GHG INVENTORY 2019

GHG emissions inventory of Cielo in 2019

CIELO

VERSION 3.0

APRIL 2020

WAY CARBON

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CLIENT	
PROJECT	CIELO19A
DELIVERABLE	CIELO GHG INVENTORY 2019
AUTHORS	TEAM Renata Pimenta; renata.pimenta@waycarbon.com
COLLABORATORS	CIELO Gabriel Mariano Picca; gpicca@cielo.com

DOCUMENT TRACK RECORD

Name of document	Date	Nature of Review
Cielo – Inventário GEE 2019_20200310	03/10/2020	First version
Cielo – Inventário GEE 2019_20200415	04/15/2020	Second version – post-audit review
Cielo – Inventário GEE 2019_20200415	04/28/2020	Third version – post-audit final review

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1. INTRODUCTION

Global warming-related issues and climate change make the low-carbon economy a major concern for sustainable development, and increasingly means are sought to harmonize economic development and climate system protection. Within this context, it is extremely relevant to quantify and manage greenhouse gas (GHG) emissions within the corporate scope.

The GHG emissions inventory is the managerial instrument that allows quantifying GHG emissions of a certain organization. From the definition of its comprehensiveness, identification of GHG sources and sinks, accounting of its respective emissions or removals, the Inventory enables us to know the profile of emissions resulting from the organization's activities.

The information generated from the elaboration of a GHG Emissions Inventory may observe the following objectives:

- **GHG emissions monitoring**: monitor and register the evolution of emissions over time. Identify opportunities for operational efficiency gains and cost-savings;
- **Benchmarking**: compare emissions of each operating unit or each sector of an organization;
- **Assessment of risks and opportunities**: identify and mitigate the regulatory risks and coupled with future obligations in relation to GHG emission rates or emission restrictions, as well as assess potential cost-effective opportunities of reducing emissions;
- **Definition of goals**: subsidize the definition of goals to reduce GHG emissions and mitigation strategies planning;
- **Monitoring of mitigation actions results**: quantify advances and improvements deriving from strategic initiatives relating to Climate Change-related issues;
- **Participation in programs disseminating the climate footprint**: allow the disclosure of information on the organization's climate performance (e.g. GHG Protocol, CDP, ISE, ICO2).

When applied to the value chain of an organization, inventory also allows the assessment of external process climate sustainability; e.g. raw material production, product utilization and layout and distribution logistics.

Among the protocols and rules available for compilation of GHG corporate inventories, this study adopted the following references:

- NBR ISO 14064 Standard; Brazilian Association of Technical Standards, 2007 (ABNT, 2007);

- Specifications of Brazil GHG Protocol Program; Specifications of Brazil GHG Protocol Program Verification; GHG Corporate Protocol - Brazil GHG Protocol Program (PBGHGP) - Getúlio Vargas Foundation; World Resources Institute (FGV/GVces; WRI, 2011);

The protocols listed above have international credibility. The main purpose of adopting them is to obtain a report that can be compared domestically and globally.

It is worth noting that this inventory is subject to verification within the scope of the protocols listed above. The objective of a third party verifying this inventory is the obtainment of an independent declaration on the inventory quality and the consistency of the information contained therein so that users are assured an accurate assessment of emissions standard in the organization's value chain.

1.1. CIELO

Cielo S.A. is a retail technology and services company, playing a leading role in Latin America's e-payment sector and one of 10 largest Brazilian corporations in the market cap. The company has a structure that keeps is clients' business in motion. Activities include accreditation, transmission, processing and financial settlement of transactions and capture of main domestic and international credit and debit card brands. Besides, it offers products and services for all business profiles.

Cielo's business structure is divided into 9 Operating Units:

- Cielo S.A.;
- Servinet Serviços Ltda;
- Cateno Gestão de Contas de Pagamentos S.A.;
- Aliança Pagamentos e Participações Ltda;
- Braspag Tecnologia em Pagamentos Ltda;
- Merchant e – Solutions;
- Multidisplay Com. e Serviços Tecnológicos S.A.;
- M4 Produtos e Serviços S.A.;
- Stelo S.A.

At Climas system, Cielo S.A.'s unit; Servinet Serviços Ltda; Aliança Pagamentos e Participações Ltda are grouped into a same operating unit: CIELO S.A., Servinet, Aliança and Multidisplay Com. e Serviços

Tecnológicos S.A. and M4 Produtos e Serviços S.A. are grouped into M4U. It is worth noting that in 2019, the building where Cielo carries out its activities underwent a structural change. Stelo S.A. was incorporated into the floor pertaining to Cielo S.A. as of September 2019, therefore, its emissions are accounted jointly with Cielo S.A., Servinet and Aliança.

Cielo, for the 7th consecutive year, elaborated its GHG emissions inventory in 2019. Cielo Scope 1, 2 and 3 emissions[1] were 4,239.60 tCO_2e, 731.20 tCO_2, and 43,055.52 tCO_2e, respectively. In 2019, key emissions of the organization derived from upstream transportation and distribution category, with nearly 78% of total emissions representativeness. Table 1 shows Cielo GHG emissions regulated by Kyoto Protocol in 2019 divided by scope, category and representativeness.

Table 1. Cielo GHG emissions regulated by Kyoto in 2019 by scope and category (tCO_2e).

Scope/Category	Emissions (tCO_2e)	Emissions (%)
Scope 1	4,239.60	8.83%
Stationary combustion	0.23	0.00%
Mobile combustion	4,239.21	8.83%
Fugitive	0.15	0.00%
Scope 2	731.20	1.52%
Acquisition of electricity	718.51	1.50%
Acquisition of thermal energy	12.69	0.03%
Scope 3	43,055.52	89.65%
Goods and services acquired	253.55	0.53%
Employees commuting hours (home-work)	3,338.09	6.95%
Waste generated in operations	431.52	0.90%
Transportation and distribution (downstream)	1.96	0.00%
Transportation and distribution (upstream)	37,492.22	78.07%
Use of goods and services sold	238.15	0.50%
Business travels	1,300.02	2.71%
Overall Total	**48,026.32**	**100.00%**

[1] GHG emissions regulated by Kyoto Protocol (carbon dioxide - CO_2, methane - CH_4, nitrous oxide - N_2O, sulfur hexafluoride - SF_6, perfluorocarbons - PFCs and hydrofluorocarbons – HFCs).

2. METHODOLOGY

2.1 ACCOUNTING PRINCIPLES AND INVENTORY ELABORATION

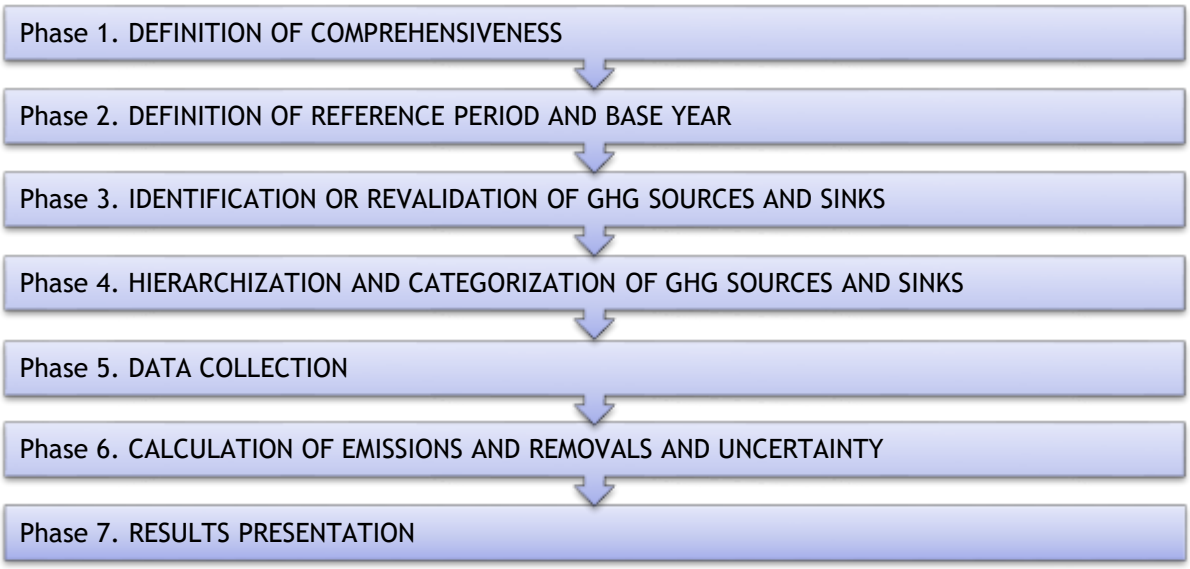
The following principles guided the elaboration of this study, in conformity with Brazil GHG Protocol Program guidelines (FGV/GVces, WRI, 2011):

- **Relevance**: Assure that the GHG Inventory appropriately reflects the focused process emissions and meets the needs of users' decision-making process.
- **Completeness**: Register all the sources and GHG emission activities within the inventory's selected boundaries. Document and justify any specific exclusions.
- **Consistency**: Adopt acknowledged methodologies and technically substantiated to allow comparisons of emissions with other similar processes. Clearly document any alterations in data, inventory boundaries, methods applied or any other relevant factor during a given period.
- **Transparency**: Treat all relevant topics consistently and factually, based on objective evidence. Reveal any relevant suppositions, as well as make appropriate reference to methods of calculation and registry, also the sources of data employed.
- **Accuracy**: By applying appropriate data relating to emission factors or estimates, assure that GHG emission measurement is not underestimated or overestimated. Reduce bias and uncertainties the least possible and obtain a level of determination to enable safe decision-making processes.

2.2 PHASES OF INVENTORY COMPILATION

The conceptual phases adopted to elaborate this inventory are presented in the flowchart below and explained thereafter (Figure 1):

Figure 1. Flowchart of methodology phases to elaborate inventories.



Firstly, the inventory comprehensiveness is defined (Phase 1), that is to say, it is necessary to determine which facilities and activities of the organization will be covered by inventory, thus, setting out its organizational boundary. Subsequently, the inventory reference period and base year are defined (Phase 2).

The organization's GHG sources and sinks are identified (Phase 3) which, then, are categorized and hierarchized (Phase 4). Subsequently, data are collected (Phase 5). Collected emission activity data and emissions factors are used to calculate emissions (Phase 6), (see below). In this phase, inventory uncertainties are also calculated. Lastly, results are compiled in an annual report (Phase 7).

The phases identified above were applied to Cielo GHG inventory, as described herein.

2.3 DEFINITION OF COMPREHENSIVENESS

2.3.1 Organizational boundaries

Two approaches are possible to consolidate emissions and removals at the organizational level. Below, each of these approaches is defined, indicating the option applied in this inventory.

☐ Shareholding: the organization assumes GHG emissions of operations, according to shareholding.

☑ Operational Control: the organization is liable for 100% of GHG emissions of operations over which it has operational control.

The Organizational Boundary of this inventory comprises all the operations under Cielo's operational control, with operations in the US and the Brazilian territories, covering the 9 operating units of Cielo S.A., Servinet Serviços Ltda, Cateno Gestão de Contas de Pagamentos S.A., Aliança Pagamentos e Participações Ltda, Braspag Tecnologia em Pagamentos Ltda, Merchant e – Solutions, Multidisplay Com. e Serviços Tecnológicos S.A., M4 Produtos e Serviços S.A., Stelo S.A.

2.3.2 Operational boundaries

The definition of operational boundaries takes into account the identification of GHG sources and sinks associated with operations by means of their categorization as direct or indirect emissions, applying the scope concept. Below, each of the three categories adopted by the GHG Protocol is defined, indicating the options envisaged herein.

☑ Scope 1: GHG direct emissions deriving from sources pertaining or controlled by the organization.

☑ Scope 2: GHG indirect emissions deriving from the acquisition of electricity which is consumed by the organization.

☑ Scope 3: Optional reporting category, it considers all other indirect emissions not classified into Scope 2. These are a result of the organization's activities, but they occur in sources not pertaining or not controlled by it.

2.3.3 Covered Period

This present inventory comprises the emissions deriving from activities carried out by Cielo in 2019 (January 1, 2019, to December 31, 2019).

2.3.4 Base year

The base year is the point of reference in the past in relation to which current atmospheric emissions can be compared consistently.

The re-calculation retroactive to base year shall be made whenever there are changes to result in emissions increase or decrease, i.e., whenever change compromises the consistency and relevance of analyses over time. The following cases may result in the need for recalculating emissions:

- Relevant structural changes to alter inventory boundaries: (i) mergers, acquisitions, divestments, (ii) outsourcing and incorporation of emission activities, and (iii) change in the emission activity inside or outside the Program's geographic boundaries (Brazil GHG Protocol);

- Significant changes in calculation methodology, improved accuracy of emission factors or data of activity to result in a significant impact on emissions data or base year;

- Discovery of relevant errors or a certain number of accumulated errors to result in significant changes in results.

Despite the acquisition of Stelo S.A. in 2018, it is not necessary to recalculate emissions, since we do not have access to the emission data of unit acquired, which does not have meaningful representativeness (less than 1%).

2.3.5 Greenhouse Gases

According to the Brazil GHG Protocol Program, Inventories must encompass 7 types of GHG composing the Kyoto Protocol reporting: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbon (HFCs), perfluorocarbon (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). Also, the Montreal Protocol includes the ozone layer depleting gases, such as hydrochlorofluorocarbons (HCFCs), which also contribute to global warming.

Each GHG has a related Global Warming Potential (GWP), which is the measure of how much each gas contributes to global warming. The GWP is a relative amount that compares the potential warming of a certain quantity of gas with the same quantity of CO_2 which, by standardization, has a GWP value equal to 1. The GWP is always expressed in terms of the equivalence of CO_2 - CO_2e. Table 2 below shows the GWP values applied in Cielo's Inventory:

Table 2. GHG GWP

Gas	Amount
HFC-125	3,500.00
N_2O	298.00
HFC-32	675.00
Renewable CO_2	1.00
CH_4	25.00

Source: PBGHGProtocol, 2019.

Cielo's inventory considered CO_2, CH_4, N_2O and HFCs emissions (HFC-32 and HFC-125) according to sources of emission mapped and data availability. Also, the inventory calculated renewable CO_2 emissions.

CO_2, CH_4, N_2O and HFCs gases are generated at Cielo, as follows:

- CO_2: generated in the burn of fossil fuels (such as diesel, natural gas and liquefied petroleum gas) by mobile and stationary sources, acquisition of electricity and thermal energy, gas and gas leakage from fire extinguishers;
- CH_4: generated in the burn of fuels by mobile and stationary sources, and decomposition of organic matter in the solid waste anaerobic treatment;
- N_2O: generated in the burn of fuels by mobile and stationary sources;
- HFCs: generated in cooling gas leakage.

2.4 IDENTIFICATION OR REVALIDATION OF SOURCES AND SINKS

Sources of emission were identified and hierarchized within the Company's organizational structure. Within the Climate system developed by WayCarbon, the Company's sources of emission were mapped and each one was classified according to the following attributes (Table 3):

Table 3. Description of attributes registered for input databank.

Attribute	Description
Operating unit	Indicates the operating unit to which the source or sink pertains
Process	Indicates the process to which the source or sink pertains
Activity	Indicates the activity to which the source or sink performs
Item supervised	Field that registers greater details to identify the source of emission
Precursor	Substance that originates GHG emissions
Technology	Technology which associated with precursor originates GHG emissions
Operating parameter	Description of inputs
Measurement unit	Measurement unit of consolidated input
Person in charge	Person of the organization in charge of collecting data.
Data origin*	Place, registration, reference or system where data are obtained
Scope	Scope of the source of emission, according to GHG Protocol classification
Category	Category of the source of emission, according to GHG Protocol classification

The sources of emission contemplated in the inventory, according to the hierarchization and organization structured at CLIMAS system is presented in Table 4, below:

Table 4. Sources of emission contemplated in inventory in accordance with scope, category and activity (hierarchy 5) structured at CLIMAS system

Scope	Category	Activity
Scope 1	Stationary combustion	Electricity generation
	Mobile combustion	Administrative fleet
	Fugitive	Fire-alarm system recharge
		Cooling system recharge
Scope 2	Acquisition of electricity	Electricity consumption
		Electricity generation
	Acquisition of thermal energy	Electricity generation
Scope 3	Goods and services acquired	Goods and services acquired
		ISO
	Employees commuting hours (home-work)	Employees transportation home-work
	Waste generated in operations	Waste disposal
	Downstream transportation and distribution	Sale of material
	Upstream transportation and distribution	Field service (Courier)
		Coil supply -field service
		Disposal in KM (Terminal, Supplies and MKT)
		Manufacturer (Acquisition of New Terminals)
		Direct and Reverse Logistics
		Milk Run
		Transportation of materials
	Use of goods and services sold	Use of machinery
	Business travels	ISO
		Employees business travels
		Clients travels

As observed in Table 4, the processes defined at CLIMAS for Cielo's inventory can be correlated with categorization defined by Brazil GHG Protocol[2]. According to the Brazil GHG Protocol Program, categories are defined as follows:

- Stationary combustion (Scope 1): GHG emissions deriving from fuel burn, which generates energy, generally used to produce water steam or electricity. This energy is not used for transportation means. Examples: furnaces, burners, heaters and generators.

[2] The definition of categories was collected from documents issued by FGV EAESP: Technical Note :Classification of GHG Scope 1 emissions in respective categories of sources of emission – version 1.0 (Available at http://mediadrawer.gvces.com.br/ghg/original/ghg-protocol_nota-tecnica_categorys-Scope-1_-v1.pdf) and Categories of Scope 3 Emissions Adopted by the Brazil GhG Protocol Program (Available at http://mediadrawer.gvces.com.br/ghg/original/ghg_ categorys_e3_definicoes_curta.pdf) and

- Mobile combustion (Scope 1): GHG emissions deriving from fuel burn, which generates energy to product movement and travels a route. Examples: cars, motorcycles, trucks, buses, tractors, forklifts, aircraft and trains.

- Fugitive (Scope 1): generally unintentional GHG exhausts occurring during production, processing, transmission, storage or use of gas. Examples: fire extinguishers (CO_2) and cooling equipment and air conditioning leakage (HFC or PFC).

- Acquisition of electricity (Scope 2): GHG emissions deriving from electricity generation acquired by inventory company.

- Acquisition of thermal energy (Scope 2): emissions relating to thermal energy consumption generated by third parties.

- Category 1: Goods and Services Acquired (Scope 3): all emissions occurring during the life cycle (extraction, production and transportation) of products (goods and services) acquired to the reception point of inventory organization, not recorded in another Scope 3 category.

- Category 4: Upstream Transportation and Distribution (Scope 3): emissions from distribution of products and transportation acquired by inventory organization in vehicles and facilities neither owned nor operated by the organization, as well as other outsourced transportation and distribution services (including both inbound and outbound logistics).

- Category 5: Waste generated in operations (Scope 3): it includes emissions from treatment and/or final disposal of solid waste and liquid effluents deriving from the inventory organization controlled by third parties. This category accounts for all future emissions (during treatment and/or final disposal process) to result in waste generated in the inventory year.

- Category 6: Business travels (Scope 3): emissions from transportation of employees to activities related to inventory organization's business, through vehicles operated or owned by third parties, such as aircraft, trains, buses, passenger vehicles and ships. This category includes all employees of entities and units operated, rented, or owned by inventory organization. This category may include employees from other relevant entities (for instance, outsourced workers), as well as advisors and other individuals who are not employees of the inventory organization but travel to its units.

- Category 7: Employees commuting hours (home-work): Employees commuting hours (Scope 3): The emissions of this category include employees' transportation from home to the workplace. This category includes transportation by car, bus, train and other modes of urban transportation.

- Category 9: Downstream Transportation and Distribution (Scope 3): Emissions from transportation and distribution of products sold by inventory organization (if not paid by the latter) between its operations and end consumer, including retail and storage, in third parties' vehicles and facilities.

- Category 11: Use of goods and services sold (Scope 3): Emissions deriving from the final use of goods and services sold by inventory organization in the inventory year. All emissions during their useful life are accounted for in the inventory year.

2.5 DATA COLLECTION

The flow of information to prepare inventory took place as follows:

1. Employees who monitored the operations verified the best way of obtaining data from the company's management systems;
2. Employees from several areas of the company validated information and inserted it into the Climas system;
3. WayCarbon's technical staff validated the consistency of operational data at the Climas system.

The governance of operational data was organized within the CLIMAS platform and employees to collect information on the operation received a login to access and directly insert information into the climate management supporting tool. Thus, the company may structure a monthly flow of information and monitor the impact on Climate Change, month by month, as a way of environmental management.

2.6 CALCULATION OF EMISSIONS AND REMOVALS

Cielo GHG emissions inventory was elaborated via CLIMAS, a calculation software developed by WayCarbon, which has a databank with the latest emission factors available for each type of source (for instance, the Brazil GHG Protocol Program and, when not available, internationally accepted references, such as GHG Protocol, IPCC, EPA and DEFRA).

Generally, GHG emissions and removals are calculated for each source and sink individually, according to the following formula:

$$E_{i,g,y} = DA_{i,y} \cdot FE_{i,g,y} \cdot PAG_g$$

Where:

- ***i*** Index that indicates the activity of individual source or sink;

- ***g*** Index that indicates a type of GHG;

- y Report reference year.
- $E_{i,g,y}$ GHG emissions or removals attributable to the source or sink *i* during year *y*, in tCO_2e,
- $DA_{i,y}$ Data of consolidated activity referring to the source or sink for the year *y*, at unit *u*. As pointed out previously, the data of consolidated activity will consist of all attributes registered of each source/sink.
- $FE_{i,g,y}$ GHG emission or removal factor *g* applicable to the source or sink *i* in year *y*, in t GEE g/u,
- PAG_g GHG global warming potential g, in $tCO_2e/tGEEg$,

The selection of appropriate calculation method derived from data availability and specific emission factors, combustion technologies applied in the process, among others.

WayCarbon's technical staff is in charge of periodically updating the CLIMAS with emission factors according to the internationally renowned methodologies for the elaboration of GHG inventories. The emission factors are mainly based on the following references (Table 5):

Table 5. References for emission factors.

Reference	Description	Link
IPCC 2006	IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Program, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan.	http://www.ipcc-nggip.iges.or.jp/public/2006gl/
PBGHGP 2018	Brazil GHG Protocol Program, Calculation Tool, version 2018.1.	http://www.ghgprotocolBrazil.com.br/ferramenta-de-calculo
BEN 2015	National Energy Balance Sheet 2015: Base year 2014 / Empresa de Pesquisa Energética. - Rio de Janeiro: EPE, 2015.	http://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-127/topico-97/Relat%C3%B3rio%20Final%202015.pdf
MCTIC 2019	MINISTRY OF SCIENCE, TECHNOLOGY, INNOVATION AND COMMUNICATIONS (MCTIC).	http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/arquivos/emissoes_co2/Inventarios_Corporativos.html

The emission factors applied in inventory and calculation log[3] are available at the CLIMAS system and can be extracted in Excel® spreadsheets.

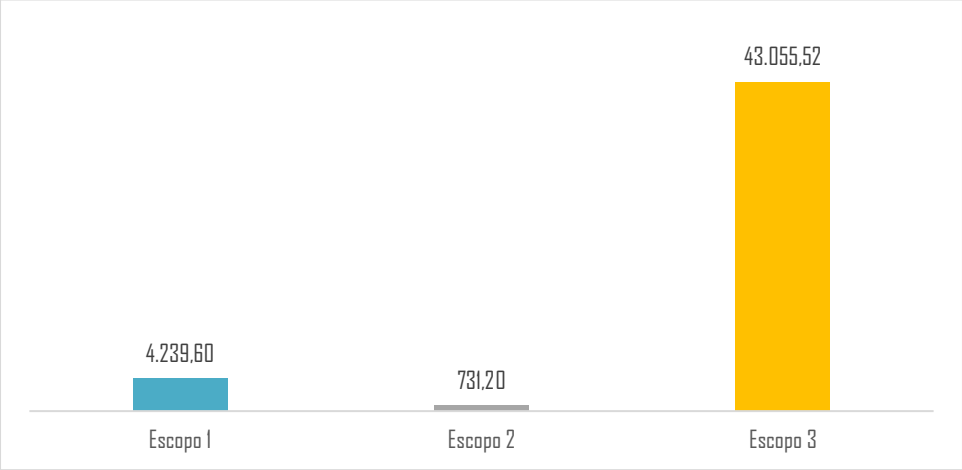
[3] The calculation log and inventory emission factors can be accessed via CLIMAS, observing the following steps: a) access the Climas system; b) click on GHG Emissions *in* the left corner of the screen*;* c) click on *Audit –Emission factors Statement*; d) select

3. RESULTS

3.1 DIAGNOSIS OF GHG INVENTORY 2019

Cielo Scope 1, 2 and 3 emissions[4] for 2019 were 4,239.60 tCO_2e, 731.20 tCO_2e and 43,055.52 tCO_2e, respecticely. Also 5,425.86 tons of renewable CO_2 [5] were emitted (2,083.40 renewable tCO_2 for Scope 1; 0.38 renewable tCO_2 for Scope 2 and 3,342.08 renewable tCO_2 for Scope 3). Figure 2 illustrates the Cielo Scope 1, 2 and 3 emissions regulated by Kyoto Protocol in 2019.

Figure 2. GHG Emissions regulated by Kyoto Protocol in 2019 by scope (tCO_2e)



Scope 1, 2 and 3

Analyzing each category, we observe that Cielo emissions mainly derive from upstream transportation and distribution (Scope 3) with 78.07% of representativeness, followed by mobile combustion category (Scope 1) with 8.83%. Emissions from employees commuting hours (Scope 3) is the third most relevant source of emission, with 6.95%. Table 6 shows GHG emissions regulated by Kyoto Protocol in 2019 by scope, category and activity.

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the inventory of year 2019 and click on *Get Statement*; e) in the last Table *Emission Factors*, look for the source of emission you intend to consult in the field search and click on the right button with an eye symbol; f) click on the button of Calculation log field.

[4] GHG emissions regulated by Kyoto Protocol (carbon dioxide - CO_2, methane - CH_4, nitrous oxide - N_2O, sulfur hexafluoride - SF_6, perfluorocarbons - PFCs and hydrofluorocarbons – HCFCs) and regulated by Montreal Protocol (chlorofluorocarbons - CFCs and hydrochlorofluorocarbons - HCFCs).

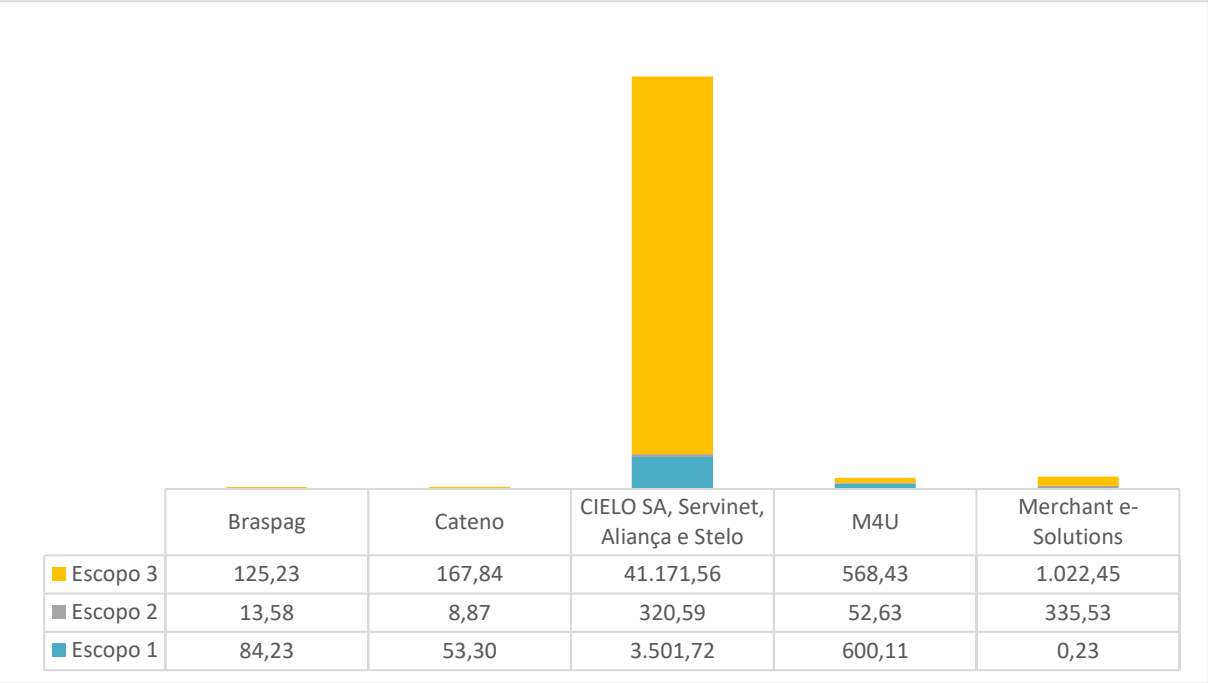
[5] CO_2 emissions deriving from energy use of renewable biomass. This study adopted the definition of renewable biomass formulated by the Executive Committee of Clean Development Mechanism of the United Nations Framework Convention on Climate Change (EB 23, Annex 18). Emissions of this nature do not contribute to increase concentration of CO_2 in the atmosphere in the long run.

Table 6. Cielo GHG Emissions Regulated by Kyoto in 2019 by scope, category and activity (hierarchy 5) (tCO_2e)

Scope/Category/Activity	Emissions (tCO_2e)	Emissions (%)
Scope 1	4,239.60	8.83%
Stationary combustion	0.23	0.00%
Electricity generation	0.23	0.00%
Mobile combustion	4,239.21	8.83%
Administrative fleet	4,239.21	8.83%
Fugitive	0.15	0.00%
Fire-alarm system recharge	0.15	0.00%
Scope 2	731.20	1.52%
Acquisition of electricity	718.51	1.50%
Consumption of electricity	718.46	1.50%
Electricity generation	0.05	0.00%
Acquisition of thermal energy	12.69	0.03%
Electricity generation	12.69	0.03%
Scope 3	43,055.52	89.65%
Goods and services acquired	253.55	0.53%
Goods and services acquired	98.73	0.21%
ISO	154.82	0.32%
Employees commuting hours (home-work)	3,338.09	6.95%
Employees transportation home-work	3,338.09	6.95%
Waste generated in operations	431.52	0.90%
Waste disposal	431.52	0.90%
Downstream transportation and distribution	1.96	0.00%
Sale of material	1.96	0.00%
Upstream transportation and distribution	37,492.22	78.07%
Field service (Courier)	3,942.10	8.21%
Coil supply - field service	745.01	1.55%
Disposal in KM (Terminal, Suppliers and MKT)	2.87	0.01%
Manufacturer (Acquisition of New Terminals)	6,350.26	13.22%
Direct and Reverse Logistics	26,410.31	54.99%
Milk Run	39.68	0.08%
Transportation of materials	1.99	0.00%
Use of goods and services sold	238.15	0.50%
Use of machinery	238.15	0.50%
Business travels	1,300.02	2.71%
Employees business travels	1,299.83	2.71%
Clients travels	0.19	0.00%
Overall Total	**48,026.32**	**100.00%**

Analyzing the operating unit, Cielo S.A., Servinet, Aliança and Stelo is mainly responsible for the organization's emissions, with 93.69% of emissions representativeness. Figure 3 shows the GHG emissions regulated by Kyoto Protocol in 2019 by the operating unit.

Figure 3. Cielo GHG Emissions Regulated by Kyoto by scope and operating unit (tCO_2e)



Scope1, 2 and 3

Table 7 shows Cielo emissions of renewable CO_2 in 2019 by scope and category.

Table 7. Cielo emissions of renewable CO_2 in 2019 by scope and category (tCO_2 renewable)

Scope/Category	Emissions (tCO_2e)	Emissions (%)
Scope 1	2,083.40	38.40%
Mobile combustion	2,083.40	38.40%
Scope 2	0.38	0.01%
Acquisition of electricity	0.38	0.01%
Scope 3	3,342.08	61.60%
Goods and services acquired	79.55	1.47%
Employees commuting hours (home-work)	2,082.61	38.38%
Waste generated in operations	35.30	0.65%
Downstream transportation and distribution	0.22	0.00%
Upstream transportation and distribution	1,138.77	20.99%
Business travels	5.63	0.10%
Overall Total	**5,425.86**	**100.00%**

Concerning the type of process executed by Cielo, we have logistics-related emissions, which are the highest, when compared to administrative and commercial, as well as in 2018, especially due to the burn

of aviation kerosene. Table 8 shows Cielo emissions regulated by Kyoto Protocol in 2019 by process (hierarchy 4), activity (hierarchy 5) and precursor.

Table 8. GHG Emissions Regulated by Kyoto in 2019 by process, activity and precursor (tCO_2e)

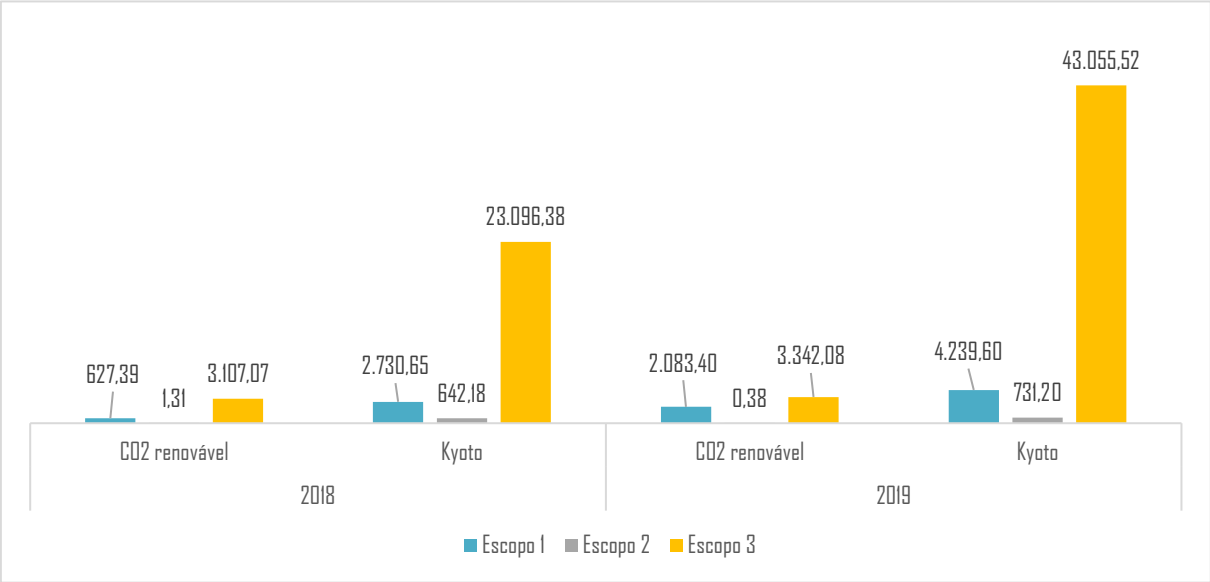
Process/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Administrative	10,141.15	21.12%
Goods and services acquired	98.73	0.21%
Electricity / Brazil	98.73	0.21%
Electricity consumption	718.46	1.50%
Diesel / Brazil	3.58	0.01%
Electricity / Brazil	392.04	0.82%
Electricity / USA / SERC South	176.52	0.37%
Electricity / USA / WECC Northwest	146.32	0.30%
Waste disposal	431.52	0.90%
Urban solid waste / paper & cardboard	412.36	0.86%
Urban solid waste /Waste not separated /South America	19.16	0.04%
Administrative fleet	4,239.21	8.83%
Hydrated ethanol	10.24	0.02%
Natural gas vehicle (NGV)	129.91	0.27%
Gasoline / Brazil	4,099.07	8.54%
Electricity generation	12.97	0.03%
Diesel / Brazil	0.05	0.00%
Diesel B0	0.23	0.00%
Natural gas	12.69	0.03%
Fire-alarm system recharge	0.15	0.00%
CO2	0.15	0.00%
Employees transportation home-work	3,338.09	6.95%
Diesel / Brazil	584.58	1.22%
Hydrated ethanol	14.02	0.03%
Natural gas vehicle (GNV)	37.85	0.08%
Gasoline	565.64	1.18%
Gasoline / Brazil	2,112.08	4.40%
São Paulo subway	23.92	0.05%
Not applicable	0.00	0.00%
Transportation of materials	1.99	0.00%
Gasoline / Brazil	1.99	0.00%
Employees business travels	1,299.83	2.71%
Gasoline	26.45	0.06%
Gasoline / Brazil	23.66	0.05%
Aviation kerosene	1.249,71	2,60%
Customers travels	0,19	0,00%
Diesel / Brazil	0,19	0,00%
Commercial	154,82	0,32%

Process/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
ISO	154,82	0,32%
Diesel / Brazil	79,04	0,16%
Hydrated ethanol	0,49	0,00%
Gasoline / Brazil	75,29	0,16%
Logistics	37.492,20	78,07%
Field services (Courier)	3.942,10	8,21%
Gasoline / Brazil	3.942,10	8,21%
Coil supply - field service	745,01	1,55%
Gasoline / Brazil	745,01	1,55%
Disposal in KM (Terminal, Supplies and MKT)	2,87	0,01%
Diesel / Brazil	2,87	0,01%
Manufacturer (Acquisition of New Terminals)	6.350,26	13,22%
Diesel / Brazil	24,95	0,05%
Aviation kerosene	6.325,31	13,17%
Direct and Reverse Logistics	26.410,31	54,99%
Diesel / Brazil	176,71	0,37%
Diesel B0	0,33	0,00%
Aviation kerosene	26.233,27	54,62%
Milk Run	39,68	0,08%
Diesel / Brazil	39,68	0,08%
Sale of material	1,96	0,00%
Diesel / Brazil	1,96	0,00%
Products sold	238,15	0,50%
Use of machinery	238,15	0,50%
Electricity / Brazil	238,15	0,50%
Not applicable	0,00	0,00%
Overall Total	**48.026,32**	**100,00%**

3.2 COMPARISON OF 2018 AND 2019 INVENTORIES

Cielo GHG Scope 1, 2 and 3 emissions included in the Kyoto Protocol and renewable CO_2 for 2018 and 2019 are presented in Figure 4.

Figure 4. Comparison of GHG emissions regulated by Kyoto and renewable CO_2 in 2018 and 2019.



Renewable CO_2/ Scope 1, 2 and 3

In comparison with 2018 emissions, we noted that emissions both regulated by Kyoto Protocol and renewable CO_2 increased in 2019. Kyoto GHG Scope 3 total emissions recorded the highest increase year-on-year, with an 86.42% variation, especially due to higher emissions from the upstream transportation and distribution category. Scope 1 emissions climbed 55.26% due to the higher consumption of gasoline in the administrative fleet. Note that, due to the presence of biofuel added to diesel and gasoline, higher consumption of these fuels in the inventory year also ramps up renewable CO_2 emissions. It is worth noting that there was also an increase in the percentage of biodiesel added to diesel, from 10% to 11%, from September 2019, according to Resolution No. 16/2018.

A low variation in Scope 2 emission from 2018 to 2019 is reflected not only from variation in electricity consumption, as shown in Table 9, but also the small variation in the national grid's average emission factor. Note that Stelo's energy consumption in 2019 is added to Cielo S.A., Servinet, Aliança, as it was incorporated into this unit's floor.

Table 9. Comparison of electricity consumption at Cielo in 2018 and 2019 by operating unit and category (MWh).

Operating Unit	Category	2018	2019	Chg. (%)
Braspag	Acquisition of electricity	185.32	183.33	-1,07%
Cateno	Acquisition of electricity	68.39	107.77	57,59%
CIELO SA, Servinet, Aliança, Stelo	Acquisition of electricity	3,681.41	4,310.99	17,10%
M4U	Acquisition of electricity	769.57	576.41	-25,10%
Merchant e-Solutions*	Acquisition of electricity	763.26	877.96	15,03%
Stelo	Acquisition of electricity	102.91	0.00	-100,00%
Overall Total		**5,570.85**	**6,056.46**	**8.72%**

*Excluding the thermal energy obtained from natural gas consumption of Merchant e-Solutions

Tables 10, 11 and 12 show a comparison of Cielo emissions regulated by Kyoto Protocol in 2018 and 2019. The emissions from the upstream transportation and distribution category were those which recorded the highest year-on-year variation, especially due to field services activities (courier), manufacturers transportation (acquisition of new terminals) and direct and reverse logistics.

Table 10: Comparison of Cielo emissions regulated by Kyoto in 2018 and 2019 by scope and category (tCO_2e).

Scope/Category	2018	2019	Chg. (%)
Scope 1	2,730.65	4,239.60	55.26%
Stationary combustion	3.73	0.23	-93.79%
Mobile combustion	2,672.45	4,239.21	58.63%
Fugitive	54.46	0.15	-99.72%
Scope 2	642.18	731.20	13.86%
Acquisition of electricity	631.19	718.51	13.83%
Acquisition of thermal energy	10.99	12.69	15.47%
Scope 3	23,096.38	43,055.52	86.42%
Goods and services acquired	492.24	253.55	-48.49%
Employees commuting hours (home-work)	3,811.78	3,338.09	-12.43%
Waste generated in operations	89.24	431.52	383.56%
Downstream transportation and distribution	0.77	1.96	153.55%
Upstream transportation and distribution	16,445.30	37,492.22	127.98%
Use of goods and services sold	244.72	238.15	-2.68%
Business travels	2,012.33	1,300.02	-35.40%
Overall Total	**26,469.21**	**48,026.32**	**81.44%**

Table 11: Comparison of Cielo emissions regulated by Kyoto in 2018 and 2019 by scope, category and activity (tCO_2e).

Scope/Category/Activity	2018	2019	Chg. (%)
Scope 1	2,730.65	4,239.60	55.26%
Stationary combustion	3.73	0.23	-93.79%
Electricity generation	3.73	0.23	-93.79%
Mobile combustion	2,672.45	4,239.21	58.63%
Administrative fleet	2,672.45	4,239.21	58.63%
Fugitive	54.46	0.15	-99.72%
Fire-alarm system recharge	0.26	0.15	-43.18%
Cooling system recharge	54.20		-100.00%
Scope 2	642.18	731.20	13.86%
Acquisition of electricity	631.19	718.51	13.83%
Electricity consumption	630.94	718.46	13.87%
Electricity generation	0.26	0.05	-82.25%
Acquisition of thermal energy	10.99	12.69	15.47%
Electricity generation	10.99	12.69	15.47%
Scope 3	23,096.38	43,055.52	86.42%
Goods and services acquired	492.24	253.55	-48.49%
Goods and services acquired	269.77	98.73	-63.40%
ISO	222.47	154.82	-30.41%
Employees commuting hours (home-work)	3,811.78	3,338.09	-12.43%
Employees transportation home-work	3,811.78	3,338.09	-12.43%
Waste generated in operations	89.24	431.52	383.56%
Waste disposal	89.24	431.52	383.56%
Downstream transportation and distribution	0.77	1.96	153.55%
Sale of material	0.77	1.96	153.55%
Upstream transportation and distribution	16,445.30	37,492.22	127.98%
Field service (Courier)	3,962.25	3,942.10	-0.51%
Coil supply- Field service	760.33	745.01	-2.02%
Disposal in KM (Terminal, Suppliers and MKT)	6.51	2.87	-55.94%
Manufacturer (Acquisition of New Terminals)	2,599.88	6,350.26	144.25%
Direct and Reverse Logistics	9,068.64	26,410.31	191.23%
Milk Run	39.56	39.68	0.31%
Transportation of materials	8.12	1.99	-75.56%
Use of goods and services sold	244.72	238.15	-2.68%
Use of machinery	244.72	238.15	-2.68%
Business travels	2,012.33	1,300.02	-35.40%
ISO	0.33		-100.00%
Employees business travels	2,011.96	1,299.83	-35.39%
Customers travels	0.04	0.19	376.75%

Overall Total	**26,469.21**	**48,026.32**	**81.44%**

Cateno Scope 3 emissions significantly decreased, on the other hand, M4U Scope 3 emissions jumped 413.66%. In absolute terms, as previously mentioned, the highest variation of emissions was found in Scope 3 emissions of Cielo S.A., Servinet, Aliança and Stelo.

Table 12: Comparison of Cielo (excluding Stelo) emissions regulated by Kyoto in 2018 and 2019 by operating unit and scope (tCO_2).

Operating Unit/Scope	2018	2019	Chg. (%)
Braspag	123,83	223,04	80,12%
Scope 1	53.80	84.23	56.57%
Scope 2	13.90	13.58	-2.31%
Scope 3	56.13	125.23	123.10%
Cateno	888.66	230.02	-74.12%
Scope 1	32.15	53.30	65.77%
Scope 2	5.23	8.87	69.58%
Scope 3	851.28	167.84	-80.28%
CIELO SA, Servinet, Aliança e Stelo	23,322.31	44,993.87	92.92%
Scope 1	2,288.93	3,501.72	52.98%
Scope 2	280.44	320.59	14.32%
Scope 3	20,752.94	41,171.56	98.39%
M4U	461.03	1,221.17	164.88%
Scope 1	323.97	600.11	85.24%
Scope 2	26.40	52.63	99.37%
Scope 3	110.66	568.43	413.66%
Merchant e-Solutions	1,434.62	1,358.22	-5.33%
Scope 1	30.19	0.23	-99.23%
Scope 2	308.63	335.53	8.72%
Scope 3	1,095.80	1,022.45	-6.69%
Stelo	238.76		-100.00%
Scope 1	1.61		-100.00%
Scope 2	7.60		-100.00%
Scope 3	229.56		-100.00%
Overall Total	**26,469.21**	**48,026.32**	**81.44%**

3.3 GREENHOUSE GASES EMISSIONS IN 2019 IN BRAZIL

Tables 13, 14 and 15 show the data of gas emissions included by the Kyoto Protocol in 2019 in Brazil and its representativeness in inventory. Emissions in the reporting format to Brazil GHG Protocol can be found in Exhibit I hereto.

Table 13. Cielo GHG Emissions regulated by Kyoto in 2019 by scope and category emitted in the Brazilian territory (tCO_2e)

Scope/Category	Emissions (tCO_2e)	Emissions (%)
Scope 1	4,239.36	9.08%
Mobile combustion	4,239.21	9.08%
Fugitive	0.15	0.00%
Scope 2	395.67	0.85%
Acquisition of electricity	395.67	0.85%
Scope 3	42,033.07	90.07%
Goods and services acquired	253.55	0.54%
Employees commuting hours (home-work)	2,772.45	5.94%
Waste generated in operations	431.52	0.92%
Downstream transportation and distribution	1.96	0.00%
Upstream transportation and distribution	37,481.06	80.31%
Use of goods and services sold	238.15	0.51%
Business travels	854.37	1.83%
Overall Total	**46,668.10**	**100.00%**

Table 14. Cielo Emissions of renewable CO_2 in 2019 by scope and precursor emitted in the Brazilian territory (tCO_2e)

Scope/Precursor	Emissions (tCO_2e)	Emissions (%)
Scope 1	2,083.40	38.40%
Hydrated ethanol	1,111.47	20.48%
Gasoline / Brazil	971.93	17.91%
Scope 2	0.38	0.01%
Diesel / Brazil	0.38	0.01%
Scope 3	3,342.08	61.60%
Diesel / Brazil	95.36	1.76%
Hydrated ethanol	1,575.33	29.03%
Gasoline / Brazil	1,636.08	30.15%
Urban solid waste/ Waste not separated/South America	35.30	0.65%
Overall Total	**5,425.86**	**100.00%**

Table 15. Cielo GHG Emissions regulated by Kyoto in 2019 by process, activity and precursor emitted in the Brazilian territory (tCO_2e)

Scope/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Scope 1	4,239.36	9.08%
Administrative fleet	4,239.21	9.08%
Hydrated ethanol	10.24	0.02%
Natural Gas Vehicle(GNV)	129.91	0.28%
Gasoline / Brazil	4,099.07	8.78%
Fire-alarm system recharge	0.15	0.00%
CO2	0.15	0.00%
Scope 2	395.67	0.85%
Electricity consumption	395.62	0.85%
Diesel / Brazil	3.58	0.01%
Electricity / Brazil	392.04	0.84%
Electricity generation	0.05	0.00%
Diesel / Brazil	0.05	0.00%
Scope 3	42,033.07	90.07%
Field service (Courier)	3,942.10	8.45%
Gasoline / Brazil	3,942.10	8.45%
Goods and services acquired	98.73	0.21%
Electricity / Brazil	98.73	0.21%
Coil supply - Field service	745.01	1.60%
Gasoline / Brazil	745.01	1.60%
Disposal in KM (Terminal, Supplies and MKT)	2.87	0.01%
Diesel / Brazil	2.87	0.01%
Waste disposal	431.52	0.92%
Urbans solid waste / Paper and cardboard	412.36	0.88%
Urban solid waste /Waste not separated/ South America	19.16	0.04%
Manufacturer (Acquisition of New Terminals)	6,350.26	13.61%
Diesel / Brazil	24.95	0.05%
Aviation kerosene	6,325.31	13.55%
ISO	154.82	0.33%
Diesel / Brazil	79.04	0.17%
Hydrated ethanol	0.49	0.00%
Gasoline / Brazil	75.29	0.16%
Direct and Reverse Logistics	26,399.15	56.57%
Diesel / Brazil	176.71	0.38%
Aviation kerosene	26,222.44	56.19%
Milk Run	39.68	0.09%
Diesel / Brazil	39.68	0.09%
Employees transportation / home-work	2,772.45	5.94%
Diesel / Brazil	584.58	1.25%
Hydrated ethanol	14.02	0.03%

Scope/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Natural Gas Vehicle(GNV)	37.85	0.08%
Gasoline / Brazil	2,112.08	4.53%
São Paulo subway	23.92	0.05%
Not applicable	0.00	0.00%
Transportation of materials	1.99	0.00%
Gasoline / Brazil	1.99	0.00%
Use of machinery	238.15	0.51%
Electricity / Brazil	238.15	0.51%
Not applicable	0.00	0.00%
Sale of material	1.96	0.00%
Diesel / Brazil	1.96	0.00%
Employees business travels	854.18	1.83%
Gasoline / Brazil	23.66	0.05%
Aviation kerosene	830.51	1.78%
Customers travels	0.19	0.00%
Diesel / Brazil	0.19	0.00%
Overall Total	**46,668.10**	**100.00%**

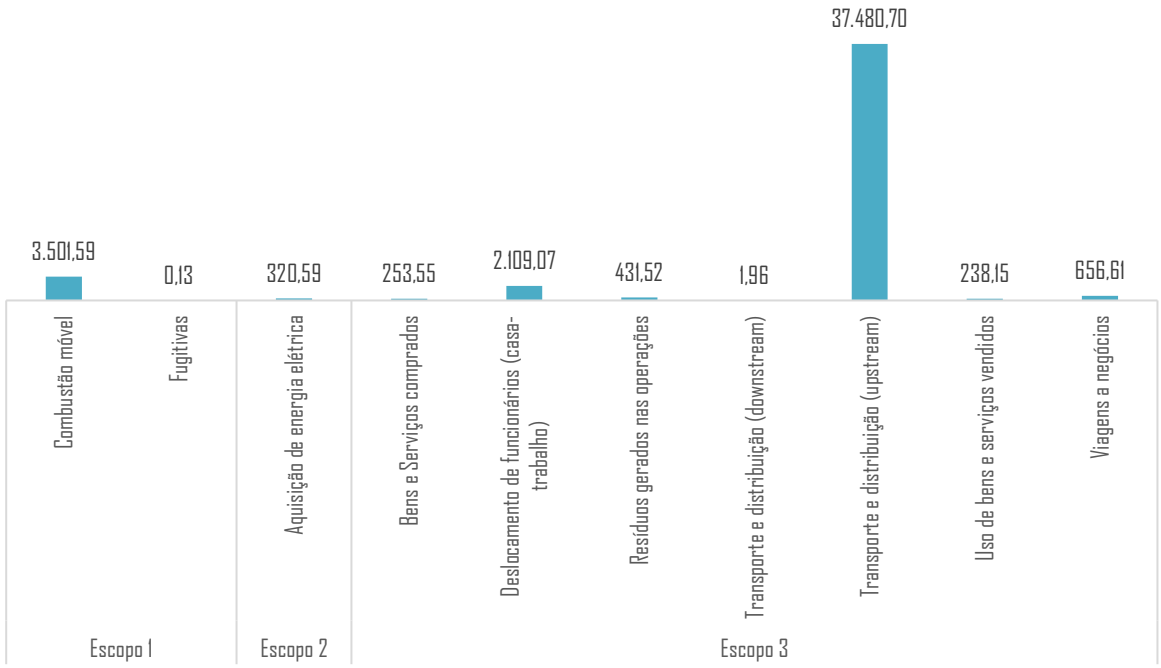
3.4 EMISSIONS BY UNIT

Below, 2019 emissions will be broken down by Cielo's operating unit: CIELO S.A., Servinet, Aliança and Stelo S.A; Braspag; Cateno, M4U and Merchant e-Solutions.

3.4.1 CIELO S.A., Servinet, Aliança and Stelo S.A.

Scope 1, 2 and 3 emissions of Cielo S.A., Servinet, Aliança and Stelo S.A. in 2019 were 3,501.72 tCO_2e, 320.59 tCO_2e and 41,171.56 tCO_2e, respectively. The other 4,398.12 tons of renewable CO_2 were emitted (1,908.51 tons of Scope 1 renewable CO_2; 0.36 tons of Scope 2 renewable CO_2 and 3,029.25 of Scope 3 renewable CO_2). Figure 5 illustrates the GHG emissions of Cielo S.A., Servinet, Aliança and Stelo S.A. in 2019 regulated by the Kyoto Protocol by Scope 1, 2 and 3 and category.

Figure 5. GHG Emissions of Cielo S.A., Servinet, Aliança and Stelo S.A. regulated by Kyoto in 2019 by scope and category (tCO_2e)



Scope 1 – mobile combustion – fugitive
Scope 2 – acquisition of electricity – goods and services acquired – employees commuting hours (home – work)
Scope 3 – waste generated in operations – downstream transportation and distribution – upstream transportation and distribution – use of good and services sold – business travels

Emissions from the upstream transportation and distribution category stood out from emissions of other categories of Cielo S.A., Servinet, Aliança and Stelo S.A in 2019. Analyzing individually this category in Table 16, we note that main emissions mainly stem from aviation kerosene burn within direct and reverse Logistics (69.96%), kerosene combustion in manufacturers aircraft (acquisition of new terminals) (16.94%) and gasoline consumption for field service (courier) (10.52%), respectively. Note that these three activities account for more than 97% of the total emissions of this category.

Table 16. GHG Emissions of Cielo S.A., Servinet, Aliança and Stelo regulated by Kyoto in 2019 by process, activity, item supervised and precursor and its representativeness for the upstream transportation and distribution category.

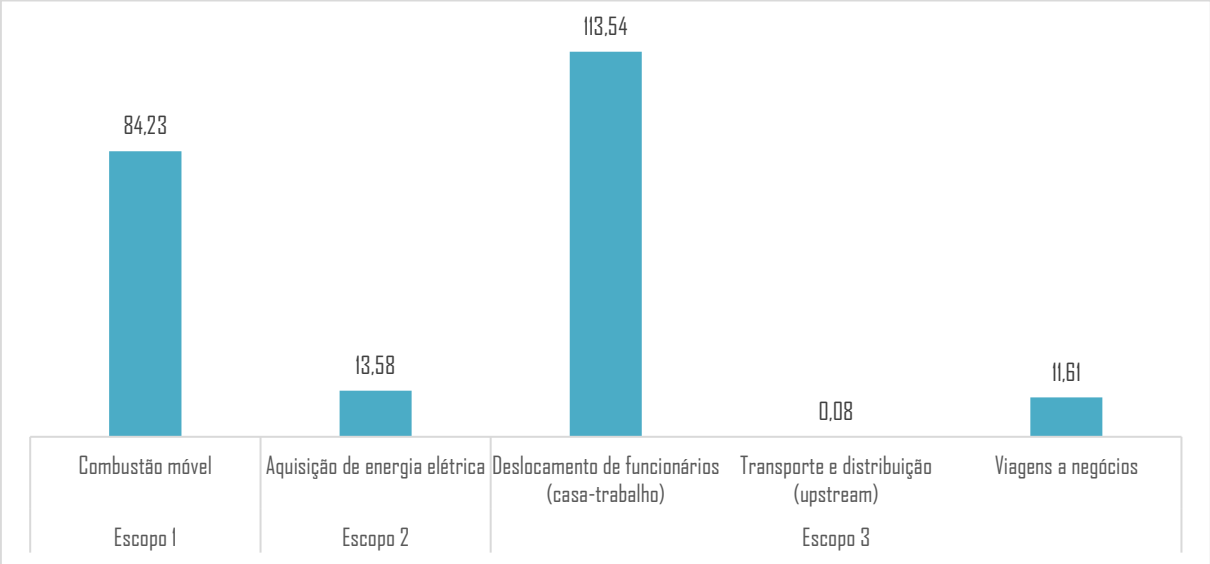
Process/Activity/Item supervised/Precursor	Emissions (tCO_2e)	Emissions (%)
Administrative	1.62	0.00%
Transportation of materials	1.62	0.00%
Motorcycle freight (Cielo and Servinet)	1.62	0.00%
Gasoline / Brazil	1.62	0.00%
Logistics	37,479.08	100.00%
Field service(Courier)	3,942.10	10.52%
Motorcycle	3,942.10	10.52%
Gasoline / Brazil	3,942.10	10.52%

Process/Activity/Item supervised/Precursor	Emissions (tCO_2e)	Emissions (%)
Coil supply- Field service	745.01	1.99%
Motorcycle	745.01	1.99%
Gasoline / Brazil	745.01	1.99%
Disposal in KM (Terminal, Supplies and MKT)	2.87	0.01%
Truck	2.87	0.01%
Diesel / Brazil	2.87	0.01%
Manufacturer (Acquisition of New Terminals)	6,350.26	16.94%
Aircraft	6,325.31	16.88%
Aviation kerosene	6,325.31	16.88%
Truck	24.95	0.07%
Diesel / Brazil	24.95	0.07%
Direct and Reverse Logistics	26,399.15	70.43%
Aircraft	26,222.44	69.96%
Aviation kerosene	26,222.44	69.96%
Truck	176.71	0.47%
Diesel / Brazil	176.71	0.47%
Milk Run	39.68	0.11%
Truck	39.68	0.11%
Diesel / Brazil	39.68	0.11%
Overall Total	**37,480.70**	**100.00%**

3.4.2 Braspag

Braspag Scope 1, 2 and 3 emissions were 84.23 tCO_2e, 13.58 tCO_2e, and 125.23 tCO_2e, respectively. In addition, 134,55 tons of renewable CO_2 were emitted (19.97 Scope 1renewable tCO_2 ;0.01Scope 2 renewable tCO_2 and Scope 3 renewable 114.57 tCO_2). Figure 6 illustrates Braspag's GHG emissions in 2019 regulated by Kyoto Protocol by scope and category.

Figure 6. Braspag GHG Emissions regulated by Kyoto in 2019 by scope and category (tCO_2e)



Scope 1 – mobile combustion
Scope 2 – acquisition of electricity
Scope 3 – employees commuting hours (home-work) – upstream transportation and distribution – business travels

Analyzing by category and activity, emissions stemming from gasoline burn, both for employees home-work transportation (44.94%) and Cielo's own fleet for various activities (37.77%), were the key emissions of inventory in 2019. Table 17 shows Braspag GHG emissions regulated by Kyoto Protocol in 2019 by process, activity, item supervised and precursor and its representativeness.

Table 17. Braspag GHG Emissions regulated by Kyoto in 2019 by process, activity, item supervised and precursor and its representativeness.

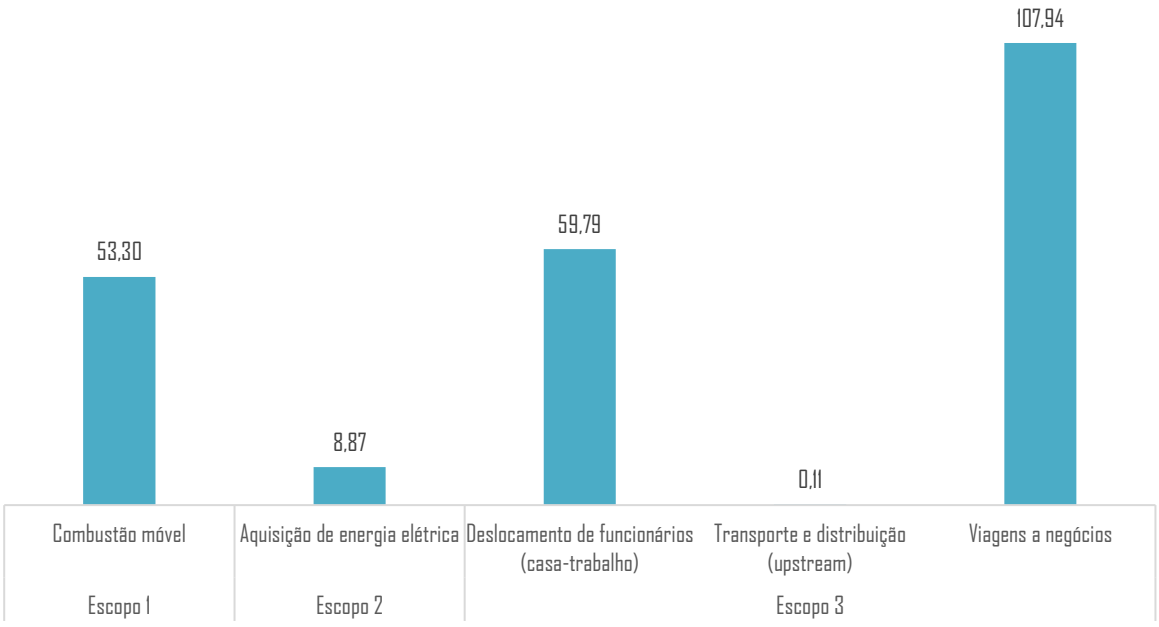
Process/Activity/Item supervised/Precursor	Emissions (tCO_2e)	Emissions (%)
Administrative	223.04	100.00%
Electricity consumption	13.58	6.09%
Electric equipment (Alphaville)	6.45	2.89%
Electricity / Brazil	6.45	2.89%
Electric equipment (Rio de Janeiro office)	7.05	3.16%
Electricity / Brazil	7.05	3.16%
Generator	0.08	0.04%
Diesel / Brazil	0.08	0.04%
Administrative fleet	84.23	37.77%
Automobile	84.23	37.77%
Gasoline / Brazil	84.23	37.77%
Employees transportation / home-work	113.54	50.90%
Ethanol-fueled car	0.81	0.37%
Hydrated ethanol	0.81	0.37%
Gasoline-fueled car	100.24	44.94%
Gasoline / Brazil	100.24	44.94%
Bus	10.01	4.49%

Diesel / Brazil	10.01	4.49%
Train/Subway	2.47	1.11%
São Paulo subway	2.47	1.11%
Transportation of materials	0.08	0.04%
Motorcycle freight	0.08	0.04%
Gasoline / Brazil	0.08	0.04%
Employees business travels	11.61	5.20%
Taxi	5.62	2.52%
Gasoline / Brazil	5.62	2.52%
Air travels	5.99	2.69%
Aviation kerosene	5.99	2.69%
Overall Total	**223.04**	**100.00%**

3.4.3 Cateno

Cateno Scope 1, 2 and 3 emissions were 53.30 tCO_2e, 8.87 tCO_2e and 167.84 tCO_2e , respectively. Also, 76.05 tons of renewable CO_2 were emitted (Scope 1 renewable 12.64 tCO_2 and Scope 3 renewable 63.41 tCO_2). Figure 7 illustrates Cateno's GHG emissions in 2019 regulated by Kyoto Protocol by scope and category.

Figure 7. Cateno GHG Emissions regulated by Kyoto in 2019 by scope and category (tCO_2e)



Scope 1 – mobile combustion
Scope 2 – acquisition of electricity
Scope 3 – employees' commuting hours (home-work) – upstream transportation and distribution – business travels

In category analysis, business travels emissions (Scope 3) are Cateno's main emissions with 46.93% of emissions, followed by emissions from employees commuting hours (Scope 3) and mobile combustion of administrative fleet (Scope 1) with 25.99% and 23.17%, respectively. Analyzing Table 18, we observe that Scope 3 emissions are the highest among scopes, with more than 70% of representativeness.

Table 18 shows Cateno's GHG emissions regulated by Kyoto Protocol in 2019 by scope, category, activity and precursor and its representativeness.

Table 18. Cateno GHG Emissions regulated by Kyoto in 2019 by scope, category, activity and precursor and its representativeness

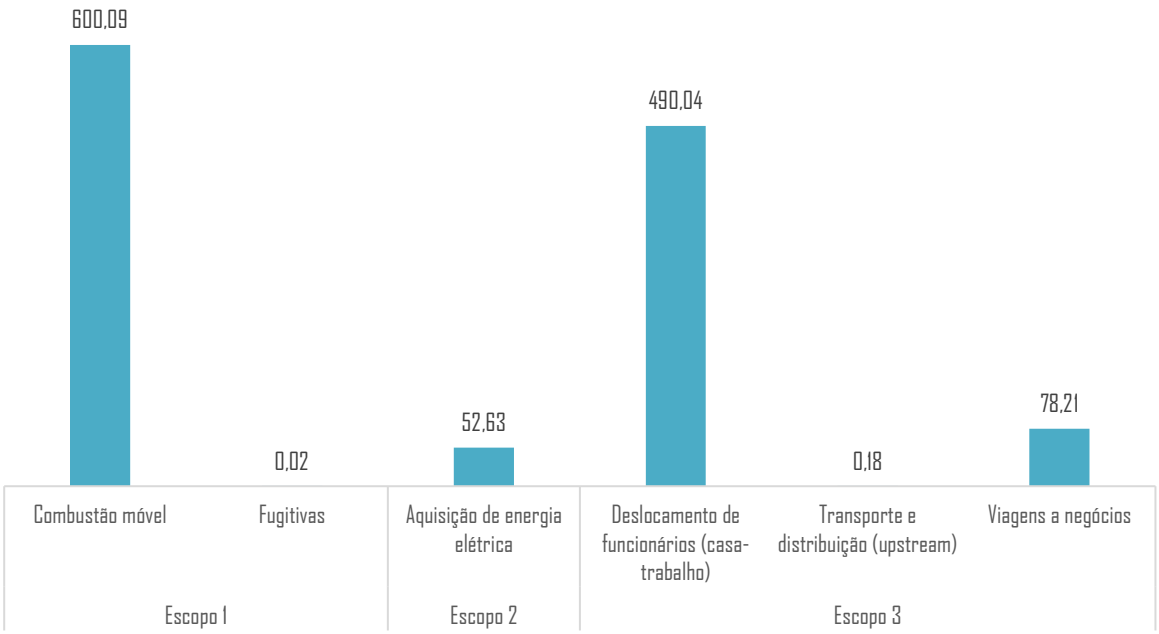
Scope/Category/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Scope 1	53,30	23,17%
Mobile combustion	53.30	23.17%
Administrative fleet	53.30	23.17%
Gasoline / Brazil	53.30	23.17%
Scope 2	8.87	3.86%
Acquisition of electricity	8.87	3.86%
Electricity consumption	8.83	3.84%
Electricity / Brazil	8.83	3.84%
Electricity generation	0.05	0.02%
Diesel / Brazil	0.05	0.02%
Scope 3	167.84	72.97%
Employees commuting hours (home-work)	59.79	25.99%
Employees transportation home-work	59.79	25.99%
Diesel / Brazil	4.52	1.96%
Hydrated ethanol	0.42	0.18%
Gasoline / Brazil	54.84	23.84%
São Paulo subway	0.01	0.00%
Upstream transportation and distribution	0.11	0.05%
Transportation of materials	0.11	0.05%
Gasoline / Brazil	0.11	0.05%
Business travels	107.94	46.93%
Employees business travels	107.94	46.93%
Gasoline / Brazil	16.51	7.18%
Aviation kerosene	91.43	39.75%
Overall Total	**230.02**	**100.00%**

3.4.4 M4U

Cielo's unit M4U Scope 1, 2 and 3 emissions were 600.11 tCO_2e, 52.63 tCO_2e, and 568.43 tCO_2e, respectively. Also, 277.14 tons of renewable CO_2 were emitted (Scope 1 renewable 142.29 tCO_2 and

Scope 3 renewable 134.85 tCO_2). Figure 8 illustrates M4U GHG emissions in 2019 regulated by Kyoto Protocol by scope and category.

Figure 8. M4U GHG Emissions regulated by Kyoto in 2019 by scope and category (tCO_2e)



Scope 1 – mobile combustion - fugitive
Scope 2 – acquisition of electricity
Scope 3 – employees commuting hours (home-work) – upstream transportation and distribution – business travels

Emissions deriving from gasoline burn in the administrative fleet (Scope 1) and employees commuting hours (Scope 3) are M4U main emissions with 49.14% and 35.33%, respectively. These emissions account for approximately 85% of M4U's total inventory emissions in 2019. Table 18 shows M4U emissions regulated by Kyoto Protocol in 2019 by scope, category and activity and its representativeness.

Table 19. M4U GHG emissions regulated by Kyoto in 2019 by scope, category, activity and precursor and its representativeness.

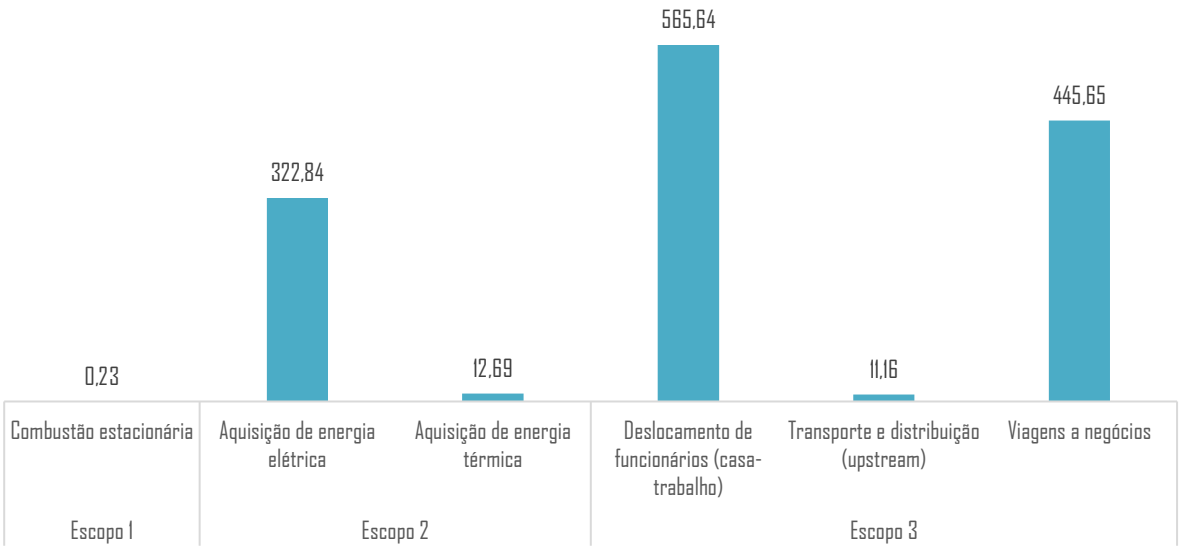
Scope/Category/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Scope 1	600,11	49,14%
Mobile combustion	600.09	49.14%
Administrative fleet	600.09	49.14%
Gasoline / Brazil	600.09	49.14%
Fugitive	0.02	0.00%
Fire-alarm system recharge	0.02	0.00%
CO_2	0.02	0.00%
Scope 2	52.63	4.31%
Acquisition of electricity	52.63	4.31%
Electricity consumption	52.63	4.31%

Scope/Category/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Electricity / Brazil	52.63	4.31%
Scope 3	568.43	46.55%
Employees commuting hours (home-work)	490.04	40.13%
Employees transportation / home-work	490.04	40.13%
Diesel / Brazil	37.34	3.06%
Hydrated ethanol	0.26	0.02%
Natural Gas Vehicle(GNV)	12.40	1.02%
Gasoline / Brazil	431.46	35.33%
São Paulo subway	8.59	0.70%
Upstream transportation and distribution	0.18	0.01%
Transportation of materials	0.18	0.01%
Gasoline / Brazil	0.18	0.01%
Business travels	78.21	6.40%
Employees business travels	78.21	6.40%
Gasoline / Brazil	1.53	0.13%
Aviation kerosene	76.67	6.28%
Overall Total	**1,221.17**	**100.00%**

3.4.5 Merchant e-Solutions

Merchant e-Solutions Scope 1, 2 and 3 emissions were 0.23 tCO_2e, 335.53 tCO_2e and 1,022.45 tCO_2e, respectively. No emissions of renewable CO_2 for this unit in 2019. Figure 9 illustrates Merchant e-Solutions GHG emissions regulated by Kyoto Protocol in 2019 by scope and category.

Figure 9. Merchant e-Solutions GHG emissions regulated by Kyoto in 2019 by scope and category (tCO_2e)



Scope 1 – mobile combustion

Scope 2 – acquisition of electricity – acquisition of thermal energy
Scope 3 – employees commuting hours (home-work) – upstream transportation and distribution – business travels

Merchant e-Solutions Scope 3 emissions accounted for 75.28% of this unit's total emissions in 2019, mainly deriving from employees commuting hours (41.65%) and business travels (32.81%) categories. Scope 2 emissions are highly relevant in inventory with 24.70% of representativeness since it considers the US grid network and has an average emission factor higher than the domestic grid. Table 20 shows Merchant e-Solutions emissions regulated by Kyoto Protocol in 2019 by scope, category and activity and its representativeness.

Table 20. Merchant e-Solutions GHG Emissions regulated by Kyoto in 2019 by scope, category, activity and precursor and its representativeness.

Scope/Category/Activity/Precursor	Emissions (tCO_2e)	Emissions (%)
Scope 1	0.23	0.02%
Stationary combustion	0.23	0.02%
Electricity generation	0.23	0.02%
Diesel B0	0.23	0.02%
Scope 2	335.53	24.70%
Acquisition of electricity	322.84	23.77%
Electricity consumption	322.84	23.77%
Electricity / USA / SERC South	176.52	13.00%
Electricity / USA / WECC Northwest	146.32	10.77%
Acquisition of thermal energy	12.69	0.93%
Electricity generation	12.69	0.93%
Natural gas	12.69	0.93%
Scope 3	1.022.45	75.28%
Employees commuting hours (home-work)	565.64	41.65%
Employees transportation/ home-work	565.64	41.65%
Gasoline	565.64	41.65%
Upstream transportation and distribution	11.16	0.82%
Direct and Reverse Logistics	11.16	0.82%
Diesel B0	0.33	0.02%
Aviation kerosene	10.83	0.80%
Business travels	445.65	32.81%
Employees business travels	445.65	32.81%
Gasoline	26.45	1.95%
Aviation kerosene	419.20	30.86%
Overall Total	**1,358.22**	**100.00%**

4. DISCUSSION

Likewise in 2018, the major source of emission in Cielo's inventory in 2019 is associated with upstream transportation and distribution of machinery, coils and other materials supplied by the company to clients, especially by means of outsourced aircraft and motorcycles. Emissions from direct and reverse logistics, field services (courier) and manufacturers (acquisition of new terminals) were key emissions in inventory, accounting for more than 75% of total inventory emissions. The mitigation options derive from the logistics optimization and the use of renewable fuels by suppliers, so that the organization may engage and qualify the supply chain in this topic.

Thereafter, we point out emissions from fuel burn at the administrative fleet (Scope 1). It should be noted that, as this is a source of emission controlled by Cielo, the replacement of gasoline at vehicles with ethanol is a good option of mitigation to reduce these emissions.

The third most relevant source of emission is associated with employees' commuting hours/home-work (Scope 3). Gasoline used in motorcycles and own vehicles accounts for approximately 80% of this category's total emissions. Therefore, we have as an option of mitigation, to internally promote strategies and policies aiming the employees' awareness about the use of renewable fuel in passenger vehicles (ex.: ethanol) or also, a carpool system for those living close to each other.

Lastly, it is worth mentioning that other emissions from other categories (stationary combustion, fugitive, acquisition of electricity, acquisition of thermal energy, goods and services acquired, waste generated in operations, downstream transportation and distribution, use of goods and services sold and business travels) contributed with approximately 6% of inventory's total emissions.

5. RECOMMENDATIONS

For companies to be adapted to the low-carbon economy, a virtuous cycle of analysis should be developed and processes improved. This set of activities, when detailed and organized, composes the corporate plan to manage greenhouse gas emissions.

Firstly, it is necessary to diagnose the current status when collecting technical knowledge about GHG emissions and apply it to the organization. Once mapped the impact on Climate Changes and its risks for business, it is possible to assess alternatives of process and select projects to reduce the carbon intensity (GHG emissions by production). Thereafter, a process should be structured to continuously monitor the organization's climate performance, so that to check the impact of projects implemented and bring information to update the diagnosis.

The GHG inventory is the first phase of diagnosis and should be continuously improved. The improvement recommendations are:

- Expansion of sources of emission monitored
    - Calculate the emissions of other Scope 3 categories, such as losses in T&D of electricity, treatment of effluents sent to the municipal network.
- The company can structure the flow of monthly information and monitor the impact on Climate Change month by month, as a way of environmental management.
- Inclusion of emissions evidence in the CLIMAS system

Besides inventory, there are other types of studies to diagnose the company's status in relation to the low-carbon economy:

- the calculation of indicators of impact by product or service offered to enable a comparison with companies of different sizes and evaluate climate efficiency
- the identification of risks and opportunities in regulatory scenarios with carbon pricing mechanisms, for instance

The next step is an action plan for Climate Change, which includes:

- Sector benchmarking
- Definition of mitigation strategy and targets of reduction
- Definition of adaptation strategy

- Definition of neutralization strategy

6. SALES AND PURCHASES OF OFFSETS

In accordance with ISO 14.064 standard- Part 1, if an organization reports reduction of emissions or increase of removals acquired or developed from quantified GHG projects, adopting methodologies, such as ISO 14.064 - Part 2, it should list these reductions of emissions or increase of removals, separately, from GHG projects.

Then, the company marks if offsets were purchased and sold or not. In the affirmative case, indicate the corresponding quantity of emissions/removals in tCO_2e.

☑ No purchase/sale of offsets.

☐ Purchase of offsets. Quantity: tCO_2e.

☐ Sale of offsets. Quantity: tCO_2e.

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GLOSSARY

Base year: specific historical period for the purpose of comparisons of GHG removals and emissions, besides other related information.

Carbon dioxide equivalent (CO2e): a unit that compares the radioactive force (global warming potential) of a certain GHG with CO2.

Greenhouse Gases (GHG): this an atmospheric constituent, of natural or anthropogenic origin, which absorbs and emits radiation in specific wavelengths within the infrared radiation spectrum emitted by earth's surface, atmosphere and clouds. Among GHG, we can mention carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), the hydrofluorocarbons (HFC), the perfluorocarbons (PFC) and sulfur hexafluoride (SF6).

GHG emissions: the total mass of a GHG released in the atmosphere in a specific period.

GHG Emission Factor or **removal factor**: factor relating data of activity to GHG emissions and removals.

GHG direct emissions: GHG emissions by sources pertaining to or controlled by the organization. Financial control and operational control concepts are employed to set out the organization's operational boundaries.

GHG indirect emissions relating to energy consumption: GHG emissions from the generation of electricity, heat or steam, imported/consumed by the organization.

GHG removals: the total mass of a GHG removed from the atmosphere in a specific period.

GHG reservoir: physical unit or component of biosphere, geosphere or hydrosphere, with the capacity to store or accumulate GHG removed from the atmosphere by a sink or GHG captured from a source. Total carbon mass in a GHG reservoir during a specific period can be referred to as reservoir carbon inventory. A GHG reservoir can transfer its gases to another GHG reservoir. The collection of a GHG of a source before this GHG enters the atmosphere and its storage in a reservoir can be referred to as GHG capture and storage.

GHG sink: physical unit or process which removes GHG from the atmosphere.

Global warming potential: a factor that describes the impact of the radioactive force of a mass unit of certain GHG, in relation to a unit of carbon dioxide mass (CO2) in a given period.

Inventory of GHG emissions: a document which details the GHG sources and sinks and GHG emissions and removals during a certain period are quantified.

Offset: GHG emissions offset credits.

Organization: company, corporation, enterprise, authority, institution or part or combination of, whether incorporated or not, public or private, which has its own duties and management.

Other GHG indirect emissions: GHG emissions different from those indirect emissions relating to energy consumption. These are the consequences of the organization's activities, but deriving from sources whose ownership or control are conducted by other organizations.

Scope: the concept of scope was introduced by GHG Protocol aiming at assisting the companies to define their operational boundaries. Scopes are differentiated in 3 categories, separated in direct and indirect emissions.

Scope 1: it comprises the category of GHG direct emissions of the organization, i.e., those originated in sources pertaining or controlled by the company within defined boundaries. For instance, we can mention the emissions from the burn of fossil fuels and manufacturing processes.

Scope 2: It comprises the category of GHG indirect emissions relating to the external acquisition of energy, for instance, the electricity consumption generated by concessionaires, suppliers of the National Interconnected System (SIN) and thermal energy acquired.

Scope 3: It comprises the category of GHG indirect emissions by other sources, i.e., emissions occurring due to the organization's activities, but originated in sources not pertaining or not controlled by the company. Few examples of Scope 3 sources: transportation of products in vehicles not pertaining to the company, use of third parties vehicles, employees transportation and business travels.

Source of GHG: physical unit or process which releases GHG in the atmosphere.

EXHIBIT - REPORT TO BRAZIL GHG PROTOCOL 2019

Summary of total emissions in tons of gas (tGEE)

Gas family	Scope 1	Scope 2	Scope 3	Total
CH4	2.052047	0.00054	19.753896	21.806483
CO2	4045.704271	395.642934	40974.93391	45416.28112
N2O	0.477714	0.000036	1.893583	2.371333

Summary of total emissions in tons of CO2-equivalent (tCO2e)

Gas family	Scope 1	Scope 2	Scope 3	Total
CH4	51.301175	0.0135	493.8474	545.162075
CO2	4045.704271	395.642934	40974.93391	45416.28112
N2O	142.358772	0.010728	564.287734	706.657234
Total	4239.364218	395.667162	42033.06905	46668.10043

Scope 1 Emissions divided by category

Scope	Category	Emissions
Scope 1	Mobile combustion	4239.214218
	Fugitive	0.15
Total		4239.364218

Scope 1 Emissions divided by category - Emissions and Removals of Biogenic CO_2

Scope	Category	Emissions (tGEE)	Removals (tGEE)
Scope 1	Mobile combustion	2083.402508	0

Scope 2 Emissions divided by category

Scope	Category	Emissions
Scope 2	Acquisition of electricity	395.667162
Total		395.667162

Scope 2 Emissions divided by category - Emissions and Removals of Biogenic CO_2

Scope	Category	Emissions (tGEE)	Removals (tGEE)
Scope 2	Acquisition of electricity	0.376808	0

Scope 3 Emissions divided by category

Scope	Category	Emissions
Scope 3	Goods and services acquired	253.552635
	Employees commuting hours (home-work)	2772.44997
	Waste generated in operations	431.524789
	Downstream transportation and distribution	1.956235
	Upstream transportation and distribution	37481.06375
	Use of goods and services sold	238.151468
	Business travels	854.370204
Total		42033.06905

Scope 3 Emissions divided by category - Emissions and Removals of Biogenic CO_2

Scope	Category	Emissions (tGEE)	Removals (tGEE)
Scope 3	Goods and services acquired	79.552403	0
	Employees commuting hours (home-work)	2082.608305	0
	Downstream transportation and distribution	35.301752	0
	Upstream transportation and distribution	0.215792	0
	Business travels	1138.768137	0

Emissions outside Brazil

Country	Scope 1	Scope 2	Scope 3	Total
United States	0.23202	335.530131	1022.45364	1358.215791
Total	0.23202	335.530131	1022.45364	1358.215791

Emissions by unit

Operating Unit	Scope 1	Scope 2	Scope 3	Total
Braspag	84.233919	13.577361	125.231156	223.042436
CIELO SA, Servinet, Aliança	3501.715823	320.590632	41171.56483	44993.87128
Cateno	53.301692	8.873148	167.843267	230.018107
M4U	600.112784	52.626021	568.429799	1221.168604
Total	4239.364218	395.667162	42033.06905	46668.10043

Edifício Asamar
Rua Paraíba, 1000 – 7° andar
CEP 30130– 141 - Belo Horizonte – MG
Telephone | Fax 55 31 3656-0501

BH | SP | RJ

WWW.WAYCARBON.COM