elecnor

Carbon Footprint Report 2018

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1958
2018

CONTENTS

TABLES INDEX

FIGURES INDEX

1. INTRODUCTION: MAIN ELECNOR PROFILES

Elecnor is a group of approximately 80 companies dedicated to the promotion and integral management of projects and the development of infrastructures. It is formed by Elecnor, S.A., and subsidiaries.

Elecnor's business model revolves around two large businesses, which complement and enrich each other:

- **Infrastructure** consisting of the execution of engineering, construction and third-party service projects.
- **Patrimonial activity** through the promotion and investment, both in property regime and in concession, of wind power projects, energy transport systems and other strategic assets for the company.

The current business model, which was designed to anticipate and adapt to the changes and cycles of the economy, pursues a profitable and sustained economic growth through, mainly, the internationalization and diversification of the activities of both the parent company and the national or foreign subsidiaries and, where appropriate, by acquiring companies that strengthen their presence in certain countries.

Elecnor's activities are structured in three main areas:

• Infrastructure:

It is the essence and traditional activity of Elecnor's business, acting as an integral project manager within the activities of electricity, power generation, telecommunications and systems, installations, gas, construction, maintenance, environment and water, railways and space. As an integral project manager, the company conducts feasibility studies, basic and detail engineering, construction, supply, installation and assembly, start-up and operation and maintenance services.

• Renewable energy:

Elecnor is one of the leading developers and turnkey contractors of reference within the renewable energy sector, undertaking projects in the areas of wind energy, photovoltaic and thermoelectric solar energy, as well as hydroelectric power plants. In wind and thermoelectric power, Elecnor's activity also includes acting as an investor and integral developer of projects.

• Concessions and investment:

Elecnor's experience in the construction and operation of infrastructures, together with its financing capacity, led the incorporation of the company to the area of concessions related to its areas of activity. Investment projects in the field of renewables and space are completed with other businesses in which Elecnor also acts as promoter of its own projects, normally under the concession modality, in the fields of electricity, gas and environment infrastructures.

2. CARBON FOOTPRINT CONCEPT

According to the increasing interest that exists in society about climate change and its consequences, in recent years several initiatives and methodologies have emerged aimed at learning about its impact. Among them is the carbon footprint.

2.1. WHAT IS THE CARBON FOOTPRINT?

The carbon footprint is a parameter that represents the total emissions of CO_2 and other greenhouse gases (GHG), expressed in mass of CO_2 equivalent, caused directly or indirectly by a product, organisation, service or event throughout its life cycle.
The carbon footprint is important to try to quantify the main emission sources and to have a complete picture of the impact of an organisation on climate change. It is also the first step to carry out a plan to reduce GHG emissions.

The carbon footprint of an organisation intends to quantify the GHG emissions implied by the activity flows of an interconnected entity or group of entities, which may be under its responsibility or on which it depends, over a period of one year with an expressed result in tonnes of CO_2 equivalent (CO_2e).

2.2. WHAT IS THE CARBON FOOTPRINT FOR?

The calculation of the carbon footprint is more than GHG emissions data, it allows to identify the main GHG emission sources of an organisation and to have a global image of its impact on climate change. Furthermore, it constitutes a necessary base to address and continue over time actions to reduce this impact.

Therefore, although the calculation of the carbon footprint by an organisation is voluntary, its assessment has an important strategic aspect and involves a large number of environmental, economic and reputational benefits:

- Knowledge about the **environmental impact** of an organisation and its contribution to climate change is enriched.
- It allows to know and identify the **energy consumption** and the **main GHG emission sources** of an organisation, which is a point of reference to design strategies aimed at a better management of the energy used and to prioritise reduction actions with the application of more efficient techniques.
- It allows to **identify the company's activities with a greater potential for reducing** GHG emissions and to set specific objectives for them.
- It facilitates the **assessment of the choice** of raw materials, selection of suppliers, manufacturing methods and production options **according to their associated GHG emissions**.
- It favours the application of **more efficient techniques** in different activities, thus assuming cost savings.
- It is an **advance to future regulations and policies on climate change**. A clear example is that the EU is already working on how to introduce the calculation of the carbon footprint in the green public procurement.
- It means **more transparent communication** about the company's commitments to sustainable development and, more specifically, the reduction of GHG.

To achieve these objectives, it is necessary to work with the greatest accuracy, covering the maximum possible amount of emissions for which the organisation is responsible. Additionally, verification by an independent entity is necessary to confirm that the methodology (see next section) has been properly applied and that the results obtained are correct based on the data entered.

2.3. METHODOLOGY USED TO CALCULATE ELECNOR'S CARBON FOOTPRINT

Currently there are several internationally recognised methodologies and standards for the calculation of carbon footprint according to their approach, scope and orientation.

The most widespread and internationally recognised standards for the calculation of an organisation's carbon footprint are briefly explained below:

- **Corporate Accounting and Reporting Standard. GHG Protocol.**

  It is an internationally recognised standard developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). The GHG Protocol offers standards and guidelines for companies and other organisations interested in calculating a basic carbon footprint (Scopes 1 and 2), with the possibility of broadening the carbon footprint approach (including Scope 3).

- **ISO 14064.**

  This standard details the principles and requirements for the design, development and management of GHG inventories for companies and organisations, and for the reporting of these inventories. It also includes the requirements to determine the GHG emission limits, quantify the emissions and removals of the organisation's gases and identify the activities or specific actions of the company in order to improve the management of these gases.

  ISO 14064, like the GHG Protocol, focuses mainly on the facilities and activities subject to the entire organisation, conducting a study of GHG emissions associated with the processes carried out by the company, leaving open the possibility of including scope 3 sources.

As mentioned previously, there are several methodologies available to calculate the carbon footprint of an organisation. In this case, **ISO 14064-1 has been chosen to carry out Elecnor's carbon footprint**, since it is considered the most internationally recognised standard in terms of calculating the organisation's carbon footprint. In addition, this methodology is based on five principles: relevance, completeness, consistency, transparency and precision.

In the case of Elecnor, the year 2014 has been established as the base or reference year. We worked for 2013 as well as for 2014, but this last one was the first year of calculation in which it was possible to involve all Elecnor organisations and that's the reason it was chosen as the base year. However, **the carbon footprint obtained in a given year is compared with the emissions calculated for the previous year**.

In this line, it is worth mentioning that Elecnor obtained in the years 2015, 2016, 2017 and 2018 the AENOR CO_2 Environment Certificate verified according to ISO 14064-1 (associated with the calculation of the carbon footprint of 2014, 2015, 2016 and 2017 respectively). In addition, in 2018, Elecnor obtained the carbon footprint calculation and reduction stamp granted by MITECO (Ministry for Ecological Transition). Through this verification, the Group has an independent and rigorous endorsement of the quantification of its GHG emissions in its activities, seeking to improve its environmental and energy management.

2.4. NATIONAL REGISTRY OF CARBON FOOTPRINT, COMPENSATION AND CARBON DIOXIDE ABSORPTION PROJECTS

One of the most outstanding initiatives at the national level in the framework of carbon footprint is the creation of the **National Registry of Carbon Footprint, Compensation and Carbon Dioxide Absorption Projects** launched by the Spanish Office for Climate Change (*Oficina* Española de *Cambio Climático*, OECC) of the MITECO with the objective of encouraging organisations to calculate, reduce and compensate their carbon footprint, and to register it voluntarily.

This measure, closely linked to the calculation of the carbon footprint, was born with the aim of promoting its calculation and reduction, as well as its compensation through absorption projects located in Spain, while promoting domestic reductions in the national territory.

This Registry grants advantages to organisations that register their carbon footprint, such as obtaining a national seal that will determine the degree and timeframe of compliance. In addition, the registration of the carbon footprint will be taken into account in the medium term by the Public Administration when awarding public procurement, so it is of great interest for entities to incorporate the registry of this indicator.

One of the objectives of this project is to continue with the integration of Elecnor's carbon footprint for 2018 in this Registry, as it was done with the calculation of the Footprint of 2017, and the previous three years, when the regulations were not yet in force to give added value to future projects. Likewise, we intend to **maintain the carbon footprint reduction stamp**.

3. DEFINITION OF THE LIMITS OF ELECNOR'S CARBON FOOTPRINT

3.1. ORGANISATIONAL LIMIT

The first step in the development of the carbon footprint is the definition of organisational limits. It is based on the principle that the operations of companies vary not only in their legal structure, but also in their organisational structure and, in this way, include operations that are their property, alliances, subcontractors and many other modalities in which they act with greater or lesser involvement. **By setting organisational limits, a company selects an approach to consolidate its GHG emissions**. In other words, it determines the business units and operations that make up the company. These organisational limits are defined by the type of control exercised by the subject from whom the footprint is calculated on a business operation and organisation that can be done with several different approaches:

- **Approach to shareholding**

  Under this shareholding approach, **a company quantifies GHG emissions according to the proportion it has in the shareholding structure**. The distribution of the risks and economic benefits of an operation is aligned with the ownership percentages, which normally correspond to the shareholding. If the case is not so, the economic essence of the relationship that the company has with a certain operation will always weigh more than the legal property.

- **Control focus**

  According to the GHG Protocol, under this approach, **a company quantifies 100% of its GHG emissions attributable to the operations over which it exercises control**. They should not quantify emissions from operations of which the company owns any participation, but over which it has no control. Control can be defined in both financial and operational terms.

- **Financial control**

  A company has **financial control over an operation if it has the power to direct its financial and operating policies in order to obtain economic benefits from its activities**. A company is considered to exercise financial control over an operation if it is capable of capturing most of the risks and benefits inherent to ownership over the assets of the operation. It is possible for a company to have financial control over an operation even if it owns less than 50% of the shareholding structure.

- **Operational control**

  A company exercises **operational control over an operation if said company or any of its subsidiaries has full authority to introduce and implement its operating policies in the year**. Under this approach, the company that owns the control of an operation (this does not necessarily mean that a company is capable of making all the decisions concerning a particular operation), either directly or through one of its subsidiaries, must quantify as its own 100% of the emissions of the operation.

For the calculation of Elecnor's carbon footprint, an operational control approach has been chosen:

- In the event that the execution of a contract has been subcontracted in its entirety, the consumption data referred to this contract have not been included in the data collection sheets.

- In the case of the UTEs, Elecnor has reported the data associated with the service managed in the contract only if it has a share of more than 50% in the UTE or if it has control of the quality and environmental policies.

- For the ESEs, the fields of the sheet that directly concern the execution of the improvement activity have been exclusively completed. We have not reported here the energy consumption and other of the facility itself in which the improvement is provided.

- In the case of concessions/exploitation contracts, the data sheet has been completed exclusively when Elecnor has had the power to introduce environmental improvement measures without the need of the client's approval.

Having chosen an approach that accounts for **100% of GHG emissions attributable to the operations over which the company exercises control**, the following items are left out of the study:

- Subcontracted machinery.
- Transport of subcontracted machinery.
- Transport of own machinery when the vehicle is rented (trailer, etc.).
- Company travel and transport of machinery by plane, train, ship and subcontracted transport in general, since it forms part of scope 3 (excluded in this study).
- Data of suppliers/subcontractors.

Table 1. Elecnor organisational map
Source: Self-made.

ORGANISATION	NATIONAL CENTRES	TYPE OF CENTRE				INTERNATIONAL CENTRES	TYPE OF CENTRE			
		Offices	Warehouses	Works	Plants		Offices	Warehouses	Works	Plants
GENERAL SUBDIVISION OF LARGE NETWORKS	Bilbao	X	X	X		Elecdor (Ecuador)	X	X	X	
						Elecnor of Angola	X	X	X	
						Elecnor of Mexico (Lines)	X	X	X	
						Elecnor of Dominican R.	X	X	X	
						Omninstal Electricidade	X	X	X	
GENERAL SUBDIVISION OF ENERGY	Bilbao (railways and Arrigorriaga)	X	X	X		Elecnor of Angola	X	X	X	
						Elecnor of Argentina	X	X	X	
	Madrid	X	X	X		Elecnor of México	X	X	X	
						Elecnor of Venezuela	X	X	X	
	Railways works	X	X	X		Elecnor of Honduras	X	X	X	
						Montelecnor (Uruguay)	X	X	X	
CENTRAL DIVISION	Madrid	X	X	X						
	Valladolid	X	X	X						
	Asturias	X	X	X						
	Galicia	X	X	X						
	La Rioja	X	X	X						
	Navarra	X	X	X						
	Basque Country	X	X	X						
	Ponferrada	X	X	X						
	CP Gas Burgos	X	X	X						
	CP León	X	X	X						
	CP Salamanca	X	X	X						
	Castilla y León Telecommunications	X	X	X						
	ADHORNA[1] Álava	X	X	X	X					
	Barcelona	X	X	X	X					
	Valladolid	X	X	X	X					
GENERAL SUBDIVISION OF ENGINEERING[2]	Madrid	X				Mexico			X	
	DEIMOS Madrid	X		X		Portugal			X	
	HIDRO-AMBIENTE Vizcaya	X		X		Algeria			X	
NORTHEAST DIVISION	Barcelona	X	X	X						
	Manresa	X	X	X						
EAST DIVISION	Valencia Community (Alicante, Aldaia, Valencia, Castellón)	X	X	X						
	Baleares (Ibiza, Mallorca)	X	X	X						
	Murcia (Alcantarilla)	X	X	X						
SOUTH DIVISION	Canarias	X	X	X						
	Extremadura	X	X	X						
	Andalusia (Málaga and Seville)	X	X	X						
GENERAL SUBDIVISION OF INTERNATIONAL DEVELOPMENT	Madrid	X								

ORGANISATION	NATIONAL CENTRES	TYPE OF CENTRE				INTERNATIONAL CENTRES	TYPE OF CENTRE			
		Offices	Warehouses	Works	Plants		Offices	Warehouses	Works	Plants
APLICACIONES TÉCNICAS DE LA ENERGÍA, S.L. (ATERSA)	Madrid	X								
	Valencia		X		X					
AUDECA, S.L.U.	Madrid	X	X	X						
	Elecnor Environment (Water and Exploitations)	X	X	X	X					
EHISA CONSTRUCCIONES Y OBRAS, S.A	Zaragoza	X	X	X						
ENERFÍN SOCIEDAD DE ENERGÍA, S.L.	Burgos				X	Brazil (Osorio, Palmares, Porto Alegre)	X			X
	Cádiz				X					
	Lugo				X					
	Madrid	X				Canada	X			X
	Navarra				X					
JOMAR SEGURIDAD, S.L.	Guadalajara	X								
CELEO	Madrid	X			X					
	Siberia Solar	X			X					
	Zinertia Renewables AASCV I	X			X					
	Zinertia Renewables AASCV II	X			X					
	Zinertia Renwwabl. ELC	X			X					
	Zinertia Renwwabl. HAE	X			X					
	Zinertia Renewables THT Antequera	X			X					
	ASTEXOL 2				X					
	ASTE 1A				X					
	ASTE 1B				X					
	Operation of Water Treatment Plants	X	X		X					
CORPORATE OFFICES	Bilbao (Licenciado Poza and Rodríguez Arias)	X								
	Madrid	X								
ELECNOR CHILE						Chile	X	X	X	
ELECNOR DO BRASIL[3]						Brazil	X	X	X	

X The organisation/delegation has this type of centres.

The organisation/delegation has reported the data from warehouses in offices or works, or vice versa.

(1). In 2018, Adhorna is included in the Carbon Footprint calculation of the Central Division. Previously, it was counted within the General Subdivision of Large Networks.
(2). In 2018, Hidroambiente S.A and Elecnor Deimos became delegations part of the General Subdivision of Engineering.
(3). Elecnor Chile and Elecnor do Brasil were calculated independently as own organisations in 2016. In previous years, these subsidiaries had been the object of study as organisations belonging to the General Subdivision of Large Networks and the General Subdivision of Energy. The same goes for Jomar Seguridad, S.L. This subsidiary was calculated for the first time in an independent manner and not integrated into the Central Division in 2016.

In 2018, the office and warehouse in Seville, part of the General Subdivision of Energy, were closed; so their numbers disappeared from the calculation of Elecnor's footprint. Likewise, there has been a restructuring within the divisions of Castilla y León, part of the Central Division:

- In 2017, the Valladolid Maintenance Centre included maintenance and telecommunications activities. In 2018, the maintenance activity was transferred to the Valladolid Warehouse Centre, which is why Valladolid Maintenance was renamed Castilla y León Telecommunications.

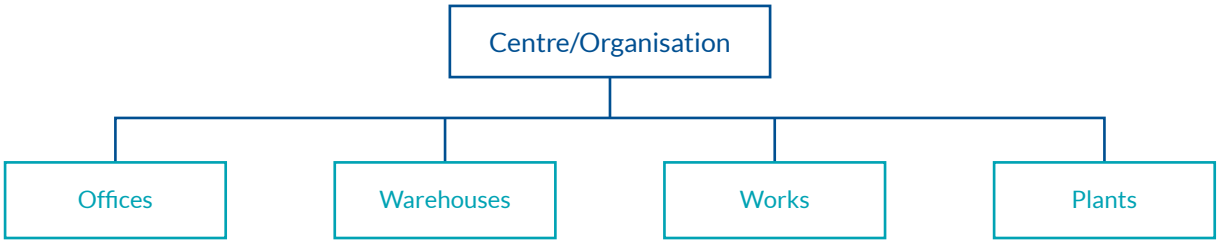
- In 2018, the activities carried out in Gas León-Padre Isla and León Maintenance and PC León have been unified in a single centre named PC León.

With these changes, Castilla y León now includes: Valladolid Warehouse, PC Gas Burgos, PC León, PC Salamanca Ponferrada, Valladolid Division, Castilla y León Telecommunications.

The facility is defined in ISO 14064-1 as a single facility, set of production facilities or processes (static or mobile) within a single limit, a unit of the organisation or a production process.

Elecnor's organisational limit is defined as a facility or a set of facilities with mobile (works) and static (plants) production processes, as well as offices and warehouses.

Figure 1. Elecnor process map
Source: Self-made.



3.2. OPERATIONAL LIMIT

Based on the organisational limits, the operational limits are determined through the classification of emission sources in the 3 possible scopes of study.

- **Scope 1 emissions** (direct emissions): emissions that result from the activities that the organisation controls. Examples of the processes that can generate them:

    - Combustion in fixed sources.

    - Physical or chemical processes.

    - Combustion in mobile sources.

    - Fugitive emissions that result from intentional or unintentional releases such as refrigerants used in air conditioning and refrigeration equipment.

- **Scope 2 emissions** (indirect emissions): emissions of the organisation due to the use of electricity, heat or water vapour acquired from outside.

- **Scope 3 emissions** (other indirect emissions): emissions of the products and services of the organisation. They are induced by the activities of the company, but they occur in sources that are not owned or controlled by the company.

The purpose of this classification is to avoid the double quantification of GHG emissions in the same scope of the inventory of several organisations. It may actually happen that two organisations have emission sources in common. However, for one organisation these emissions will be part of its direct emissions and for the other organisation they will be part of its indirect emissions.

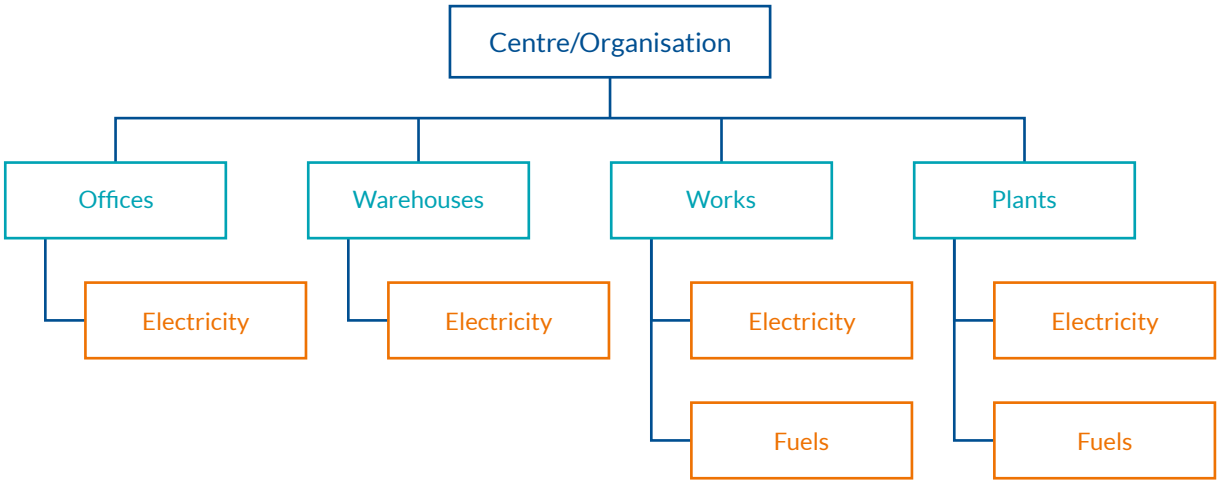
In the calculation of Elecnor's carbon footprint, scope 1 direct emissions and scope 2 indirect emissions have been quantified, so that certain emissions have been taken into account or not, depending on the facilities and activities controlled by the company.

Each organisation reports its data on **electricity and fuel consumption**[4], disaggregated by type of facility.

With regard to the **recharge of refrigerant gases**, since this emission source has a contribution of less than 1% with respect to the total of Elecnor's footprint, (0.43% of the total for the year 2018), since 2017 the data will be monitored annually, verifying that its representation is maintained below those levels. However, it will be excluded from operational limits, and will only be calculated and reported every three years of study.

The emission sources considered in the calculation of each type of Elecnor facility are shown below:

Figure 2. Process map with emission sources.
Source: Self-made.



3.3. OTHER SCOPE ELEMENTS

Excludes emissions associated with combustion in generating sets in office activities, as they are negligible.

It should also be clarified that scope 3 trips are not reported, so they are outside the present study.

Exception to be taken into account in the following organisation:

- Jomar Seguridad, S.L.: in 2018 Jomar Seguridad, S.L. has not had fugitive emissions associated with the retimbing of CO_2 extinguishers. In this sense, and according to its certificate in UNE-EN ISO 14001:2015, the pressurised/depressurised machine is conveniently maintained and to date there is no record of reports of environmental accidents as a result of CO_2 leakage.

(4). Fuels consumed in 2018 by vehicles of the different centres that make up Elecnor have been: gasoil A (and B) or diesel, gasoline, biodiesel and ethanol (these last two in Brazil). In the stationary combustion equipment or through direct energy consumption, fuels consumed in 2018 were gasoil C, gasoline, natural gas and LNG.

4. DATA COLLECTION AND CALCULATION

Elecnor has designed a tool for the calculation of carbon footprint (CO_2data) that allows each Elecnor organisation to report the activity data necessary for the calculation and obtain greenhouse gas emissions associated with its activity.

The CO_2data virtual platform **(http://www.elecnorco2data.es)** has allowed Elecnor to report the necessary activity data in a more comfortable and efficient way. With separate sections for each organisation, it is prepared so that each one of them can enter the activity data of the previously defined emission sources. In addition, it has subsections to enter the different types of data and the location of their source, and allows more than one agent to enter data associated with the same source.

On the other hand, it allows entering evidence associated with the activity data, allowing for a single file or several files associated with a single data.

4.1. ACTIVITY DATA

Activity data are those that are associated with the consumption of energy or consumables of the organisation. These must be precise, transparent, complete, reliable, accurate in terms of information, consistent and reproducible.

All the activity data have been provided by Elecnor through the CO_2data platform. Those associated with fuel and electricity consumption have been considered. The data associated with the consumption of refrigerant gases have also been uploaded, in order to monitor them and verify that their contribution does not exceed 1% of the footprint.

The collection of data has been prioritised so that they are of the highest possible quality, with the aim of reducing the uncertainty of the calculations. Failing that, there has been an option to report them in another way and the necessary estimates have been made.

- **Fuel consumption:** the report in litres and fuel type has been prioritised. Failing this, there has been the possibility of reporting in km travelled and type of fuel.

- **Electricity consumption:** the report in kWh consumed has been prioritised. Secondarily, the option of reporting on illuminated surface has been given. In the case of works, the second option of reporting is to indicate the number of works whose duration has been greater than six months.

Although the fugitive emissions associated with the recharge of refrigerant gases will not be reported in Elecnor's footprint until the carbon footprint of 2020, the activity data provided is monitored. Thus, for this emission source, the data collection in kg and refrigerant type is prioritised. However, in cases where this has not been possible, it has been reported on a refrigerated surface.

Table 2. Examples of data collection sheets for electricity and fuel consumption.
Source: Self-made.

SOURCE		ELECTRICITY							
Type of facility		Offices		Warehouses		Works		Plants	
Organisation	Division	kWh	m^2	kWh	m^2	kWh	N° works	kWh	m^2
XXX	XXX								

SOURCE		MOBILE FUEL					
Type of facility		Works					
Organisation	Division	Diesel (litres)	Diese (km)	Gasoline (litres)	Gasoline (km)	Ethanol (litres)	Biodiesel (litres)
XXX	XXX						

SOURCE		STATIONARY COMBUSTION				DIRECT CONSUMPTION	
Type of facility		Works		Plants		Plants	
Organisation	Division	Gasoil C (litres)	Gasoline (litres)	Gasoil C (litres)	Gasoline (litres)	Gasoil C (litres)	Natural Gas (kWh)
XXX	XXX						

For the 2018 activity data, the distribution according to the type of report was as follows:

- **Fuel consumption:** 100% of the consumption data were reported following the priority option, that is, from litres and fuel type.
- **Electricity consumption:** 94.28% of the primary data were provided following the priority reporting option, that is, expressed in kWh. Only 5.72% of the data were reported from the illuminated area or the number of works lasting more than six months [5].

As regards the consumption of refrigerant gases, which is monitored annually, in most cases it is still impossible to provide the recharged kg of refrigerant, thus 90% of the activity data are expressed in m^2 of refrigerated surface area.

On the other hand, since 2015 a section called avoided emissions has been designed, in order to enable the collection of positive measures that Elecnor is doing with regard to the environment and climate change. In this section we can report:

- **Avoided emissions associated with the generation of electricity from renewable** sources, based on the installed power and hours of operation, or directly by the number of renewable kWh generated.
- **Avoided emissions through the management of waste in clean points or through its energy recovery**, since its landfill management is being avoided, which supposes a greater impact.

4.2. EMISSION FACTORS

Emission factors are representative values that relate a quantity of gas emitted to the atmosphere with an activity associated with the emission of said gas. Normally, these factors are expressed as the weight of the gas divided by the weight, volume, distance or duration of the activity that generates the gas.

The emission factors used in the calculation of Elecnor's footprint to transform energy consumptions or consumables into GHG emissions must be transparent and consistent. Therefore, the most suitable and reliable emission factors have been used geographically.

(5). It should be noted that there continues to be an improvement in the quality of the data provided in 2018, since the selection of priority reporting options has increased substantially with respect to the previous years of study.

Table 3. Examples of emission factors.
Source: Self-made.

ELECTRICITY

Country	EF	Unit	Source
Spain	0.430	kg CO_2/kWh	OECC Registry April 2018 (mix 2017)
Angola	0.383		IEA - CO_2 EMISSIONS FROM FUEL COMBUSTION 2018 Edition (Emissions from year 2016)
Algeria	0.509		
Argentina	0.376		
Brazil	0.120		
Canada	0.149		
Chile	0.443		
Ecuador	0.280		
United States	0.433		
Honduras	0.385		
Mexico	0.464		
Portugal	0.287		
United Kingdom	0.278		
Dominican Republic	0.598		
Uruguay	0.026		
Venezuela	0.301		

MOBILE COMBUSTION (VEHICLES)

Fuel	EF	Unit	Source
Gasoil A / Diesel	74,100.00	kg CO_2/TJ	IPCC Guidelines 2006 Volume 2 - Chapter 3: Mobile combustion (tables 3.2.1 and 3.2.2)
	3.90	kg CH_4/TJ	
	3.90	kg N_2O/TJ	
Gasoline	69,300.00	kg CO_2/TJ	
	25.00	kg CH_4/TJ	
	8.00	kg N_2O/TJ	
Ethanol	0.00	kg CO_2/TJ	
	18.00	kg CH_4/TJ	
	NA	kg N_2O/TJ	
Gasoil A / Diesel	0.1735	kg CO_2e/km	Defra Carbon Factors 2018: passenger vehicles, medium car
Gasoline	0.1939		

STATIONARY COMBUSTION / DIRECT ENERGY CONSUMPTION

Fuel	EF	Unit	Source
Gasoil C	74,100.00	kg CO_2/TJ	IPCC Guidelines 2006 Volume 2 - Chapter 2: Stationary combustion. Manufacturing and construction industries.
	3.00	kg CH_4/TJ	
	0.60	kg N_2O/TJ	
Gasoline	69,300.00	kg CO_2/TJ	
	3.00	kg CH_4/TJ	
	0.60	kg N_2O/TJ	
Natural Gas	56,100.00	kg CO_2/TJ	
	1.00	kg CH_4/TJ	
	0.10	kg N_2O/TJ	
Liquefied Natural Gas (LNG)	64,200.00	kg CO_2/TJ	
	3.00	kg CH_4/TJ	
	0.60	kg N_2O/TJ	

AUXILIARY DATA: PROPERTIES OF FUELS

Fuel	Density	Unit	Source
Gasoil A / Diesel	0.8325	kg/l	OECC Registry April 2018: Densities specified in Royal Decree 1088/2010, of September 3, which modifies Royal Decree 61/2006, of January 31.
Gasoil C	0.9000		
Gasoline	0.7475		
Ethanol	0.8100		FENERCOM
Fuel	**NCV**	**Unit**	**Source**
Gasoil	43.00	TJ/Gg	OECC Registry April 2017: National Inventory Emissions
Gasoline	44.30		
Ethanol	24.90		FENERCOM
Biodiesel	27.00		OECC Registry April 2018: IPCC Guidelines for National Greenhouse Gas Inventories 2006-Volume 2-Chapter 1: Introduction

In the case of the **electric power emission factors, for the case of Spain, it is reported based on the data of the Registry of the Spanish Office for Climate Change** (the data is not specifically associated with any trader, since there are several for the different Elecnor group organisations). **In the case of the other countries, the data of year 2016 of the corresponding electric mix is used**, since the source (IEA - CO2 EMISSIONS FROM FUEL COMBUSTION Highlights, 2018 Edition) does not have the most recent emission factors.

With regard to fuel consumption, the use of international emission factors from IPCC sources has been prioritised, both for those of mobile origin and those of static origin. In those cases in which the activity data is provided per kilometre, DEFRA is prioritised as source of information.

The global warming potentials of the fourth IPCC report have been used. These are listed in the following table:

Table 4. Global warming potentials.
Source: Self-made.

GLOBAL WARMING POTENTIALS

GHG	GWP	Unit	Source
CO_2	1	kg CO_2e/ kg GEI	Fourth IPCC Evaluation Report
CH_4	25		
N_2O	298		

4.3. CALCULATION OF THE CARBON FOOTPRINT

Based on the activity data collected in the CO_2data platform and the previously mentioned emission factors, the calculations associated with fuel and electricity consumption of the different organisations that make up Elecnor were developed.

4.4. CALCULATION UNCERTAINTY

Based on the calculation methodology used, a qualitative analysis is made of the uncertainty associated with the calculation, based on the activity data (AD) and emission factors (EF) used.

With regard to **AD**, those that affect a calculation methodology with less uncertainty are prioritised:

- **Fuel consumption:** the report in litres and fuel type has been prioritised. Failing this, there has been the possibility of reporting in km travelled and type of fuel.
- **Electricity consumption:** the report in kWh consumed has been prioritised. Secondarily, the option of reporting on illuminated surface has been given.

If each type of emission source is analysed, it can be affirmed that work has been carried out from lesser to greater uncertainty as follows:

- Electricity consumption: it has been reported based on invoices and not from the illuminated area in almost all cases.
- Fuel consumption: in almost all cases the activity data have been reported in litres.

If we analyse the **EFs** used, since almost all of them use the IPCC as source, it can be stated that the uncertainty associated to them will be of ±5% in a generic way. If we analyse it by emission source:

- **Electricity EF:** for Spain the data of the OECC Registry has been used in the absence of a trader. Since it deals with the EF of the country, it has a reduced uncertainty, although for subsequent years this could be reduced by differentiating consumptions per trader.
- **Fuel EF:** we have worked with the EFs of the IPCC, so the uncertainty is of ± 5% for CO2 and a little higher for the rest of the greenhouse gases.

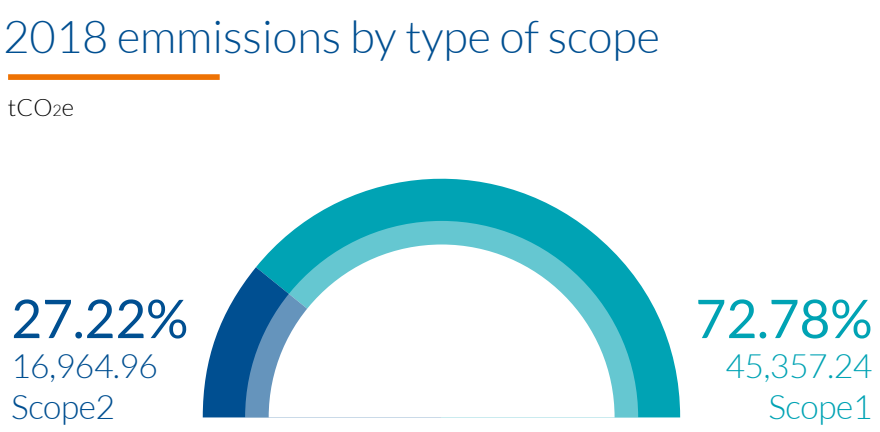
5. RESULTS: CARBON FOOTPRINT OF 2018

In this section we present the results of Elecnor's organisation carbon footprint analysed in different ways.

5.1. ELECNOR'S CARBON FOOTPRINT

Elecnor's carbon footprint in 2018 was 62,322.2 tonnes of CO_2e, of which **about 73% were scope 1emissions,** that is, associated with fuel consumption.

Figure 3. Contribution of emissions by scope to the total of Elecnor's carbon footprint.
Source: Self-made.



Scope 1 emissions are distributed by gases as follows:

- Tonnes of CO_2e of CO_2: 44,663.14
- Tonnes of CO_2e of CH_4: 66.73
- Tonnes of CO_2e of N_2O: 627.37

The following table shows the amounts of CO_2 equivalent emitted, disaggregated by scope or emission source:

Table 5. Emissions by source type and scope.
Source: Self-made.

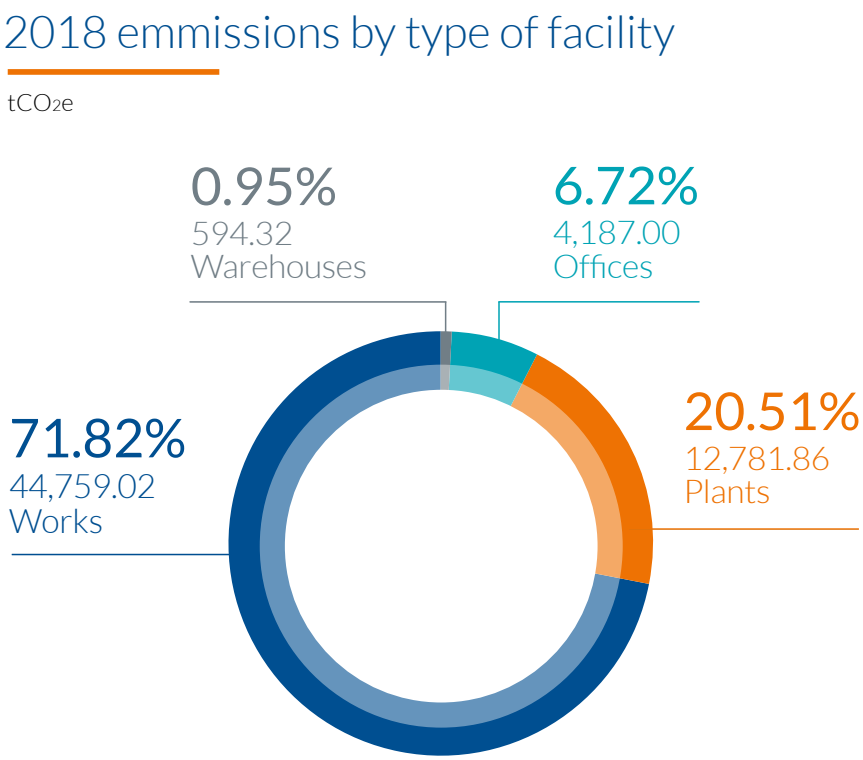
Scope	Source	Emissions (tCO_2e)
Scope 1	Fuels	45,357.24
Scope 2	Electricity	16,964.96
TOTAL		**62,322.20**

If we analyse the emissions according to the type of facility where they have been generated, **the contribution of the works stands out, with 71.82% of the total. These are followed by plants (factories/farms), which generate 20.51% of emissions**. With less representation are the offices, which account for almost 7%, and finally, the fixed warehouses with around 1%.

The following graph shows the distribution of total emissions by type of facility, distinguishing between the four existing categories.

Figure 4. Contribution of emissions by type of facility to the total of Elecnor's carbon footprint

Source: Self-made.



On the other hand, it is interesting to analyse the contribution of each organisation to the total of Elecnor's emissions.

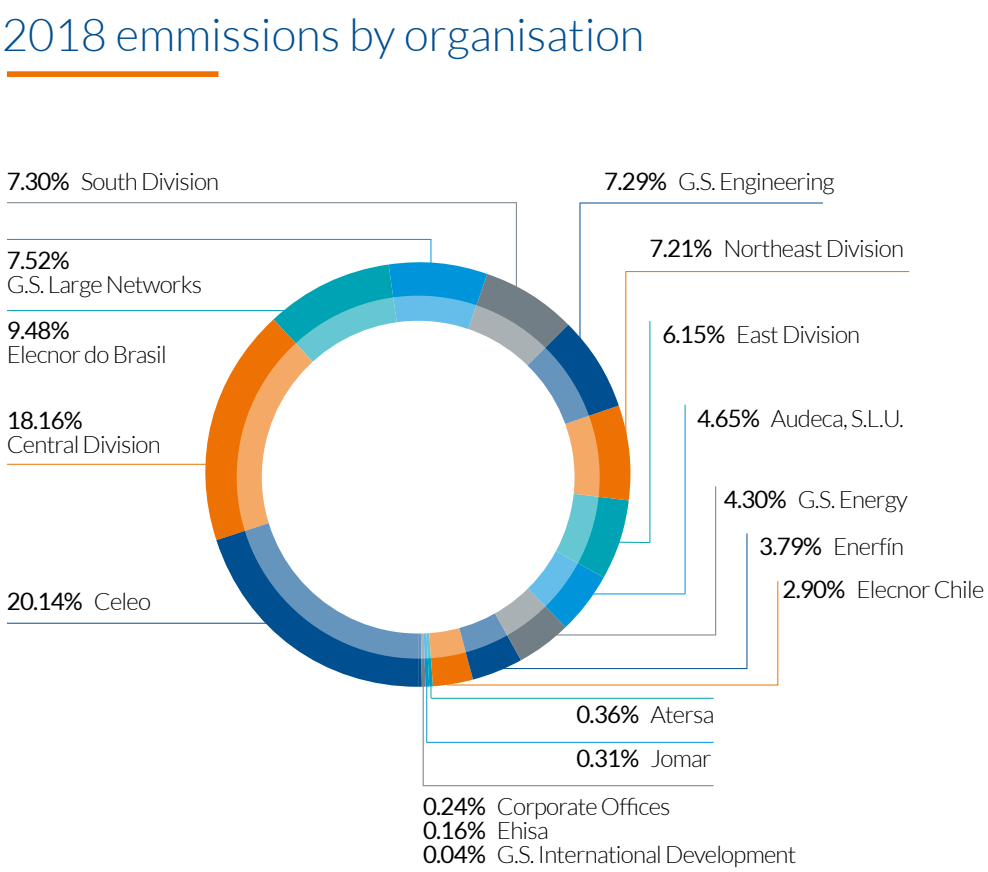
The table and figure shown below reflect the contribution of each organisation with respect to the total emissions generated by Elecnor.

Table 6. Carbon Footprint of each General Subdivision / Division / Subsidiary.
Source: Self-made

Organisation	Organisation emissions (tCO_2e/year)	% of total
Celeo	12,551.24	20.14%
Central Division[6]	11,316.14	18.16%
Elecnor do Brasil	5,908.26	9.48%
General Subdivision of Large Networks	4,686.32	7.52%
South Division	4,548.05	7.30%
General Subdivision of Engineering[7]	4,542.28	7.29%
Northeast Division	4,495.66	7.21%
East Division	3,835.51	6.15%
Audeca, S.L.U.	2,900.68	4.65%
General Subdivision of Energy	2,677.60	4.30%
Enerfín Sociedad de Energía, S.L.	2,361.87	3.79%
Elecnor Chile	1,810.15	2.90%
Aplicaciones Técnicas de la Energía, S.L. (ATERSA)	222.97	0.36%
Jomar Seguridad, S.L.	190.35	0.31%
Corporate Offices	147.44	0.24%
Ehisa Construcciones y Obras, S.A.	101.26	0.16%
General Subdivision of International Development	26.41	0.04%

(6). Central Division includes Adhorna
(7). General Subdivision of Energy includes Hidroambiente and Deimos.

Figure 5. Contribution of each organisation to the total of Elecnor's carbon footprint.
Source: Self-made



As can be seen in the image, the organisations **that contribute the most to the total of Elecnor's emissions are Celeo, Central Division, Elecnor do Brasil, General Subdivision of Large Networks, South Division, and General Subdivision of Energy.** The sum of the contributions of these six organisations is almost 72% of total emissions.

Next, is the Northeast Division, with 7.21% of the total, followed by the East Division, which represents 6.15%. The rest of the organisations contribute to a lesser extent, with representations of less than 5%.

5.1.1. AVOIDED EMISSIONS

It should be noted that Elecnor sent, in 2018, **15,945.460 tonnes of waste to clean points**, with the corresponding emissions avoided since these are not managed in landfills.

On the other hand, the **generation of renewable energy** in the photovoltaic plants of Celeo and the wind farms of Enerfín amounted to **27,076 MWh** in 2018.

The following table shows the emissions of greenhouse gases that were avoided thanks to the two previous initiatives.

In both cases, the equivalence in tCO_2e has been achieved by comparing the emissions avoided with a trend scenario, that is, had the waste not been managed in a clean point or had the energy not been generated from renewables, what associated emissions would they have had.

Table 7. Avoided Emissions in 2018.
Source: Self-made from comparison with a trend scenario

INITIATIVES	AVOIDED EMISSIONS (tCO_2e)
Waste management in clean points	11,922
Generation of renewable energy	495,500
TOTAL	**507,422**

5.1.2. COMPARISON BETWEEN 2017 AND 2018

In Elecnor's internal protocol for the calculation of GHG emissions, the comparison of the carbon footprint obtained in a given year with the emissions calculated for the previous year is defined as a **control and monitoring system**.

In this way, based on the activity data for the years 2017 and 2018, a comparison was made of the greenhouse gas emissions generated both years by Elecnor, in order to be able to analyse the evolution of the organisation's carbon footprint over time.

Due to division changes within the organisations and modifications in the methodologies for reporting results, for the purpose of calculating the carbon footprint and in order for the values to be comparable, the analysis of the footprint of 2018 with respect to the value of 2017 is made with the following modifications:

- In 2018, **Elecnor Do Brasil changed its fuel consumption reporting methodology**, with the methodology used in 2018 being more rigorous than in previous years. This year it reported them through fuel consumption bills, while in previous years the consumption in litres was estimated from the total price spent on fuels divided by the average price of it. The total footprint of the organisation is affected by this change in methodology, so that in order to make a real comparison (using the same methodology) over previous years, the data from previous years have been calibrated with those from 2018.

- Given that in 2018, HYDROAMBIENTE AND ELECNOR DEIMOS are included in the calculation of the footprint of the General Subdivision of Engineering, for the year 2017 these values have been added to the total of the General Subdivision of Engineering.

- In 2018, Adhorna is included in the Central Division's footprint while, in 2017, Adhorna was within the General Subdivision of Large Networks. Therefore, for the comparison, in 2017 this value has been subtracted from the General Subdivision of Large Networks and it has been added to the Central Division.

Elecnor Do Brasil has additionally provided the data for 2018, according to the old methodology. In this way, it has been possible to calibrate the data and transfer them to previous years, the results of the Total Footprint trend of the Organisation being as follows:

	NEW METHODOLOGY	OLD METHODOLOGY
2018	62,322 tCO_2e	58,765 tCO_2e
2017	66,631 tCO_2e	63,827 tCO_2e
2016	58,163 tCO_2e	55,826 tCO_2e
2015	56,837 tCO_2e	54,446 tCO_2e
2014	49,490 tCO_2e	48,274 tCO_2e

It is worth noting the existence of a variation of 6.05% in the total result of carbon footprint for the year 2018 between the two methodologies for reporting results, and therefore **its relative importance is greater than 5%**.

Annex 1 of this report shows in more detail the change of methodology in the procedure for calculating fuel consumption by Elecnor do Brasil and the results of the indicators before and after calibrating for the previous years.

Thus, **Elecnor's carbon footprint has decreased by 4,309 tCO_2e** between 2017 (66,632 tCO_2e generated) and 2018 (62,322 tCO_2e), **which represents a decrease of 6.47%.**

It should be noted that the decrease in Elecnor's carbon footprint is partly due to the **decrease in the organisation's activity**, since the hours worked decreased from 28,846,770 in 2017 to 26,890,193 in 2018.

From the above, it is concluded that Elecnor's behaviour has maintained a constant trend, since the **ratio of emissions generated per hour worked has remained similar with respect to the year 2017**. (2.3 $kgCO_2e$/hour in 2017 and 2.3 $kgCO_2e$/hour in 2018.)

The following table shows the differences in the behaviour of the different organisations between the years 2017 and 2018.

Table 8. Comparison of the carbon footprint of 2017 and 2018.
Source: Self-made

Organisation	2018	2017	Difference	Variation %
Celeo	12,551	12,134	417	3.44
Central Division	11,316	10,425	891	8.55
Elecnor do Brasil	5,908	4,104	1,804	43.96
GSD Large Networks	4,686	7,474	-2,788	-37.30
South Division	4,548	3,927	623	15.83
GSD Engineering	4,542	3,483	1,059	30.40
Northeast Division	4,495	4,229	267	6.31
East Division	3,835	3,616	219	6.07
Audeca	2,900	2,726	175	6.40
GSD Energy	2,677	5,119	-2,441	-47.69
Enerfín	2,361	2,001	361	18.06
Elecnor Chile	1,810	6,717	-4,833	-73.05
Atersa	222	246	-23	-9.41
Jomar	190	193	-3	-1.44
Corporate Offices	147	137	11	7.83
Ehisa	101	77	24	31.70
International Development	26	24	3	10.81
TOTAL	**62,322**	**66,631**	**-4,309**	**-6.47**

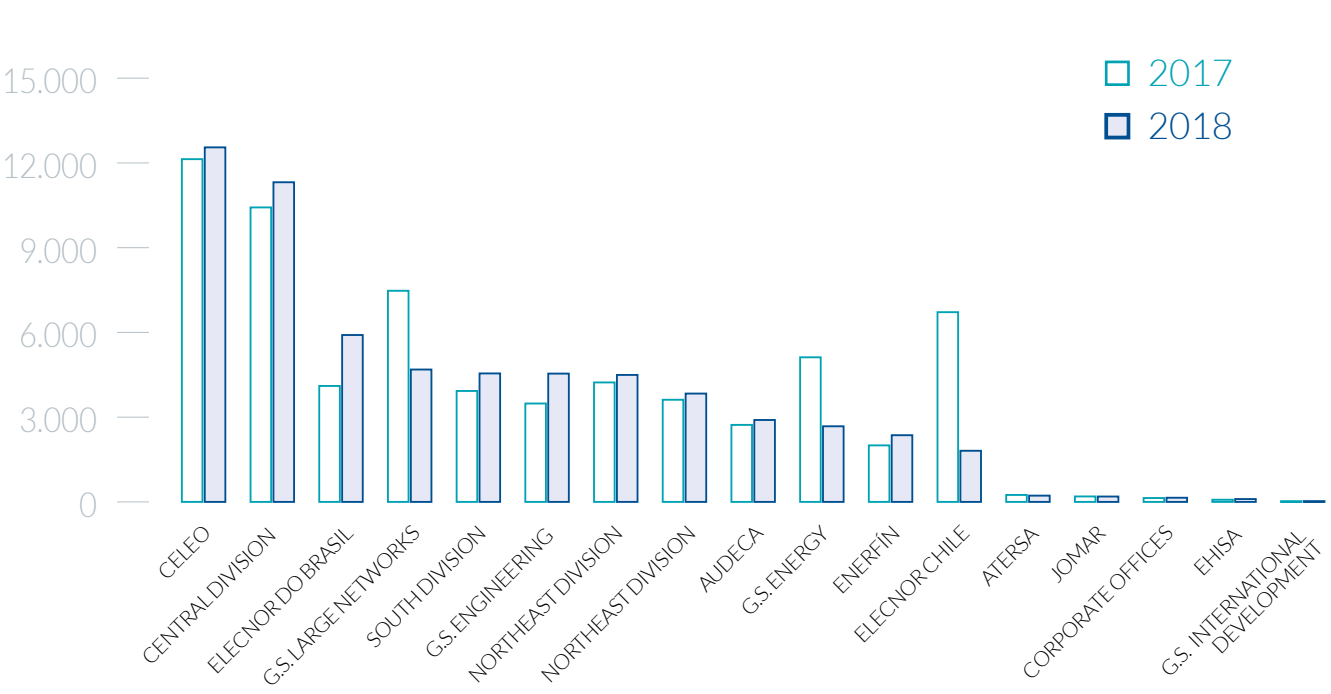
The organisation that accounted for the most significant increase was: Elecnor do Brasil (43.96%).

The organisations that have experienced a substantial decrease are Elecnor Chile (-71.95%), GSD Energy (-47.69%) and GSD Large Networks (-37.30%).

The following figure shows the conclusions previously exposed:

Figure 6. Comparison of results 2018 vs. 2017, by organisation.
Source: Self-made

Evolution of emmissions

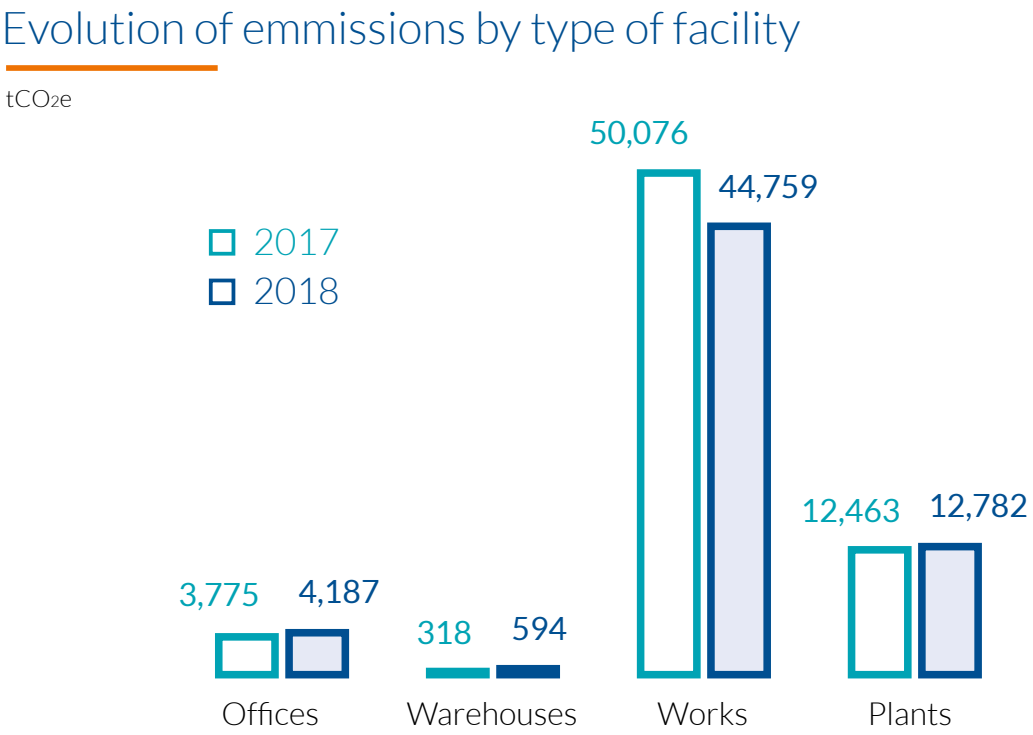


The increase in Elecnor do Brasil's footprint is due to the increase in the number of works in execution for the year 2018 with its consequent increase in the use of fuels.

In the case of Elecnor Chile and GSD Energy, the decrease is explained by the decrease in fuel consumption of both vehicles and machinery. Lastly, in GSD Large Networks fuel consumption has decreased, because there has been a very significant decrease in the number of hours worked in the Dominican Republic, especially in large construction projects, which explains the decrease in emissions.

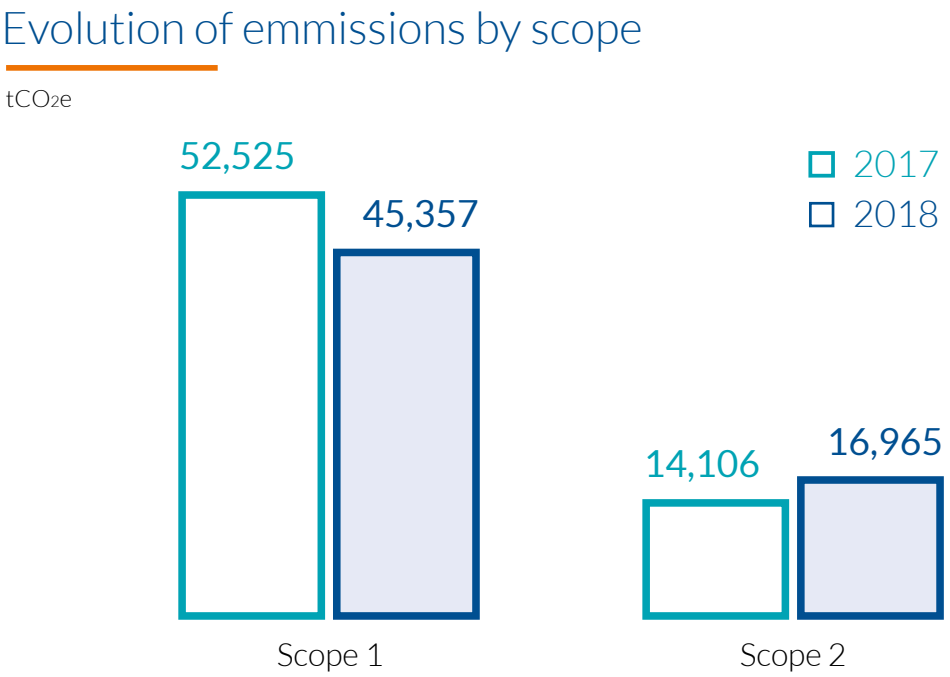
Analysing the **evolution of Elecnor's emissions by type of installation**, we can see that **the contributions** in absolute values for each of these are very similar to those **of the previous year**. The emissions associated with the **works have decreased by -10.62%**, while those of the **offices and plants** have increased by **10.5% and 2.56%** respectively. It should be noted that the emissions associated with the **warehouses** have increased by **86.8%**; however, as these are very low figures, their contribution is not as large.

Figure 7. Comparison of results 2018 vs. 2017, by type of facility
Source: Self-made



Finally, if we analyse the evolution of Elecnor's emissions by type of scope, we can see how **the emissions associated with electricity consumption** (scope 2) **show an increase of 20.2%**. On the other hand, **scope 1 emissions decreased by 13.65%**.

Figure 8. Comparison of results 2018 vs. 2017, by type of scope.
Source: Self-made



6. REPORT VERIFICATION

AENOR

Environmental Certificate
CO2 Verified

AENOR Environment CO_2 verified

HCO-2015/0011

AENOR certifies that the organisation

ELECNOR, S.A.

generates, according to the requirements of the UNE-EN ISO 14064-1:2006 Standard, emissions of 62.322,20 t of CO2-eq (Scope 1: 45.357,24 t of CO2-eq, Scope 2: 16.964,96 t of CO2-eq and is committed to track them over time.

for the activities:	The activities of Engineering, development and construction of Infrastructures Projects which are the purpose for the verification performed within the Organizations of ELECNOR GROUP specified in Annex I. Within the activities of the purpose two scopes are established according to the criteria of the 14064-1 ISO standard), which are: -Scope 1: Direct GHG emissions -Scope 2: Indirect GHG emissions for purchase of electric and thermal energy acquired for own use
which is/are carried out in:	CL LICENCIADO POZA, 55 4ª PLANTA. 48013 - BILBAO (BIZKAIA)
Calculated period:	2018
According to:	Verified Emissions Report of the period 2018 and the AENOR Verification Statement, resulting from the verification, dated March 18, 2019.
First issued on:	2015-12-22
Last issue date:	2019-03-18
Validity date:	2021-04-19

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HCO-2015/0011

Annex I
(Calculated period 2018)

List of organizations included in the 2018 inventory of GRUPO ELECNOR that has been verified:

- Subdirección General Grandes Redes
- Subdirección General Energía
- Dirección Centro (Incluye Adhorna prefabricación)
- Subdirección General de Ingeniería (Incluye Elecnor Deimos e Hidroambiente)
- Dirección Nordeste
- Dirección Este
- Dirección Sur
- Subdirección General Desarrollo Internacional
- Aplicaciones Técnicas de la Energía S.L. (ATERSA)
- Audeca,
- Ehisa construcciones y obras, S.A.
- Enerfín Sociedad de Energía, S.L.
- Jomar Seguridad, S.L.
- Celeo
- Oficinas Corporativas
- Elecnor Chile, S.A.
- Elecnor do Brasil, LTDA

This document is dependent on Certificate No. HCO-2015/0011 (calculated period: 2018), and its validity is limited to that of the mentioned certificate.

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ANNEX 1: CHANGE OF METHODOLOGY IN THE PROCEDURE FOR CALCULATING FUEL CONSUMPTION BY ELECNOR DO BRASIL.

1. CALIBRATION OF DATA

Until the year 2017, in order to perform the total calculation of fuel consumption in litres, Elecnor Do Brasil made an average estimate considering the total price spent on fuels divided by the average price of fuels in Brazil.

In 2018, the collection of fuel consumption data has been improved based on the invoices that detail the litres consumed.

In order to compare the results of the year 2018 with those of previous years, Elecnor do Brasil has provided the 2018 data according to the old methodology, which has allowed to calibrate the old method with respect to the new one.

Table 9. Calibration of the trend based on the 2018 data.
Source: Self-made

	TOTAL (litres)	BIODIESEL (litres) %92	ETHANOL (litres) %3	GASOLINE (litres) %5
Year 2018 - Old	1,201,558.17	1,104,796.99	37,396.90	59,364.28
Year 2018 - New	3,120,057.98	2,868,800.50	97,107.65	154,149.83
Variation	1,918,499.81			
%	160%			

With the old methodology, no segmentation of the percentage of each type of fuel has been obtained, so the same percentage has been applied as in the case of the new methodology. (Biodiesel 92%, Ethanol 3% and Gasoline 5% of the total).

A variation of almost 2 million litres is obtained, which is equivalent to an increase of 160% in the data reported with the new methodology with respect to the old one.

Therefore, to calibrate these data, those of **the old methodology have been added** their variation with respect to the new one, i.e. **160% of the total value:**

$$N = O + (1{,}6 \times O)$$

Where:

- N is the new Methodology
- O is the old Methodology

Applying the obtained calibration for the 2018 data, the available historical data have been recalculated; the results for fuel consumption being the following:

Table 10. Calibrated Fuel Results for 2014-2017.
Source: Self-made

HISTORICAL DATA	Total fuel consumption before calibration (litres)	Total fuel consumption calibrated (litres)
2017	802,008.31	2,082,556.21
2016	490,682.35	1,274,143.38
2015	625,095.00	1,623,169.56
2014	501,780.00	1,302,960.39

2. CALIBRATED FOOTPRINT RESULTS

The following table shows the carbon footprint results of Elecnor Do Brasil, as well as of Elecnor in its entirety from 2014 to 2018.

The **first columns** show the results obtained with the **new methodology**, and the second column shows the results obtained with the **old methodology** (these data are those in the reports from 2014 to 2017).

The last column shows the variation (%) in the total result of carbon footprint for the different years between the two methodologies for reporting results.

For each of the years, **a calculation tool according to that year** has been used, which implies the following:

- **Emission factors** corresponding to each year.
- **Segmentation of the total percentage** of fuels according to what is reported each year, given that having used one fuel or another has a different associated emission factor and affects the total footprint.

In 2014 and 2015, Elecnor Do Brasil reported on the set of GSD Energy and GSD Large Networks, so their data has been extracted from these organisations.

In 2014, no segmentation of the total hours of each centre was reported within the aforementioned General Subdivisions, so it has not been possible to calculate Elecnor Do Brasil's ratio for that year.

From 2016 onwards, Elecnor Do Brasil has reported its data as an independent organisation.

Table 11. Comparison of Carbon Footprint results according to methodologies
Source: Self-made

TENDENCY	NEW METHODOLOGY				OLD METHODOLOGY				ELECNOR FOOTPRINT VARIATION
	Brazil's Footprint (tCO_2e)	Brazil's Ratio ($kgCO_2e/H^o$)	Elecnor's Footprint (tCO_2e)	Elecnor's Ratio ($kgCO_2/H^o$)	Brazil's Footprint (tCO_2e)	Brazil's Ratio ($kgCO_2e/H^o$)	Elecnor's Footprint (tCO_2e)	Elecnor's Ratio ($kgCO_2/H^o$)	according to methodologies
2018	5,908	1.4	62,322	2.3	2,350	0.6	58,765	2.2	6.05%
2017	4,104	0.9	66,632	2.3	1,300	0.3	63,827	2.2	4.39%
2016	3,470	3.2	58,163	2.5	1,133	1.0	55,826	2.4	4.02%
2015	3,888	6.7	56,837	2.6	1,497	2.8	54,446	2.5	4.21%
2014	2,492	-	49,490	2.8	1,276	-	48,274	2.7	2.46%

In regards to the results obtained, the following comments are noteworthy:

- GSD Engineering was included for the first time in 2017.
- Fugitive emissions were included in the years 2014, 2015 and 2016; however, in this calculation they have been eliminated in order to compare them with other years.

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