

CARBON FOOTPRINT CALCULATION



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1. PURPOSE

Description of the methodology used by Sacyr to measure the carbon footprint associated with its activities.



2. SCOPE

The system described is applicable to the calculation of Sacyr carbon footprint at a global level, that is, considering all the locations where Sacyr operates and for the operational centers which it has control.

The carbon footprint calculation is carried out taking into account the following boundaries and scopes.

Organizational boundaries

The Sacyr emissions calculation is carried out under the operational control approach, that is, on those activities / contracts which it has the authority to introduce and implement its operating policies.

Operational Scope

The emissions associated with Sacyr activities and facilities are quantified considering the following scopes:

- **SCOPE 1: Direct Emissions GHG (Greenhouse Gases)**

The Sacyr direct emissions occur in its different operational centers and are in relation with:

- Mobile combustion sources: Emissions from the fuel consumption of the movement and use of vehicles and machinery.
- Stationary combustion sources: Emissions from the fuel consumption of stationary equipment and stationary facilities.
- Fugitive emissions: Emissions from leaked refrigerant gases from air-conditioning /refrigeration units installed in the facilities that are property of the company or that the company is responsible of their maintenance.

- **SCOPE 2: Indirect Emissions GHG (Greenhouse Gases)**

Sacyr indirect emissions occur in its different operational centers and are associated with electric power consumption in the facilities of these centers.

- **SCOPE 3: Other indirect emissions Greenhouse Gases (GHG).**

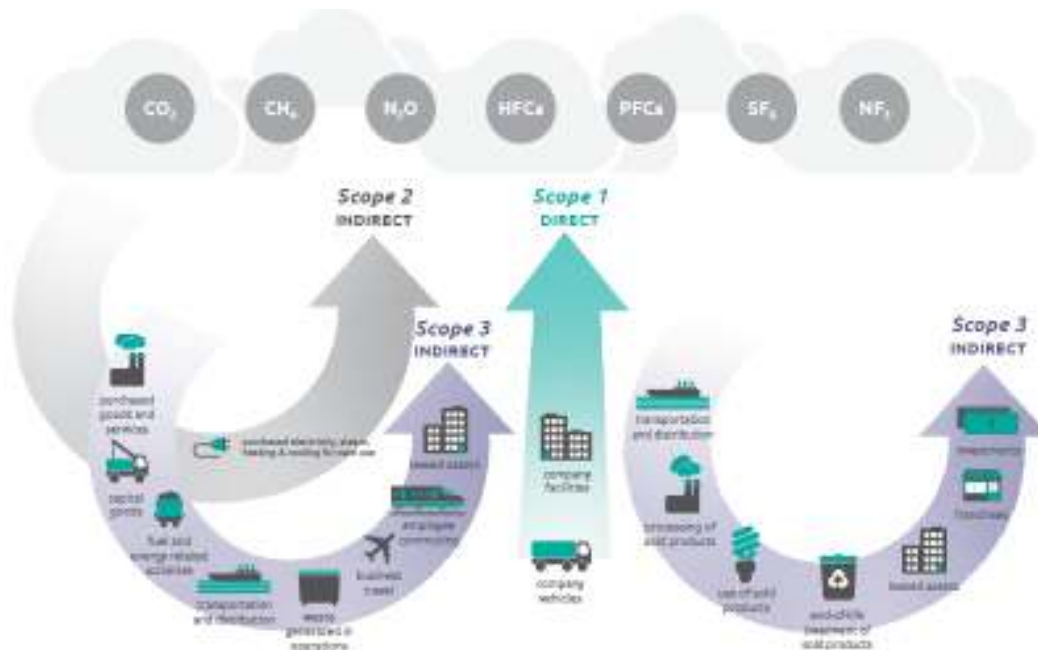
These emissions are consequence of the company activity, but they are emitted neither by company property sources nor by activities that are not under its control.

The considered emissions within this scope are the following:

- Purchased goods and services: emissions from purchased or acquired goods that are necessary for the execution of the activity (mainly materials and water)
- Fuel and electricity related activities: emissions from the fuel and electricity production, transport and distribution.
- Upstream transportation and distribution: emissions due to parcel transport and distribution.

- Waste generated in operations: emissions from waste management.
- Business travel: emissions from train and plane trips and business overnight stay of employees.
- Employee commuting: emissions from transportation of employees between their homes and their worksites.
- Upstream leased assets: emissions from the operation and maintenance of industrial plants.
- Downstream transportation and distribution: emissions from the transport and distribution of RARx* product.
- Processing of sold products: emissions from the processing of RARx product sold.
- Use of sold products: emissions from the use of RARx product sold.

Figure 1. Overview of GHG Protocol scopes and emissions across the value chain



Source: GHG Protocol. Corporate standard of accounting and report. WRI/WBCSD.



3. RELATED DOCUMENTATION

- ISO 14001. “Environmental Management System. Requirements with guidance for use”.
- ISO 50001. “Energy Management Systems. Requirements with guidance for use”.
- Greenhouse Gases Protocol. Corporate Standard of Accounting and Report (GHG).
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard. GHG Protocol.
- ISAE 3410 Assurance Engagements on Greenhouse Gas Statements.

* RARx: additive made from end-of-life tire dust for use in asphalt mixes .



4. RESPONSIBILITIES

Quality, Environment and Energy Director at Sacyr Group

- Will notify the Quality, Environment and Energy Area/country Manager and the Quality, Environment and Energy Management technicians, as appropriate, the scheduled dates to report the energy consumption data or keep this information updated in the quality computer application of the

centers under their control. In addition, she/he will notify the expected date to report the information of the equipment with refrigerant gases / air conditioning.

- Will collect and review of the reported data, as well as the calculation of emissions at Company Group Level.
- Will update the last revision of the "Sacyr Emissions Spreadsheet" (spreadsheet designed to calculate each type of CO₂eq emissions generated in the Group).
- Will manage the changes and update the spreadsheet when circumstances may make it necessary this updating, for example, when a change in the calculation methodology is produced (e.g. associated with emission factors), etc.
- Will support and advice the Quality, Environment and Energy Area/country Manager in the collection and reporting of data.

The assigned responsibilities of the Quality, Environment and Energy Director at Sacyr Group can be carried out by staff of the Quality, Environment and Energy Management at corporate level to whom these functions are delegated.

Quality, Environment and Energy Area/country Manager

- Designates the responsible supervisors of collecting and recording the information required in this procedure on energy consumption and equipment with refrigerant gases/air conditioning, of the centers under its control.
- Controls and reviews the data provided by his/her area, before communicating them to the Quality, Environment and Energy Director of the Sacyr Group

The assigned responsibilities of the Quality, Environment and Energy Area/Country Managers can be carried out by the Quality, Environment and Energy Management Technicians or by staff of the business areas to which these functions are delegated.



5. REFERENCES, TERMS AND DEFINITIONS

5.1 References

The reference to workplace is also to site, project, service, operational center and vice versa.

5.2 Terms and definitions

Carbon Footprint

The total amount of greenhouse gases emitted directly or indirectly by a company.

Greenhouse Gases (GHG)

A gaseous component of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the surface of the earth, the atmosphere, and clouds. GHGs are measured in equivalent tons of CO₂eq and the six gases listed in the Kyoto Protocol are: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulfur hexafluoride (SF₆).

CO₂eq Emissions

These are the set of greenhouse gas emissions, which in the case of Sacyr are made up of CO₂, CH₄, and N₂O emissions.



Scope 1. Direct emissions GHG

Scope 1 emissions are direct emissions from company-owned and controlled resources.

Scope 2. Indirect emissions GHG

These are emissions from the purchased or acquired electricity generation and consumed by the company. These emissions occur in the plant where the electricity is generated.

Scope 3. Other indirect emissions

This is an optional category that includes the rest of the indirect emissions.

These emissions GHG are the consequence of the company activity, but they are emitted neither by company property sources nor by activities that are not under its control. The 15 categories proposed by GHG Protocol in its standard “Corporate Value Chain (Scope 3) Accounting and Reporting Standard” are the following:

1. Purchased goods and services
2. Capital goods
3. Fuel and energy related activities (not included in scope 1 and 2)
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets
9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchises
15. Investments

Source of greenhouse gases

Chemical unit or process that releases GHG into the atmosphere.

Stationary equipment

These are fixed equipment such as generators, boilers, furnaces, burners, turbines, heaters, incinerators, motors, flammers, etc. that use fossil fuel to generate heat, electricity or steam or used to carry out a company process.



GWP Index - Global-Warming Potential

It is a relative measure of how much heat can be trapped by a certain greenhouse gas, compared to a reference gas, usually carbon dioxide (CO₂). Carbon dioxide has a GWP value of 1.



6. PROCEDURE

6.1.- PROCEDURE OF CARBON FOOTPRINT CALCULATION

6.1.1.- DATA COMPILATION AND REPORT

All Sacyr business areas involved in the Carbon Footprint calculation through its operational centers register their fuel and electricity consumption, material use, water consumption and waste generation data in Sacyr application called CYMAE on an ongoing basis.

There are some exceptions in relation with data compilation and its report that are the following:

- Somague does not use CYMAE application. Somague has its own IT tools and reports the data in Excel sheets.
- Sacyr extracts the SOLRED company fuel consumption from SOLRED webpage directly.
- Business travel and overnight stays data are provided by the travel agency of “El Corte Inglés”.
- Information about refrigerant gases/conditioning is reported in an Excel sheet.
- The information provided to meet some categories of emissions of scope 3 is reported by the business/departments of the company that manage them directly.

6.1.2.- EMISSIONS CALCULATION METHODOLOGY

The calculation methodology is based in GHG Protocol published by “The Greenhouse Gas Protocol Initiative” (World Resources Institute (WRI) y World Business Council for Sustainable Development (WBCSD).

All available data are included and consolidated in an Excel sheet at corporate level.

In order to develop the calculation of the different type of emissions, Sacyr has an Excel sheet with different tabs to each category of Sacyr Group emissions.

Additionally, the emission factors source is reviewed at corporate level on a regular basis to check if there are new updates or new possible sources of emission factors. Depending on the results of the revision the emission factors will be updated or not.

6.1.2.1 Scope 1: Direct emissions

Scope 1 emissions are direct emissions from company-owned and controlled resources.

Emissions from stationary and mobile combustion sources

Emissions from the fuel consumption of the different Sacyr operational center.

- Calculation Methodology

In order to calculate the scope 1 emissions, the first thing that shall be known is the total amount of fuel consumption of each operational center broken-down by type of fuel.

CO_{2eq} emissions are calculated by multiplying each type of fuel consumption for the related CO_{2eq} emission factor and using a conversion energy factor when necessary.

The emission factors used to calculate the direct emissions are the last version of DEFRA (UK Government GHG Conversion Factors for Company Reporting. Department for Business, Energy & Industrial Strategy) in force when developing the calculation of the Carbon Footprint.

Fugitive emissions of refrigerant gases from air-conditioning /refrigeration units

Fugitive emissions of refrigerant gases are emissions from air-conditioning /refrigeration units installed in some Sacyr operational centers that are property of the company and the company is responsible of their maintenance.

It is considered leaked gas from a unit the equivalent of refilled gas of this unit.

- Calculation Methodology

The fugitive emissions are calculated based on refilled gas developed in the previous year (refilled gas=leaked gas).

CO_{2eq} emissions are calculated by multiplying the gas refill of each type of gas for the related Global Warming Potential (GWP).

Sacyr uses the last version of the refrigerant gases Global Warming Potential (GWP) of the Spanish Office for Climate Change (OECC) in force when calculating the Carbon Footprint.

6.1.2.2 Scope 2: Indirect emissions

Indirect emissions are emissions from the purchased or acquired electricity generation and consumed by the company, namely, these are emissions from the electricity consumption of the different Sacyr operational centers.

- Calculation Methodology

In order to calculate the scope 2 emissions, the first thing that shall be known is the total amount of electric power consumption of each operational center broken-down by country.

CO_{2eq} emissions are calculated by multiplying the electric power consumption in each country for the country specific CO_{2eq} emission factor.

Depending on the country where the electricity is consumed the source of the emission factors varies:

- Spain: The used emission factors are the last version published by the Spanish Office for Climate Change (OECC) in force when calculating the Carbon Footprint. Specifically, it is used the emission factors of the different Spanish energy suppliers that are part of “Sistema de Garantía de Origen y Etiquetado de la Electricidad (GdO)” and from them the energy is purchased and the emission factor for energy suppliers without (GdO) for purchased energy from energy suppliers that are part of this group.
- United Kingdom: It is used the last version of DEFRA (UK Government GHG Conversion Factors for Company Reporting. Department for Business, Energy & Industrial Strategy) factor in force when calculating the carbon footprint.
- Portugal: It is used the emission factors published by the different Portuguese energy suppliers and from them the energy is purchased. In that case where the emission factor is not available the ECOINVENT factor shall be used. Both cases, the emission factor used shall be the last version in force when calculating the carbon footprint.
- Rest of the countries: the emission factors used shall be the last version published by ECOINVENT in force in each country.

6.1.2.3 Scope 3: Other indirect emissions.

Scope 3 emissions are the consequence of the company activity, but they are emitted neither by company property sources nor by activities that are not under its control.

The considered emissions within this scope are the following: Purchased goods and services, fuel and electricity related activities, upstream transportation and distribution, waste generated in operations, business travel, employee commuting, upstream leased assets, downstream transportation and distribution, processing of sold products and use of sold products.

- Calculation Methodology

Category 1 - Purchased goods and services

This category refers to the emissions from materials and resources purchased by Sacyr and are used in the execution of the activities. It is considered the most relevant materials and resources from the point of view of the purchased volume and environmental point of view, e.g. steel, concrete, asphaltic materials, aggregates, soil, paper and water.

CO_{2eq} emissions are calculated by multiplying the material consumption for the related CO_{2eq} emission factor.

It is used the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” factor in force when calculating the carbon footprint.

Category 3 - Fuel and electricity related activities

The emissions of this category are emissions from the fuel and electricity production purchased by the company and are not considered in Scope 1 and 2.

The activities included are the following:

- a) Emissions from extraction, production, and transportation of fuels consumed by Sacyr.
- b) Emissions from extraction, production, and transportation of fuels used in the electricity generation and consumed by Sacyr, including the transmission losses.

CO_{2eq} emissions from fuels are calculated by multiplying the fuel consumption of each type of fuel for the related Scope 3 CO_{2eq} emission factor. The emissions from electricity are calculated by multiplying the country specific consumption for the CO_{2eq} emission factor for the generation, transport and transmission losses.

It is used the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” factor in force when calculating the carbon footprint, in both cases.

Category 4 - Upstream transportation and distribution

In this category are included emissions from transport and distribution of purchased products by Sacyr but from vehicles that are not Sacyr property (post office, package delivery, goods transportation in general), namely, emissions from parcel transport and distribution. It is included the following types of transport:

- a) External transport of materials and products (it is just calculated parcel delivery, currently) between supplier and company facilities.
- b) Internal transport (it is just calculated parcel delivery, currently) among the different company facilities.

CO_{2eq} emissions are calculated by multiplying the weight of each package delivery for the covered distance and the related transport CO_{2eq} emission factor that consider characteristics of the transport.

It is used the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” factor in force when calculating the carbon footprint, in both cases.

Category 5 – Waste generated in operations

In this category are included emissions from the generated waste by Sacyr activities and it is included the whole amount of waste, namely, construction and demolition waste, non-hazardous waste and hazardous waste.

CO_{2eq} emissions are calculated by multiplying the amount of each type of waste for the waste specific CO_{2eq} emission factor, different depending on disposal method.

It is used the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” factor in force when calculating the carbon footprint, in both cases.

Category 6 – Business travel

In this category are included emissions from company business travel. Specifically, emissions due to train and plane trips and overnight stays.

Sacyr business travel and overnight stays data are provided by the travel agency of “El Corte Inglés” and all the relevant information to calculate the emissions.

Emissions calculation is developed different for business travel and overnights stays.

Calculation of emissions from business travel

The travel agency provides the data of all company business trips, detailing the covered distance in each trip (Train and/or plane)

CO_{2eq} emissions are calculated by multiplying the covered distance in each trip for the trip specific CO_{2eq} emission factor, different depending on type of transport and covered distance.

The used emission factors for train trips are the last version published by Catalonia Office for Climate Change “Guía práctica para el cálculo de emisiones de gases efecto invernadero” in force when calculating carbon footprint.

The used emission factors for plane trips are the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” in force when calculating carbon footprint.

Calculation of emissions from overnight stays

The travel agency provides the data of all company overnight stays.

CO_{2eq} emissions are calculated by multiplying the total number of overnight stays per country for the country specific overnight stay CO_{2eq} emission factor, different depending on the country.

The used emission factors for overnight stays are the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” in force when calculating carbon footprint.

Category 7 – Employee Commuting

In this category are included emissions from transportation of employees between their homes and their worksites.

CO_{2eq} emissions are calculated by an internal tool designed by EcoAct based on mobility patterns in a country level for each geography where Sacyr operates. The basic data of the calculation is the number of employees in each geography with the aim to know the covered kilometers that are multiplied by CO_{2eq} emission factors, modelled based on DEFRA factors to know final emissions.

Category 8 - Upstream leased assets

In this category are included emissions from the operation of plants that are leased by the company and are not included in the scopes 1 and 2. It is included in this category industrial plants where company do not have operational control.

The CO_{2eq} emissions calculation method is like Scope 1 and 2 emissions calculation for the industrial plants where Sacyr has operational control.

For stationary combustion fuels and refrigerant gases are used emissions factors of sources for scope 1 for the total amount of kwh or kg. In the case of electricity the emission factor used is the one defined for scope 2, depending on the country.

Category 9 - Downstream transportation and distribution

In this category are included emissions from the transport and distribution developed by third parties of the sold products between point of sale and final consumer. Specifically, it is calculated emissions from transport and distribution of RARx product.

CO_{2eq} emissions are calculated by multiplying the total amount of RARx product distributed for the covered distance and the CO_{2eq} emission factor related to the type of transport used.

The used emission factors are the last version of DEFRA (Department for Business, Energy & Industrial Strategy), “UK Government GHG Conversion Factors for Company Reporting” in force when calculating carbon footprint.

Category 10 - Processing of sold products

In this category are included emissions from the further processing after the sale of those products that require it to achieve the purpose of the product. Specifically, it is calculated the emissions from the processing of the sold RARx product.

CO_{2eq} emissions are calculated by multiplying the number of hours that are needed to use the RARx product sold in the reported year for the CO_{2eq} emission factor related to construction phase.

It is used the last version ECOINVENT factors in force when calculating the carbon footprint.

Category 11 –Use of sold products

In this category are included emissions from the use of products sold by the company. Specifically, it is calculated emissions from the use of RARx product sold.

CO_{2eq} emissions are calculated by multiplying the number of hours that are needed to use the RARx product sold in the reported year for the CO_{2eq} emission factor related to pavement repair phase.

It is used the last version ECOINVENT factors in force when calculating the carbon footprint.



6.2.- DOCUMENTED INFORMATION

The Excel sheet with the emissions shall be maintained as documented information. The Excel sheet contains energy consumption, materials and water consumption, waste generation and the calculation of the different types of Sacyr emissions (Scope 1, Scope 2 and Scope 3).