

**ROADMAP FOR
DECARBONIZATION
Greenhouse Gas
Emissions Quantification
Process**

Start





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Introduction

Quantifying the carbon footprint is nowadays an important management tool for organizations, both in legal terms and in technological, economic and reputational terms. In order to ensure national and international targets for reducing greenhouse gas (GHG) emissions and achieving carbon neutrality in 2050, it is essential that companies take a proactive attitude towards implementing measures and programs capable of mitigate its emissions and, simultaneously, adapt its processes and infrastructures to the challenges arising from these transformations. In this context, calculating the carbon footprint is the first step towards developing holistic and transversal decarbonization strategies, capable of generating gains and opportunities for companies, both environmentally and in social and economic terms, in the short term, medium and long terms.

Mobinov - Emissions Quantification

As a result of this process, MOBINOV will support ten partner companies in surveying their emissions, with the aim of contributing to the development of more resilient and sustainable companies, highlighting that it is essential to design a typical carbon footprint for each of the major areas businesses that make up this sector. We highlight that the scope of this calculation process is to identify the critical points of carbon emissions and support the construction of the decarbonization roadmap, as well as exercising companies in the search for data for their carbon quantification, especially for SCOPE 3.

This process will not, therefore, be subject to any type of certification.

Due to the short project time, we will not close companies' SCOPE 3 emissions.

Carbon Footprint Quantification

An organization's carbon footprint is divided into three distinct areas:

Scope 1, **Scope 2** e **Scope 3**.

Scope 1 concerns emissions resulting from the burning of fuel within its facilities, namely natural gas, oil, fuels used in the company's fleet, fluorinated gases (leaks), among others.

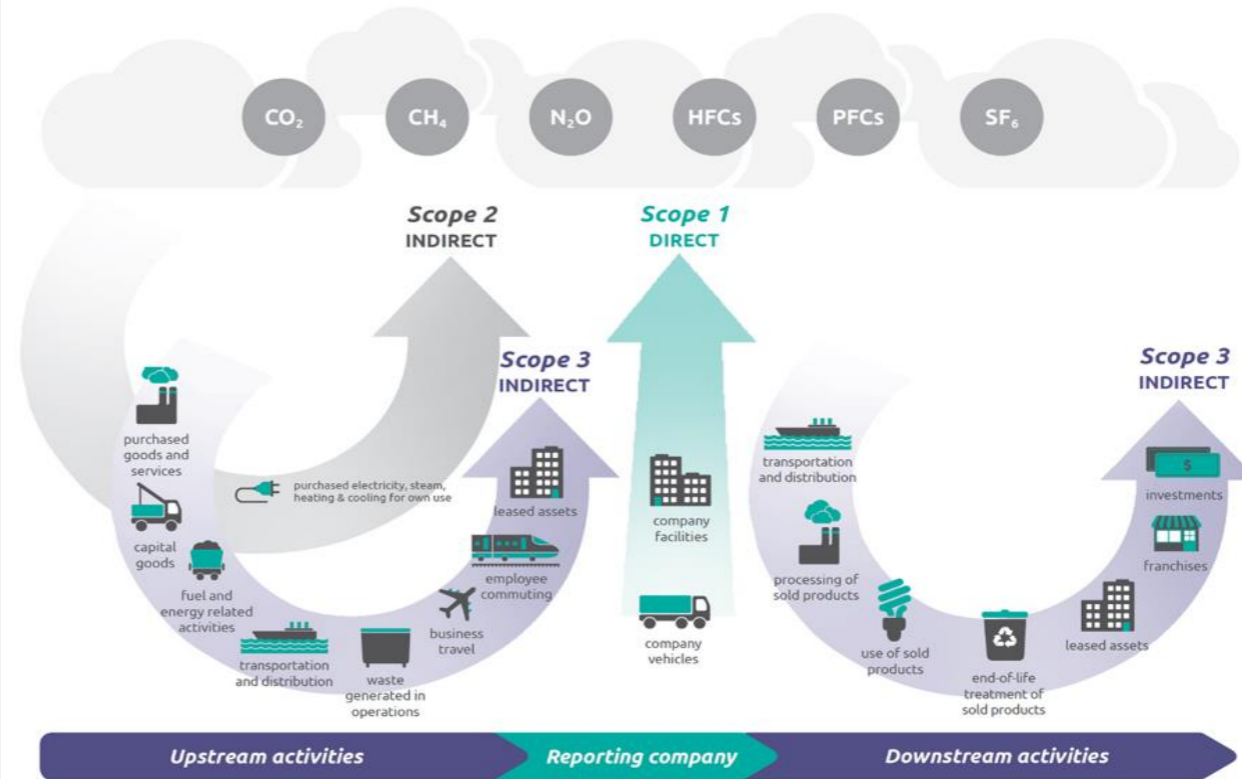
Scope 2 refers to the consumption of energy from third parties (purchased energy), mostly associated with the consumption of electricity and/or steam.

Scope 3 concerns emissions present throughout the value chain, both upstream and downstream of the manufacturing unit. In this project, all Scope 1 and Scope 2 emissions will be quantified, as well as the most significant emissions present upstream of the value chain, therefore adopting a cradle-to-gate approach. Due to the type of activity, the Scope 3 category referring to Assets Leased Upstream of the Value Chain will not be considered. Additionally, and if companies have reliable information, emissions associated with the transportation of products after manufacturing will also be considered. The footprint concerns a single site. Whenever companies present more than one production location, they must select the one in which they want the calculation to be carried out. In this context, we recommend that you opt for one that has a greater production capacity or size.

The quantification of each of these areas and categories necessarily involves an exhaustive data collection process, with their robustness and reliability being a fundamental condition for the success of this project.

Throughout the next sheets, all the necessary data will be presented, as well as a defined space for filling them in. If you have any questions about how to complete this document, please contact:

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Scope 1 Emissions

Emissions associated with fuel consumption in your installation, namely natural gas, diesel, propane gas, fuels in your own fleet, among others (biofuel, biomass, ethanol...).

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information. If you have different meters, we ask you to present the detailed values.

Fuels Used in Machines and Equipment						
Type of Fuel	Units(1)	Equipment (Optional)	Type of Combustion (Fixed or Mobile)	Total Consumption (Evaluated Year)	Comments	Source (2)
Natural Gas	m ³					
Natural Gas	m ³					
Natural Gas	m ³					
Add new line...	m ³					
Propane gas	kg					
Propane gas	kg					
Propane gas	kg					
Add new line...	kg					
Diesel in Equipment	L					
Diesel in Equipment	L					
Diesel in Equipment	L					
Add new line...	L					
Others (Specify)						
Others (Specify)						
Others (Specify)						
Add new line...						

(1) Proposal of units based on the most common practices. If you have different units, please don't hesitate to change.

(2) In the "Source" field, please indicate where this information is available. This data is fundamental to the footprint automation process.

Fluorinated Gases (Gases used mainly in refrigeration systems)					
Type of Fluorinated Gas (3)	Units	Equipment (Optional)	Total Consumption (Evaluated Year)	Comments	Source
R-22	kg				
R-403A	kg				
R-134A	kg				
Add new line...					

(3) Examples of fluorinated gases used. Please identify only those consumed during the period in question.

Fleet Fuels (Fuels used in the company's own or rented fleet during the period in question)

Type of Fuel (4)	Units	Equipment (Optional)	Total Consumption (Evaluated Year)	Comments	Source
Diesel	L				
Diesel	L				
Diesel	L				
Add new line...	L				
Gasoline	L				
Gasoline	L				
Gasoline	L				
Add new line...	L				
LPG	L				
LPG	L				
LPG	L				
Add new line...	L				
Biodiesel	L				
Biodiesel	L				
Biodiesel	L				
Add new line...	L				
Compressed Natural Gas	L				
Compressed Natural Gas	L				
Compressed Natural Gas	L				
Add new line...	L				
Ethanol	L				
Ethanol	L				
Ethanol	L				
Add new line...	L				
Electricity in Public Chargers	kWh				
Electricity in Public Chargers	kWh				
Electricity in Public Chargers	kWh				
Add new line...	kWh				
Other					
Other					
Other					
Add new line...					

(4) You can use one fill line per vehicle. There is no need to sum by fuel type.

Scope 1 Emissions: European Emissions Trading

As a result of their activity, some companies are covered by European Emissions Permit Trading. In this context, they have an emissions limit assigned at the beginning of each year and are legally obliged to report, annually, the number of licenses used.

Therefore, this section aims to identify the quantity of emissions licenses consumed during the year in question.

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information.

European Emissions Trading				
Typology	Units	Total Consumption (Evaluated Year)	Comments	Source
	tCO2eq			
Add new line...				

Scope 2 Emissions

Emissions associated with energy consumption from third parties, mainly electricity and steam.

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information. If they have different meters, they may present the itemized value. There is no need to present the total amount.

Electricity Purchased from the Grid						
Electricity Supplier	Units (1)	Having a PPA (2)	% of Renewables in the Mix (3)	Total Consumption (Evaluated Year)	Comments	Source
	kWh					
	kWh					
	kWh					
Add new line...	kWh					

(1) Proposal of units based on the most common practices.

(2) PPA or Power Purchase Agreement is a long-term contract established between the company and the energy supplying entity in which a mandatory clause can be established to supply a % of energy from renewable sources. Please, if this is the case, indicate the respective % of renewable energy in the contracted energy mix.

(3) Only complete if you have an agreed PPA.

Produced Energy				
Type of production	Units	Total Consumption (Evaluated Year)	Comments	Source
Photovoltaics	kWh			
Wind	kWh			
Hydro	kWh			
Add new line...	kWh			

Another Type of Purchased Energy				
Type of Energy	Units	Total Consumption (Evaluated Year)	Comments	Source
Steam	kg			
Add new line...				

Add new line...				

Scope 3 Emissions: Acquisition of Products and Raw Materials

Emissions associated with the quantity of capital goods acquired during the period under analysis. This is a very broad category and, for this purpose, the following products, goods and services must be considered:

- Products that serve as input to production processes and are not identified in the Acquisition of Materials and Raw Materials category;
- Equipment and machines acquired;
- Buildings acquired;
- Vehicles purchased.

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information.

Purchased Capital Goods				
Purchased Goods	Units (1)	Unit Cost (Evaluated Year) (2)	Comments (2)	Source
Add new line...				

(1) As a unit, it is recommended to use monetary values.
 (2) For each identified product, a brief description must be given in the observations column in order to have a clear idea of what is being analyzed and, therefore, be able to estimate the associated emissions with a high level of reliability.

Scope 3 Emissions: Transport of Goods Upstream of the Value Chain

Emissions associated with the transport of materials and raw materials acquired by the company from their place of origin to the factory facilities.

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information.

Transport of Goods Upstream of the Value Chain						
Type of Product	Type of Transport	Origin (1)	Destination (1)	Transported Quantity (2)	Comments	Source
	Heavy Articulated Vehicle (Diesel)					
Add new line...						

(1) The respective address must be indicated in order to obtain the distance traveled. For each product, the route taken must be divided according to the type of transport used.

(2) Preferably, it should be presented in kg.

Scope 3 Emissions: Waste Generated by the Company

Emissions associated with the treatment of waste generated by the company's premisses under analysis during the activity carried out during the period under analysis.

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information.

Waste Generated by the Company					
Type of Waste	Units	Quantity Produced (Evaluated Year)	Type of Treatment	Comments	Source
Paper	kg		Recycling		
			Incineration with energy recovery		
			Landfill		
Add new line...					



Scope 3 Emissions: Business Travel

Emissions associated with business travel carried out by the company, whether by plane, train, boat or other types.

Please, when filling out the cells below, pay attention to the units in order to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new lines to the table below to fill in more information.

Business Trips Taken					
Type of Transport	Transporting Company	Origin	Destination (1)	Comments	Source
Plane	Ryanair	Lisboa	Madrid		
Add new line...					

(1) For the calculation, the shortest trip will be accepted, assuming, whenever possible, the absence of stopovers.

Scope 3 Emissions: Workers Commuting

Emissions associated with employee commuting between their homes and workplaces, and vice versa.

The information necessary to quantify the carbon footprint associated with this category is not always available within organizations. Therefore, it is often necessary to conduct a survey of employees to characterize their modal behaviors. In this context, if a survey is needed, there are three categories of information that are essential to obtain:

- The average number of times the employee makes the home-work and work-home trip;
 - The preferred type of transport, such as private car, bus, train, subway, bicycle, walking, etc.;
 - The average distance in kilometers.
- Please, when filling in the cells below, pay attention to the units to minimize potential calculation errors.

Whenever you have additional notes relevant to the process, please use the observation column for that purpose.

If deemed relevant, you may add new rows to the table below to include more information.

Workers Commuting					
No of Workers	Number of times you complete the route per week	Average Total Travel Distance Home-Work-Home (km)	Means of transport	Comments	Source
1			Bus		
2			Own car		
3			Bike		
Add new line...					

Scope 3 Emissions: Transport of Goods Downstream of the Value Chain

Emissions associated with the transport of products generated by the company, from its facilities to the respective buyer. Both final products and products that will later be reprocessed must be considered.

Please, when filling out the cells below, pay attention to the units to mitigate potential calculation errors as much as possible.

Whenever you have additional notes relevant to the process, please use the comments column for that purpose.

If you deem it relevant, you can add new rows to the table below to include more information.

Transport of Goods Downstream of the Value Chain						
Type of Product	Type of Transport	Origin (1)	Destination (1)	Quantity Transported (2)	Comments	Source
	Heavy refrigerated vehicle (Diesel)					
Adicionar nova linha.						

(1) The respective address must be indicated in order to obtain the distance traveled. For each product, the route taken must be divided according to the type of transport used.

(2) Preferably, it should be presented in kg.