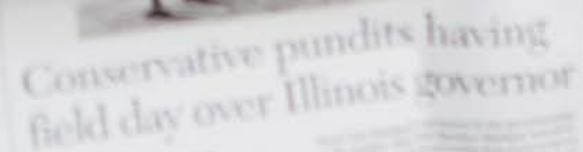


# B3 S.A. – Brasil, Bolsa, Balcão

2018 Greenhouse Gas Emissions Inventory  
Results

A newspaper clipping is visible in the bottom right corner of the slide. It features a cartoon illustration of a person in a suit running, with a speech bubble above them. Below the illustration, the text reads: "Conservative pundits having field day over Illinois governor".

Conservative pundits having  
field day over Illinois governor

# Corporate GHG Inventory – 2018

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# Executive Summary

The greenhouse gas (GHG) emissions inventory aims to increase the company's transparency and control over its GHG impacts, by recording and disclosing the GHG emissions released by its business activities. The inventory should be used as a basis for the company's Carbon Management practice, which will support initiatives related to opportunities for reducing emissions and enhancing processes.

In 2018, B3 prepared its first annual inventory with third party verification, following the commitment of BM&FBOVESPA S.A., that quantified its emissions since 2009. In 2019, KPMG assisted B3 in the compilation of its second inventory, based on data from 2018. The results of this engagement are set out in this report and will serve as a basis to support B3's carbon management and direct its initiatives.

B3's absolute emissions in 2018 totalized 241.56 tCO<sub>2</sub>e for scope 1, 2,134.39 tCO<sub>2</sub>e for scope 2 and 1,496.22 tCO<sub>2</sub>e for scope 3. The scope 1 emissions presented a reduction of 19% regarding 2017, consequence of the reduction of refrigerant gases recharged in the HVAC (heating, ventilation and air conditioning) system at B3, in 2018. For scope 2 emissions, there was a substantial reduction of 29%, compared to the previous year, consequence of the reduction in energy consumption in 2018 and the decrease of approximately 20% in the annual emission average factor of the Brazilian GRID in 2018. The indirect scope 3 emissions, did not present significant variation, an increase of just 0.2% over the previous year. The scope 3 stability is a result of the reduction in employees commuting emission, counterbalanced by the increase of business travel emission.

B3 has been offsetting the greenhouse gas emissions it cannot reduce, thereby making it carbon neutral. The objectives of these initiatives include identifying, managing and reducing its environmental impact, and contributing to the global effort against climate change and the effects thereof.

# Definitions and Concepts

- This inventory includes the following greenhouse gases embraced by the Kyoto protocol: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, NF<sub>3</sub> and HFCs and PFCs.
- The Global Warming Potential – GWP indicates the amount of heat trapped by a certain mass of gas compared to the amount of heat trapped by a similar mass of carbon dioxide, whose potential is standardized to 1 over a given time period. And is used to calculate the carbon dioxide equivalent (CO<sub>2</sub>e) of greenhouse gases, transforming them into a standard unit. In accordance with the protocol decisions, the GWP amounts were adopted in the Fourth IPCC Assessment Report – AR4. The amounts can be seen in the table below and the full list on the IPCC site:

<b>Gas</b>	<b>New GWP value (2013 to 2018 inventory)</b>
CO <sub>2</sub>	1
CH <sub>4</sub>	25
N <sub>2</sub> O	298
SF <sub>6</sub>	22,800
Hf Cs	124 – 14,800
PFCs	7,390 – 12,200
NF <sub>3</sub>	17,200

# Methodologies used

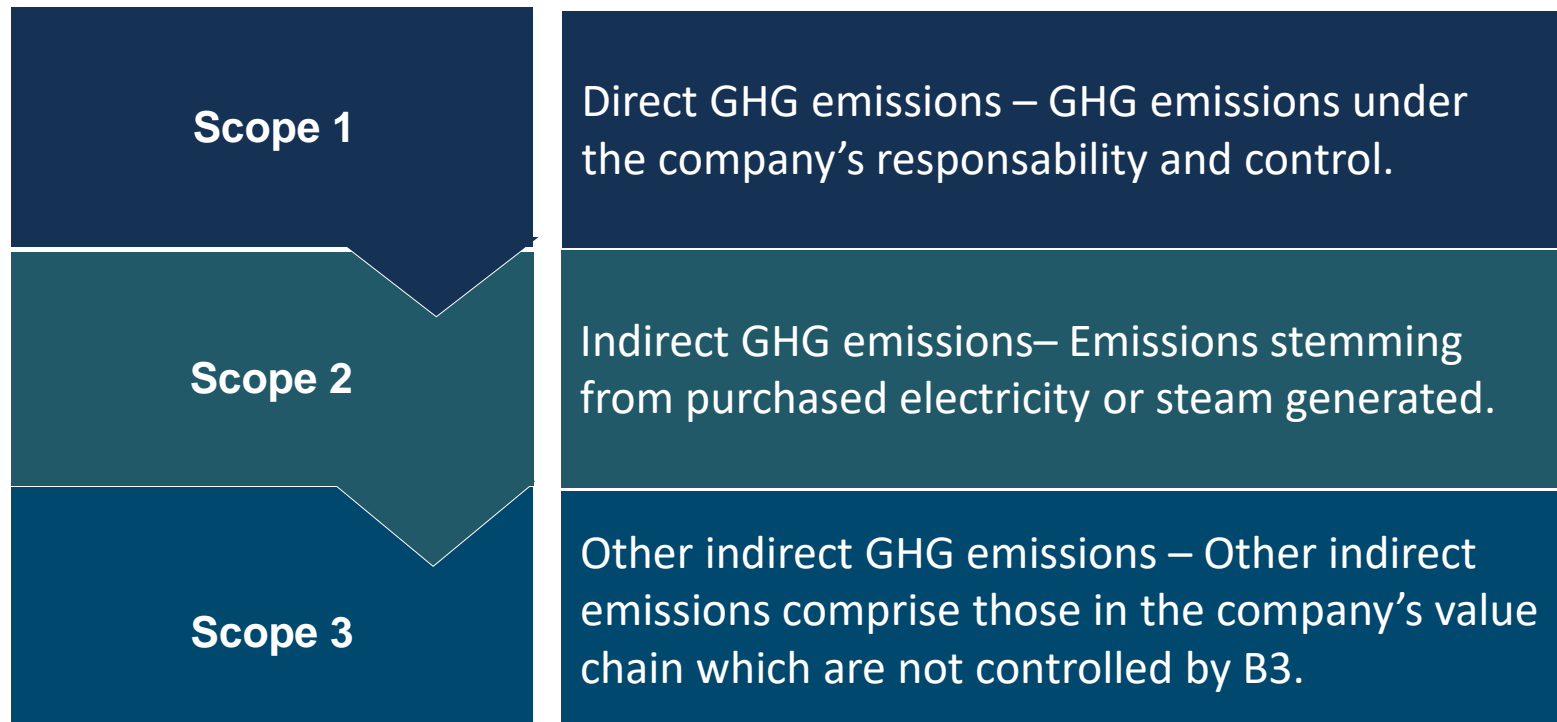
- The methodologies, scope, calculations and assumptions used to create this inventory can be seen in the report of procedures for compiling greenhouse gas inventories - 2018 and in the calculation spreadsheet and collection forms, accompanying this report.
- The main references used for this inventory are:
  - The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard - Revised Edition - March 2004 - WRI/WBCSD.
  - 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Intergovernmental Panel on Climate Change).
  - Programa Brasileiro do GHG Protocol - Guia para elaboração de inventários corporativos de emissões de gases de efeito estufa (GEE) – FGV, 2009.

# Inventory Limits

- In order to determine the organizational limits of its inventory, the company should adopt one of the approaches presented by the GHG Protocol: equity interest and control (operational or financial).
- B3 opted for the operational control approach, whereby the company is responsible for the emissions from sources and activities it controls. Therefore, if B3 exercises control over a given source of emission, where it can implement operational measures, this source is considered to be an integral part of the company's organizational limit.
- This inventory embraced all companies over which the stock exchange exerts operational control. The following groups were therefore included:
  - B3 S.A
  - Banco B3.
  - Bolsa de Valores do Rio de Janeiro (BVRJ)
  - Supervisão de Mercados (BSM)
  - B3 Social
  - International Offices: London and Shanghai

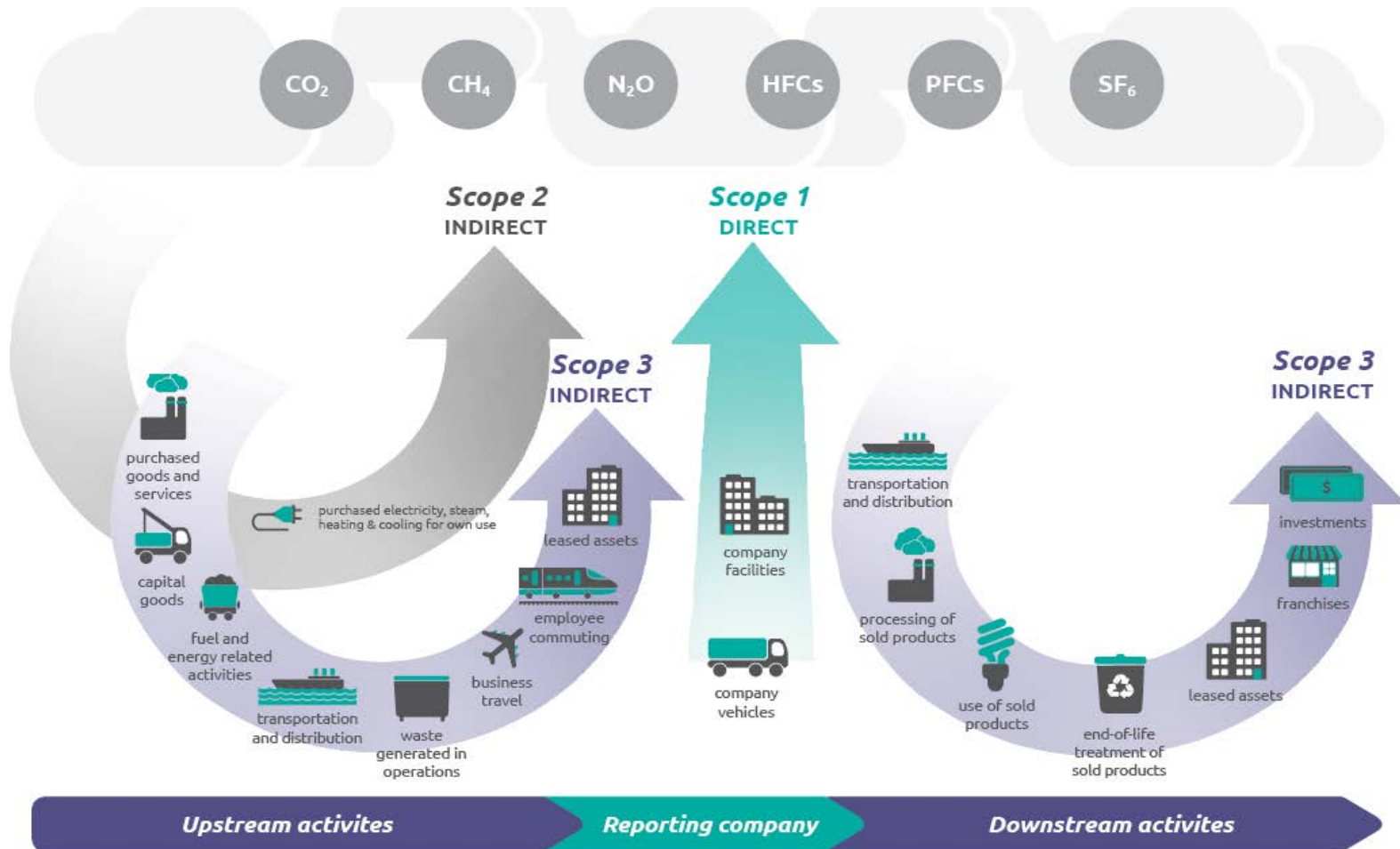
# Inventory Limits

The scope concept introduced by the GHG Protocol will help companies set operational limits to be recorded. The three scopes are defined as follows :





# Inventory Limits



Source: Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Greenhouse Gas GHG Protocol

# Inventory limits

Based on the Brazilian GHG protocol program guidelines and B3 activities this inventory identified and included the following emission sources:

## B3 Emissions Source

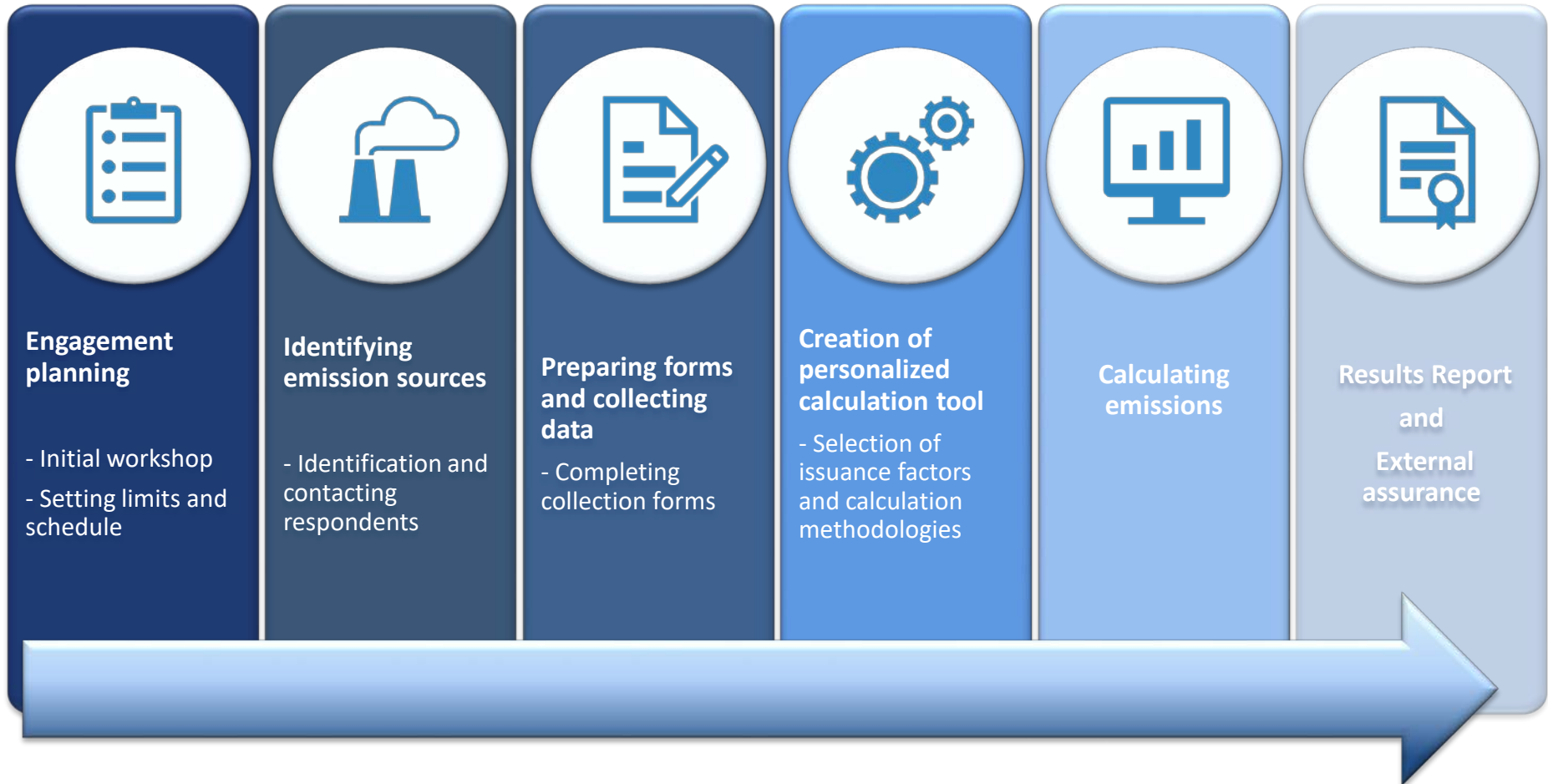
Scope 1	Stationary combustion sources	Use of fossil fuels to generate energy and cook food.
	Mobile combustion sources	Combustion of fossil fuels used in the operation of vehicles.
	Fugitive emissions	Unintentional release from sources including refrigerant systems and use of extinguishers.
Scope 2	Purchased energy	Emissions from the generation of purchased electricity, and use of fossil fuels to generate electricity.
Scope 3	Category 1 – Purchased goods and services	Combustion of fuel vehicles operated by third parties to transport documents (motorbike couriers)
	Category 5 - Waste generated in operations	Treatment of solid waste managed by third parties.
	Category 6 - Business travel	Air travel involving employees and use of taxi for business-related activities
	Category 7 - Employee commuting	Commuting
	Other emissions under Scope 3 (Fugitive)	Unintentional release from refrigerant systems controlled by third parties.

# Core Changes in 2018

In 2018 the following offices were deactivated:

- Ipiranga (Deactivated in April 2018);
- Rondonópolis (Deactivated in April 2018);
- Sorriso (Deactivated in April 2018);
- Rua do Mercado 11 (Deactivated in December 2018);
- República do Chile (Deactivated in May 2018);
- Clube Atletismo (Deactivated in July 2018);
- New York (Did not operate in 2018).

# Stages of Compiling the GHG Emissions Inventory





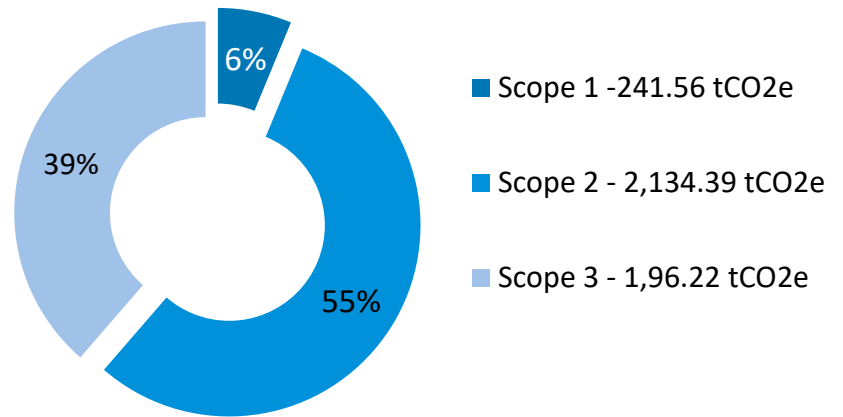
# Results

# Results - Absolute Emissions

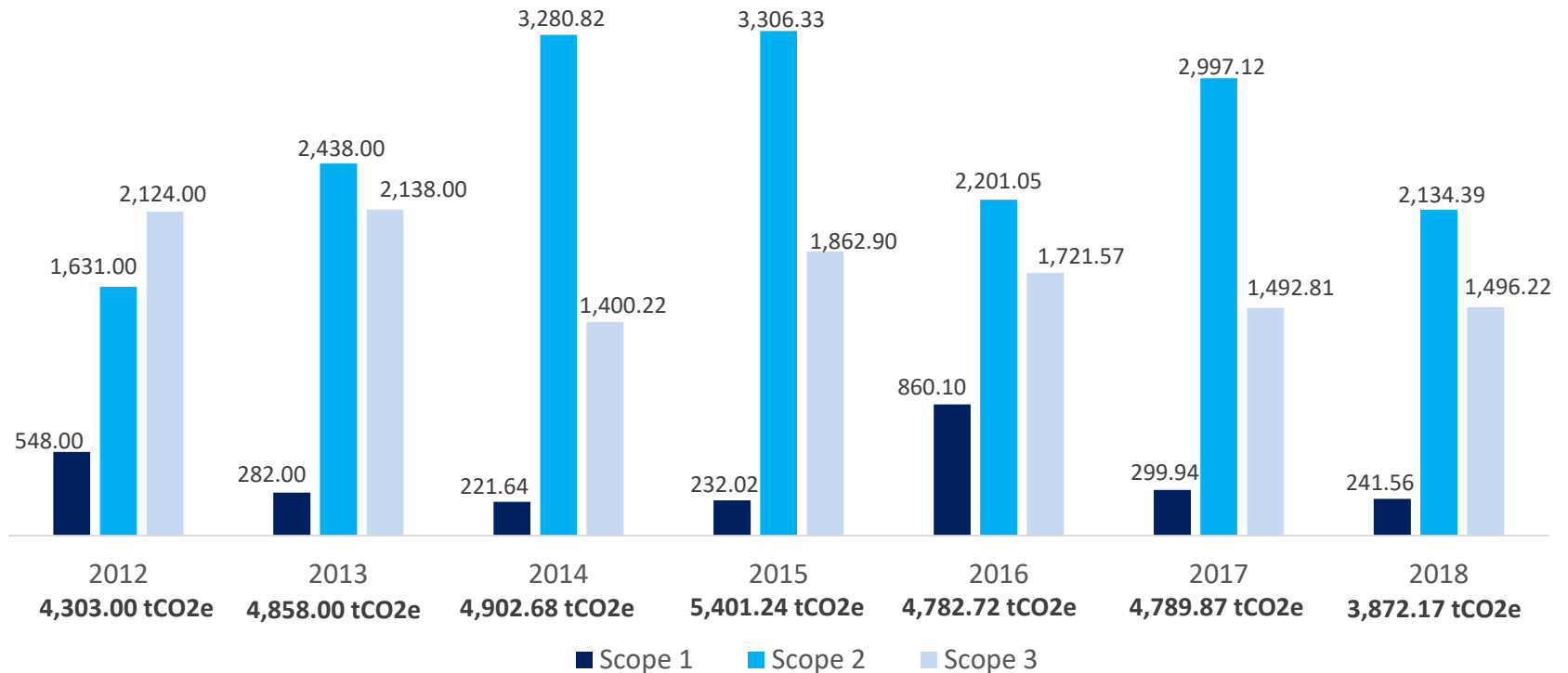
This chapter presents B3's GHG inventory results for 2018, compiled based on information collected internally and the methodologies and assumptions presented in this report.

B3's total GHG emissions for 2018 amounted to 3,872.17 tCO<sub>2</sub>e. As show in the imagem beside, 6% of the emissions refer to direct sources controlled by the company (scope 1). The other emissions are indirect, with 55% belonging to scope 2 and 39% to scope 3.

## B3 Emissions by Scope



# Results - Absolute Emissions



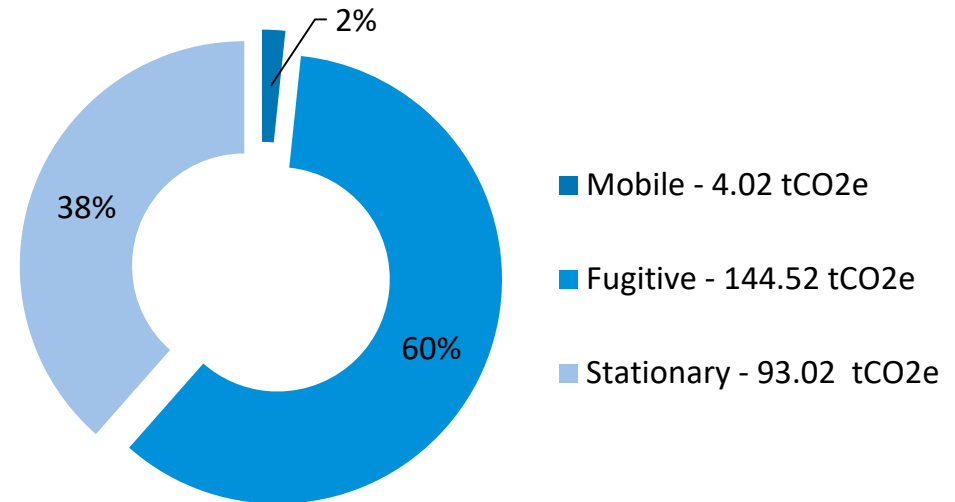
As is usual for financial and services companies, B3's direct emissions are much lower than its indirect emissions.

In 2018, B3's total emissions presented a decrease of approximately 19% compared to B3's 2017 emissions, highlighting the scope 2 variation as the most significant factor for the reduction.

# Results - Absolute Emissions Scope 1

The largest scope 1 emission sources were found in fugitive sources, due to the replacement of air-conditioning gases (refrigerants). Although the mass of gas was low (approximately 0.081 tonnes), its heating potential is very high, making it an important source of emission to the company when converted to CO<sub>2</sub>e.

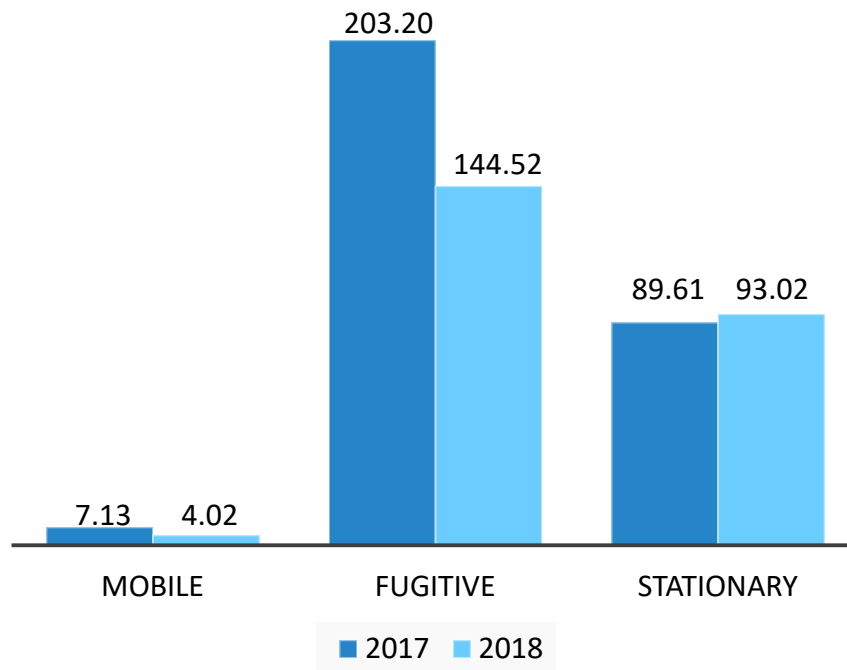
## B3 GHG Emissions – Scope 1



Source of Emission	tCO <sub>2</sub>	tCH <sub>4</sub>	tN <sub>2</sub> O	tHFCs	tCO <sub>2</sub> e
Mobile	3.860	0.002	0.0004	0.000	4.021
Fugitive	1.724	0.000	0.000	0.081	144.519
Stationary	92.460	0.013	0.001	0.000	93.016



# Results - Absolute Emissions Scope 1



When comparing 2017 and 2018 total scope 1 emissions it is possible to notice a significant reduction of 19%.

The most significant reduction is related to fugitive emissions, representing about 60% of the total emission for scope 1. The reduction in the replacement of refrigerant gases was responsible for the 29% decrease in fugitive emission.

Replacement of gas in air conditioning appliances varies and depends on how much the equipment is used. It is normal for years of heavy use to be followed by years of lower use, as the replacement does not always take place every year.

In 2018, emissions from B3's mobile and stationary sources accounted for 2% and 38% of the total scope 1 emissions. The stationary source increased 4% in absolute emissions, due to the higher consumption of Diesel Oil at the Data Center. Mobile source emissions reduced 44% compared to 2017, as a result of the offices deactivation (Ipiranga, Rondonópolis and Sorriso), that had vehicle fuels consumption.

# Results - Absolute Emissions

## Scope 1

### Mobile sources

Scope 1 mobile emissions stem from the use of vehicles owned or controlled by the company. B3 has a very small fleet, which explains the low emissions compared with other sources comprising this scope. In 2018, B3's fleet ran on ethanol, gasoline and diesel. Gasoline accounted for 59% of the emissions from this source.

In 2018 the percentage of ethanol in gasoline held steady at 27%, although diesel had its composition changed from 7,8% to 9,7% of biodiesel in the annual average. This change helped reduce non-biogenic emissions, thereby mitigating the impact on diesel consumption.

As it can be seen in the table below, the decrease in mobile source emissions is mainly connected to the lower gasoline consumption:

Source of Emission	Activity	Fuel	2017		2018	
			Consumption in liters	tCO2e	Consumption in liters	tCO2e
Mobile	Company's fleet	Ethanol	2,212.04	0.03	2,160.41	0.03
Mobile	Company's fleet	Diesel	772.925	1.89	683.71	1.64
Mobile	Company's fleet	Gasoline	3,087.50	5.21	1,395.09	2.36

# Results - Absolute Emissions

## Scope 1

### Stationary sources

Stationary source emissions result from the combustion of fuel (diesel oil) by generators and the use of natural gas and LPG in restaurants and heaters. The most significant emissions from this source in 2018 came from generators, representing approximately 90% of the emissions. We emphasize that this scope only took into account generators owned by B3. All energy from third-party sources was allocated to scope 2, in accordance with the guidelines of the Brazilian GHG Protocol.

The consumption of diesel by the Data Center's generators accounted for 68% of stationary source emissions, and in 2018 increased its emissions in 56% regarding 2017. The Data Center emission rise is consequence of its diesel consumption increase.

Source of Emission	Activity	Fuel	tCO2e
Stationary	Canteen	Natural Gas	7.81
Stationary	Canteen	LPG	0.42
Stationary	Generator	Diesel Oil	83.98
Stationary	Heater	LPG	0.81

# Results – Absolute Emissions

## Scope 1

### Fugitive Sources

In 2018, fugitive emissions primarily stemmed from the replacement of CO<sub>2</sub> in the units' fire extinguishers (1.72 tonnes) and the replacement of R407C gases (0.0805 tonnes). R-22 was also replaced, however as this gas is not encompassed in the Kyoto protocol, its emissions were not included in the inventory.

Compared with previous years, the replacement of extinguishers continues to be of negligible importance and refrigerant gases accounted for 98.8% of the fugitive emissions and 59.1% of the absolute emissions in scope 1.

Source of Emission	Activity	2017		2018	
		Gases (t)	tCO2e	Gases (t)	tCO2e
Fugitive	Extinguishers – CO2	1.22	1.22	1.72	1.72
Fugitive	Air conditioning – R134A	0.01	12.30	0.00	0.00
Fugitive	Air conditioning – R407C	0.10	182.80	0.08	142.80
Fugitive	Air conditioning – R410A	0.003	6.89	0.00	0.00

# Results - Absolute Emissions

## Scope 2

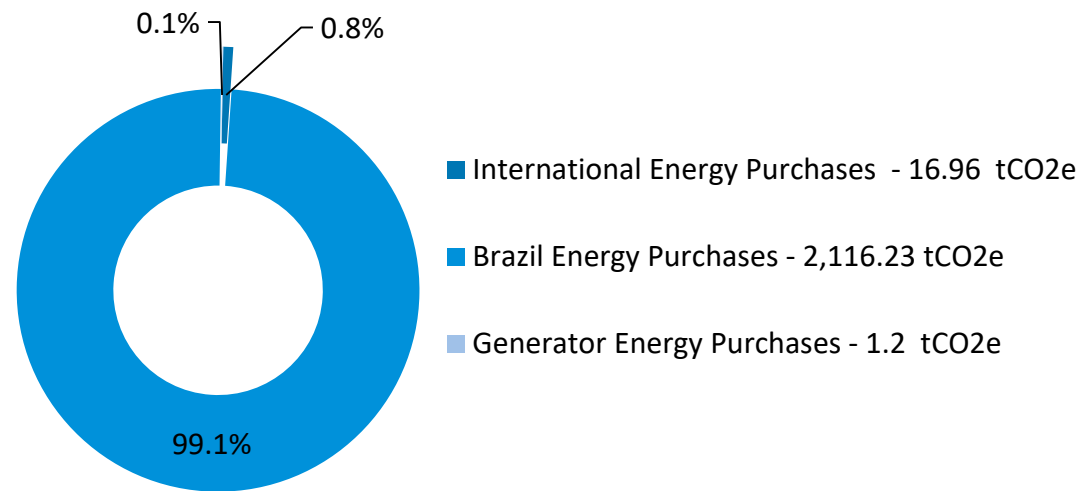
Scope 2 emissions consist of emissions from energy (electricity and steam) purchased externally. In 2018, B3 consumed 28.54 GWh from the Brazilian electricity grid in its operations, a decrease of 9% compared with the consumption in 2017.

In 2018, the emissions associated with this scope accounted for 55% of the company's total emissions, which can be divided in three categories: use of third-party generators, energy consumed in international offices and energy consumed in Brazilian offices.

International emissions in London and Shanghai were calculated by estimating the annual energy consumption per employee of the units in Brazil. This figure was used to quantify these units' emissions, which accounted for 0.8% of scope 2.

The GHG emissions from third-party generators accounted for 0.1% of scope 2 emissions.

### B3 GHG Emissions – Scope 2



# Results - Absolute Emissions

## Scope 2

The distribution of emissions are coherent with the company's structure. As most of the offices are located in Brazil, 99% of the scope 2 emissions consist of energy purchased in this country.

Source of Emission	tCO2	tCH4	tN2O	tCO2e
International Energy Purchases	16.96	-	-	16.96
Brazil Energy Purchases	2,116.23	-	-	2,116.23
Generator Energy Purchases	1.19	0.0002	0.00001	1.20

The emissions from purchased energy are based on specific emission factors determined according to each country's energy matrix, although Brazil is the most significant country, because of the number of units, its emission factor (tCO2e/Mwh) is lower compared with overseas units since it has a predominantly renewable energy matrix.

Source of Emission	tCO2e/MWh
International Energy Purchases - London	0.283
International Energy Purchases - Xangai	0.704
Brazil Energy Purchases	0.074

# Results - Absolute Emissions

## Scope 2

The 9% reduction in energy consumption, allied with the 20% decrease in the GRID emissions factor in 2018, was responsible for the reduction of 27.5% in the scope 2 emissions linked to energy acquired from the Brazilian GRID.

The deactivation of some units supported the reduction in electric energy at B3's Brazilian offices, representing approximately 74% of the energy saved in Brazil, in 2018.

The GRID emissions factor is related to the use of thermal power plants during the year (when hydroelectric power plants cannot meet the population's energy requirement, more thermal power plants are activated to meet this demand) which consequently leads to a variance in greenhouse gas emissions.

The table below presents the stock exchange's values and variation between 2017 and 2018 for its electricity consumption and GRID emission factor.

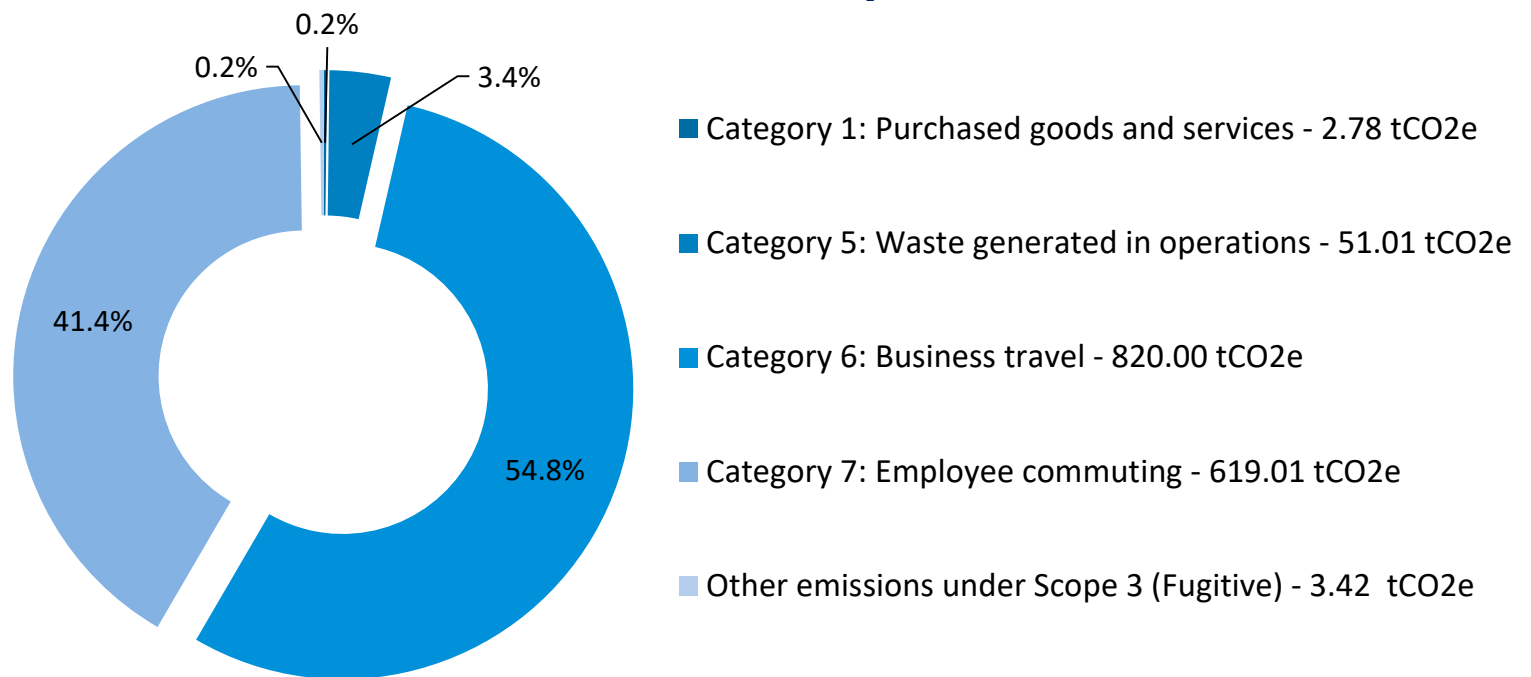
	Energy Consumption in Brazil (Mwh)	Emissions Factor (Average annual tCO2eq/Mwh)	Scope 2 Emissions Brazil (tCO2eq)
<b>2017</b>	31,347	0.0927	2,919.87
<b>2018</b>	28,538	0.0740	2,116.23
<b>Variation</b>	-8.96%	-20.22%	-27.52%

# Results - Absolute Emissions

## Scope 3

Scope 3 emissions consist of indirect emissions related to B3's activities. Five scope 3 categories, which are applicable to and reportable by the stock exchange, were considered in B3's inventory.

### B3 GHG Emissions- Scope 3



\*Included the scope 3 categories defined by the Brazilian GHG Protocol program.



# Results - Absolute Emissions

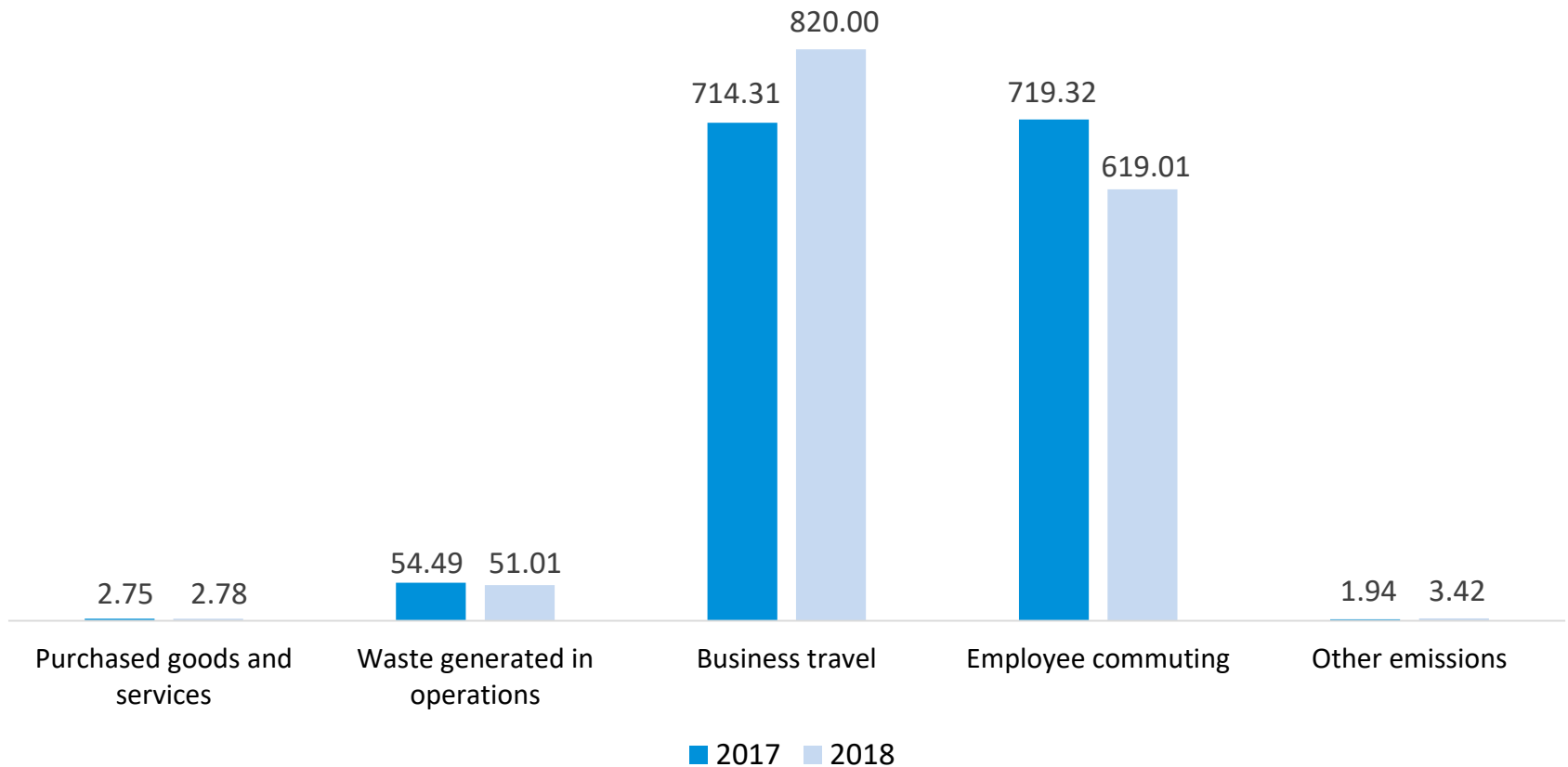
## Scope 3

Source of Emission	2018				
	Other gases (t)	tCO2	tCH4	tN2O	tCO2e
Category 1: Purchased goods and services	-	2.66	0.001	0.0003	2.78
Category 5: Waste generated in operations	-	-	2.04	-	51.01
Category 6: Business travel	-	810.11	0.03	0.03	820.00
Category 7: Employee commuting	-	597.25	0.24	0.05	619.01
Other emissions under Scope 3 (Fugitive)	0.002	-	-	-	3.42

According to the table above, scope 3 emissions primarily stemmed from the category Business Travel and Employee Commuting, jointly accounting for 96% of the total emissions under this scope

# Results - Absolute Emissions Scope 3

## B3 – GHG Emissions –Scope 3



# Results - Absolute Emissions

## Scope 3

### **Other Scope 3 emissions (Fugitive)**

There was a growth of 1.47 CO<sub>2</sub>e tonnes, as a result of the increase in the amount of R134-A replaced by the Praça XV office, in 2018.

### **Category 1: Purchased goods and services**

This category comprise the emissions from the transportation of documents by motorbike couriers. In 2018, there was an increase in the mileage traveled, representing a negligible rise of approximately 0.03 tonnes of CO<sub>2</sub>e.

### **Category 5 - Waste generated in operations**

Category 5 presents emissions related to the disposal of waste generated on B3's operation. In the last two years organic waste was disposed in landfills, in 2018, there was a reduction in the quantity of waste sent to the landfill, resulting in a 6% emission reduction in category 5.

Destination	2017 tCO <sub>2</sub> e	2018 tCO <sub>2</sub> e
Landfill	54.49	51.01

# Results - Absolute Emissions

## Scope 3

### Category 6 - Business travel

Category 6 (business travel) is the largest source of scope 3 emissions for B3. This category includes business travel and employee commuting by taxi and other forms of transportation, as shown below.

Category 6 (Business travel)	2017 tCO2e	2018 tCO2e
Employees/Directors Transport (Taxi)	45.75	61.18
Air Travel	668.56	758.82

In 2018, emissions due to taxi journeys increased 34% over 2017. This change occurred due to 2018 mileage rise, as shown in the table below.

	2017	2018
Taxi - distance traveled (km)	312,386.89	438,221.00

# Results - Absolute Emissions

## Scope 3

Emissions from flights increased in 2018 (13.5%), due to a growth in the distance traveled and the update of DEFRA emission factors, that presented an increase of 11.6% and 7.6% for short and long flights, respectively.

As it can be seen in the table below the mileage increase is higher for longer trips, usually associated with overseas flights. Even though the number of flights decreased, the distance traveled was higher.

	2017	2018	Variation
<b>Number of flights</b>	4,186	3,943	-5.8%
<b>Short KM</b>	709,356	630,715	-11.1%
<b>Medium KM</b>	1,938,694	1,760,076	-9.2%
<b>Long KM</b>	3,862,522	4,52,790	17.1%
<b>Total KM</b>	6,510,572	6,913,580	6.2%
<b>tCO2e</b>	668.56	758.82	13.5%

# Results - Absolute Emissions

## Scope 3

### **Category 7 - Employee Commuting**

In 2018, emissions from employee commuting accounted for 41.4% of the total scope 3 emissions. The data was obtained from an online survey applied to B3 employees and trainees. Whom 41.7% answered the survey for this inventory, and those who did not answer had their emissions calculated by extrapolating the patterns observed in the answers obtained.

Regarding 2018, a reduction of 14% in absolute emissions was observed for this category, compared to B3's 2017 emissions. The decrease in commuting emissions is linked to two factors: the reduction in the report of individual vehicles, added to the increase of public transport commute; and the reduction of 2% in employees number.

# Results - Absolute Emissions

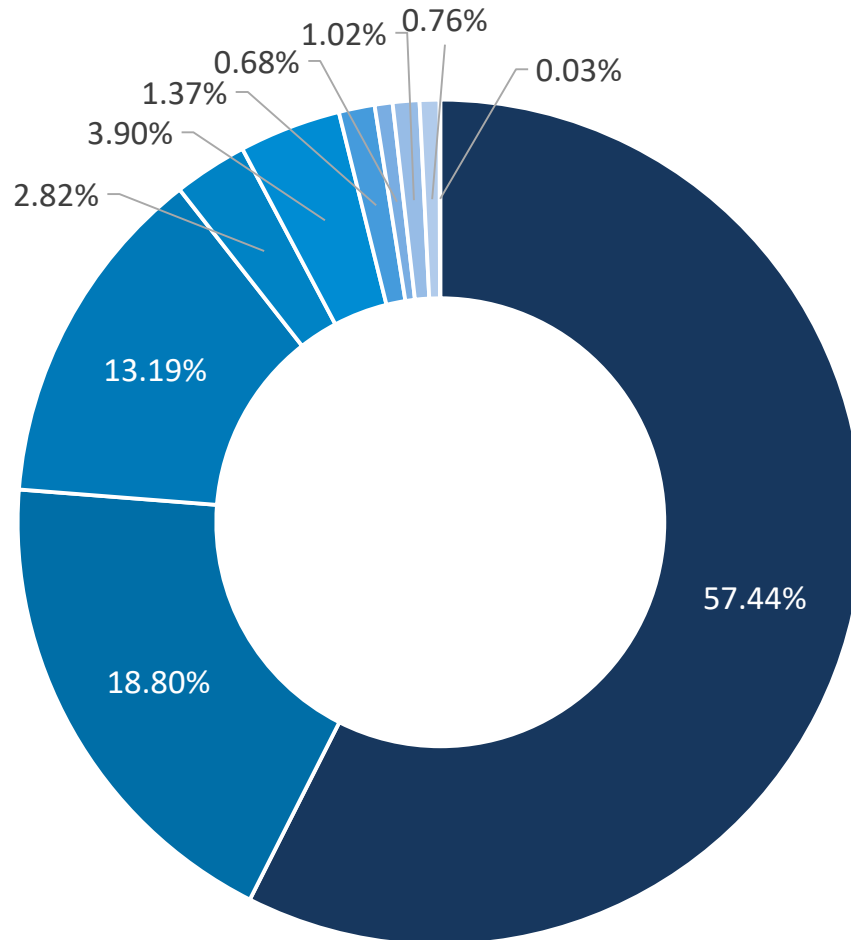
## Scope 3

### Results of the Survey "How do you commute to B3?"

Result by form of transportation	2013		2014		2015		2016		2017		2018	
	Nº. of people	%	Nº. of people	%	Nº. of people	%	Nº. of people	%	Nº. of people	%	Nº. of people	%
Subway/train + Bus	333	22.90%	198	18.00%	228	20.50%	300	22.49%	77	6.92%	131	14.69%
Subway/train	326	22.40%	223	20.20%	193	17.40%	211	15.82%	385	34.59%	153	17.15%
Car	155	10.60%	130	11.80%	125	11.30%	139	10.42%	198	17.79%	101	11.32%
Bus	104	7.10%	149	13.50%	107	9.60%	126	9.45%	182	16.35%	70	7.85%
Subway/train + car	171	11.70%	121	11.00%	88	7.90%	110	8.25%	39	3.50%	62	6.95%
Motorcycle	54	3.70%	45	4.10%	50	4.50%	44	3.30%	49	4.40%	35	3.92%
On foot	43	3.00%	50	4.50%	35	3.20%	36	2.70%	36	3.23%	25	2.80%
Subway/train on foot	18	1.20%	24	2.20%	35	3.20%	58	4.35%	5	0.45%	46	5.16%
Bus + on foot	22	1.50%	12	1.10%	16	1.40%	19	1.42%	2	0.18%	9	1.01%
Bicycle	13	0.90%	6	0.50%	5	0.50%	10	0.75%	7	0.63%	6	0.67%
Others*	218	15.00%	144	13.10%	228	20.50%	281	21.06%	133	11.95%	254	28.48%
Total	1,457	100%	1,102	100%	1,110	100%	1,334	100%	1,113	100%	892	100%

\* The item "Other" primarily denotes taxes, lifts and the combination of 3 different forms of transportation.

# Results - Absolute Emissions Scope 3



## B3 GHG Emissions – by transport

- Extrapolation
- Car - Employees and interns
- Bus - Employees and interns
- Motorcyle - Employees and interns
- Taxi - Employees and interns
- Subway - Employees and interns
- Students Transport - Train
- Train - Employees and interns
- Students Transport - Bus
- Students Transport - Subway



# Results - Absolute Emissions

## Biogenic and fugitive emissions

Emissions resulting from the combustion of biofuels are different and were therefore treated differently to those deriving from the combustion of fossil fuels. The combustion of biomass has a neutral CO<sub>2</sub> emission, this assumption is made because it considers that the CO<sub>2</sub> released during the combustion of biomass is equal to the CO<sub>2</sub> absorbed from the atmosphere during photosynthesis, meaning it can be considered neutral. Emissions of CH<sub>4</sub> and N<sub>2</sub>O cannot be considered neutral because these gases are not removed from the atmosphere during the biomass life-cycle. In this case the emissions of CH<sub>4</sub> and N<sub>2</sub>O were included in scope 1.

In Brazil, all diesel sold contains a fraction of biodiesel (Law 11097 issued 1/13/2005) and all Brazilian gasoline must contain a variable fraction of biogenic fuel, i.e ethanol. For the diesel and gasoline consumption it was therefore necessary to segregate the fossil fuel portion from the renewable portion. In 2018 the gasoline and diesel oil produced in Brazil contained an average 27% anhydrous ethanol and 9.7% biodiesel respectively.

The following table presents the neutral emissions for scopes 1, 2 and 3 resulting from the burning of biomass fuels in B3's activities in 2018. The emissions of R-22 refrigerant gas, which is not included in the Kyoto Protocol as it is already regulated by the Montreal<sup>1</sup> Protocol, is also reported since it has a representative global warming potential.

<sup>1</sup> The Montreal protocol is an agreement that restricts the emissions of ozone layer harmful gases.

# Results - Absolute Emissions

## Biogenic and fugitive emissions

Scope	Source of Emission	Consumed fuel	Neutral emissions
Scope 1	Stationary Sources	B5 Diesel	7.97
	Mobile Sources	B5 Diesel	0.16
		Gasoline	0.57
		Hydrated Ethanol	3.15
Scope 2	Purchased electricity (generator)	B5 Diesel	0.11
Scope 3	Category 1 :Purchased goods and services	Gasoline	0.68
	Category 6: Business travel	Gasoline	14.93
	Category 7: Employee commuting	Ethanol	140.08
		B5 Diesel	9.77
		Gasoline	33.11
		Extrapolation	255.12

Scope	Source of Emission	Gas Consumed	Emissions of Montreal protocol gases (tCO2e)
Scope 1	Fugitive Sources	R-22	172.31

# Results - Emissions Intensity

B3 uses the following 4 indicators to assess its GHG emissions performance:

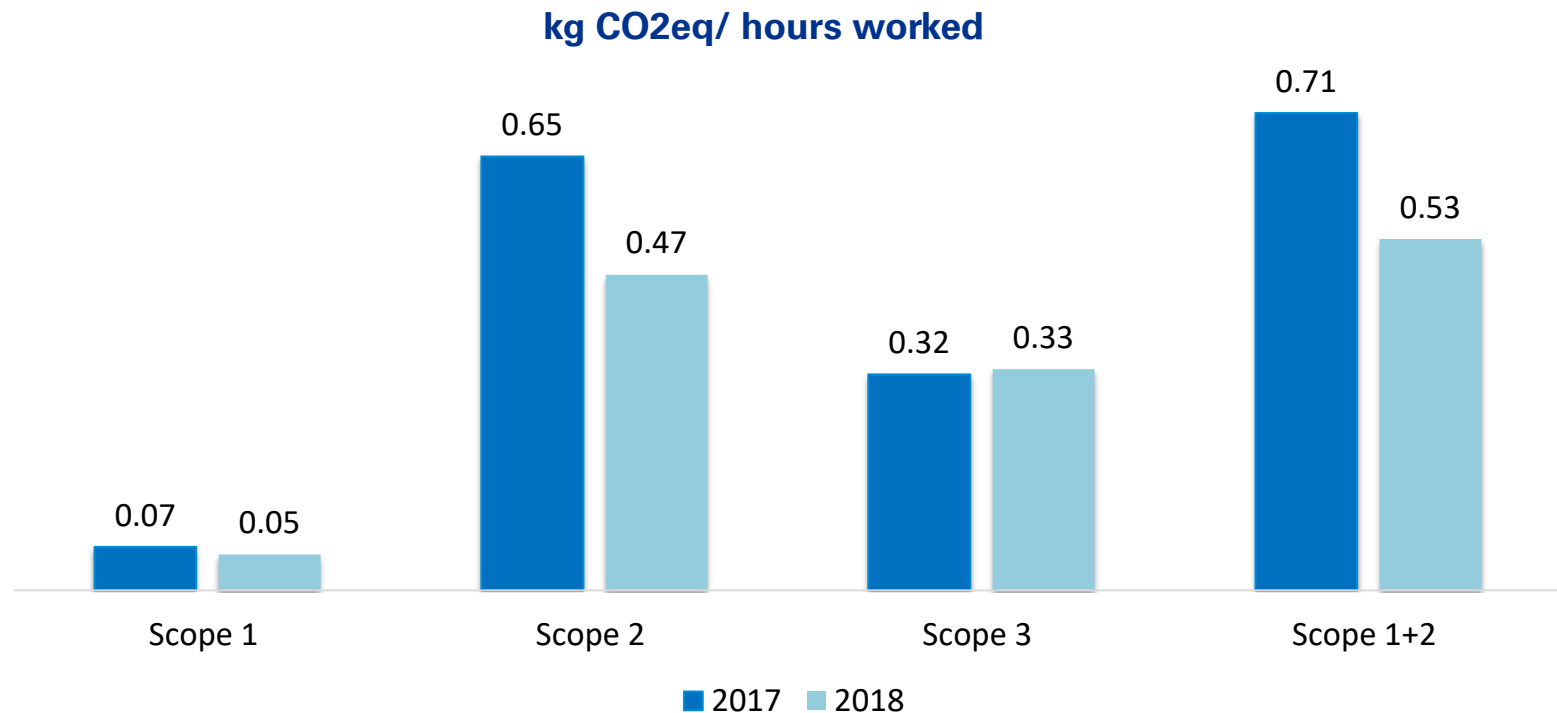
- Intensity of emissions by hours worked
- Intensity of emissions by gross revenue
- Intensity of emissions by trading volume - Bovespa Segment
- Intensity of emissions by trading volume - BM&F Segment

# Results - Emissions Intensity

## Intensity kg CO<sub>2</sub>eq/ hours worked

The quantification of the emissions by hours worked shows the participation of the company staff and interns in the company's emissions.

B3 reduced the intensity of scope 1 and 2. Scope 3 values held steady. Those results are connected directly to the scopes emissions fluctuation, since there was a low variation on the worked hours (-2%).

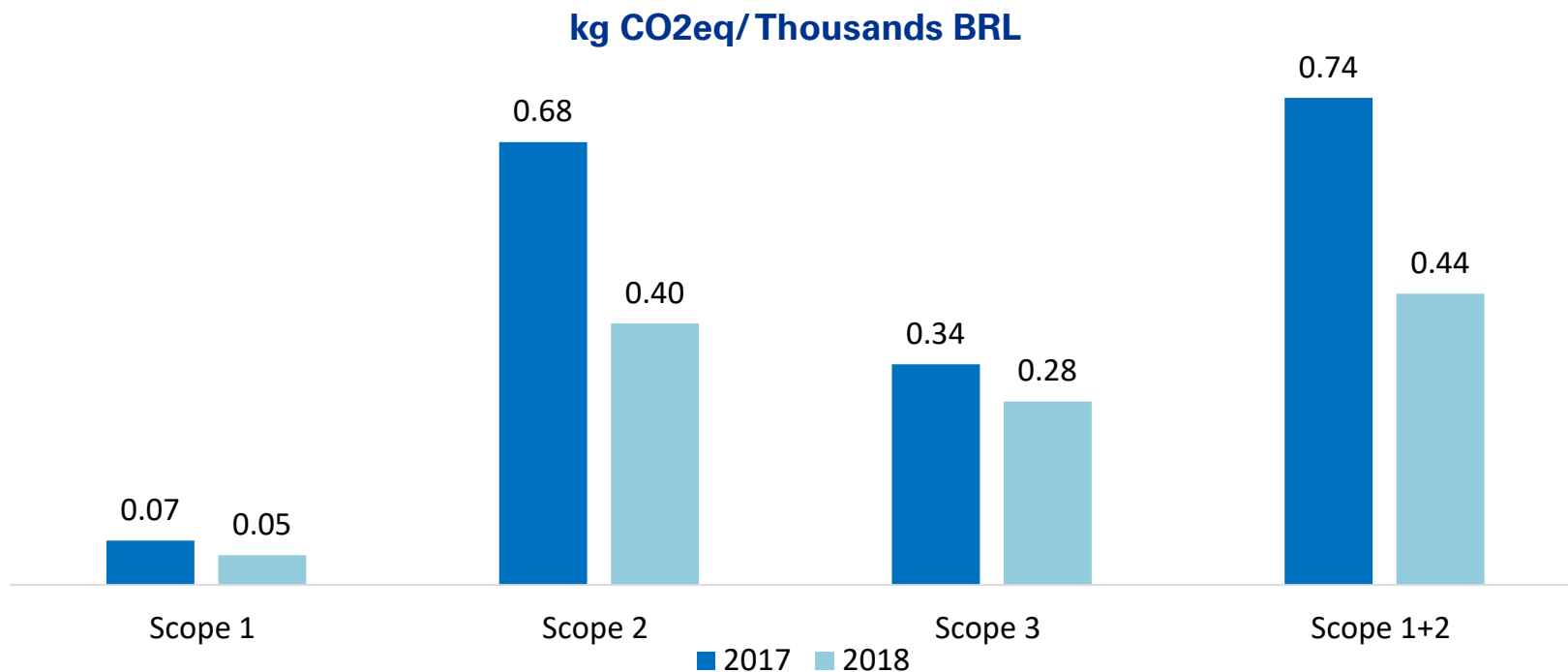


# Results - Emissions Intensity

## Intensity kg CO<sub>2</sub>eq/ gross revenue

In 2018 the revenue rose by 21% compared to 2017, this increase in addition to the scopes 1 and 2 emissions reduction, caused significant decrease in the emissions intensity for scopes 1 and 2 which reduced respectively 33% and 41%.

As scope 3 emissions did not show significant variations (increased of 0.2% compared to 2017), the 17% reduction in emissions intensity can be related to the revenue growth in 2018.

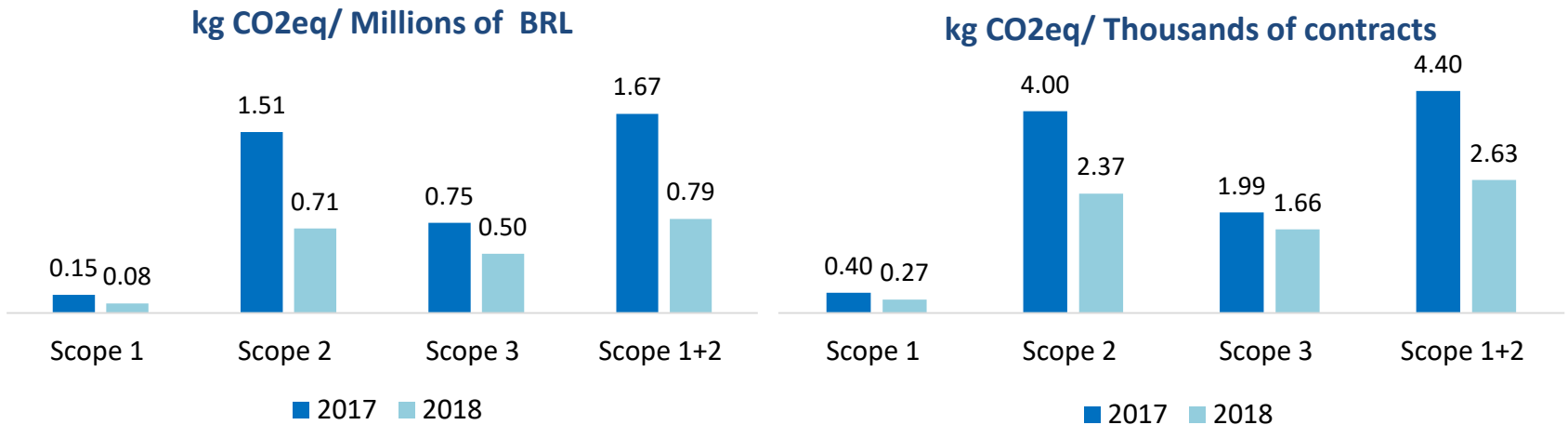


# Results - Emissions Intensity

## Intensity kg CO<sub>2</sub>eq/ trading volume

Increasing 53% in the day average of millions of BRL traded, boosted the reduction of the scopes 1 and 2 emissions intensity by 47% and 53%, and allowed the reduction of scope 3 intensity by 34%.

The day average of contracts negotiated rose approximately 21% in 2018, and the scope 1, 2 and 3 intensities for the contracts reduced, respectively 33%, 41% and 17%.



# References

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