759	9.315
CEPEL	1.295	1.450	1.755
ELETROBRAS holding	2.842	2.287	2.153
ELETROBRAS D. Acre	85.942	154.802	175.295
ELETROBRAS D. Alagoas	17.343	118.391	159.567
ELETROBRAS D. Rondonia	134.411	286.644	338.627
ELETROBRAS D. Roraima	84.820	83.217	134.644
ELETROBRAS D. Piauí	262.477	126.794	186.300
Total	11.772.144	13.870.272	13.888.615



It is relevant to note that there is a stabilization of the total emission of Eletrobras Companies over the past two years, after a sharp increase of emissions in the year 2013.

As advocates the methodology used, the CO₂ emissions derived from the burning of biofuels (ethanol and biodiesel) are not accounted in the calculation of inventory due to the fact that the gases originated from the burning of such fuels are reabsorbed in the photosynthesis process. These emissions are presented in Table 5 below.

Table 5 - CO₂ emissions from the burning of biofuels ethanol (hydrous and anhydrous) and biodiesel (B-100) - year of reference: 2014 (tCO₂e)

Eletrobras Company	CO ₂ coming from burning of biofuels (tCO ₂ e)
CGTEE	344,10
Chesf	15.195,70
Furnas	581,40
Eletronorte	27.275,06
Eletronuclear	452,66
Eletrosul	188,22
Amazonas Energia	154.163,12
Itaipu	448,79
Cepel	42,79
Eletrobras Holding	35,19
Distribuição Acre	7.358,61
Distribuição Alagoas	147,07
Distribuição Rondônia	11.452,04
Distribuição Roraima	6.488,61
Distribuição Piauí	137,18
TOTAL (tCO₂e)	224.310,56



4 | GENERATION MATRIX AND EMISSIONS INTENSITY [GRI EN 3]

The total generation of electric power by Eletrobras companies in 2014 was 166,583 GWh. Hydroelectric generation represented approximately 84% of the total, followed by nuclear generation (9.3%), oil (3.6%), natural gas (1.7%), coal (1.5%), and the wind and photovoltaic sources (0.2%) (Figure 7 and Table 6).

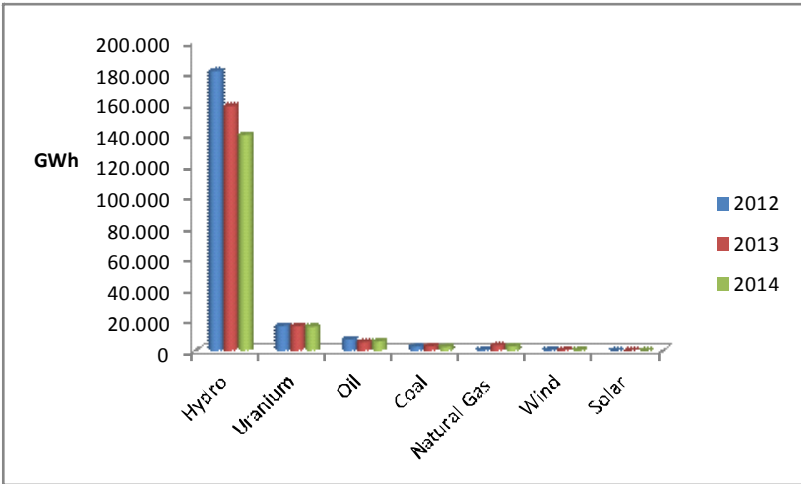


Figure 7 - History of power generation by primary energy source of Eletrobras companies

The renewable energy sources (hydro, wind and solar) accounted for approximately 85% of all generation in 2014. If included nuclear generation, this number increases to about 94%, featuring an array of low-GHG emission generation.

Table 6- Evolution in time of primary energy generation of Eletrobras companies by source

Sources of primary	Net Generation(GWh)					
	2012	%	2013	%	2014	%
Hydro	180.757,4	86,3	157.958,0	84,9	139.453,2	83,7
Uranium	16.006,5	7,7	15.829,0	8,5	15.433,3	9,3
Oil	7.158,7	3,4	5.524,0	3,0	6.021,0	3,6
Coal	2.677,2	1,3	2.836,0	1,5	2.462,9	1,5
Natural Gas	472,7	0,2	3.468,0	1,9	2.909,6	1,7
Wind	332,5	0,2	477,0	0,3	302,2	0,2
Solar	0,0	0,0	0,0	0,0	0,5	0,0
Total	207.405	100,0	186.092	100,0	166.583	100,0

In recent years, the total generation of electric power by Eletrobras companies has decreased due mainly to the reduction in hydroelectric generation, resulting from one of the longest and most severe droughts that have occurred in Central and South-Eastern regions of the country. In 2014, there was a reduction of 11% in power generation



in about 2013. In the same period, GHG emissions were reduced by 0.4%, remaining virtually stable (Table 7).

Due to this situation, the emission intensity of the Eletrobras, companies, which is a relationship between GHG emissions (sum of scopes 1 and 2) and the generation of energy, increased 10% in 2014 compared to 2013, from 0.0647 tCO₂e/MWh to 0.0720 tCO₂e/MWh, as shown in Tables 7 and 8 below.

Table 7 - Evolution in time of emission intensity of Eletrobras companies (sum of scopes 1 and 2)

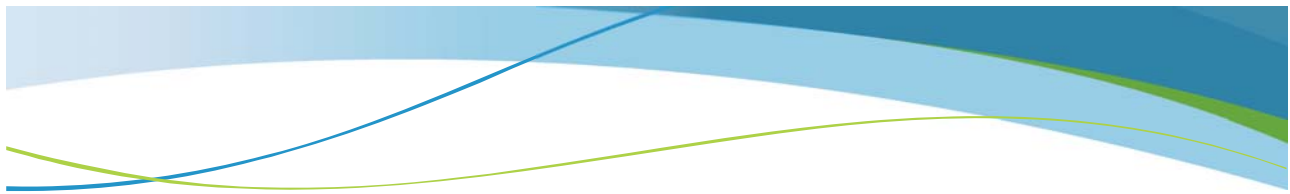
	2012	2013	2014	Variation 2013/2014
Emissions (tCO₂e)	9.823.960	12.042.186	11.991.086	-0,4
Total net generation (MWh)	207.405.000	186.092.000	166.582.688	-11,7
tCO₂e/MWh	0,0474	0,0647	0,0720	10,1

Table 8 - Emission intensity of Eletrobras companies in the year of 2014 (sum of scopes 1 and 2)

Eletrobras companies	Emissions (t CO ₂ e)	Generation (MWh)	tCO ₂ e/MWh
CGTEE	2.869.306	2.462.939	1,1650
Chesf	725.283	28.738.675	0,0252
Furnas	2.548.674	25.149.136	0,1013
Eletronorte	658.925	42.429.447	0,0155
Eletronuclear	18.162	15.433.252	0,0012
Eletrosul	259.167	2.151.391	0,1205
Amazonas Energia	4.374.853	6.320.152	0,6922
Itaipu	7.679	43.897.697	0,0002
Other Eletrobras Companies*	529.036	-	-
Total	11.991.086	166.582.688	0,0720

*Eletrobras companies that are not energy-generating, but have GHG emissions: Cepel, Holding, Distribuição Acre, Distribuição Alagoas, Distribuição Rondônia, Distribuição Roraima e Distribuição Piauí.

Even considering this scenario of hydraulic stress, the emission intensity of Eletrobras companies is low if compared to the average emission intensity of the international



electric sector (Table 9), including Brazil. This is due to the large majority of low-intensity sources of GHG emission in the array of Eletrobras companies generation, reaching the mark of 94% of its total net generation (see Table 6).

Table 9 - Average emission intensity (tCO₂e/MWh) of the electricity sector in the world compared with the figures of Eletrobras companies

	tCO ₂ e/MWh
China¹	0,745
EUA¹	0,481
European Union¹	0,403
Brazil²	0,137
Eletrobras Companies	0,072

Source: 1 International Energy Agency (2013); 2 EPE (Energetic Research Company linked to the Ministry of Mines and Energy in Brazil) (2015).

The use of financial variables also allows to evaluate the emission intensity. Thus, the emission intensity as a function of the net operating revenue (ROL) of Eletrobras companies in 2014 was 0.29 tCO₂e/thousand BRL (R\$). This means that for each thousand BRL of net operating revenue generated there is the issuance to the atmosphere of 0.29 tCO₂e (table 10).

Table 10 - Emission Intensity of Eletrobras companies in the year 2014 (sum of scopes 1 and 2) – as a function of net operating revenue.

Eletrobras Companies	Emissions (tCO₂e)	Total Liquid Revenue - R\$ thousand	tCO₂e/R\$ thousand
CGTEE	2.869.306,43	474.154,00	6,05
Chesf	725.282,98	3.563.435,00	0,20
Furnas	2.548.673,94	6.316.045,00	0,40
Eletronorte	658.925,09	6.046.351,00	0,11
Eletronuclear	18.162,38	1.926.762,00	0,01
Eletror Sul	259.167,28	1.118.657,00	0,23
Amazonas Energia	4.374.853,38	3.610.036,00	1,21
Itaipu	7.678,78	9.730.878,00	0,00
Cepel	971,40	-	-
Eletrobras Holding	776,67	2.815.950,00	0,00
Distribuição Acre	38.523,69	374.145,00	0,10
Distribuição Alagoas	159.440,20	1.342.133,00	0,12
Distribuição Rondônia	126.987,41	1.308.939,00	0,10
Distribuição Roraima	16.036,32	207.099,00	0,08
Distribuição Piauí	186.300,30	1.291.577,00	0,14
TOTAL	11.991.086,24	41.385.312,00	0,29



5 | SULFUR AND NITROGEN OXIDE EMISSIONS (SO_x E NO_x) [GRI EN 20]

Emissions of sulphur oxides (SO_x) and nitrogen oxides (NO_x) were estimated for the 5 Eletrobras companies that generate thermoelectric energy from fossil fuels, namely: CGTEE, Amazonas energia, Eletronorte, Furnas and Chesf. These emissions are calculated indirectly based on fuel consumption for power generation and emission factors specific to each fuel⁴.

The total emission from Eletrobras companies estimated for sulphur oxides (SO_x), in 2014, was 52,364 tons. The largest contribution to these emissions comes from the CGTEE, followed by Amazonas energia, Eletronorte, Chesf and Furnas (Table 11 and Figure 8).

Emissions of nitrogen oxides (NO_x) totaled 23,510 tons in the year 2014. Amazonas energia and CGTEE are the largest emitters of this gas, followed by Furnas, Eletronorte and Chesf.

Table 11 - Estimation of NO_x and SO_x gas emissions by Eletrobras companies in the year of 2014

Eletrobras Companies	Sox emissions	Nox emissions
CGTEE	24.420,33	9.274,98
Amazonas Energia	23.183,17	9.353,19
Eletronorte	3.040,33	1.189,69
Furnas	32,16	2.823,19
Chesf	1.688,79	869,40
Subtotal by each source	52.364,78	23.510,44

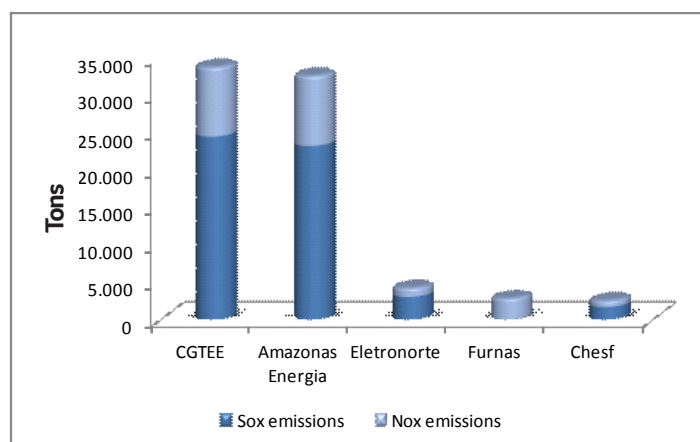


Figure 8 - SO_x and NO_x emissions by Eletrobras companies – year of reference: 2014

⁸ Source: *European Environmental Agency. Air pollutant emission inventory guidebook: Technical guidance to prepare national emission inventories* (2009).



6 | ACTIONS FOR ELIMINATION/REDUCTION OF GHG EMISSIONS [GRI EN5 EEN 7]

Many initiatives taken by Eletrobras companies contribute to the removal and reduction of GHG emissions.

Among them can be mentioned some actions for the reduction of GHG emissions from scope 1, as the gradual replacement of gasoline or diesel powered vehicles by flex vehicles (which can also use ethanol as fuel), expanding the use of electric vehicles and the rationalization of land travel.

The subsidiary companies Eletronorte and Eletrobras-Furnas are investing in equipment and training of technical personnel to prevent the escape of SF₆ gas into the atmosphere. Since 2010, Eletrobras-Furnas is acquiring new circuit breakers that include more stringent criteria in relation to rates of fugitive emissions of this gas. The company also initiated the "SF₆ Conscious Project" with an investment of ten million BRL, whose goal is to provide state-of-the-art machinery and equipment for the technical teams to perform maintenance activities onto equipment that use the SF₆ gas. This project has already conducted training for more than 300 technicians. Currently, the maintenance engineering of Eletrobras-Furnas is reviewing all technical manuals related to the topic.

The Eletrobras Amazonas Energia built four gas-fired thermal power plants which are already in operation in the municipalities of Anamá, Anori, Caapiranga and Codaja, in the State of Amazonas. Furthermore, in the State of Amazonas, photovoltaic micro systems are also being deployed, replacing diesel-powered generators operation. It is also under deployment a new gas-fired power plant (Mauá III) in Manaus.

The Eletrosul subsidiary company has developed a solar powered generation project in its headquarters building, the first public building of Brazil having a photovoltaic generation complex integrated. In 2014, the Megawatt Solar Plant produced about 600 MWh, generating revenue of 400 thousand BRL through the sale of this energy in the free contracting environment.

With regard to initiatives in Eletrobras companies which reduce emissions in scope 2, it is important to highlight the actions of retrofit for air conditioning and lighting systems, installation of solar heaters, establishment of hours of operation for lighting and air conditioning, and conscious consumption programs to motivate employees on the reduction of the consumption of electric energy.

The Eletrosul replaced all the electrical energy consumption in its headquarters building, which was bought from the distribution concessionaire connected to it, by energy generated in the small hydroelectric plant (PCH) João Borges, of its property. In addition to contributing to the reduction of GHG emissions, this initiative resulted in a saving of 13 thousand BRL.

Scope 3 related initiatives include the control of the number of air travel using more intensively videoconferences, resulting in a reduction of these emissions in 11.7% or 1,386.3 tCO₂e, compared to 2013.



7 | CLIMATE STRATEGY OF ELETROBRAS COMPANIES

The operational strategy of the Eletrobras companies with respect to climate change has been based on some pillars, which are expressed in its Declaration of Commitment⁵, and that guide the future planning and practices of the Eletrobras companies.

Since 2009, the Eletrobras publishes annually its inventory of GHG emissions, a free-access tool that reports to stakeholders on liability of Eletrobras companies regarding GHG emissions.

The inventory of GHG emissions is the instrument that subsidizes Eletrobras companies to answer a series of environmental reports demanded by the market, among them: the Carbon Disclosure Project, the ISE-Bovespa and the Dow Jones Sustainability Index.

Linked with its climate strategy, Eletrobras also participates in forums that aim to discuss and propose solutions to issues related to climate change, both with corporate-oriented and public policy focus. Among these may be mentioned the Technique Chamber for Climate and Energy of the Brazilian Business Committee for Sustainable Development (CEBDS), the Platform Companies by Climate (EPC), the Climate Change Working Group of the Environmental Forum of the Power Sector (FMASE), the GHG Protocol Brazil, the Brazilian Forum on Climate Change and the Global Sustainable Electricity Partnership organization..

With respect to the risks, vulnerabilities and opportunities related to global climate change, Eletrobras has developed studies and analysis aimed to assess the impact of these issues on its businesses. In 2014, the Eletrobras holding company developed, for the third time, sensitivity analysis regarding the financial impacts of a possible taxation of CO₂ emissions on the billing of Candiota III thermal power plants and Presidente Médici (both belonging to the Eletrobras CGTEE), Camaçari (owned by CHESF) and Santa Cruz (Eletrobrás Furnas). The result of this analysis showed that, if implemented the regulation, there will be a substantial elevation of the costs and billing expenses of these plants. It is intended that this type of study be part of its strategic planning-related processes, seeking to incorporate the regulatory risks to the decision-making.

Finally, it is observed that the targets of reduction of GHG emissions set by Eletrobras in 2013, are in the final stage of evaluation, since this first commitment period has the year 2015 as a target. In addition to the dissemination of the results achieved in the future, the strategy of Eletrobras is setting a second commitment period with a focus on reduction of GHG emissions, which should have a horizon until 2019.

⁵ Go to the Eletrobras' Declaration of Commitment on climate change: <http://www.eletrobras.com> > [Sustentabilidade](#)>[Meio Ambiente](#)>Declaração de Compromisso sobre Mudanças Climáticas.



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Limited assurance report issued by independent auditors

To the Board of Directors and Shareholders of
Centrais Elétricas Brasileiras S.A - Eletrobras
Rio de Janeiro – RJ

Introduction

We have been engaged by Centrais Elétricas Brasileiras S.A – Eletrobras (“Eletrobras” or “Company”) to present our limited assurance report on the compilation of the Information regarding “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” of Eletrobras related to the year ended December 31st, 2014.

Responsibilities of Company Management

The management of Eletrobras is responsible for preparing and adequately presenting the Information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” in accordance with the criteria of “*The Greenhouse Gas (GHG) Protocol - Corporate Accounting and Reporting Standard - Revised Edition from WRI (World Resources Institute) and WBCSD (World Business Council for Sustainable Development)*” - (2004 Revised Edition), “*2006 IPCC (Intergovernmental Panel on Climate Change) Guidelines for National Greenhouse Gas Inventories*”, “*Especificações do Programa Brasileiro GHG Protocol: Contabilização, Quantificação e Publicação de Inventários Corporativos de Emissões de Gases de Efeito Estufa – Segunda Edição*” and by the internal controls determined as necessary to allow the elaboration of those information free from material misstatement, even though it was resulted by fraud or error.

Independent auditors’ responsibility

Our responsibility is to express a conclusion about the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” based on the limited assurance engagement conducted and prepared in accordance with Technical Communication (CT) 07/2012, approved by the Federal Accounting Council and prepared in accordance with NBC TO 3000 (Assurance Engagements Other Than Audits or Reviews) issued by the Federal Accounting Council – CFC, which is the equivalent to international standard ISAE 3000 issued by the International Federation of Accountants applicable to Non-Historical Information. These standards require compliance with ethical requirements, including independence ones and also that the engagement is conducted to provide limited assurance that the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” taken as a whole is free from material misstatement.

A limited assurance engagement conducted in accordance with NBC TO 3000 (ISAE 3000) consists mainly in questions and interviews with the management of Eletrobras and other professionals of the Company involved in preparation of the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” and applying analytical procedures



to obtain evidence that allows us to make a limited assurance conclusion about the information taken as a whole. A limited assurance engagement also requires additional procedures when the independent auditor acknowledges of issues which lead them to believe that the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” could present material misstatement.

The selected procedures were based on our understanding of the issues related to the compilation, materiality and presentation of the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” other engagement circumstances and considerations regarding areas and procedures associated with information which misstatement could exist. The procedures consisted of:

(a) Planning: considering the relevance, consistency, amount of quantitative and qualitative information and the operational systems and internal controls that served as a basis for preparing of the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” of Eletrobrás.

(b) understanding of the calculation methodology and procedures used to consolidate the indicators through interviews with the management in charge of the preparation of the information.

(c) reviewing of the calculation records of greenhouse gas emissions taking into consideration Scope 1 (direct greenhouse gas emissions) amounting to 9,358,352.15 tons of CO₂e, Scope 2 (indirect greenhouse gas emissions from energy purchased), amounting to 2,632,734.09 tons of CO₂e and Scope 3 (other indirect greenhouse gas emissions), amounting to 1,897,528.32 tons of CO₂e, according to the GHG Protocol.

(d) verification and analysis of evidences, based on sample of the data used to calculate the greenhouse gas emissions.

(e) Visit Eletrobrás units and offices to apply these procedures, as itens (b), (c) and (d).

We believe that the information, evidence and results we have obtained are sufficient and appropriate to provide a basis for our limited assurance conclusion.

Scope and limitations

The procedures applied in a limited assurance engagement are substantially less extensive than those applied in an reasonable assurance engagement. Therefore, we cannot ensure we are aware of all issues that would have been identified in a reasonable assurance engagement, which aims to issue an opinion. If we had conducted a reasonable assurance engagement, we may have identified other issues and possible misstatements within the information presented in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions”.

Nonfinancial data is subject to more inherent limitations than financial data, due to the nature and diversity of the methods used to determine, calculate or estimate this data. Qualitative

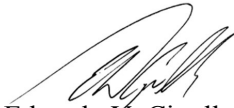
interpretations of the data's materiality and accuracy are subject to individual presumptions and judgments. Additionally, we did not examine data regarding prior periods to assess the adequacy of policies, practices and sustainability performance, nor future projections.

Conclusion

Based on the procedures carried out, described in this report, we have not identified any relevant information that leads us to believe that the information in the “Corporate Inventory of Direct and Indirect Greenhouse Gas Emissions” of Centrais Elétricas Brasileiras S.A – Eletrobras, was not compiled in all material respects, in accordance with the guidelines “*The Greenhouse Gas (GHG) Protocol - Corporate Accounting and Reporting Standard - Revised Edition from WRI (World Resources Institute) and WBCSD (World Business Council for Sustainable Development)*” - (2004 Revised Edition), “*2006 IPCC (Intergovernmental Panel on Climate Change) Guidelines for National Greenhouse Gas Inventories*” and “*Especificações do Programa Brasileiro GHG Protocol: Contabilização, Quantificação e Publicação de Inventários Corporativos de Emissões de Gases de Efeito Estufa – Segunda Edição*” and with the records and files that subsidized its elaboration.

São Paulo, May 28th, 2015

KPMG Risk Advisory Services Ltda.
CRC SP-023233/O-4



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