elecnor

Carbon Footprint Report 2019

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1. Introduction: Main profiles of Elecnor

Elecnor is a group of approximately 80 companies engaged in comprehensive project development and management and infrastructure development. It is made up of Elecnor, S.A. and subsidiary companies.

The business model of Elecnor operates around two large businesses, which mutually complement and enrich each other:

- **Infrastructures** that consist of the execution of engineering and construction projects, and third party services.
- **Capital Activity** through the development and investment, both in property and in concession regime, of wind energy and energy transport systems projects, and other assets strategic for the company.

The current business model, which was designed to anticipate and adapt to the changes and cycles of the economy, seeks profitable and sustained economic growth primarily through the internationalisation and diversification of the activities of both the parent company and the domestic or foreign affiliates, and, if applicable, through the acquisition of companies that strengthen its presence in certain countries.

The activities of Elecnor are structured into three large areas:

- **Infrastructures:**
This is the essence and traditional activity of Elecnor's business, acting as comprehensive project manager within the activities of electricity, power generation, telecommunications and systems, facilities, gas, construction, maintenance, environment and water, railways and space. As a comprehensive project manager, the company conducts feasibility, basic and detail engineering, construction, supply, installation and maintenance, startup and operational and maintenance services studies.

- **Renewable energies:**
Elecnor is one of the large expert "turnkey" developers and contractors within the renewable energies sector, undertaking projects in the areas of wind energy, photovoltaic solar energy and thermoelectric energy, as well as hydroelectric power stations. In wind and thermoelectric energy, Elecnor's activity also comprises acting as a comprehensive project investor and developer.

- **Concessions and investment:**
Elecnor's experience in the construction and explotation of infrastructures, along with its financing capacity, was years ago the impetus for the company's incorporation into the field of concessions related to its areas of activity. The investment projects in the field of renewables and space are complemented by other businesses, in which Elecnor also acts as developer of its own projects, usually under the concession modality, in the fields of electricity, gas and environmental infrastructures.

2. Carbon footprint Concept

According to the current increasing interest in society around climate change and its consequences, several initiatives and methodologies aimed at learning about its impact have come about in recent years. These include carbon footprint.

2.1. What is carbon footprint?

Carbon footprint is a parameter that represents total CO_2 emissions and other greenhouse gases (GHG), stated in CO_2 equivalent mass, caused directly or indirectly by a product, organisation, service or event throughout its life cycle.

Carbon footprint is important in order to try to quantify main emissions sources and to have a complete picture of the organisation's impact on climate change. It is therefore the first step in being able to carry out a GHG emissions reduction plan.

The **organisation carbon footprint** tries to quantify the GHG emissions involved in the activity flows of an organisation or group of interconnected organisations, which can be their responsibility or on which they depend, over a period of one year with a result stated in tonnes of CO_2 equivalent (CO_2e).

2.2. What is carbon footprint for?

The carbon footprint calculation is more than GHG emissions data, since it enables an organisation's larger GHG emission sources to be identified and to have an overall picture of their impact on climate change. It also constitutes a necessary basis to approach and continue over time actions to reduce this impact.

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

- It enriches knowledge of an organisation's **environmental impact** and contribution to climate change.
- It enables an organisation's **energy consumption** and main GHG emission sources to be known and identified, entailing a point of reference to design strategies aimed at a better management of the energy used and prioritising reduction actions with the application of more efficient techniques.
- It makes it possible to **identify the company's activities with greater potential to reduce** GHG emissions and propose specific objectives for them.
- It facilitates **evaluation for choosing** raw materials and selecting suppliers, manufacturing methods and production options **according to their** associated **GHG emissions.**
- It favours the application of **more efficient techniques** in different activities, thereby entailing a cost saving.
- It serves as **an idea as to future climate change regulations and policies.** One clear example is that from the EU, work is already being done on how to introduce carbon footprint calculation in green government procurement.
- It encompasses **more transparent communication** on the company's commitments to sustainable development and, more precisely, GHG reduction.

To achieve these objectives, it is necessary to work with greater accuracy, covering as large an amount as possible of emissions for which the organisation is responsible. Verification by an independent body is also necessary to confirm that the methodology (see next section) has been appropriately applied and that the results obtained are correct based on the data entered.

2.3. Methodology used to calculate Elecnor carbon footprint

There are currently several internationally recognised methodologies and standards for calculating carbon footprint according to their approach, scope and orientation.

The most extensive standards with international recognition for the calculation of an organisation's carbon footprint are explained briefly below:

• International Organization for Standardization (ISO) 14064-1: 2019

This standard outlines the principles and requirements for the design, development and management of GHG inventories for companies and organisations, and for the submittal of reports for these inventories. It also includes the requirements to determine GHG emission limits, quantify the organisation's gas emissions and removals, and identify the company's specific activities or actions with the aim of improving the management of these gases.

Standard ISO 14064, like the GHG Protocol, focuses above all on the facilities and activities attached to the organisation, with a study of the GHG emissions associated with the processes carried out by the company being conducted, leaving open the possibility to include Scope 3 sources, depending on their importance.

• Corporate Accounting and Reporting Standard. Greenhouse Gas Protocol

This is a standard developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), which is internationally recognised. The GHG Protocol offers standards and guidelines for companies and other organisations interested in calculating carbon footprint (Scopes 1, 2 and 3).

As set out above, there are several methodologies available to calculate an organisation's carbon footprint. In this case, **ISO 14064-1 has been chosen for Elecnor** carbon footprint, since it is deemed to be the most internationally recognised standard with regard to the calculation of an organisation's carbon footprint. Furthermore, this methodology is based on these five principles: relevance, completeness, consistency, transparency and precision.

In the case of Elecnor, two base years have been established, since 2019 is the first year for which the calculation of Scope 3 emissions is made, while for Scopes 1 and 2, it is done by calculating since 2014 and Elecnor's strategy already set reduction objectives in these scopes.

For **Scopes 1 and 2,** 2014 was chosen. It was done for both 2013 and 2014, but this was the first year of calculation in which all Elecnor organisations were successfully involved and this is why a base year was chosen. Therefore, it is considered that 2014 has sufficient information to carry out a high scope footprint.

For Scope 3, 2019 was established as the reference year, since it is the first year in which the organisation has complete and reliable data on Scope 3 emissions. In previous years, work was done on the characterisation of this scope.

Nevertheless, the carbon footprint obtained in a certain year is compared with the emissions calculated for the previous year.

In this regard, it should be mentioned that Elecnor in 2015, 2016, 2017, 2018 and 2019 obtained the AENOR Verified Environment CO_2 Certificate, according to Standard ISO 14064-1 (associated with the calculation of the carbon footprint of 2014, 2015, 2016, 2017 and 2018, respectively). Furthermore, in 2018 and 2019, Elecnor obtained the carbon footprint calculation and reduction seal granted by MITECO (Ministry for Ecological Transition). Through this verification, the Group has an independent and rigorous back-up of the quantification of its GHG emissions in its activities, and seeks to improve its environmental and energy management.

2.4. National Carbon Footprint Registry, compensation and carbon dioxide absorption projects

One of the most outstanding national initiatives within the carbon footprint framework is the creation of the **National Carbon Footprint Registry, compensation and carbon oxide absorption projects** started from the Spanish Climate Change Office (OECC) of MITECO, with the aim of encouraging organisations to calculate, reduce and compensate their carbon footprint, and to voluntarily record it.

This measure, closely linked to the calculation of carbon footprint, came about to promote its calculation and reduction, as well as its compensation, through absorption projects located in Spain, in turn driving domestic reductions on national territory.

This registry grants advantages to organisations that record their carbon footprint, such as obtaining a national seal that will determine the degree and timeframe of compliance. Furthermore, the recording of the carbon footprint will be taken into account in the medium term by the Public Administration when it comes to awarding government procurements, therefore, it is in the interests of companies to incorporate the recording of this indicator.

One of the objectives of this project is to continue with the integration of the 2019 Elecnor carbon footprint in this Registry, as was done with the calculation of the 2018 footprint and that of the three previous years, when the regulation was still not in force, in order to give added value to future projects. It also seeks to **maintain the carbon footprint reduction seal.**

3. Limits Definition of Elecnor carbon footprint

3.1. Materiality Analysis

At the start of this study, in-person meetings were held with those responsible for the activities described in this study. The objective of these meetings was to obtain an early characterisation of the processes carried out at the organisation, define the main emission flows and analyse the types of data and the methodology to obtain them. At these meetings, it was decided that the data would be collated in a centralised manner through the ElecnorCO_2Data Platform described in Section 4. Data collation and calculation, of this document to facilitate attendance at the verification.

With regard to emission flows, the emissions derived from the equipment and facilities belonging to Elecnor were determined in a special manner through their consumption, fuel type, the person responsible for collating the data and the type of system for obtaining them (invoices, registries, surface plans).

The activities and emission flows not controlled by Elecnor, but that had to be approached in the study to carry out a high scope footprint, were also identified and defined. To do so, the Scope 3 flows recommended by the GHG Protocol were used. After this characterisation, the most relevant emission flows for the scope were defined to be:

- Purchased goods and services
- Transportation and upstream and downstream distribution
- Consumption of materials used for the activities of Elecnor (amount purchased)
- Water consumption
- Work-related travel (origin, distance)
- Business travel (origin, distance)
- Renting of vehicles and management vehicles (origin, distance)
- Waste management
- Use of the sold products

The results of the meetings with the heads of each department provided the initial information to define the organisational and operational scope that is described in the following sections.

This carbon footprint has sought, through this analysis of processes and materiality, to cover all the flows recommended by the GHG Protocol, although in some cases it was not possible to cover all the desired perimeter. The protocol for the calculation of GHG emissions of Elecnor describes and justifies the emission flows that were not included due to low influence on the results or the lack of information on the flows: transportation and upstream and downstream distribution, and use and end of life of sold products.

3.2. Organisational limit

The first step in the development of the carbon footprint is the definition of organisational limits. It starts from the principle that companies' operations vary not only in their legal structure, but also in their organisational structure and, as such, include operations that are owned thereby, are alliances, subcontracts and many other modalities in which they operate with more or less involvement. **Upon setting the organisational limits, a company selects an approach to consolidate their GHG emissions.** In other words, it determines the business units and operations that constitute the company. These organisational limits are defined by the type of control exerted by the subject, from which the footprint is calculated on a business and organisational operation, which can be done with several different approaches:

- **Shareholding approach**

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

- **Control approach**

  According to the GHG Protocol, under this approach **a company calculates 100% of its GHG emissions attributable to the operations over which it exerts control.** They must not calculate emissions from operations of which the company is the owner of a share, but over which it has no control. Control can be defined both in financial and operational terms.

- **Financial control**

  A company has **financial control over an operation if it has the power to direct its financial and operational policies with the purpose of obtaining economic benefits from its activities.** A company is deemed to exercise financial control over an operation if it is able to capture the majority of the risks and benefits inherent to ownership over the assets of the operation. A company can have financial control over an operation even if it is the owner of less than 50% of the shareholding structure.

- **Operational control**

  A company exercises **operational control over an operation if said company or one of its subsidiaries has full authority to introduce and implement its operational policies during the financial year.** Under this approach, any company that has control of an operation (this does not necessarily mean that a company is able to take all the decisions regarding a particular operation), either directly or through one of its subsidiaries, should principally calculate 100% of the emissions of the operation.

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

Table 1. Organisational Map of Elecnor.
Source: Prepared in house.

ORGANISATION	NATIONAL CENTRES	TYPE OF CENTRE				INTERNATIONAL CENTRES	TYPE OF CENTRE			
		Offices	Warehouses	Works	Plants		Offices	Warehouses	Works	Plants
DEPUTY GENERAL MANAGEMENT LARGE NETWORKS	Bilbao	X	X	X		Elecnor of Angola	X	X	X	
						Elecnor of México (Lines)	X	X	X	
						Elecnor of Dominican Rep	X	X	X	
						Omninstal Electricidade	X	X	X	
DEPUTY GENERAL MANAGEMENT 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	
	Railway works	X	X	X		Elecnor of Honduras	X	X	X	
						Montelecnor (Uruguay)	X	X	X	
MANAGEMENT CENTRE	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						
	Telecommunications Castilla y León	X	X	X						
	ADHORNA[1] Álava	X	X	X	X					
	Barcelona	X	X	X	X					
	Valladolid	X	X	X	X					
DEPUTY GENERAL MANAGEMENT ENGINEERING[2]	Madrid	X				México			X	
	Valencia	X								
	DEIMOS Madrid	X		X		Green Light Contractors (Australia)	X			
	HIDRO-AMBIENTE Vizcaya	X		X		Algeria			X	
MANAGEMENT NORTHEAST	Barcelona	X	X	X						
	Montacada	X	X	X						
	Sabadell	X	X							
MANAGEMENT EAST	Valencian Community (Alicante, Aldaia, Valencia, Castellón)	X	X	X						
	Balearics (Ibiza, Mallorca)	X	X	X						
	Murcia (Alcantarilla)	X	X	X						
MANAGEMENT SOUTH	Canarias	X	X	X						
	Extremadura	X	X	X						
	Andalusia (Málaga and Seville)	X	X	X						
DEPUTY GENERAL MANAGEMENT INTERNATIONAL DEVELOPMENT	Madrid	X								
APLICACIONES TÉCNICAS DE LA ENERGÍA, S.L. (ATERSA)	Madrid	X								
	Valencia		X		X					
AUDECA, S.L.U.	Madrid	X	X	X						
	Elecnor Environment (Water & 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	Canada	X			X
	Madrid	X								
	Navarra				X					
JOMAR SEGURIDAD, S.L.	Guadalajara	X								
CELEO	Madrid	X			X					
	Siberia Solar	X			X					
	Zinertia Renovables AASCV I	X			X					
	Zinertia Renovables	X			X					
	Zinertia Renovabl. ELC	X			X					
	Zinertia Renovabl. HAE	X			X					
	Zinertia Renovabl. THT	X			X					
	ASTEXOL 2				X					
	ASTE 1A				X					
	ASTE 1B				X					
	Exploitation Wastewater Treatment Plant	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	
IQA						Scotland	X	X	X	

X The organisation/delegation has these types of centres.
The organisation/delegation has reported the warehouse data in offices or at works, or viceversa.

(1) In 2018, Adhorna is included in the carbon footprint calculation of Management Centre. Previously it was calculated within Deputy General Management Large Networks.
(2) In 2018, Hidroambiente S.A and Elecnor Deimos move to be delegations belonging to Deputy General Management Engineering.
(3) Elecnor Chile and Elecnor do Brasil were calculated independently as own organisations in 2016. In previous years, these affiliates had been the subject to study as organisations belonging to the Deputy General Management Large Networks and Deputy General Management Energy. The same occurs with Jomar Seguridad, S.L. This affiliate was calculated for the first time independently and not integrated into Management Centre in 2016.

In 2019 activity ceased at the following organisations:

- Elecdor, belonging to the Deputy General Management Large Networks
- Venezuela, belonging to the Deputy General Management Energy.
- Portugal (Fundao & Viseu), belonging to Deputy General Management Engineering.

Therefore, these disappear from the calculation of Elecnor footprint.

Conversely, during 2019, the following delegations have been incorporated:

Valencia y Green Light Contractors (Australia), belonging to the Deputy General Management Engineering. Therefore, these are included for the first time in the calculation.

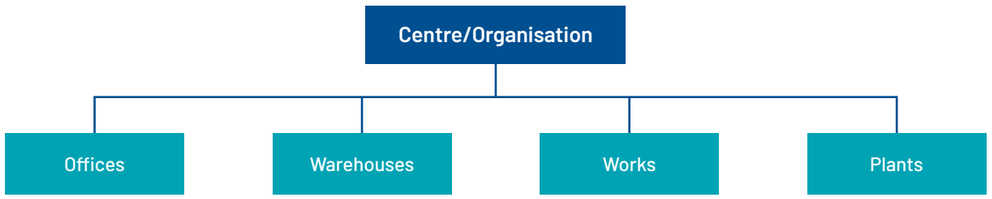
Likewise, there has been a restructuring within the organisations of General Management Northeast. The Manresa centre has been replaced by the Montcada one and a new centre has been included: Sabadell.

Finally, it should be underlined that IQA, an organisation belonging to the Elecnor Group, is included for the first time in the calculation, which for the first time reports data associated with the assessed period.

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

For the definition of the organisational limit in the Elecnor study, facility is defined as a set of facilities with mobile production processes – works – and stationary ones – plants – in addition to offices and warehouses.

Figure 1. Map of Elecnor processes.
Source: Prepared in house.



3.3. Operational limit

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

According to the GHG Protocol, the operational limit defines the scope of direct and indirect emissions for the operations that fall within the organisational limit established for the company. The organisations must mandatorily calculate and report Scopes 1 and 2 separately, the calculation of the Scope 3 emissions being optional but recommended. However, the new update of ISO 14064 establishes the need to conduct a prior analysis of all the emissions included in Scope 3, in order to study and include those of greater significance.

When it comes to making the calculation of the carbon footprint, the different emission sources must be taken into account. These will be defined within Scope 1, 2 or 3, depending on how the organisational limits are defined.

In the calculation of the CF of Elecnor, the following Scope 1 direct emissions, Scope 2 indirect emissions and other Scope 3 indirect emissions have been quantified:

- **Scope 1 emissions** (direct emissions): emissions that result from the activities controlled by the organisation. Examples of the processes that can generate them:
  - Combustion at stationary sources.
  - Physical or chemical processes.
  - Combustion at mobile sources.
  - Fugitive emissions that result from intentional or non-intentional releases, such as refrigerants used in air conditioning and refrigeration equipment.
- **Scope 2 emissions** (indirect emissions): emissions of the organisation caused by the use of electric power, heat or water vapour acquired from outside.
- **Scope 3 emissions** (other indirect emissions): emissions from the products and services of the organisation. They are induced by the company's activities, but occur in sources that are not owned or controlled by the company. To identify the significant Scope 3 emission sources, the recommendations set out by the Scope 3 emissions calculation guidelines have been followed, which is a supporting document for the GHG Protocol standard. Primary emission sources within this category are set out therein.

Due to the size that their emissions can have, the influence they can have in terms of reduction, the availability of the data or the importance that it can have for future regulations, this study considers the following emission sources:

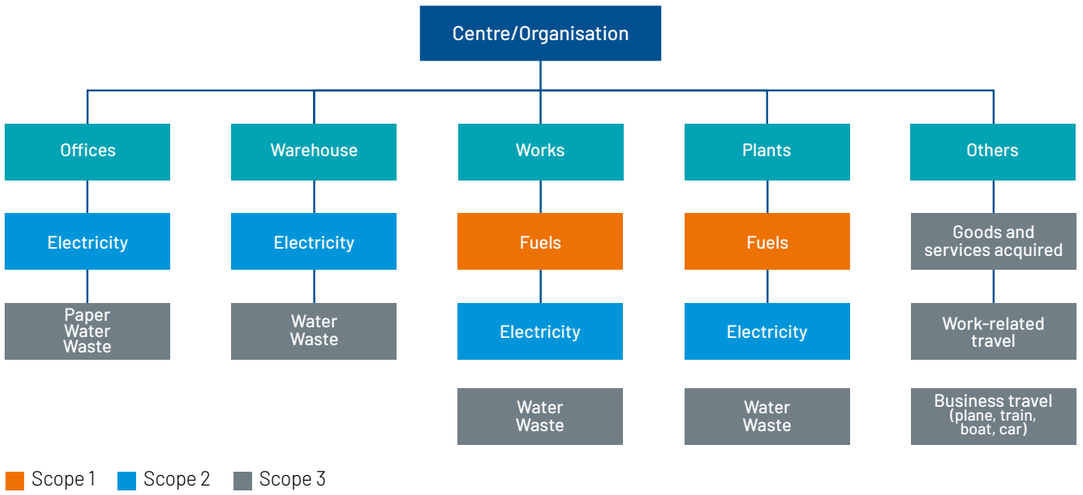
- Good and services purchased: energy consumption of suppliers and subcontractors associated with the activity of Elecnor.
- Consumption of materials used for the activities of Elecnor (quantity purchased): normal and recycled paper consumption.
- Water supply consumption.
- Work-related travel (origin, distance).
- Business travel (origin, distance): plane, train, boat.
- Rental of vehicles and management vehicles (origin, distance): cars.
- Waste generated at the operations.

The objective of this classification is to prevent the double calculation of GHG emissions in the same scope of the inventory of several organisations. Two organisations may indeed have emission sources in common. However, for one organisation, these emissions will form part of their direct emissions and for the other of its indirect emissions.

For each centre or organisation that the general managements comprise, the emissions have been differentiated based on the location where they have been produced. Therefore, offices, warehouses, works and plants (factories/exploitations) have been defined as potential locations of emission generation.

Below is the organisational map of Elecnor with its respective emission sources. The emission sources are divided by segment and characterised according to their scope. For the selection of the scope for each emission source, the definitions of Standard ISO 14064 have in general been followed. The existence of the segment "Others" should be underlined, where those scope 3 emissions belonging to the Elecnor Group, but which it has not been possible to break down by type of facility, have not been reported.

Figure 2. Map of processes of each centre/organisation with their corresponding emission sources.



In the event that the execution of a contract has been subcontracted in its totality, the consumption data referring to this contract have not been included in the limits.

- In the case of Temporary Joint Ventures (TJV), Elecnor has reported the data associated with the service managed in the contract only if it has a share over 50% in the TJV or if it has operational control.

- For Energy Services Companies (ESC), the fields of the sheet that are of direct interest to the execution of the improvement activity have been completed exclusively. The energy and other consumption of the actual facility at which the improvement is provided have not been reported here.

- In the event that exploitation concessions/contracts have been obtained from data exclusively when Elecnor has had the authority to introduce environmental improvement measures with the necessary approval of the client. That is, when there is control.

The following must be taken into account at the following organisation:

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

3.4. Types of gases included in the study

The GHG considered in Elecnor carbon footprint are those that, from among those considered in the Kyoto Protocol, are generated by the activity carried out by Elecnor. These are: carbon dioxide, methane and nitrous oxide (CO_2, CH_4 and N_2O), as well as hydrofluorocarbons (HFC) associated with refrigerant gas leaks. HFC emissions will be reported only every three study years, when fugitive emissions associated with reloading of these gases are calculated.

Given that sulphur hexafluoride (SF6), nitrogen trifluoride (NF3) and perfluorocarbons (PFC) are not generated within Elecnor equipment or activities, they have not been taken into account for the scope of the current footprint.

3.5. Exclusion of emission flows

Finally, it should be underlined that several emission flows have been excluded. Standard ISO 14064 (2019) underlines the importance of justifying that these excluded emission flows are insignificant. For this study, emissions deemed to have little influence for the calculation and whose information was not reliable or easily accessible have been ruled out. These excluded flows along with their justification are described below:

Scope 1:

- With respect to the reloading of refrigerant gases, given that **this emission source has a contribution lower than 1% with respect to the total of Elecnor footprint,** an annual follow-up of the data is done, confirming that their representation remains below those levels. However, it will be excluded from the operational limits and will be reported only every three study years.

- Emissions associated with combustion in the power generating sets in office activities are excluded, since they are negligible.

Scope 3:

Within the 15 categories of Scope 3 offered by the GHG Protocol, not all are deemed to be relevant for the activity of Elecnor, therefore, these have been excluded and justified in the calculation protocol of Elecnor.

The emission sources that have been deemed relevant in the analysis conducted are presented below, but due to a lack of reliability or accessibility data, it was not possible to include them in the calculation.

- **Transportation and upstream and downstream distribution:** Relevant, as yet not calculated. As of today, it has not been possible to compile quality information regarding the transportation carried out, since Elecnor has a large amount of supplier flow with different locations.

- **Use and end of life of products sold;** Relevant, as yet not calculated. These emissions are only important in the organisations whose activity is the production of a product, such as: Atersa and Adhorna. However, it is not deemed essential, given that it is a small part of its activity. It is established that, in the coming years, after defining with maturity other more relevant Scope 3 emissions, work will begin in this category.

4. Data collation and calculation

Elecnor has designed a tool for the calculation of carbon footprint (ElecnorCO_2data), which enables each Elecnor organisation to report the activity data required for the calculation and to obtain the greenhouse gas emissions associated with its activity.

This virtual platform has enabled Elecnor to report the required activity data more easily and effectively. With different contributions for each organisation, it is prepared for each of them to enter the activity data of the previously defined emission sources. Furthermore, it has sub-divisions to enter the different types of data and the location of their source, and enables more than one agent to enter data associated with the same source.

It also enables evidence associated with the activity data to be entered, which can be a single file or several files associated with a single datum.

4.1. Activity data

Activity data are those that are associated with the organisation's energy or consumables consumption. These must be precise, transparent, complete, reliable, accurate with regard to information, consistent and reproducible.

The activity data have been provided by Elecnor through the platform Elecnor CO_2data and data associated with consumables, electricity, water, paper and waste consumption have been included.

It should be underlined that the activity data of the category "Others" associated with other Scope 3 indirect emissions have been provided directly by the General Services Department of Elecnor Group, since there is no breakdown of these data for each centre or facility.

Data collection has been prioritised to be as high quality as possible, with the purpose of reducing the uncertainty of calculations. Failing this, there is the option to report them in another way and the necessary estimates have been made.

- **Consumables consumption:** the reporting in litres and fuel type has been prioritised. Failing this, it is possible to report in km covered and fuel type.
- **Electricity consumption:** the reporting in kWh consumed has been prioritised. Secondly, there is the option to report in illuminated surface area. In the case of works, the second reporting option consists of indicating the number of works whose duration has been greater than six months.
- **Water consumption:** the consumption in m^3 has been prioritised, even though there is the option to enter the number of employees.
- **Paper consumption:** the data associated with consumption in kg of both normal paper and recycled paper are entered.
- **Waste:** the data associated with waste generation in kg are entered, making a distinction between hazardous and non-hazardous waste.
- **Refrigerant gas consumption:** the collection of data in kg and refrigerant type has been prioritised.

Table 2. Examples of data recording sheets for electricity and fuel consumption.
Source: Prepared in house.

SOURCE		ELECTRICITY							
Facility type		Offices		Warehouses		Works		Plants	
Organisation	Delegation	kWh	m^2	kWh	m^2	kWh	No works	kWh	m^2
XXX	XXX								

SOURCE		MOBILE COMBUSTIBLE					
Facility type		Works					
Organisation	Delegation	Diesel (litres)	Diesel (km)	Petrol (litres)	Petrol (km)	Ethanol (litres)	Biodiesel (litres)
XXX	XXX						

SOURCE		STATIONARY COMBUSTION				DIRECT CONSUMPTION	
Facility type		Works		Plants		Plants	
Organización	Delegación	Gasóleo C (litros)	Gasolina (litros)	Gasóleo C (litros)	Gasolina (litros)	Gasóleo C (litros)	Gas natural (kWh)
XXX	XXX						

SOURCE		PAPEL		WATER		WASTE	
Facility type		Normal	Recycled	Office/Warehouse/Work/Plant		Hazardous	Non- hazardous
Organisation	Delegation	kg		m^3	No employees	Kg	
XXX	XXX						

For the 2019 Scope 1 and 2 activity data, the breakdown according to type of report has been as follows:

- **Consumables consumption:** 98.5% of the consumption data were reported by following the priority option, that is, from litres and fuel type. **Electricity consumption:** 93,3% of the primary data were provided by following the priority reporting option, that is, stated in kWh. Only 6.7% of the data were reported from the illuminated surface area or the number of works of a duration greater than six months[4] .

Regarding refrigerant gas consumption, on which an annual follow-up is done, in most of the cases it is still impossible to provide the kg of refrigerant reloaded, therefore 90% of the activity data are stated in m2 of refrigerated surface area.

Also, since 2015, a section called **prevented emissions** was designed with regard to facilitating the collation of those positive measures that Elecnor is undertaking with regard to the environment and climate change. In this section the following can be reported:

- The **prevented emissions associated with renewable electric power generation,** from the installed potency and the operating hours, or directly through the generated renewable kWh figure.

- The **emissions prevented by waste management at clean points or by their energy assessment,** since their management in dump is being prevented, which entails a greater impact.

[4] It should be underlined that there is still an improvement in the quality of the data provided in 2019, since the selection of priority reporting options continues to rise with respect to previous study years.

4.2. Emission factors

Emission factors are representative values that relate a quantity of gas emitted into the atmosphere with an activity associated with the emission of this gas. These factors are usually stated as weight of the gas divided between the weight, volume, distance or duration of the activity generated by the gas.

The emission factors used in the calculation of the footprint of Elecnor to transform energy or consumables consumption in GHG emissions have to be transparent and consistent. Therefore, the most geographically appropriate and reliable emission factors have been used. These emission factors can be found in Annex 1 of this document.

4.3. Carbon footprint calculation

From the activity data included in the platform ElecnorCO_2data and of the emission factors previously set out, the calculations associated with the consumables and electricity consumption of the different organisations that make up Elecnor were made.

4.4. Uncertainty of the calculation

Based on the calculation methodology used, an analysis of the uncertainty of the data used is conducted. Given that it is a high scope footprint with a high quantity of emission flows, it is considered that a quantitative calculation would be costly to do. It is done by following the regulation ISO 14064, a qualitative study of the uncertainty associated with the calculation, based on the activity data (AD) and emission factors (EF) used.

The collection of data in litres and kWh has been prioritised with the purpose of reducing the uncertainty of the calculations, but, failing this, there is the option to report them in another manner and the resulting estimates have been made. Furthermore, in the event that the data entered does not physically exist, a record has been requested, through which the head of each organisation is responsible for the data reported.

With regard to the AD, those that influence a calculation methodology with lower uncertainty are prioritised:

- **Fuel consumption:** the reporting in litres and fuel type has been prioritised. Failing that, it is possible to report in km covered and fuel type.
- **Electricity consumption:** the reporting in kWh consumed has been prioritised. Secondly, there is the option to report in illuminated surface area. In the case of the works, the second reporting option consists of indicating the number of works whose duration has been greater than six months.
- **Water consumption:** the consumption in m^3 has been prioritised even though there is the option to enter the number of employees.
- **Paper consumption:** the data associated with the consumption in kg of both normal paper and recycled paper are entered.
- **Waste:** the data associated with waste generation in kg are entered, making a distinction between hazardous and non-hazardous waste.
- **Refrigerant gas consumption:** the data recording in kg and refrigerant type has been prioritised.

Despite the fact that the fugitive emissions associated with the reloading of refrigerant gases is not going to be reported in the footprint of Elecnor until within three years, a follow-up is conducted on the activity data provided. Therefore, for this emission source, the data recording in kg and refrigerant type is prioritised. However, in the cases in which this has not been possible, it has been reported in refrigerated surface area.

Official sources closest to the geographical context of Elecnor have been prioritised in the EF used. If emission source is analysed:

- **Combustibles EF (stationary and mobile combustion):** for CO_2, CH_4 and N_2O emissions that have been reported in litres, the IPCC data that reflect total average values have been used for each fuel, with a mean variability, given that the activity of Elecnor covers different geographical areas, not only national ones. Their associated uncertainty is low.
- **Transportation EF (mobile combustion):** for the CO_2, CH_4 and N_2O emissions that have been reported in km, the data from the DEFRA source have mainly been used. DEFRA shows a high level of detail for each type of transportation (vehicle type, load, etc.). These EF reflect a low-medium uncertainty, given that they are specific for the United Kingdom, but are updated annually.
- **Electricity EF:** in the case of electricity emissions, the national data from the OECC Registry have been used for Spain and for the centres outside Spain, the emission factors of the IEA (International Energy Agency) have been used. These EF are of low uncertainty and are updated annually.
- **Waste EF:** the data from the DEFRA source have been used, which show a long list of waste with data for each type of management of this waste at the end of its useful life. These EF generically reflect a low-medium uncertainty, given that they are specific for the United Kingdom, but are updated annually.
- **Water and paper consumption EF:** the software SimaPro developed by PRé Sustainability, a company that develops metrics for sustainability and innovation, has been used as a main source. This software is widely used in carbon footprint studies, since emission factors can be obtained that include all the phases of the product life cycle (e.g. the transportation of materials). It is considered a medium uncertainty, since for most of the factors it has been possible to obtain only European or global data.

It is therefore estimated that the uncertainty in the Scope 1 and 2 emissions is low and, therefore, appropriate for their study and comparison with successive years. In a qualitative way, it is estimated that the uncertainty in the Scope 3 emissions is medium and, therefore, higher than the uncertainty in the Scope 1 and 2 emissions. This seems logical, since in Scope 3 all the activities out of the control of Elecnor occur, where it becomes more costly to obtain primary data. This being said, it is considered that Scope 3 has a good range of uncertainty as a starting point and that the results could be used in order that Elecnor start involving all the interested parties that manage these emission flows.

5. Results: 2019 carbon footprint

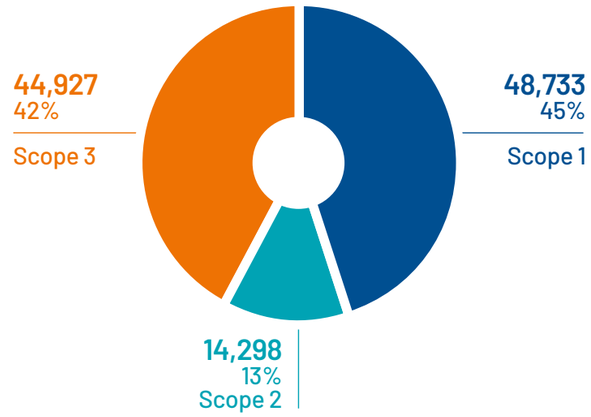
This section will set out the results of the organisation Elecnor carbon footprint, analysed in different ways.

5.1. Elecnor Carbon footprint

Elecnor carbon footprint in 2019 was 107,958.53 tonnes of CO_2e.

Of the total CF emissions, almost 45% were Scope 1 emissions, that is, direct emissions associated with refrigerant gases and fuel consumption. The Scope 2 indirect emissions (electricity consumption) were approximately 13% of the total footprint. The rest of the footprint emissions belong to Scope 3 (42%).

Figure 3. Contribution of the emissions by scope to the total of Elecnor carbon footprint.
Source: Prepared in house.



The Scope 1 emissions are broken down by gases, as follows:

- Tonnes of CO_2e of CO_2: 47,947
- Tonnes of CO_2e of CH_4: 77
- Tonnes of CO_2e of N_2O: 708

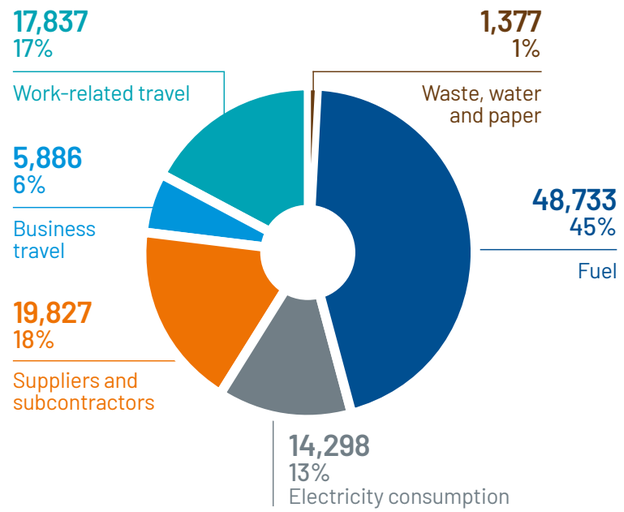
The following table shows the quantities of CO_2 equivalent emitted, broken down by scope or emission source:

Table 3. Emissions by type of source and scope.
Source: Prepared in house.

Scope	Source	Emissions (t CO_2e)
Scope 1	Fuels	48,733
Scope 2	Electricity	14,298
Scope 3	Suppliers and subcontractors	19,827
	Business travel	5,886
	Work-related travel	17,837
	Waste, water and paper	1,377
TOTAL		**107,958.5**

The emissions that have contributed more to the footprint are those of Scope 1, followed very closely by those of Scope 3.

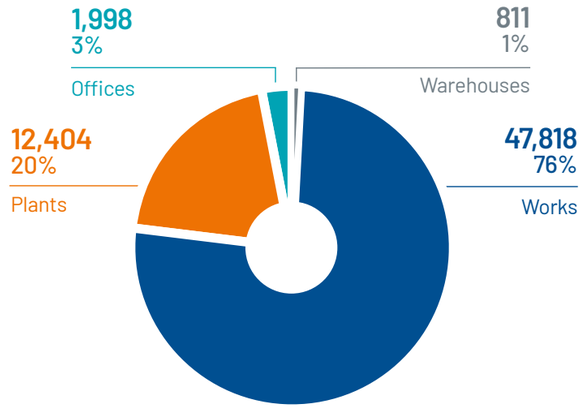
Figure 4. Contribution of the emissions by source to the total of Elecnor carbon footprint.
Source: Prepared in house.



If It is analysed the Scope 1 and 2 emissions according to the type of facility where they were generated, the contribution of **the works stands out, with 76% of the total. These are followed by plants (factories/exploitations), which generate 20% of the emissions**. Offices have a smaller representation, entailing 3%, and finally, fixed warehouse with around 1%.

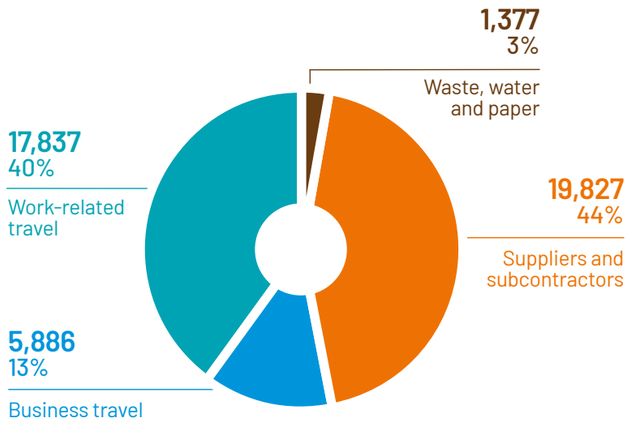
The following chart shows the breakdown of the total Scope 1 and 2 emissions by facility type, distinguishing between 4 categories. The Scope 3 emissions have not been segmented by facility type.

Figure 5. Contribution of the Scope 1 and 2 emissions by facility type to the total of Elecnor carbon footprint.
Source: Prepared in house.



With regard to the Scope 3 emissions, the emissions generated by suppliers and subcontractors are those that contribute most, with 44%, followed by work-related travel (40%) and business travel (13%). The emissions of consumables and waste generated at the facilities generate only 3% of the total emissions.

Figure 6. Contribution of each source to the Scope 3 emissions.
Source: Prepared in house.



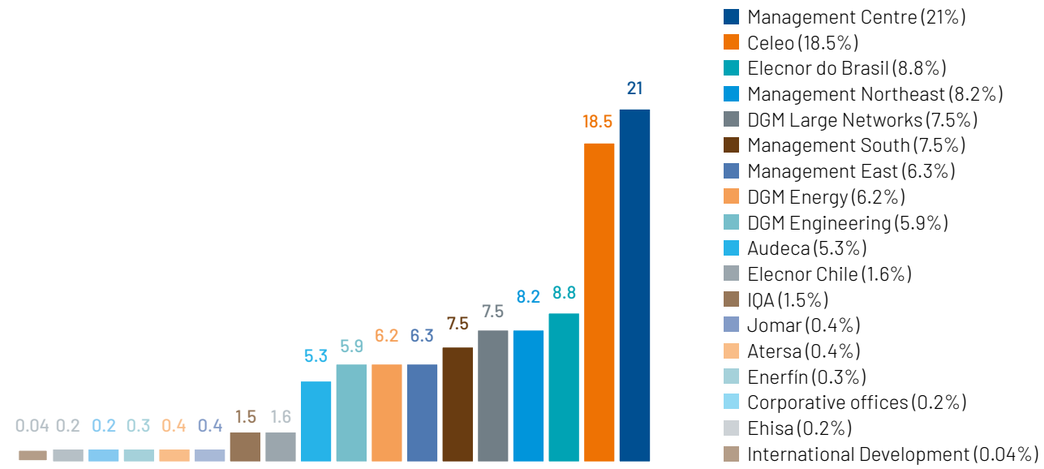
It is also interesting to analyse the contribution of each organisation to the total emissions of Elecnor. It should be underlined that only Scope 1 and 2 emissions are broken down by organisation, since the Scope 3 ones are reported globally.

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

Table 4. Carbon footprint of each Deputy General Management/ Management/ Affiliate.
Source: Prepared in house.

Organisation	Organisation emissions (t CO_2e/year)	% of the total
Management Centre [5]	13,250	20.92%
Celeo	11,958	18.88%
Elecnor do Brasil	5,547	8.76%
General Management Northeast	5,109	8.20%
Deputy General Management Large Networks	4,754	7.51%
Management South	4,724	7.46%
Management East	4,004	6.32%
Deputy General Management Energy	3,938	6.22%
Deputy General Management Engineering [6]	3,739	5.90%
Audeca	3,348	5.29%
Enerfín	173	0.27%
Elecnor Chile	996	1.57%
IQA	766	1.54%
Jomar	253	0.40%
Atersa	224	0.35%
Corporate Offices	114	0.18%
Ehisa	109	0.17%
International Development	24	0.04%

Figure 7. Contribution of each organisation to the total of Elecnor carbon footprint.
Source: Prepared in house.



[5] Management Centre includes Adhorna
[6] Deputy General Management Engineering includes Hidroambiente and Deimos.

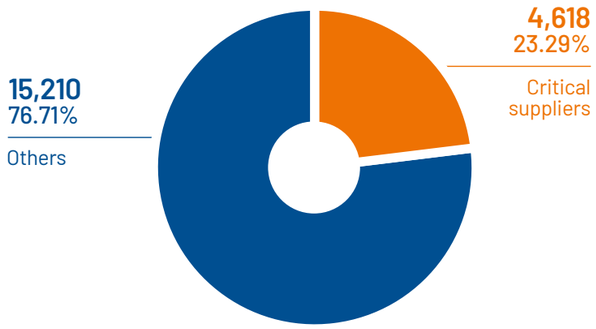
As can be seen in the image, **the organisations that contribute more to the total emissions of Elecnor are Management Centre, Celeo, Elecnor do Brasil, Management Northeast, Deputy General Management Large Networks and Management South.** The total of the contributions from these six organisations almost reaches over 70% of the total emissions.

Below is Management East, with 6.32% of the total, followed by the Deputy General Management Energy, which encompasses 6.22%. The rest of the organisations contribute less, with representations under 6%.

With regard to Scope 3 emissions, these are broken down into 4 main categories. Below is an analysis of what are the emission sources of each of the categories, showing the analysis in priority order, from the category that contributes more emissions to the one that has fewer emissions.

Regarding suppliers and subcontractors (44% of the Scope 3 footprint), these are broken down into two sub-categories: critical suppliers and rest, which refers to the total of remaining suppliers and sub-contractors. The emission sources within these sub-categories are their Scope 1 and 2 emissions associated with the activity of Elecnor, that is their fuel and electricity consumption.

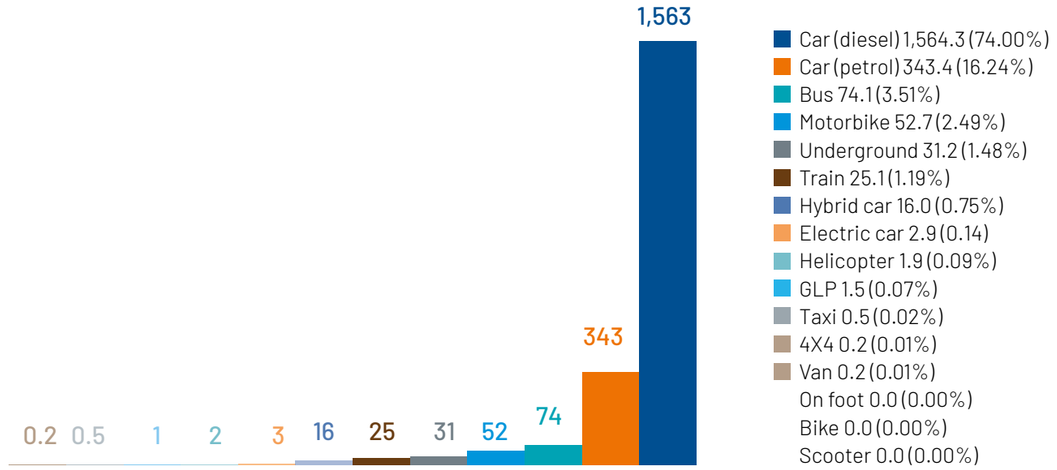
Figure 8. Contribution of each sub-category to the Scope 3 footprint of suppliers and sub-contractors.
Source: Prepared in house



It can be seen that critical suppliers, those that have greater billing, contribute 23% of the footprint of the category.

With regard to work-related travel of employees (40% of the Scope 3 footprint), it is observed that the main transportation used and the one that generates most emissions is the diesel car (74%), followed by the petrol car (16%).

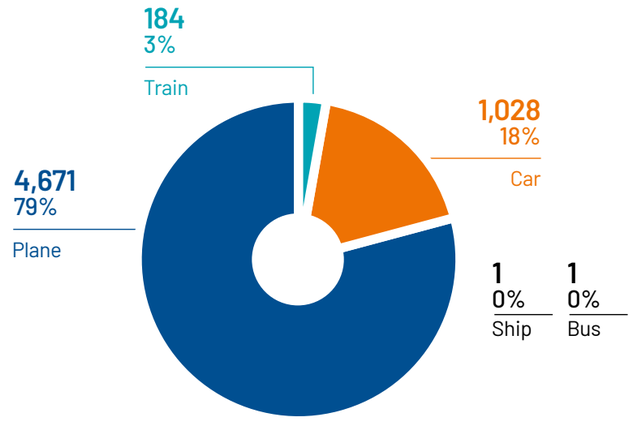
Figure 9. Contribution of each sub-category to the Scope 3 footprint of work-related travel.
Source: Prepared in house



Coach has 4%, followed by the emissions associated with travel by motorbike with 2%. The remaining transportation means have associated emissions lower than 1% of the total of the category.

With regard to business travel **(13% of the Scope 3 footprint),** the travel done by car, both in diesel and petrol vehicles, as well as travel by plane, coach and boat.

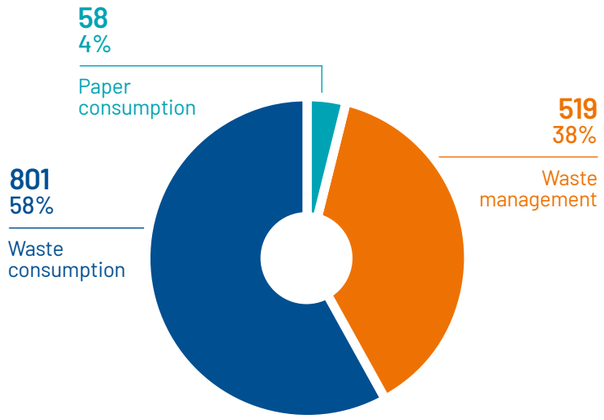
Figure 10. Contribution of each sub-category to the Scope 3 footprint of business travel.
Source: Prepared in house



It can be seen that travel by plane contributes the greatest footprint, at almost 80% within the category. It is followed by travel by car and by train, with 18% and 2% respectively. Finally, travel by boat and coach do not reach 1%.

Finally, the category that generates fewer emissions is the one associated with waste, water consumption and paper consumption **(3% of the Scope 3 footprint).**

Figure 11. Contribution of each sub-category of the Scope 3 footprint of waste and consumables.
Source: Prepared in house



The largest contribution of emissions of this category refers to water supply consumption (58%), since some of the group's energy facilities, the thermosolar plants, are large water consumers. This is followed by emissions associated with waste management (38%) and finally emissions caused by paper consumption (4%), both normal and recycled.

5.1.1. Prevented emissions

It should be underlined that Elecnor in 2019 sent **14,374,960 tonnes of waste to clean points,** with the respective prevented emissions, since they were not allocated to being dumped.

Also, **renewable energy generation** at the photovoltaic plants of Celeo and at the wind farms of Enerfín rose in 2019 to **1,964,538 MWh.**

The following table shows the greenhouse gas emissions that were prevented thanks to the two initiatives mentioned above.

In both cases, the equivalence in tCO_2e has been achieved through the comparison of the prevented emissions with a trendential scenario, that is, if the waste had not been generated at a clean point or the energy generated from renewables, what association emissions would there have been.

Table 5. Prevented emissions in 2019.
Source: Prepared in house from the comparison with a trendential scenario

Initiatives	Prevented emissions (t CO_2e)
Waste management at clean points	11,172
Renewable energy generation	465,867
TOTAL	**477,039**

5.1.2. Comparison between 2017 and 2018 of Scope 1 and 2

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

Therefore, from the activity data of 2017 and 2018, the aim was to establish a comparison of the greenhouse gas emissions generated in both years by Elecnor, in order to analyse the evolution of the carbon footprint of the organisation over time.

It should be underlined that the 2019 carbon footprint is the first one to include Scope 3 of the emissions. In this regard, the **2020 carbon footprint will be the first one to also include the comparison of Scope 3 emissions.**

Therefore, **Elecnor carbon footprint Scope 1 and 2 increased by 710 tCO_2e** between 2018 (62,322 tCO_2e generated) and 2019 (63.032 tCO_2e), **which represents a gross increase of 1.14%.** It should be underlined that the increase in Elecnor carbon footprint is partly due to the **increase in the organisation's activity,** since the hours worked rose by 26,890,193 in 2018 to 31,500,715 in 2019.

Given the above, it is concluded that the behavior of Elecnor has experienced an improvement, **since the ratio of emissions generated per hour worked fell by 2.3 $kgCO_2e$/hour in 2018 to 2.0 $kgCO_2e$/hour in 2019.**

Table 6. Variation ratio $kgCO_2e$/hours worked 2018-2019.
Source: Prepared in house from the comparison with a trendential scenario

	2019	2018	VARIATION
Total Scope 1 and 2 Emissions ($kgCO_2e$)	63,031,734	62,322,199	1.14%
No. hours worked	31,500,715	26,890,190	17.15%
RATIO (kg CO_2e/hour)	**2.0**	**2.3**	**-13.66%**

Likewise, it can be seen that the ratio shows a downward trend with respect to the base year 2014. For 2019, the carbon footprint was successfully reduced with respect to the base year in relative terms by 27.8%.

Table 7. Variation ratio $kgCO_2e$/hours worked 2014-2019 period.
Source: Prepared in house from the comparison with a trendential scenario

	EVOLUTION RATIO ($kgCO_2e$/hour) 2014-2019 PERIOD				
	Elecnor footprint (tCO_2e)	Hours worked	Elecnor ratio ($kgCO_2e$/Hº)	Evolution with respect to previous year	Evolution with respect to base year 2014
2019	63,032	31,500,715	2.00	-13.7%	-27.8%
2018	62,322	26,890,190	2.32	0.0%	-16.4%
2017	66,632	28,759,640	2.32	-8.9%	-16.4%
2016	59,042	23,227,010	2.54	-4.8%	-8.3%
2015	56,837	21,289,250	2.67	-3.7%	-3.7%
2014	53,683	19,370,330	2.77		

The following table shows the differences in the behavior of the different organisations between 2018 and 2019.

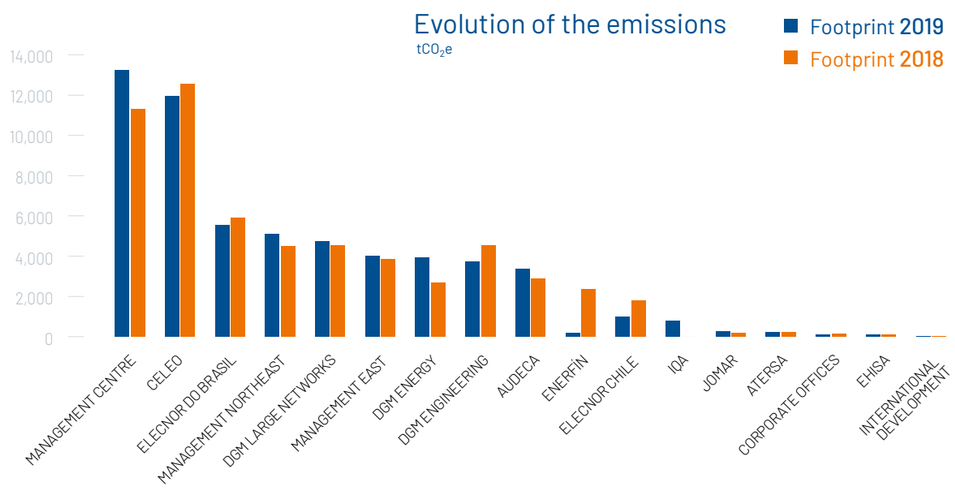
Table 8. Comparison of the carbon footprint of 2018 and 2019.
Source: Prepared in house

Organisation	2019	2018	Difference	Variation %
Management Centre	13,250	11,316	1,934	17.09%
Celeo	11,958	12,551	-593	-4.72%
Elecnor do Brasil	5,547	5,908	-361	-6.11%
Management Northeast	5,109	4,496	698	13.64%
Deputy General Management Large Networks	4,754	4,686	68	1.45%
Management South	4,724	4,548	176	3.87%
Management East	4,004	3,836	169	4.40%
Deputy General Management Energy	3,938	2,678	1,261	47.09%
Deputy General Management Engineering	3,739	4,542	-803	-17.67%
Audeca	3,348	2,901	447	15.43%
Enerfín	173	2,362	-2,189	-92.68%
Elecnor Chile	996	1,810	-814	-44.99%
IQA	766	-	-	-
Jomar	253	190	63	33.07%
Atersa	224	223	1	0.60%
Corporate Offices	114	147	-33	-22.48%
Ehisa	109	101	7	7,35%
International Development	24	26	-3	-10,40%
TOTAL (tCO_2e)	**63,031.7**	**62,322.2**	**710**	**1.14%**

The organisation that represented the most significant drop (92%) is Enerfin.
The organisation that represented the most significant increase was: Deputy General Management Energy (47%).

The following figure shows the conclusions previously set out:

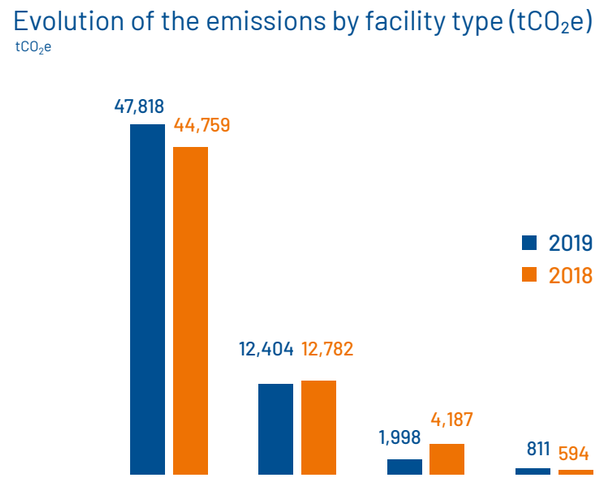
Figure 12. Comparison of 2018 vs 2019 results, by organisation.
Source: Prepared in house



The drop in Enerfin carbon footprint is due to the fact that the power consumed at its facilities in Spain was of renewable origin. This has represented a large reduction in terms of emissions, since the organisation's wind facilities are large electricity consumers.

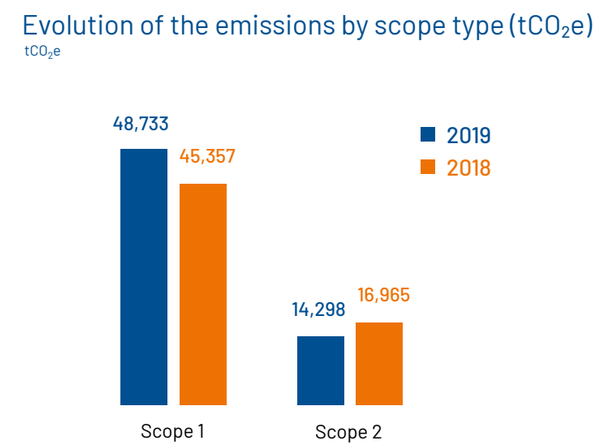
By conducting an analysis of the evolution of the **emissions of Elecnor by facility type, the contributions** in absolute values for each of these are very similar **to those of the previous year.** The emissions associated with the offices fell by **52.2%,** while those of the **works and the warehouses** rose by **6.8% and 36.4%** respectively. It should be underlined that the emissions associated with the **plants** remain rather constant, falling by **2,9%** with respect to 2019.

Figure 13. Comparison of 2018 vs 2019 results, by facility type.
Source: Prepared in house



Finally, if it is analysed the evolution of the emissions of Elecnor by scope type, it can be seen how **the emissions associated with electricity consumption** (Scope 2) **experienced a fall of 15.7%.** For their part, **the Scope 1 emissions rose by 7.4%.**

Figure 14. Comparison of 2018 vs 2019 results, by scope type.
Source: Prepared in house



6. Report verification declaration

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 107.958,5 t of CO2-eq (Scope 1: 48.733 t of CO2-eq, Scope 2: 14.298 t of CO2-eq and Scope 3: 44.927 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 - Scope 3: Other indirect emissions of GHG • Suppliers and subcontractors • Business travel • Work-related travel • Waste generation • Water consumption and paper consumption
which is/are carried out in:	CL LICENCIADO POZA, 55 4ª PLANTA. 48013 - BILBAO (BIZKAIA)
Calculated period:	2019
According to:	Verified Emissions Report of the period 2018 and the AENOR Verification Statement, resulting from the verification, dated April 12, 2019.
First issued on:	2020-04-07

Rafael GARCÍA MEIRO
Chief Executive Officer

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Tel. 91 432 60 00.- www.aenor.com

ANNEX 1: EMISSION FACTORS

Table 9: Emission factors used in the calculator.
Source: Prepared in house.

Scope 1.

MOBILE COMBUSTION (VEHICLES)

Fuel	FE	Unit	Source
Gasoil A / Diesel	74,100.00	kg CO_2/TJ	IPCC 2006 Guidelines 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	
Petrol	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	
CNG	56,100.00	kg CO_2/TJ	
	92.000	kg CH_4/TJ	
	3.000	kg N_2O/TJ	
LPG	63,100.00	kg CO_2/TJ	
	1.000	kg CH_4/TJ	
	0.100	kg N_2O/TJ	
Gasoil A / Diesel	0.171	kg CO_2e/km	Defra Carbon Factors 2019: passenger vehicles, medium car
Petrol	0.192		
CNG	0.181		
LPG	0.162		

STATIONARY COMBUSTION / DIRECT ENERGY CONSUMPTION

Fuel	Density	Unit	Source
Gasoil C	74,100.00	kg CO_2/TJ	IPCC 2006 Guidelines Volume 2 - Chapter 2: Stationary Combustion. Manufacturing and Construction Industries.
	3.00	kg CH_4/TJ	
	0.60	kg N_2O/TJ	
Petrol	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 (LPG)	64,200.00	kg CO_2/TJ	
	3,00	kg CH_4/TJ	
	0,60	kg N_2O/TJ	

AUXILIARY DATA: FUEL PROPERTIES

Fuel	Density	Unit	Source
Gasoil A / Diesel	0.8325	kg/l	OECC Registry April 2018: Densities Specified in Royal Decree 1088/2010 of 3rd September, whereby Royal Decree 61/2006 of 31st January is modified.
Gasoil C	0.9000		
Petrol	0.7475		
Ethanol	0.8100		FENERCOM
CNG	0.158		GASNAM (Iberian Association of Natural Gas for Mobility) and Sedigas
LPG	0.56		
Fuel	**VCN**	**Unit**	**Source**
Gasoil	43.00	TJ/Gg	OECC Registry April 2017: National Emissions Inventory
Petrol	44.30		
Ethanol	24.90		FENERCOM
Biodiesel	27.00		OECC Registry April 2018: IPCC Guidelines for National Greenhouse Gas Inventories of 2006-Volume 2-Chapter 1: Introduction
CNG	0.158		
LPG	0.56		

Scope 2.

ELECTRICITY

Country	FE	Unit	Source
Spain	0.410	kg CO_2/kWh	OECC Registry April 2019 (mix 2018)
Angola	0.499		IEA - CO_2 EMISSIONS FROM FUEL COMBUSTION 2019 Edition (Emissions from year 2017)
Algeria	0.496		
Argentina	0.351		
Australia	0.743		
Brazil	0.117		
Canada	0.142		
Chile	0.435		
Ecuador	0.179		
United States	0.421		
Honduras	0.315		
Mexico	0.477		
United Kingdom	0.245		
Dominican Republic	0.521		
Uruguay	0.014		
Venezuela	0.288		

In the case of **electric power emission factors, these are reported for Spain based on the data from the Registry of the Spanish Climate Change Office** (the data is not specifically associated with any marketer, since there are several for the different organisations of Elecnor Group). **In the case of the other countries, the data from 2018 of the respective electrical mis is used,** since the source (IEA - CO_2 EMISSIONS FROM FUEL COMBUSTION, 2019 Edition) does ot have the most recent emission factors.

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

As for the Scope 3 emission factors, the following have been used:

Scope 3.

WATER AND PAPER CONSUMPTION

Activity	FE	Unit	Source
Water supply consumption	0.34	kg CO2/m^3	Defra Carbon Factors 2019 - Water Supply
Lightweight paper	1.44	kg CO_2/kg	SIMAPRO - Material, Paper + Board, Graphic Paper-Market - Paper, wood containing, lightweight coated {RER}| market for | APOS, S
Recycled paper	0.05		SIMAPRO - Material, Paper + Board, Graphic paper, 100% recycled {GLO}| market for | APOS, S

MEANS OF TRANSPORT-BUSINESS TRAVEL AND WORK-RELATED TRAVEL

Activity	FE	UNIT	Source
TRail travel	0.04115	kg CO_2e/ person*km	Defra Carbon Factors 2019- Business travel-national rail
Domestic flights	0.13483	kg CO_2e/ person*km	Defra Carbon Factors 2019- Average passenger, without RF, domestic flight
Short haul flights	0.0837	kg CO_2e/ person*km	Defra Carbon Factors 2019- Average passenger, without RF, short haul flight
Long haul flights	0.10342	kg CO_2e/ person*km	Defra Carbon Factors 2019- Average passenger, without RF, long haul flight
Boat	0.112863	kg CO_2e/ person*km	Defra Carbon Factors 2019- Average (all passenger)
Coach	0.02779	kg CO_2e/ person*km	Defra Carbon Factors 2019- Coach
Underground	0.03084	kg CO_2e/ person*km	Defra Carbon Factors 2019- Business travel- land-Underground
Bus	0.12076	kg CO_2e/ person*km	Defra Carbon Factors 2019- Business travel- land-Local bus (not London)
Light rail and tram	0.03508	kg CO_2e/ person*km	Defra Carbon Factors 2019- Business travel- land-light rain and tram
Car (petrol)	0.18084	kgCO_2e/ km	Defra Carbon Factors 2019- Passenger vehicles, average, petrol
4X4	0.20257	kgCO_2e/ km	Defra Carbon Factors 2019- Passenger vehicles, 4x4, diesel
Car (diesel)	0.17336	kgCO_2e/ km	Defra Carbon Factors 2019- Passenger vehicles, average, diesel
Car (electric)	0.11473	kgCO_2e/ km	Defra Carbon Factors 2019- Passenger vehicles, average, electric
Van	0.25213	kgCO_2e/ km	Defra Carbon Factors 2019- Delivery vehicles, vans, average
Motorbike	0.11551	kgCO_2e/ km	Defra Carbon Factors 2019- Passenger vehicles, motorbike, average

WASTE MANAGEMENT

Activity	FE	UNIT	Source
Hazardous Waste; Offices	26.99	kg CO_2e/ tonne	Defra 2019-Waste Disposal Recycled: Plastics average (87%) and batteries (13%)
Hazardous Waste; Warehouses	9.52	k kg CO_2e/ tonne	Defra 2019-Waste Disposal Recycled: Soils (58%) and mineral oil (42%)
Hazardous Waste; Works	33.88	kg CO_2e/ tonne	Defra 2019-Waste Disposal Recycled: Average plastic (71%) and batteries (29%)
Hazardous Waste; Plants	1.0091	kg CO_2e/ tonne	Defra 2019-Waste Disposal Recycled: Soils (100%)
Non-hazardous Waste; Offices	225.45	kg CO_2e/ tonne	Defra 2019-Waste Disposal-Paper and board (100%): 80% recycled, 20% landfill
Non-hazardous Waste; Warehouses	1.009	kg CO_2e/ tonne	Defra 2019-Waste Disposal Recycled: Average construction (100%)
Non-hazardous Waste; Works	17.11	kg CO_2e/ tonne	Defra 2019-Waste Disposal-Soils (100%): 3% recycled, 97% landfill.
Non-hazardous Waste; Plants	17.11	kg CO_2e/ tonne	Defra 2019-Waste Disposal-Soils (100%): 3% recycled, 97% landfill.

The use of the international EF from IPCC sources for fuel emission factors has been prioritised, whether of mobile or stationary origin. In the event that the activity data is by kilometre, the DEFRA data is prioritised.

The global warming potential from the Fourth IPCC Report have been used. These are included in the following table:

Table 10. Global warning potentials.
Source: Prepared in house.

GLOBAL WARMING POTENTIALS

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

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