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SMART HEALTHCARE ENGINEERING

Empowering Engineers for Better Healthcare

HEALTH: ZER0 EMISSIONS IN 2030 – RAÚL FALCÓN GRACIA

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HEALTH: ZERO EMISSIONS IN 2030

TITLE

01 From climate change to carbon footprint

02 Basics of carbon footprint calculation and its market

03 Methodologies and tools available

04 Practical exercise of calculating the carbon footprint of an organization

05 Strategic plan to reduce your carbon footprint - debate

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PRESENTATION

SUMMARY CV AND EXPERIENCE

Industrial engineer with a master's degree in PRL in the 3 specialties, quality management and environmental management. 20 years of experience in the industrial and environmental sector. Several scientific publications, two international patents and one national patent stand out.

Finalist of the SET 2018 international contest as best global initiative against climate change in the water and environment category.

Co-author of the book "Zer0 emissions strategy in the Canary Islands healthcare" by Julieta Martín Fuentes.

Raúl Falcón

Deputy Director of Sustainability Management and Ecological Transition of the Canary Islands Health Service.

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WHAT IS CLIMATE CHANGE?

TOMORROW' S CONSEQUENCES DEPEND ON OUR ACTIONS TODAY

Climate has undergone significant changes throughout the Earth's history, due to natural causes. For example, in the last glacial period, which ended about 10,000 years ago, the Earth's climate was colder than it is today and glaciers occupied large areas of the Earth's surface.

However, the current climate change is very different from previous ones, essentially for two reasons:

Its causes

Scientists agree that the cause of the current climate change is the emission, as a result of human activity, of the so-called "greenhouse gases". These gases increase the capacity of the earth's atmosphere to retain heat, giving rise to the phenomenon of global warming.

Your speed

The current climate change is occurring very rapidly, making it very difficult for both nature and human societies to adapt to the new conditions.

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CLIMATE CHANGE, AN OBSERVABLE REALITY

Climate change is already a reality that is expressed across the planet through rising average temperatures, rising sea levels, melting Arctic ice and an increase in extreme events.

Climate change acquires specific features in different areas of the planet. In the Spanish territory it has been observed:

The lengthening of summers

estimated by AEMET in almost five weeks since the 70s of the last century.

The decrease in flow rates

of the rivers, in some cases by more than 20% in the last decades.

The expansion of the semi-arid climate

with more than 30,000 km2 of new semi-arid territories in a few decades.

The increase in heat waves

more frequent, longer and more intense.

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INTERNATIONAL RESPONSE

In 1992, countries from all over the world adopted a major agreement with the aim of "avoiding dangerous interference with the climate system": the so-called **"United Nations Framework Convention on Climate Change".**

Decisions relating to the Convention are taken at the "Conferences of the Parties", better known by their acronym in English: COPs. The COPs, the highest authority of the treaty, have been numbered consecutively: COP1 was held in 1995 in Berlin and, since then, they have almost always been organized on an annual basis... until COP27 held in Egypt.

COP21, held in Paris in 2015, marked a milestone as a major agreement was reached there, centered on three major objectives:

- Keeping the global temperature increase below 2°C, continuing efforts to limit it to only 1.5°C.
- Increasing the capacity to adapt to the adverse effects of climate change by promoting development with low greenhouse gas emissions.
- Orient financial flows to achieve climate-resilient, low-emission development.

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ULPGC Universidad de Las Palmas de Gran Canaria

Universitatea Transilvania din Brașov

SPITALUL MUNICIPAL SĂCELE

MANİSA CELAL BAYAR ÜNİVERSİTESİ

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WHAT IS THE ECOLOGICAL FOOTPRINT?

Any product or service does not only generate waste when it is served. It must be analyzed throughout its useful life, which also generates substantial waste.

Therefore, it is vital to consider the overall impact, from the extraction of raw materials, to transportation, storage, packaging or reuse.

Fuente: https://castillalamancha.es/sites/default/files/documentos/pdf/20210318/presentacion_didactica_huella_de_carbono.pdf

ECOLOGICAL BAGGAGE OR ECOLOGICAL COST is defined as the amount (kilograms) of material consumed, displaced or transformed into waste during the life cycle of the products: extraction of raw materials, manufacturing, packaging, transport and waste treatment it generates.

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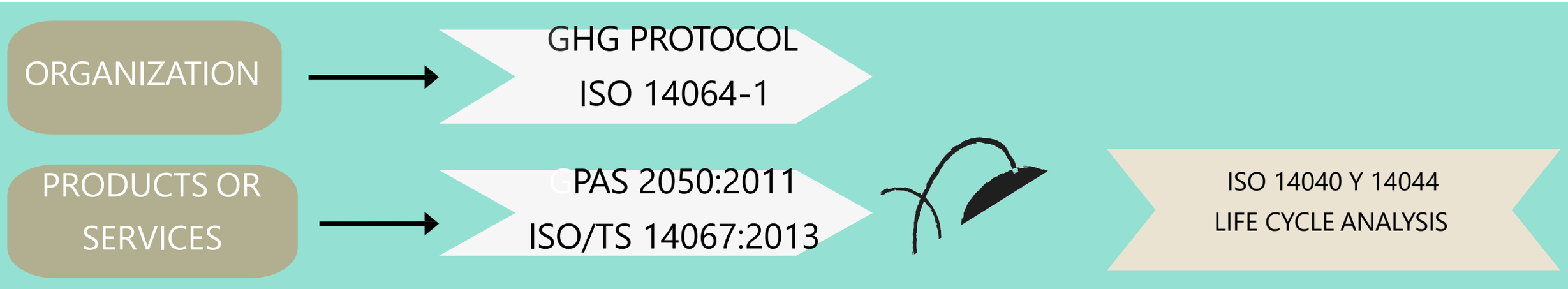
WHAT IS THE CARBON FOOTPRINT?

The **CARBON FOOTPRINT** is an environmental indicator that aims to reflect the total greenhouse gases (GHG) emitted directly or indirectly by an individual, organization, event or product.

Such environmental impact is measured by carrying out a GHG emissions inventory or a life cycle analysis according to the type of footprint, following recognized international standards such as **ISO 2007, ISO 14069, ISO 14067, PAS 2050 or GHG PROTOCOL** among others.

The carbon footprint is measured in **EQUIVALENT CO2 MASS**. Once the size and footprint is known, it is possible to implement a reduction or offset strategy, public or private.



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CARBON FOOTPRINT OF AN ORGANIZATION

When referring to an organization's carbon footprint and the emission sources that are analyzed in its calculation, we use the term Scope, classifying it into Scope 1, 2 and 3.

First, it should be noted that emissions associated with an organization's operations can be classified as direct or indirect emissions.

§ Direct GHG emissions are emissions from sources owned or controlled by the organization. In a very simplified way, they could be understood as emissions released on -site at the place where the activity takes place, for example, emissions due to the heating system if it is based on the burning of fossil fuels.

§ Indirect GHG emissions are emissions resulting from the activities of the organization but occurring at sources owned or controlled by another organization. An example of an indirect emission is the emission from electricity consumed by an organization, whose emissions have been produced at the place where the electricity was generated.

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CARBON FOOTPRINT OF AN ORGANIZATION

Once the direct and indirect GHG emissions have been defined and in order to facilitate the detection of all of them, 3 scopes have been defined:

§ Scope 1: direct GHG emissions. For example, emissions from combustion in boilers, furnaces, vehicles, etc., which are owned or controlled by the entity in question. It also includes fugitive emissions (e.g., air conditioning leaks, CH4 leakage from ducts, etc.).

§ Scope 2: indirect GHG emissions associated with the generation of electricity purchased and consumed by the organization.

§ Scope 3: other indirect emissions. Examples of Scope 3 activities are the extraction and production of materials purchased by the organization, business travel by external means, transportation of raw materials, fuels and products (e.g. logistics activities) by third parties, or the use of products or services offered by others.

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CARBON FOOTPRINT OF AN ORGANIZATION

CALCUL ATION METHODOLOGY

Carbon Footprint = Activity Data x Emission Factor

Where:

- **Activity data** is the parameter that defines the degree or level of the activity generating the GHG emissions. For example, amount of natural gas used in heating (kWhPCS of natural gas).
- **The emission factor (EF)** is the amount of GHG emitted per unit of the "activity data" parameter. These factors vary depending on the activity in question. For example, for the above data, the EF for 2022 would be 0.183 kgCO2/ kWhPCS of natural gas.

As a result of this formula we will obtain a given amount (g, kg, t, etc.) of carbon dioxide equivalent **(CO2 eq).**

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CARBON FOOTPRINT OF AN ORGANIZATION

CALCUL ATION METHODOLOGY

On the other hand, it is worth mentioning what the term **CO2 equivalent (CO2 eq)** refers to, a unit used to show the results in terms of GHG emissions. The gases indicated in the Kyoto Protocol as the most responsible for the greenhouse effect that contribute to global warming, the so -called **greenhouse gases (GHG),** are: carbon dioxide (CO2), methane (CH4), nitrogen oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF6) and, since COP 181 held in Doha at the end of 2012, nitrogen trifluoride (NF3).

However, CO2 is the GHG that has the greatest influence on global warming, which is why GHG emissions are measured in terms of this gas. The t CO2eq is the universal unit of measurement that indicates the global warming potential or global warming potential (GWP)^2 of each of these GHGs, expressed in terms of the GWP of one unit of CO2.

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CARBON FOOTPRINT OF AN ORGANIZATION

Internationally recognized standards and methodologies for greenhouse gas emissions or carbon footprint calculation methods

- ISO 14064-1:2006: Greenhouse gases - Part 1
- ISO 14065:2021
- GHG Protocol
- Corporate Accounting Standard
- Public Sector Standard
- Guide for calculating the carbon footprint and for developing an improvement plan for an organization
- Bilan Carbone
- PAS 2050

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CASE STUDY

ORGANIZATION: HUGCDN

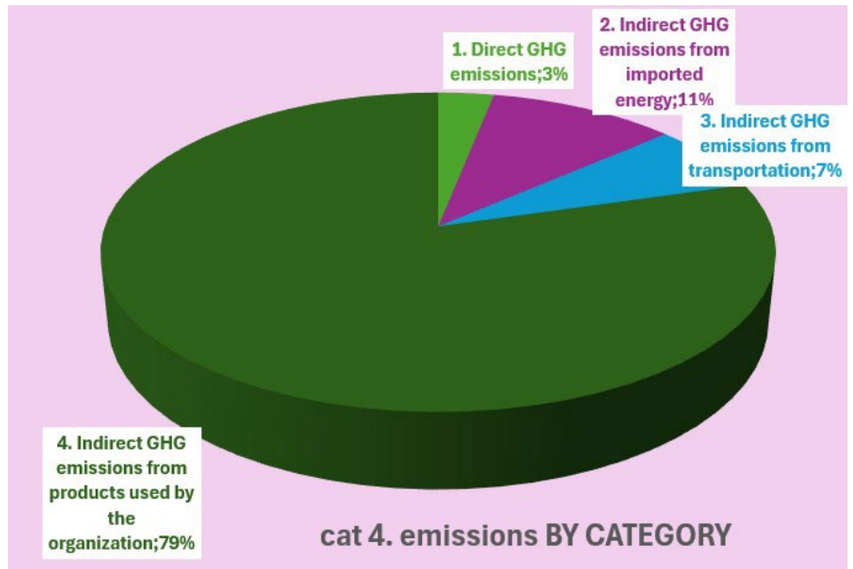
Inventory of greenhouse gases (carbon footprint)

Year stated: 2021

Calculator developed for training

Versión: 1.0
15 de julio 2024

The data provided have been manipulated and do not necessarily coincide with the organization's actual data.



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DISCUSSION

ENGINEERING

MANAGEMENT

MANAGEMENT TEAM

HR

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