



CARBON FOOTPRINT 2025

Católica - Campus Porto



UNIVERSIDADE
CATÓLICA
PORTUGUESA

27th of march 2026





GHG* CERTIFICATE

GREENPATH

Veolia certifies that the study Carbon Footprint Assessment 2025 done for

Universidade Católica Portuguesa - Católica Campus Porto

Has been conducted with GreenPath whose GHG calculation methodology complies with the following international standards:

- GHG Protocol Corporate Accounting and Reporting Standard
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate
- ISO 14064-1 (2006) and 14069 (2014) GreenHouse Gases

The calculation methodology used in GreenPath has been externally verified by CITEPA (Interprofessional Technical Center for Atmospheric Pollution). <https://www.citepa.org/en/activities/international-studies>



CITEPA

Date: 27/03/2026

*GHG : GreenHouse Gases

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EXECUTIVE SUMMARY

Universidade Católica Portuguesa is a leading academic institution with a national presence across four campuses in Portugal. As part of a broader institutional commitment to sustainability and environmental responsibility, Universidade Católica Portuguesa engaged Veolia to conduct a comprehensive assessment of its corporate carbon footprint across all campuses, in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and the GHG Protocol Corporate Value Chain (Scope 3) Standard. This report focuses specifically on the Campus Porto campus, located in Porto, the second largest city in Portugal, and encompassing eight teaching units spanning areas as diverse as biotechnology, law, economics, health sciences, education, psychology, theology and the arts. Parallel reports have been produced for the remaining three campuses, collectively providing Universidade Católica Portuguesa with a comprehensive and consistent picture of its carbon footprint at both campus and institutional level.

Relative to previous reporting cycles, which were limited to Scope 1 and Scope 2 emissions, the 2025 assessment extends the inventory boundary to include three Scope 3 categories for the first time (water consumption, upstream fuel- and energy-related emissions, and waste generated in operations), providing a broader and more representative picture of the institution's environmental impact across its value chain.

The total greenhouse gas emissions associated with Campus Porto's operations during the reporting year amount to 498.7 tCO₂e, of which 7.8% correspond to direct Scope 1 emissions, 65.9% to indirect emissions from purchased electricity (Scope 2) and 26.3% to Scope 3 value chain emissions. The emission profile is strongly dominated by energy-related sources, which collectively account for approximately 98% of the total footprint, a pattern consistent with the operational complexity of a large multi-faculty campus managing a diverse built environment, from standard lecture theatres and administrative offices to the energy-intensive laboratories of the Faculty of Biotechnology and the clinical training facilities of the Faculty of Health Sciences and Nursing. When considering exclusively Scope 1 and Scope 2 emissions, the combined footprint amounts to 367.4 tCO₂e, of which 89.4% is attributable to purchased electricity, underscoring the central role of electricity consumption in the campus's direct environmental impact.

Purchased electricity is the single largest emission source, totalling 328.4 tCO₂e. A particularly noteworthy development in this context is the commissioning of a photovoltaic solar installation in September 2025, which generated 60 MWh of renewable electricity between its commissioning date and the end of the reporting year. Once fully operational across a complete calendar year, the system is expected to supply approximately 12% of the campus's total annual electricity consumption,

avoiding an estimated 39 tCO₂e per year and representing a meaningful and structural step towards reducing the campus's dependence on grid electricity. The feasibility of expanding this installation to further increase the share of self-generated renewable electricity is identified as a strategic priority for the short term. Within Scope 3, upstream energy emissions (Category 3.3, 123.2 tCO₂e) represent the most material contribution, structurally linked to the scale of electricity consumption across the campus. Waste generated in operations (3.7 tCO₂e) and water consumption (4.4 tCO₂e) complete the Scope 3 inventory.

Based on these results, five strategic priority areas have been identified: energy efficiency and demand reduction across all campus facilities; consolidation and expansion of renewable energy procurement and on-site solar generation; decarbonisation of Scope 1 sources through the electrification of heating systems and the institutional diesel fleet; improved waste management and promotion of circular economy principles; and the progressive expansion of the Scope 3 inventory through a structured materiality assessment, with priority given to commuting and business travel in the next reporting cycle. These priorities are supported by a decarbonisation roadmap anchored to the 2024 Scope 1 and Scope 2 baseline of 514.29 tCO₂e, targeting a 20% reduction by 2027, a 50% reduction by 2030, in alignment with the European Climate Law, and net-zero operational emissions by 2040, consistent with the Science Based Targets initiative (SBTi), the European Green Deal and Portugal's National Carbon Neutrality Strategy (RNC2050).

The emissions baseline established in this report, combined with the concrete progress already achieved through the photovoltaic installation, provides Campus Porto with a robust and credible foundation for evidence-based climate action, reinforcing its role as a responsible and forward-looking campus within the Universidade Católica Portuguesa network.

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Background

Campus Porto Campus is part of Universidade Católica Portuguesa, a leading academic institution with a national presence across four campuses in Portugal. Located in Porto, the second largest city in Portugal, Campus Porto plays a prominent role in the regional academic landscape, bringing together eight teaching units: Campus Porto Business School, Faculty of Biotechnology, Faculty of Education and Psychology, Faculty of Health Sciences and Nursing, Faculty of Law, Faculty of Theology, School of Arts and School of Nursing.

As part of a broader institutional engagement with Veolia, Universidade Católica Portuguesa has undertaken a comprehensive carbon footprint assessment across all its campuses, with this report focusing specifically on the Porto campus. The assessment was conducted in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and the GHG Protocol Corporate Value Chain (Scope 3) Standard, ensuring methodological consistency and comparability across all campus-level reports.

Campus Porto is committed to sustainability and recognises the importance of addressing environmental challenges in both the academic and broader societal context, leading by example and defining specific strategic goals to reduce its environmental impact. Building on previous reporting efforts focused on Scope 1 and Scope 2 emissions, this 2025 report represents a significant step forward in the campus's climate transparency journey, extending the assessment to include three Scope 3 emission categories for the first time. This broader scope enables Campus Porto to develop a more complete understanding of its carbon footprint across its value chain, prioritise key areas for improvement, and define more robust and targeted strategies to reduce its greenhouse gas emissions in line with the institution's sustainability commitments.

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Wake up call regarding the greenhouse effect

The greenhouse gases (GHG) keep part of the sun's heat and maintain an average temperature of about 15°C on the surface of the Earth.

The CO₂ concentration, one of the main greenhouse gas effects, is naturally of about 0,04%. Beyond this concentration, the average earth temperature will rise.

Human activities (transport, dwellings, agriculture, etc) increase the proportion of GHG in the atmosphere and create some additional greenhouse effect..

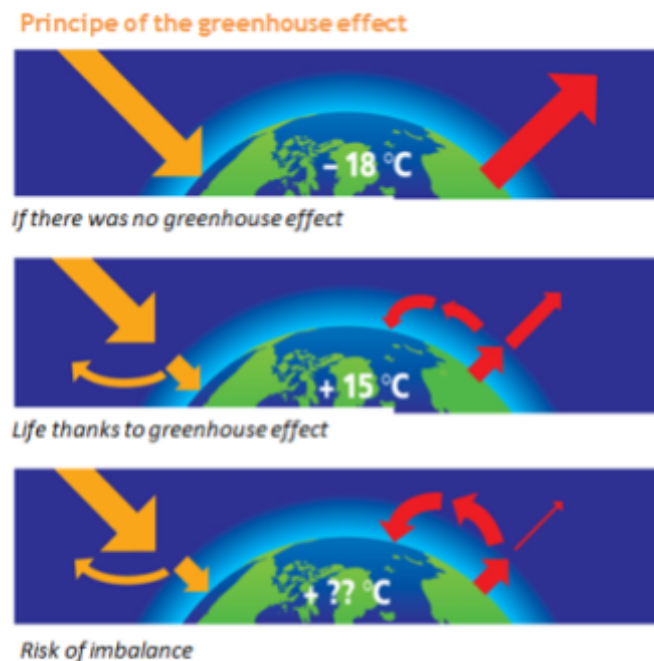


Figure 1: Greenhouse effect principle

|03

Selected Approach

3.1. Carbon footprint definition

A product or an activity carbon footprint is a tool that allows assessing and ranking the greenhouse gases generated by the whole physical process needed to produce an activity or create a human activity.

Thanks to this method, observable activities can be translated into greenhouse gas (GHG) emissions using conversion coefficients also called emission factors.

The purpose of the carbon footprint is to take into account six greenhouse gases listed in the Kyoto Protocol (carbon Dioxide [CO₂], methane [CH₄], nitrous oxide [N₂O], hydrofluorocarbons [HFC], perfluorocarbons [PFC], sulfur hexafluoride [SF₆]) and all other emission sources. In fact, this method allows to exhaustively cover the direct and indirect emission perimeter linked to an entity's activity, i.e. the scope.

Scopes 1, 2 and 3 have different perimeters, summarized as follows and shown in Figure [2].

Scope 1 refers to direct emissions of GHGs from the combustion of fossil fuels of controlled or possessed resources (Ex: consumption of oil-fired boilers, consumption of fuels for company vehicles, etc).

Scope 2 refers to indirect GHG emissions induced by the purchase or production of electricity (Ex: electricity consumption).

Scope 3 refers to other indirect GHG emissions not considered in Scope 2 that occur in the company's value chain, both up and downstream (Ex: consumables, telephones, waste, commuting, transport of visitors and customers, fixed assets, etc).

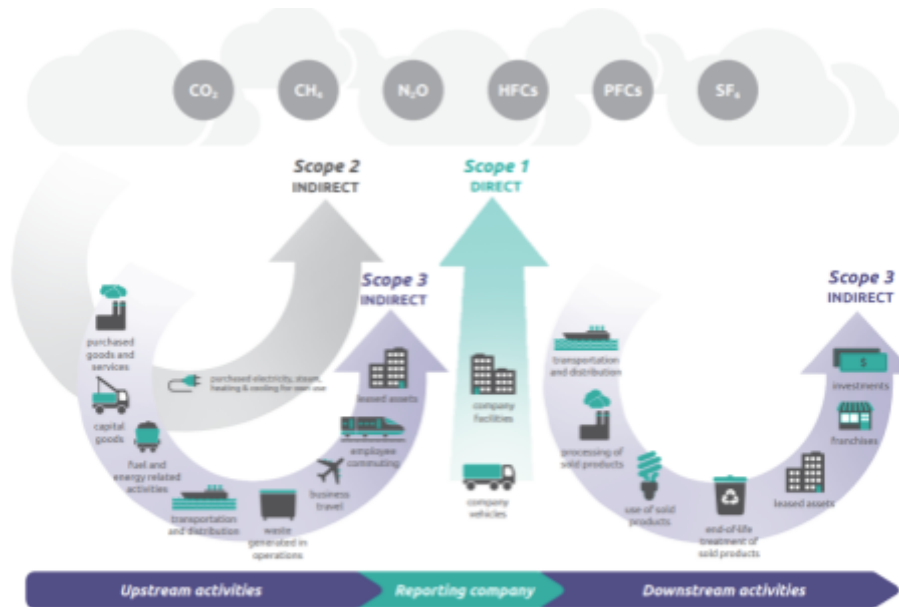


Figure 2: Overview of GHG Protocol scopes and emissions across the value chain

(Source: Corporate Value Chain (Scope 3) Accounting and Reporting Standard)

The carbon footprint (expressed in tCO_{2eq}) assessment is carried out by the multiplication of the activity data by the emission factors in a given perimeter:

$$\sum_{i=1}^i A_i \times FE_i$$

Where,

i : is the analysis perimeter

A_i : the activity data (kWh, natural gas, tons of steel, tons-kilometers of freight, etc).

FE_i : the emission factors (value that allows converting data into greenhouse gas emissions)

For each gas, a conversion factor is used to integrate the effect of the various GHG: the global warming potential (GWP) measures the importance of the contribution to global warming of a given greenhouse gas mass against CO_2 . For instance, 1 ton of fossil CH_4 is the equivalent of 30 tons of CO_2 . The GWP values retained are those given in the 5th IPCC report.

Conversions are automatically calculated by the GreenPath tool.

3.2. The tool: GreenPath

To carry out a greenhouse gas emissions inventory, Veolia developed a tool to calculate the carbon footprint based on the ISO 14064 norm and completed by the IPCC, ASTEE, EcoInvent, Carbone 4 and Veolia emission factors.

The aim of the GreenPath tool is to supply a diagnosis of greenhouse gas (GHG) emissions linked to the various Veolia activities in the water, waste and energy sectors.

GreenPath covers direct and indirect emissions perimeters i.e. Scopes 1, 2 and 3. By taking into account all the components of a carbon footprint (direct and indirect emissions), the authors have a complete vision and the levers for action to reduce GHG emissions are more numerous and more easily identifiable. Stakeholders are thus adopting an ambitious and virtuous climate policy!

GreenPath Carbon calculation tool has been audited by third parties and is recognized as compliant with the international GHG calculation protocols: GHG Protocol Standard (revised edition) and ISO 14064-1 (2006) and ISO 14069-2 (2014) GreenHouse Gases. Certificate of the study according to GHG and certificate of compliance are available in Appendix 3 and 4, respectively.

3.3. Results reporting format (BEGES, ISO, GHG)

Green Path proposes three results restitution formats:

- Article 75
- GHG Protocol
- ISO

Article 75 of the Grenelle II Act requires legal entities employing more than 500 employees to take into account their greenhouse gas emissions. They must report on their greenhouse gas emissions.

The reporting is disclosed. It is updated every three years. It had to be established for the 31st December 2012.

The ISO 14064 norm 2006 defines specifications and guidelines at organization level, to quantify and disclose emissions and removal of greenhouse gas. It includes requirements for the design, adjustment, management, writing of the reports, and checking the greenhouse gas inventory of an organization.

The GHG Protocol was published to guide enterprises and voluntary organizations to measure their GHG emissions. It defines the greenhouse gas emissions accounting and reporting standards and provides guidelines for the perimeter, the evaluation of emissions over time and their reporting. It also provides avenues to implement management programmes aiming at reducing the enterprise's GHG emissions, or that of the organization assessing the emissions.

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General information on the site studied

4.1. Study perimeter

This study aimed to calculate the carbon footprint of Universidade Católica Portuguesa (UCP), Porto Campus, that integrates eight of the nineteen faculties of Católica. The activity data refers to 2025 and includes the Centro Regional do Porto.

The organisational boundary was defined according to the operational control approach, meaning that all facilities and activities over which the University exercises operational control were included in the scope of this assessment.

With regard to the operational boundary, Scope 1, Scope 2 and selected Scope 3 categories were considered, in alignment with the GHG Protocol Corporate Standard and the Corporate Value Chain (Scope 3) Standard. A summary of included categories is presented in Table 1.

Scope	GHG Protocol Category
Scope 1	1.1 Combustion from stationary sources (Off-road Diesel Consumption)
	1.1 Combustion from stationary sources (Natural Gas Consumption)
	1.2 Combustion from mobile sources (Fleet Fuel Consumption - Diesel)
Scope 2	2.1 Purchase of Electricity
Scope 3	3.1 Purchased Goods and Services (Drinking Water Purchase)
	3.3 Fuel and Energy-Related Activities
	3.5 Waste Generated in Operations

Table 1: Operational Boundary and respective categories according to the GHG Protocol

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Input data, Assumptions and Methodology

This section describes the methodological approach applied to quantify the greenhouse gas (GHG) emissions associated with Campus Porto's activity during the reporting year. The assessment was conducted in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and the GHG Protocol Corporate Value Chain (Scope 3) Standard, ensuring methodological consistency, transparency and comparability.

5.1. Data

5.1.1 Data Sources

Data used in the calculation of Campus Porto's corporate carbon footprint were collected from multiple internal sources, reflecting the operational structure of the institution.

The main data sources included:

- **Facilities and energy management records:** electricity invoices for all campus buildings and facilities, including contractual documentation confirming the sourcing of 100% renewable electricity, natural gas consumption records and fuel consumption data for off-road diesel equipment and the institution's vehicle fleet;
- **Water utility records:** water consumption invoices and meter readings across all campus locations, used to estimate emissions associated with water supply and treatment;
- **Waste management records:** waste generation data by type and disposal route, provided by the institution's waste management contractors, used to quantify emissions under Scope 3 Category 5 (Waste Generated in Operations);

- **Procurement and administrative records:** supporting documentation related to operational activities and service contracts where relevant to emission boundary definitions.

Primary data were used wherever available, particularly for energy consumption (electricity, natural gas, diesel and fuel), water consumption and waste generation volumes. Where physical data were not available or incomplete, conservative assumptions and secondary data sources were applied, as described in Section 5.2. in data sources included:

5.2. Data Hierarchy and Assumptions

The GHG inventory was developed following a structured data hierarchy approach, prioritising the use of activity-based calculations supported by primary data. Physical activity data, such as electricity consumption (kWh), fuel consumption (litres), natural gas consumption (m³ or kWh), water consumption (m³) and waste volumes by disposal route (tonnes), were used wherever available to ensure methodological robustness and transparency.

Where physical data were unavailable or incomplete, secondary data sources and default emission factors from recognised databases (e.g., IPCC, national inventories, DEFRA) were applied. This approach was adopted in accordance with the GHG Protocol Corporate Standard and the Scope 3 Standard, ensuring completeness while maintaining conservative and transparent assumptions.

All emission factors were selected to ensure consistency across scopes and categories. Category-specific assumptions and calculation methodologies are described in detail in Section 5.3.

5.3. Methodology

5.3.1 Scope 1

Scope 1 covers all direct GHG emissions from sources owned or controlled by Campus Porto. Three emission sources were identified and included in this assessment:

Category 1 - Combustion from stationary sources (off-road diesel)

This category covers GHG emissions associated with the combustion of diesel fuel in off-road equipment operated on campus (e.g., generators, maintenance machinery or other stationary/mobile off-road equipment).

Methodological Principles

1. Collection of total diesel consumption data (litres) for off-road equipment across the reporting period;
2. Application of combustion emission factors for diesel, covering CO₂, CH₄ and N₂O.

Category 1 - Combustion from stationary sources (natural gas)

This category covers GHG emissions resulting from the combustion of natural gas used for heating, hot water production or other energy purposes across Campus Porto's campus buildings.

1. Collection of total natural gas consumption data (m³ or kWh) from utility invoices across all relevant campus locations;
2. Application of natural gas combustion emission factors, covering CO₂, CH₄ and N₂O.

Category 2 - Combustion from mobile sources (diesel)

This category covers GHG emissions associated with the combustion of diesel fuel in the university's fleet.

Methodological Principles

3. Collection of total diesel consumption data (litres);
4. Application of combustion emission factors for diesel, covering CO₂, CH₄ and N₂O.

5.3.2 Scope 2

Category 2 - Purchased Electricity

This category covers GHG emissions associated with the consumption of purchased electricity across all buildings and facilities operated by Campus Porto.

Annual electricity consumption data (kWh) were collected from utility invoices for all metered locations within the institution's operational boundary.

In accordance with the GHG Protocol Corporate Standard, Scope 2 emissions are reported using two complementary approaches:

- **Location-based approach**, reflecting the average emission intensity of the national electricity grid;
- **Market-based approach**, reflecting emissions from electricity that organisations have purposefully chosen through contractual instruments, such as supplier-specific emission factors or certified renewable electricity (e.g., Guarantees of Origin).

Location-Based Approach

The location-based method was calculated by applying the Portuguese national grid emission factor to total annual electricity consumption across all campus locations. This approach reflects the average carbon intensity of the national electricity mix and ensures comparability across reporting periods.

Market-Based Approach

Campus Porto holds a supply contract with the electricity supplier confirming that 100% of the electricity supplied to the institution is sourced from renewable energy, specifically from hydro, wind and solar generation sources.

However, under the GHG Protocol Scope 2 Guidance, the application of a zero emission factor under the market-based approach requires that the contractual instrument fulfils a set of quality criteria, including temporal and geographic specificity, uniqueness and independent verification. In the European context, the recognised mechanism for meeting these criteria is the issuance and cancellation of Guarantees of Origin (GOs) in the name of the consuming organisation, as governed by the Portuguese ROVE registry (Registo de Origem e Valor Energético), supervised by DGE, and in accordance with the Renewable Energy Directive (2018/2001/EU).

While the existing supply contract provides a contractual commitment to renewable sourcing, it does not, in isolation, constitute sufficient evidence that GOs have been formally issued and cancelled on behalf of Campus Porto for the volume of electricity consumed during the reporting period. Accordingly, the institution is in the process of confirming with the electricity supplier whether certified Guarantees of Origin have been issued and cancelled in its name in accordance with the applicable registry requirements and GHG Protocol quality criteria.

Pending this confirmation, market-based Scope 2 emissions are provisionally reported as zero (0 tCO₂e) for the reporting year, reflecting the contractual commitment to 100% renewable electricity sourcing. This provisional result is subject to verification upon receipt of the relevant GO cancellation documentation.

Both results, location-based and market-based, are reported in parallel in this assessment, in line with GHG Protocol dual-reporting requirements, ensuring full transparency regarding the institution's electricity-related emissions under both methodological perspectives.

5.3.3 Scope 3

This section outlines the approach applied to quantify GHG emissions associated with the Scope 3 categories included in Campus Porto's corporate carbon footprint assessment, in accordance with the GHG Protocol Corporate Value Chain (Scope 3) Standard.

This report represents a significant methodological advancement relative to previous reporting cycles, in which the assessment was limited to Scope 1 and Scope 2 emissions. For the 2025 reporting year, Campus Porto has extended its GHG inventory to include three Scope 3 categories, broadening the assessment to capture relevant indirect emissions across the institution's value chain. The inclusion of these three categories reflects Campus Porto's commitment to progressively expanding the boundary of its GHG inventory in line with best practice and the GHG Protocol Scope 3 Standard. Future reporting cycles will consider the materiality and feasibility of incorporating additional Scope 3 categories, through a structured materiality assessment of all fifteen categories defined under the GHG Protocol Scope 3 Standard, with the aim of achieving a progressively more comprehensive and complete carbon footprint assessment.

The three Scope 3 categories included in this assessment are described below.

Category 1 - Purchased Goods and Services (Drinking Water Purchase)

This category covers the indirect GHG emissions associated with the supply, treatment and distribution of water consumed across Campus Porto's campus operations. These emissions arise from the energy-intensive processes involved in abstracting, treating and distributing potable water.

Methodological Principles:

- Collection of total water consumption data (m³) from utility invoices and meter readings across all campus locations for the reporting period;
- Application of emission factors covering both water supply and treatment (upstream).

Category 3 - Fuel and Energy-Related Activities

This category covers indirect GHG emissions associated with the extraction, production, processing and transportation of fuels and energy consumed by Campus Porto that are not already accounted for under Scope 1 or Scope 2. These include the upstream lifecycle emissions associated with the fuels and electricity used by the institution, as well as the emissions resulting from transmission and distribution (T&D) losses in the electricity grid.

In accordance with the GHG Protocol Scope 3 Standard, Category 3.3 is calculated regardless of the Scope 2 reporting approach adopted. Specifically, although market-based Scope 2 emissions are provisionally reported as zero, reflecting the contractual procurement of 100% renewable electricity, the upstream and T&D loss emissions associated with electricity consumption are nonetheless included in this category. This ensures that physically occurring emissions are not omitted from the inventory solely as a result of the contractual instrument applied under the market-based Scope 2 approach.

Methodological Principles:

a) Upstream emissions from fuel combustion (Scope 1 sources)

- Upstream (well-to-tank) emission factors were applied to the same fuel consumption data used in the Scope 1 calculations, covering natural gas and off-road diesel;
- These factors account for the GHG emissions associated with the extraction, refining, processing and transportation of each fuel prior to its combustion on-site.

b) Upstream and T&D loss emissions from purchased electricity (Scope 2 source)

- T&D loss emissions were calculated by applying the Portuguese national transmission and distribution loss rate to total electricity consumption, and subsequently applying the national grid emission factor to the resulting estimated energy losses;
- Both upstream and T&D components are calculated using the location-based national grid emission factor, as this reflects the actual physical carbon intensity of the electricity infrastructure, independently of any contractual renewable energy claims.

The combined result of components (a) and (b) represents the total Category 3.3 emissions included in Campus Porto's GHG inventory for the reporting year.

Category 5 - Waste Generated in Operations

This category covers GHG emissions associated with the treatment and disposal of waste generated by Campus Porto's campus operations during the reporting year. Emissions are attributed to the waste treatment processes (e.g., landfill, incineration, recycling, composting).

Methodological Principles:

- Collection of waste generation data by waste type (e.g., mixed municipal waste, paper and cardboard, plastics, organic waste, hazardous waste) and disposal route (e.g., landfill, incineration with or without energy recovery, recycling, composting), provided by the institution's licensed waste management contractors;
- Application of waste-type- and treatment-specific emission factors, expressed in kgCO₂e per tonne of waste, sourced from recognised references (e.g., DEFRA, IPCC or Portuguese national inventory).

Table 3 summarizes the emission factors considered for each emissions category, as well as their Scopes, approaches and sources for consultation.

Item	EF	Unit	GHG	Comment	Source
Scope 1 - C1. Combustion from Stationary sources (Off-road Diesel)					
Off-road Diesel	0.26	kg CO ₂ eq/L	CO ₂		[1]
Off-road Diesel	0.00218	kg CO ₂ eq/L	N ₂ O	Volume of fossil fuel consumed: Off-road Diesel	[1]
Off-road Diesel	0.00000977	kg CO ₂ eq/L	CH ₄		[1]
Scope 1 - C1. Combustion from Stationary sources (Natural Gas)					
Natural Gas	0.202	kg CO ₂ eq/kWh	CO ₂		[1]
Natural Gas	0.00239	kg CO ₂ eq/kWh	N ₂ O	Natural Gas Consumed in kWh	[1]
Natural Gas	0.00054	kg CO ₂ eq/kWh	CH ₄		[1]
Scope 1 - C2. Combustion from mobile sources (Diesel)					
Diesel	2.47	kg CO ₂ eq/L	CO ₂		[1]
Diesel	0.0213	kg CO ₂ eq/L	N ₂ O	Volume of fossil fuel consumed: Road Diesel B7	[1]
Diesel	0.000857	kg CO ₂ eq/L	CH ₄		[1]

Scope 2 - C1. Purchase of Electricity					
Electricity Consumption	0.1052	kg CO ₂ eq/kWh	CO ₂	Portugal's electricity mix	[2]
Scope 3 - C1. Purchase of Goods and Services (Drinking Water Purchase)					
Drinking Water Purchase	0.221	kg CO ₂ e/m ³	CO ₂	Volume of drinking water purchased	[3]
Scope 3 - C3. Fuel and Energy Related Activities					
Natural Gas	0.0379	kg CO ₂ eq/kWh	CO ₂	Upstream and online losses	[1]
Diesel	0.610	kg CO ₂ e/L	CO ₂	Upstream and online losses	[1]
Gasoline	0.491	kg CO ₂ eq/L	CO ₂	Upstream and online losses	[1]
Purchase of Electricity	0.06786	kg CO ₂ eq/kWh	CO ₂	Upstream and online losses	[2]
Scope 3 - C5. Waste Generated in Operations					
Medical Waste and similar (incineration)	943	kg CO ₂ eq/ton	CO ₂	Incineration of waste from group IV	[4]
Medical Waste and similar (autoclaving + landfill)	549	kg CO ₂ eq/ton	CO ₂	Autoclaving and subsequent landfill of waste from group III	[5]
Solvents and cleaning fluids	21.28	kg CO ₂ eq/ton	CO ₂	Treatment of solvents	[6]
Municipal Solid Waste for valorization (Paper/Cardboard)	992	kg CO ₂ eq/ton	CO ₂	Paper and cardboard recycling process	[1]
Non-hazardous Solid Waste for valorization (Energy recovery)	336	kg CO ₂ eq/ton	CO ₂	Paper and cardboard recycling process	Veolia EF

Table 2: Emission factors used and conversions considered for the Campus Porto study

[1] Base Carbone ADEME - 2023, Origin: France

[2] IEA 2025, International Energy Agency (Scope 2), Origin: Portugal

[3] ecolnvent

[4] France Source: Base Carbone ADEME (GT Déchets Base Carbone)

[5] WM Healthcare Solutions - Autoclave & Incineration Emission Factors - April 2025

[6] DEFRA/BEIS. Greenhouse gas reporting: conversion factors 2024 for company reporting

5.4. Uncertainty Assessment

The Greenpath tool takes into account two kinds of uncertainties: The activity data uncertainty and emission factors uncertainty. The emission factors uncertainty is given by the tools database and the activity data uncertainty is considered with the following criteria shown in Table 3.

Uncertainty (%)	Activity Data Source
0	Exact data collected from analyzers or SI files (Example: EDP declaration of kWh consumed through in-house software)
5	Detailed primary data that may contain omissions in the margin
10	Data estimated from company experience (Example: data estimated from the history of recent years)
15	Data reconstructed from primary data or where the source files have been reprocessed (Example: kWh estimate from m ² heated)
20	Data extrapolated from a sample
30	Data extrapolated from a similar company/activity
50	Data not collected and use of statistical data

Table 3: Uncertainty Criteria for Activity Data

To calculate the amount of uncertain emissions, the following equation was used:

$$uncertain\ emissions = CE \times \sqrt{uad^2 + uef^2}$$

Where,

CE : Carbon emissions calculated by multiplying activity data with correspondent emissions factors.

uad : uncertainty of activity data in percentage.

uef: uncertainty of emissions factor in percentage.

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Results

The total greenhouse gas emissions associated with Campus Porto's operations during the reporting year amount to 498.7 tCO₂e, encompassing direct and indirect emissions across Scope 1, Scope 2 and three Scope 3 categories. The emission breakdown by Scope is presented in Graph 1 and the respective distribution by GHG Protocol Category is presented in Graph 2.

The emission profile of Campus Porto is strongly dominated by energy-related sources, which jointly account for approximately 98% of total emissions when Scope 1, Scope 2 and Category 3.3 are considered together. This pattern is consistent with the operational profile of a large multi-faculty campus, where the continuous use of HVAC systems, IT infrastructure, laboratory equipment and specialised research and clinical training facilities generates a substantial and sustained energy demand throughout the academic year.

Purchased electricity (Scope 2, Category 2.1) is the single largest emission source, representing 65.9% of total emissions (328.4 tCO₂e). The diversity of Campus Porto's facilities, ranging from standard lecture theatres and administrative offices to the more energy-intensive environments of the Faculty of Biotechnology and the Faculty of Health Sciences and Nursing, contributes to a high and varied electricity demand across the campus. It is noted that Campus Porto holds an electricity supply contract confirming the procurement of 100% renewable electricity. Pending formal confirmation of Guarantee of Origin cancellation documentation, market-based Scope 2 emissions are provisionally reported as zero (0 tCO₂e), though the location-based result of 328.4 tCO₂e is adopted as the primary figure in this assessment to ensure methodological rigour and auditability.

A particularly relevant development in the context of Scope 2 emissions is the installation of a photovoltaic (PV) solar system on the Porto campus, commissioned in 2025. Between its commissioning date and the end of the reporting year, the system generated 60 MWh of renewable electricity, directly offsetting an equivalent volume of grid electricity consumption and contributing to a reduction in the campus dependence on purchased electricity. Based on the system's performance during this initial partial-year period, it is estimated that the installation will supply approximately 12% of

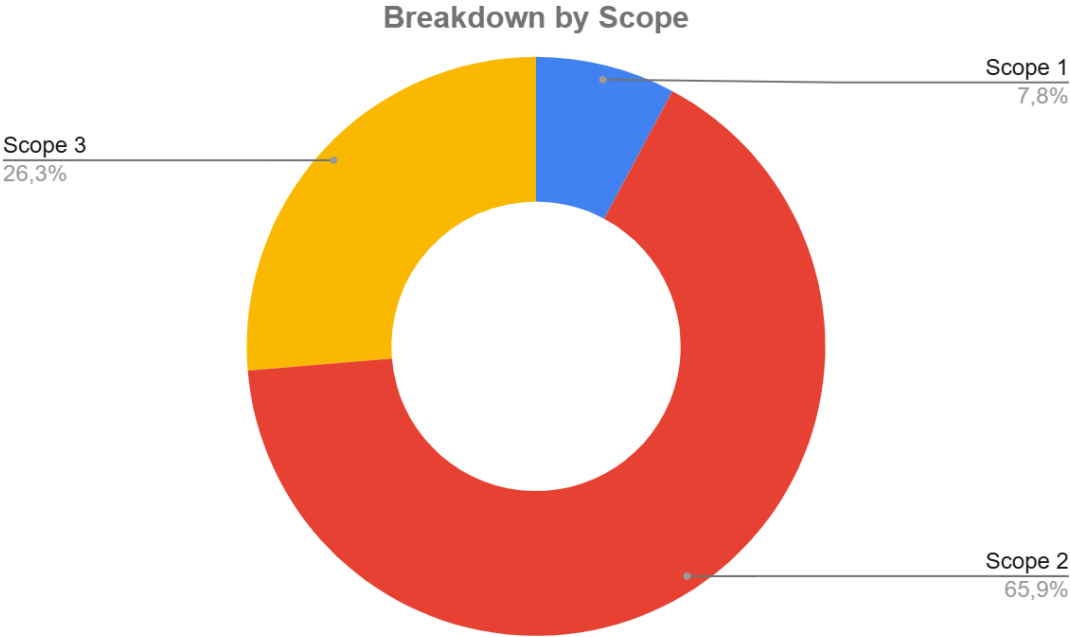
the campus's total annual electricity consumption once fully operational across a complete calendar year. This represents a meaningful and structural reduction in Scope 2 emissions, equivalent to approximately 39 tCO₂e per year avoided under the location-based approach, corresponding to roughly 12% of the current Scope 2 result. The campus should monitor the system's performance closely over the first full year of operation to validate this estimate and assess whether the conditions exist to support an expansion of the photovoltaic installation, which could further increase the share of self-generated renewable electricity and deliver additional emission reductions beyond the 12% currently projected. An expanded system, if technically and economically feasible, would not only reduce Scope 2 emissions but also generate a cascading reduction in the upstream energy emissions captured under Category 3.3, amplifying the overall decarbonisation benefit across the inventory.

Scope 1 emissions (39.0 tCO₂e, 7.8% of total GHG emissions) arise from two sources: the stationary combustion of natural gas for heating and hot water production across campus buildings (21.8 tCO₂e, 4.4%) and diesel fuel consumption by the institutional vehicle fleet (17.2 tCO₂e, 3.4%). Although modest in relative terms, both sources represent clear and actionable decarbonization opportunities through the progressive electrification of heating systems and the gradual transition to a lower-emission fleet in future reporting cycles.

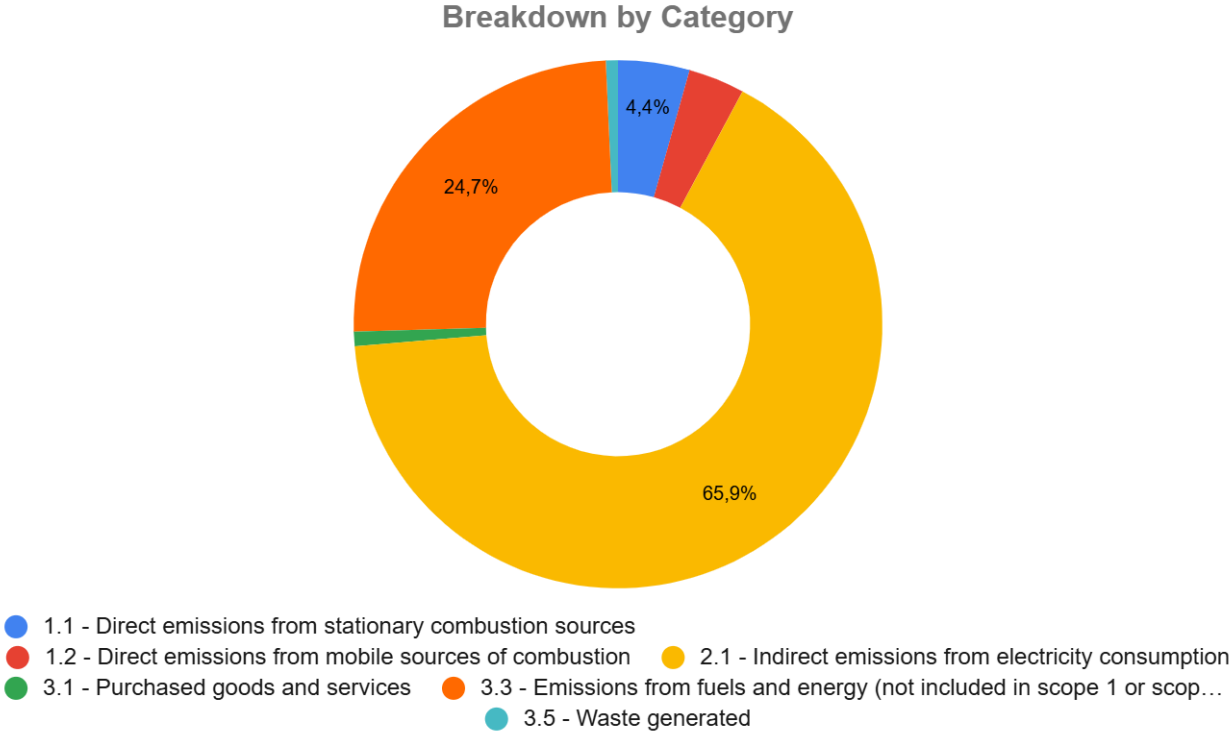
Within Scope 3 (131.3 tCO₂e, 26.3%), Category 3.3 (Upstream Fuel- and Energy-Related Emissions) represents the most material contributor, totalling 123.2 tCO₂e and capturing the upstream lifecycle emissions associated with fuel production and the transmission and distribution losses inherent to the electricity supply infrastructure. The structural link between this category and the scale of electricity consumption under Scope 2 means that the emission reductions expected from the photovoltaic installation will also translate into a progressive reduction in Category 3.3 emissions, further reinforcing the strategic value of on-site renewable generation as a decarbonisation lever. Category 3.5, Waste Generated in Operations (3.7 tCO₂e, 0.7% of total GHG emissions), reflects the waste produced across the campus, including the clinical, biological and hazardous waste streams generated by the Faculty of Biotechnology and the Faculty of Health Sciences and Nursing. Despite the specialised nature of these waste streams, which are associated with higher emission factors than conventional municipal waste, their overall contribution to the total footprint remains limited. Finally, in Category 3.1, Water Consumption (4.4 tCO₂e, 0.9%), accounts for the indirect emissions associated with the supply and treatment of water across the campus facilities and, while modest in absolute terms, warrants continued monitoring as part of the institution's broader environmental management strategy.

Overall, these results provide Campus Porto with a robust and transparent emissions baseline. The clear dominance of energy-related sources identifies energy efficiency, the consolidation of renewable energy procurement and the expansion of on-site solar

generation as the primary levers for emission reduction. The photovoltaic installation commissioned in 2025 marks a concrete and commendable first step in this direction, and its full-year impact will be captured and assessed in the next reporting cycle. The progressive expansion of the Scope 3 inventory in future reporting cycles will further enable a more complete understanding of the campus's full value chain impact.

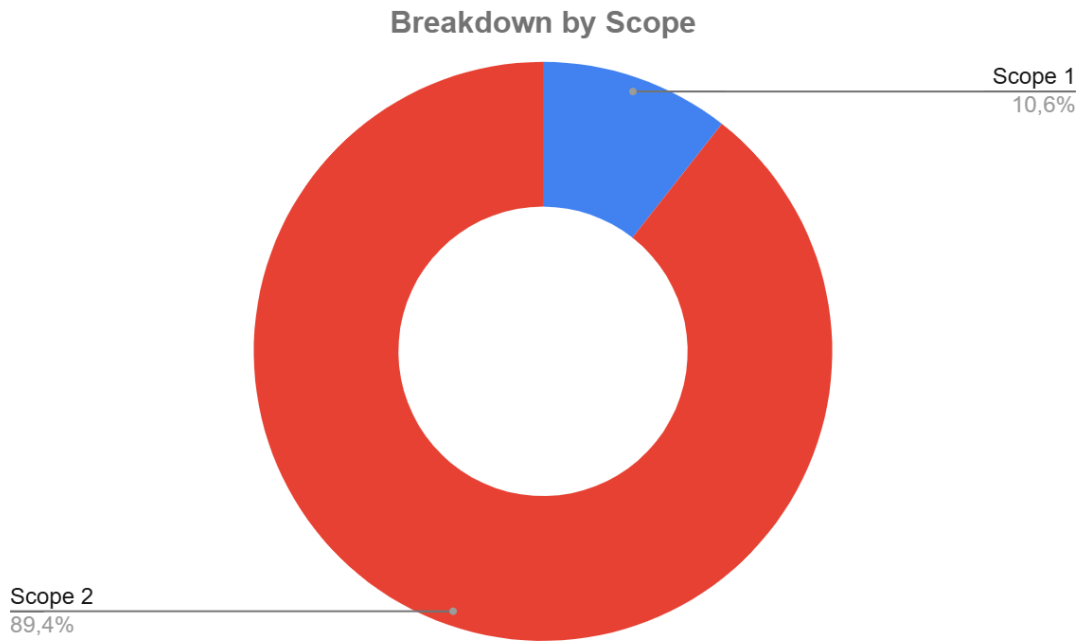


Graph 1: GHG Emissions breakdown by Scope



Graph 2: GHG Emissions breakdown by category

Focusing the analysis exclusively on Scope 1 and Scope 2 emissions, Campus Porto's controllable carbon footprint amounts to 367.4 tCO₂e, representing the portion of the inventory most directly influenced by the institution's operational decisions and investment choices. The distribution between these two scopes is presented below:



Graph 3: GHG Emissions breakdown by Scope (1&2)

Purchased electricity dominates this sub-total, accounting for 89.4% of combined Scope 1 and Scope 2 emissions, underscoring the central role of electricity consumption in the campus's direct environmental impact. This result has important strategic implications: interventions targeting electricity demand reduction and renewable energy procurement will deliver the greatest and most immediate emission reductions within the institution's direct sphere of control.

The residual Scope 1 emissions, arising from natural gas combustion (21.8 tCO₂e) and diesel fleet consumption (17.2 tCO₂e) represent the remaining direct emission sources to be addressed through the electrification of heating systems and the progressive transition to a zero-emission fleet, as outlined in the strategic recommendations in Chapter 7.

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Strategic Recommendations and Decarbonization Pathways

7.1. Overview

The results of this assessment provide a clear and evidence-based foundation for defining Campus Porto's decarbonization strategy. The emission profile of the campus is strongly dominated by energy-related sources, with purchased electricity and upstream energy emissions collectively accounting for approximately 98% of the total carbon footprint. When considering exclusively Scope 1 and Scope 2 emissions, the portion of the inventory most directly within the institution's operational control, the combined footprint amounts to 367.4 tCO₂e, of which 89.4% is attributable to purchased electricity. Furthermore, the commissioning of a photovoltaic solar installation in September 2025 marks a concrete first step in the campus's transition towards greater energy self-sufficiency, and its full strategic potential (including the possibility of expansion) is reflected in the recommendations that follow. These recommendations are aligned with the institution's sustainability commitments and the broader context of the European Green Deal and Portugal's National Energy and Climate Plan (PNEC 2030)

Sections 7.2 to 7.6 outline the priority areas of action based on the emissions profile obtained.

7.2. Energy Efficiency

Given that purchased electricity alone accounts for 89.4% of combined Scope 1 and Scope 2 emissions, demand-side energy management is unequivocally the most impactful lever available to the institution within its direct sphere of control. Reducing overall electricity consumption not only decreases Scope 2 emissions directly but also generates a cascading reduction in the upstream emissions captured under Category 3.3, amplifying the overall decarbonisation effect across the full inventory. It is also worth noting that reducing total electricity demand will increase the effective share of

consumption covered by the existing photovoltaic installation, enhancing its relative contribution without requiring any additional capital investment.

The following measures are recommended:

- **Building energy audits:** Conduct systematic energy audits across all campus buildings to identify the highest-consuming facilities and prioritise retrofit interventions, with particular focus on older buildings with poor thermal performance and outdated HVAC systems;
- **Building Management Systems (BMS):** Deploy or upgrade building management systems to enable real-time monitoring and optimisation of energy consumption across all campus facilities, including automated control of lighting, heating, cooling and ventilation based on occupancy patterns;
- **LED lighting and smart controls:** Accelerate the replacement of conventional lighting with LED technology, complemented by occupancy sensors and daylight-responsive controls to minimise unnecessary consumption;
- **HVAC optimisation:** Review and optimise HVAC system configurations, scheduling and set-point temperatures across all buildings, with particular focus on spaces with variable occupancy such as lecture theatres, laboratories and common areas;
- **Energy performance benchmarking:** Establish energy intensity metrics ,such as kWh per m² or kWh per student, to enable performance benchmarking across faculties and track efficiency improvements over successive reporting cycles.

7.3. On-site Renewable Generation and Energy Procurement

The commissioning of the photovoltaic solar installation in September 2025 represents a significant and strategically important milestone for Campus Porto. With an estimated annual contribution of 12% of total campus electricity consumption, the system is expected to avoid approximately 39 tCO₂e per year under the location-based approach, equivalent to a 10.6% reduction in combined Scope 1 and Scope 2. This result, to be fully captured in the next reporting cycle, demonstrates the tangible impact that on-site renewable generation can deliver within the institution's direct emission boundary.

Under the market-based approach, the combination of verified renewable electricity procurement and on-site solar generation has the potential to reduce Scope 2

emissions to zero, bringing the combined Scope 1 and Scope 2 footprint down to 39.0 tCO₂e, a reduction of 89.4% relative to the current location-based result. Realising this potential in full requires the consolidation of the contractual and certification framework supporting the market-based approach, as well as the continued expansion of on-site generation capacity.

The following measures are recommended:

- **Photovoltaic expansion feasibility study:** Conduct a detailed technical and economic feasibility study to assess the potential for expanding the existing solar installation across available rooftop and open areas of the campus, considering factors such as available surface area, structural capacity and grid connection constraints;
- **Guarantee of Origin documentation:** Engage with the electricity supplier to obtain and retain formal GO cancellation certificates confirming that the full volume of grid electricity consumed is covered by verified renewable energy certificates, enabling the market-based Scope 2 result of zero tCO₂e to be robustly substantiated in future reporting cycles. As on-site generation grows, the volume of electricity requiring GO coverage will progressively decrease;
- **Power Purchase Agreement (PPA):** As a longer-term complementary option, explore the possibility of entering into a direct PPA with a renewable energy producer, providing additional price stability and supply security as the campus's energy strategy matures.

7.4. Decarbonization of Scope 1 sources

Scope 1 emissions currently represent 10.6% of combined Scope 1 and Scope 2 emissions (39.0 tCO₂e), arising from the stationary combustion of natural gas (21.8 tCO₂e) and diesel fleet consumption (17.2 tCO₂e). While modest in absolute terms, these are the residual direct emission sources that must be addressed to achieve net-zero operational emissions in the long term. As the share of on-site renewable generation increases and the campus's electricity supply becomes progressively decarbonised, the carbon intensity of electrified end-uses, including heating and vehicle charging, will decrease further, amplifying the emission reduction benefit of Scope 1 decarbonisation measures over time.

The following measures are recommended:

- **Electrification of heating systems:** Develop a phased plan to replace natural gas boilers and heating systems with electric alternatives, such as heat pumps, across campus buildings, prioritising facilities where heating systems are

approaching end-of-life or where retrofit works are already planned. This transition would eliminate Category 1.1 emissions (21.8 tCO₂e) entirely while leveraging the campus's growing renewable electricity supply;

- **Fleet electrification:** Establish a roadmap for the progressive electrification of the institutional vehicle fleet. Given that the Porto campus fleet operates exclusively on internal combustion vehicles, the transition to electric vehicles represents a particularly impactful and straightforward intervention, with a direct and measurable effect on Category 1.2 emissions (17.2 tCO₂e);

7.5. Waste Management and Circular Economy

Although waste-related emissions currently represent a modest share of the total footprint (0.7%, 3.7 tCO₂e), the presence of the Faculty of Biotechnology and the Faculty of Health Sciences and Nursing means that the Porto campus generates clinical, biological and hazardous waste streams that carry a disproportionate environmental significance relative to their volume. Proactive waste management in these facilities is therefore strategically important, both for emission reduction purposes and for regulatory compliance.

The following measures are recommended:

- **Waste minimisation at source:** Implement waste reduction initiatives across health and life sciences facilities, reviewing procurement practices to reduce the acquisition of single-use materials and promoting the adoption of reusable alternatives where clinically and operationally appropriate;
- **Enhanced waste segregation:** Strengthen waste segregation infrastructure and training across all campus areas to maximise the diversion of recyclable and compostable materials from residual waste streams, reducing the proportion of waste directed to higher-emission disposal routes;
- **Circular economy initiatives:** Promote circular economy principles across the campus community, including food waste reduction in catering facilities, paper consumption reduction through digitalisation, and the reuse or refurbishment of furniture and equipment.

7.6. Scope 3 Boundary Expansion

The current Scope 3 assessment covers three categories, representing an important first step in mapping Campus Porto's value chain emissions. However, a significant portion of the institution's indirect emissions, including those associated with employee and student commuting, business travel, supply chain procurement and capital investments, remains outside the current inventory boundary. The following actions are recommended to progressively expand the Scope 3 assessment:

- **Materiality assessment:** Conduct a structured materiality assessment of all fifteen Scope 3 categories defined under the GHG Protocol Scope 3 Standard, evaluating the relevance, magnitude and data availability of each category in the context of Campus Porto's operations. This assessment will provide the evidence base for prioritising which additional categories to include in the next reporting cycle;
- **Commuting and business travel:** Given the large number of students, academic staff and administrative personnel associated with the institution, commuting and business travel are likely to represent material Scope 3 emission sources. A commuting survey and a review of business travel records should be conducted to enable the inclusion of Categories 3.6 (Business Travel) and 3.7 (Employee Commuting) in the next reporting cycle;
- **Supply chain engagement:** Initiate engagement with key suppliers, particularly those providing goods and services to the health sciences faculties, to improve the availability and quality of primary emissions data, enabling a transition from spend-based to activity-based methodologies for Category 3.1 in future assessments;
- **Data collection infrastructure:** Invest in the development of robust internal data collection processes and systems to support the progressive expansion of the GHG inventory, ensuring that the data required for additional Scope 3 categories can be collected systematically and consistently across all faculties and campuses.

7.7. Decarbonization Targets and Roadmap

Building on the emissions assessed in this report and the Scope 1 and Scope 2 baseline of 514.29 tCO₂e established in 2024, the following target framework is proposed as a foundation for Campus Porto's decarbonisation roadmap.

In the short term, by 2027, the campus should target a 20% reduction in Scope 1 and Scope 2 emissions relative to the 2024 baseline, equivalent to a reduction of approximately 102.9 tCO₂e, bringing the combined Scope 1 and Scope 2 footprint to below 411.4 tCO₂e. The photovoltaic installation commissioned in September 2025 is expected to contribute meaningfully to this target once fully operational across a complete calendar year, with energy efficiency measures, BMS deployment and LED lighting upgrades delivering further reductions. The consolidation of renewable electricity procurement through verified Guarantee of Origin documentation and the initiation of a feasibility study for the expansion of the photovoltaic system should also be completed within this timeframe. In parallel, the Scope 3 inventory should be expanded to cover at least two additional categories, with commuting and business travel as the priority candidates.

By 2030, a 50% reduction in Scope 1 and Scope 2 emissions relative to the 2024 baseline should be targeted, equivalent to a reduction of approximately 257.1 tCO₂e, bringing the combined Scope 1 and Scope 2 footprint to below 257.1 tCO₂e. This target should be driven by the progressive electrification of heating systems and the institutional fleet, the potential expansion of on-site solar generation and continued investment in energy efficiency across the campus building infrastructure. If the photovoltaic expansion feasibility study yields a positive outcome, the additional installed capacity should be operational by this date, maximising the contribution of self-generated renewable electricity to the campus's decarbonisation trajectory. This target is deliberately aligned with the European Climate Law and the EU's binding commitment to reduce net greenhouse gas emissions by at least 55% by 2030 relative to 1990 levels, ensuring that Campus Porto's institutional ambition is consistent with the broader European policy framework. A comprehensive Scope 3 inventory covering all material categories should also be in place by 2030.

By 2040, Campus Porto should target net-zero operational emissions across Scope 1 and Scope 2, with a defined and credible strategy for addressing residual Scope 3 emissions. This long-term target is aligned with the Science Based Targets initiative (SBTi) framework, the European Green Deal, Portugal's National Carbon Neutrality Strategy (RNC2050) and the overarching goal of the Paris Agreement to limit global warming to 1.5°C. The photovoltaic installation already in place, combined with the broader decarbonisation measures outlined in this report, provides Campus Porto with a concrete and credible starting point for this long-term journey. Achieving net-zero by 2040 will require sustained and progressive action across all priority areas, complemented by the adoption of emerging low-carbon technologies and the continued engagement of the entire campus community in the institution's climate transition.

These targets should be reviewed and updated annually in conjunction with the GHG reporting cycle, ensuring that progress is tracked transparently and that the

decarbonisation strategy remains responsive to new data, evolving technologies and the regulatory landscape.

APPENDIX

APPENDIX 1: RESULTS ACCORDING TO THE GHG PROTOCOL (YEAR 2025)

GHG Emissions	GHG Details								
	tCO2-eq	Uncertainty	CO2	CH4	N2O	HCFCs	HFCs	PFCs	SF6
Scope 1	123	11	121	0.3	1.3	0	0	0	0
Direct GES emissions	123	11	121	0.3	1.3	0	0	0	0
1.1 - Direct emissions from stationary combustion sources	81	5.7	80	0.2	0.9	0	0	0	0
1.2 - Direct emissions from mobile sources of combustion	41	4.8	41	0.1	0.3	0	0	0	0
1.3 - Direct process emissions	0	0	0	0	0	0	0	0	0
1.4 - Fugitive direct emissions	0	0	0	0	0	0	0	0	0
Scope 2	809	406	-	-	-	-	-	-	-
Indirect emissions associated with Energy	809	406	-	-	-	-	-	-	-
2.1 - Indirect emissions from electricity consumption	809	406	-	-	-	-	-	-	-
2.2 - Indirect emissions linked to the consumption of energy other than electricity	0	0	-	-	-	-	-	-	-
Scope 3	623	7.1	-	-	-	-	-	-	-

Upstream indirect emissions	623	7.1	-	-	-	-	-	-	-
3.1 - Purchased goods and services	16	4.9	-	-	-	-	-	-	-
3.2 - Capital goods	0	0	-	-	-	-	-	-	-
3.3 - Emissions from fuels and energy (not included in scope 1 or scope 2)	587	2.2	-	-	-	-	-	-	-
3.4 - Upstream transportation and distribution	0	0	-	-	-	-	-	-	-
3.5 - Waste generated	20	10	-	-	-	-	-	-	-
3.6 - Business travel	0	0	-	-	-	-	-	-	-
3.7 - Employee commuting	0	0	-	-	-	-	-	-	-
3.8 - Upstream leased assets	0	0	-	-	-	-	-	-	-
Downstream indirect emissions	0	0	-	-	-	-	-	-	-
3.9 - Downstream transportation and distribution	0	0	-	-	-	-	-	-	-
3.10 - Transformation of products sold	0	0	-	-	-	-	-	-	-
3.11 - Use of sold products	0	0	-	-	-	-	-	-	-
3.12 - End of life of products sold	0	0	-	-	-	-	-	-	-

3.13 - Downstream leased assets	0	0	-	-	-	-	-	-	-
3.14 - Franchises	0	0	-	-	-	-	-	-	-
3.15 - Investments	0	0	-	-	-	-	-	-	-
Total	1,555	434	121	0.3	1.3	0	0	0	0

APPENDIX 2: GREENPATH CERTIFICATE OF COMPLIANCE



CITEPA

CERTIFICATE OF COMPLIANCE

CITEPA certifies that the company



has established a calculation tool of carbon footprint

GREENPATH v. 2.02.05-2

in compliance with guidelines

  International Organization for Standardization	<p>GHG Protocol standard Revised Edition</p> <p>ISO 14064-1:2018 – Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals</p> <p>ISO 14069- 2:2013 Greenhouse gases – Quantification and reporting of greenhouse gas emissions for organizations – Guidance for the application of ISO 14064-1</p>
Certificate issued on	March 3rd, 2022
Recommendation report from CITEPA	« Mise à jour de l'audit du volet Empreinte carbone de GreenPath – Mars 2021 » The non-compliances identified in the report have been lifted. This certificate does not include the sections relating to the calculations of avoided emissions.
Carbon expertise	https://www.citepa.org/en/activities/international-studies

Jerôme BOUTANG

Signature numérique de Jérôme BOUTANG
Date : 2022.03.09 09:14:56 +01'00'

Directeur Général du CITEPA
Jérôme BOUTANG

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