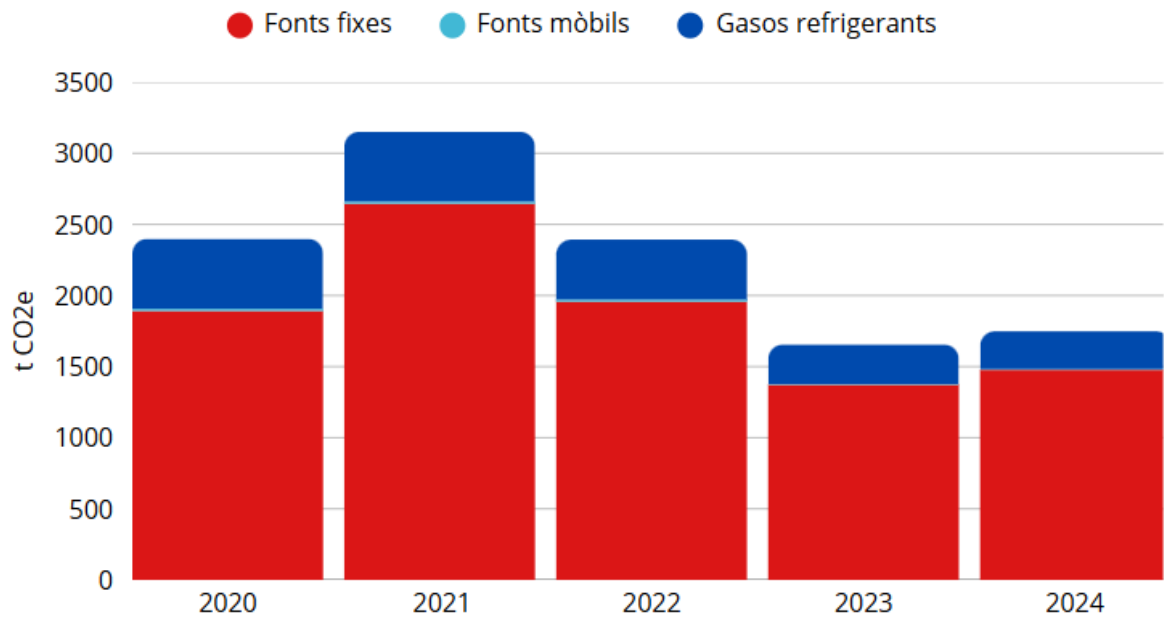


Emissions directes GEH UPC



2024 GREENHOUSE GAS EMISSIONS INVENTORY

September 2025

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The cover image shows the evolution of the UPC's direct emissions from 2019 to 2024. There was a slight increase in 2024 due to an increase in direct emissions from the combustion of natural gas.

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SUMMARY

Following a motion by students in the University Senate in May 2019, in 2020 the UPC approved its climate action strategy, which has three main objectives:

- To determine the UPC's greenhouse gas emissions (GHG) for its carbon budget.
- To achieve carbon neutrality for Scope 1 and 2 by 2030 by reducing emissions and developing emission compensation models.
- To draw up climate adaptation plans for each of the campuses in collaboration with city councils.

This document covers actions pursuing the first objective and shows the evolution of the UPC's GHG emissions since 2019. Total emissions in 2024 were **24,532 t CO_{2e}**, distributed as shown in Table 1 for the six sections proposed by the Voluntary Agreement Programme of the Catalan Office of Climate Change (OCCC), the body that verifies the calculations of the UPC's carbon footprint.

GHG emissions (t CO _{2e})	2019	2020	2021	2022	2023	2024
A. DIRECT (Scope 1)	2737	2432	3179	2402	1575	1753
B. PURCHASED ENERGY (IND, Scope 2)	20	192	844	70	13	21
C. MOBILITY (IND, Scope 3)	456	102	241	19,277	18,098	18,222
D. PURCHASED SERVICES (IND, Scope 3)	40	16	24	26	123	148
E. PURCHASED GOODS (IND, Scope 3)	3341	3317	3287	4265	4591	4399
F. SOLD PRODUCTS (IND, Scope 3)	0	0	0	0	0	0
Direct emissions (A)	2737	2432	3179	2402	1575	1753
Indirect emissions (from B to F)	3857	3628	4396	23,638	22,825	22,790
TOTAL	6594	6060	7575	26,039	24,401	24,543

Table 1. UPC GHG emissions by emission source and year

The method for calculating direct emissions¹ (Section A in the table, corresponding to Scope 1) and indirect emissions (Section B, Scope 2) from energy and the process for collecting data are both well established. However, Scope 3 (the rest of the indirect sources) evolves every year as new calculation methods are incorporated and UPC data becomes available. As a new feature in 2024, the emissions of a fourth supplier (the maintenance company Serveo) were incorporated into the footprint calculation, as well as the calculation of emissions linked to the management of hazardous waste collection. Regarding the methodology of the OCCC, there are no new emission factors that affect the UPC.

Measuring the emissions of the UPC's activity is a necessary step towards the second objective, that is, carbon neutrality in Scope 1 and 2 by 2030. The following graph shows the reduction in emissions achieved in these five years (48%) and what still remains in order to achieve this

¹ See Appendix I.

objective in terms of reduction and compensation for what cannot be reduced. The milestone of 1000 t CO_{2e} marked on the graph is a realistic goal if we consider the renovations of building envelopes and boilers that are under way.

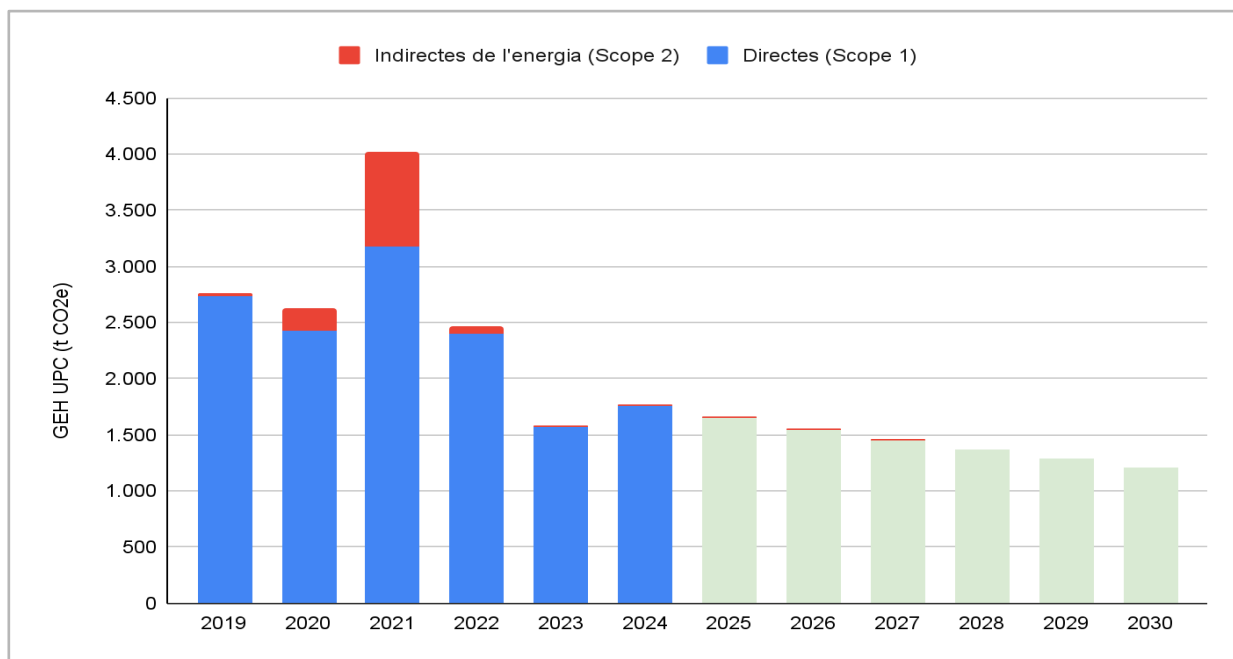


Figure 1. Towards carbon neutrality in Scope 1 and 2 by 2030

Finally, in order to compare the evolution of different buildings, campuses or universities, it is very useful to use common and comparable ratios such as the number of ECTS credits enrolled. The working group of the Catalan Association of Public Universities developed an initial set of five activity indicators, which are included in Table 1 and which each of the universities has adopted.

UPC operational GHG KPI	2019	2020	2021	2022	2023	2024	% 2019–2024
GHG Scope 1 and 2 / ECTS credits enrolled	2.27	2.06	3.07	1.84	1.00	1.11	-50.96%
GHG Scope 1 and 2 / surface (m ²)	5.53	5.19	7.93	5.52	3.55	3.95	-28.71%
GHG Scope 1 and 2 / k€ budget	9.35	8.64	13.65	7.79	4.55	4.77	-48.97%
GHG Scope 1 and 2 / UPC staff	576.4	539.0	817.9	500.4	310.8	337.6	-41.43%

Figure 2. Indicators of university activity and GHG

From here on in, the document explains each of the emission sources in detail and disaggregated by campus (when data are available), their evolution since the source's base year and relevant actions taken in 2024.

A. DIRECT EMISSIONS

Direct emissions are those generated by sources that can be controlled by the organisation. In the case of the UPC, direct emissions are i) the combustion of boilers for heating, ii) recharging of refrigerant gases and iii) transport using the University's fleet. These data are obligatory information in the Voluntary Agreement Programme, whether or not they are significant.

Although the overall evolution is positive, in 2024 there was an increase in direct emissions due to the increase in natural gas consumption, while the other two elements decreased, as explained in detail in each section.

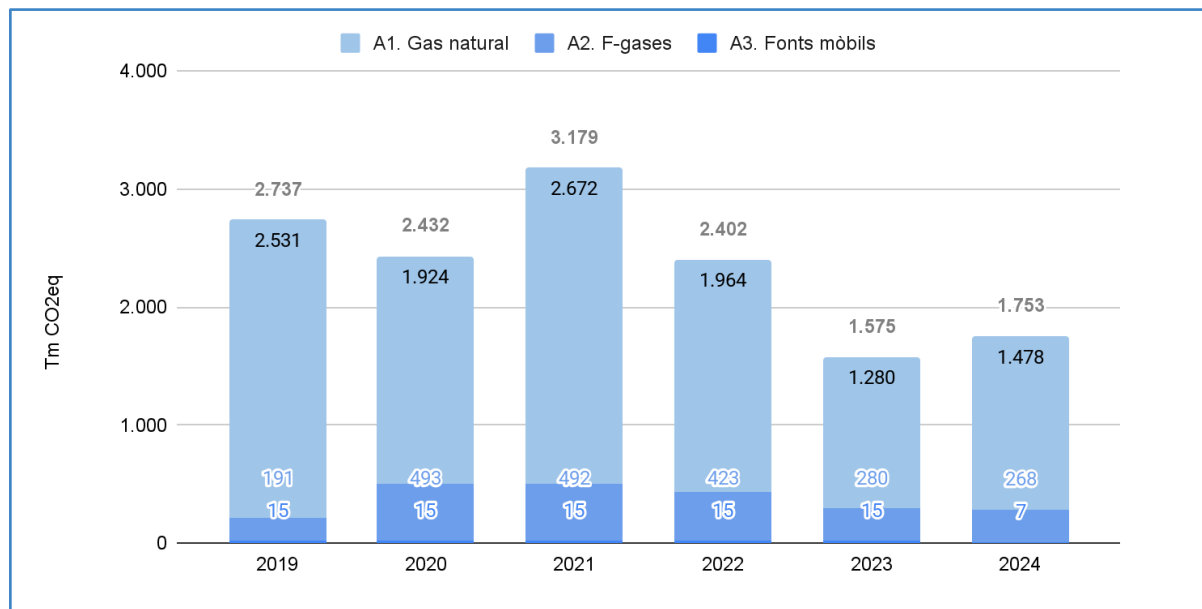


Figure 3. Evolution of direct emissions

The actions taken over the years to **improve inventory preparation** are the following.

- **2019** First data collection for the inventory.
- **2020** Incorporation of gas consumption data for 2020, by campus.
Improvement in the collection of data on refrigerant recharge volume from management and support units.
First inventory of vehicles and vessels.
- **2024** Vehicle and vessel inventory check.
Incorporation of refrigerant recharge in the maintenance application.

A1. Fixed sources: natural gas consumption

The consumption of natural gas in UPC boilers for the year 2024 was 8,209,603 kWh, which, once converted, represents a total of 1477 t CO_{2e}, an increase of 15% compared to the previous year that changes the downward trend of recent years. A possible explanation is the relaxation of energy conservation measures (guidelines for work groups in buildings) once energy costs returned to normal.

Most UPC buildings have this source of heating energy. Very few have fully electric heating or district heating. In total, there are around 90 boilers, each one with its own record and efficiency. The boilers are often managed in a distributed, complementary way by varying their load. The only fuel used is natural gas.

In 2024, a tender was made for boiler renovation projects. It is expected to be completed in 2025 and will mean a reduction in natural gas consumption in the winter of 2025–2026. Work was also done on drawing up a [building rehabilitation plan](#), as well as on identifying classrooms that are not within the comfort threshold, to prioritise investments.

Data origin and availability

The consumption data are obtained from invoices from supply companies. Each campus and, in some cases, different buildings have volumetric meters. Data are gathered on the SIRENA digital platform, which also collects electricity and water consumption data. However, unlike electricity data, a verification and checking task must be carried out on the meters and bills. In 2024, the CO₂ energy conversion factor was 0.18 kg CO_{2eq}/kWh, according to the guide published by the OCCC.

A2. Fugitive emissions: refrigerant gases (F-gases)

In 2024, air conditioning units were recharged with a total of 129 kilograms of refrigerant gases. This is equivalent to 268 t CO_{2e}, according to the OCCC conversion table. This is less than in 2023 but higher than in 2022. It is an arbitrary value that depends on both the quantity recharged and the specific gas. The UPC uses six types of refrigerant gas, each with its own global warming potential (GWP) and consequently a different emission factor. Notably, here the issue is not the electricity that the units consume but the refrigerant gases. Although these gases are present in small quantities, they have GWP values that are up to 23,000 times that of CO₂, which is the unit taken as a reference.

The EU [introduced a new directive](#) that regulates the gradual disappearance of these gases by replacing them with gases that have a GWP close to 1. This means that many of the units installed at the UPC will no longer be rechargeable from 2025.

Data origin and availability

The internal procedure for gathering these data has not been digitalised and each campus's maintenance service reports refrigerant gas purchases. The volumes of gases range from 0.8 litres in the small exterior units to 20 litres in the large units on the roofs. Data are gathered based on the volume of gas recorded on the invoice sent to the UPC by the company that supplies the recharge gas. This volume is multiplied by the GWP value to obtain the final value. New units are not included in this inventory, as the supplier notifies the administration. The process of adding these refills to the maintenance application began in 2024, to facilitate reading and for it not to depend on the schools.

A3. Mobile sources: vehicles and vessels

This section includes all of the UPC's vehicles and vessels that run on fossil fuels. Thirty years ago, universities' fleets of vehicles were quite large. Now, numerous services have been outsourced and few vehicles are owned by the institution. Many of the UPC's remaining vehicles

are for research projects that require regular field trips or they are vessels used by the Barcelona School of Nautical Studies as a teaching tool.

In 2020, an inventory of university-owned vehicles was drawn up to confirm that the volume of emissions was not significant compared to global emissions, considering the requirements of ISO 14064-2018. The result was around 15 t CO_{2eq}. In any case, this figure is not significant. However, this value must be reported, as it is part of Scope 1 or direct emissions, according to the protocol.

Data origin and availability

The data are obtained from the kilometres travelled or the volume of fuel purchased. The resources and services unit of each campus must be informed. Once the information has been gathered, the conversion factors from the official guide must be applied for every vehicle or type of vehicle.

In 2024, the vehicle inventory was updated due to the payment of the Catalan government's CO₂ tax, and approximately half of the vehicles were deregistered. This reduced the total emissions figure that is not significant, in any case.

B. B. INDIRECT EMISSIONS OF PURCHASED ENERGY

Indirect emissions of purchased energy are emissions related to energy that in previous editions of ISO 14064 and in other methods were called Scope 2. At the UPC, they include consumption of electricity and generation of heat and cold in the Diagonal-Besòs Campus through the district heating method.

The evolution of emissions has been recorded since 2019 and shows a downward trend. Emissions due to electricity consumption come from companies with a GdO certificate and are zero. Regarding the heating and cooling of the Diagonal-Besòs Campus, cooling is nil, and heating is generated in the incinerator with a contribution of natural gas when necessary, which is what makes the conversion factor vary from year to year.

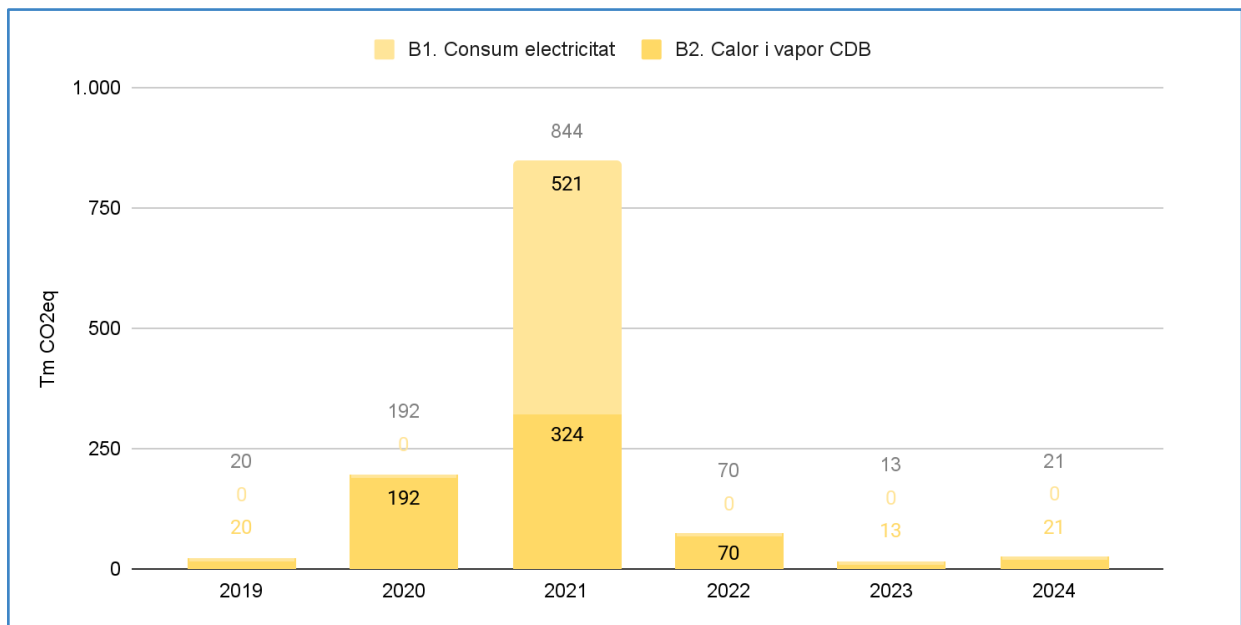


Figure 4. Evolution of indirect emissions of energy acquisition

The steps taken over these years to **improve the inventory** in this category are the following.

- **2019** Initial data collection for the inventory.
- **2020** Incorporation of data on the consumption of purchased energy per campus.
- **2021** Description of emissions differentiated by heat and cold at the Barcelona East School of Engineering (EEBE).
- **2022** Procedure established for both sources.

B1. Purchased energy: electricity consumption

Since 2018, the UPC has been supplied by electricity of renewable origin, with certification. There are zero emissions from this source, according to the methodology used. The purchase is shared through public procurement for universities and research centres by the University Services Consortium of Catalonia (CSUC). The total consumption of grid electricity was 24,545 MWh in 2023, of which 803 MWh came from self-supply generated with solar panels on roofs.

Data origin and availability

In the case of electricity, the UPC has the [SIRENA system](#), which enables the consumption of different spaces to be monitored. This means that comparisons can be made, and nocturnal or weekend consumption, which is high due to servers and their cooling, can be controlled.

B2. Purchased energy: heat, vapour and cold

The Diagonal-Besòs Campus is heated and air conditioned through the Districlima network of heat and cold that feeds the entire district. Hot water is generated from residual heat from the waste treatment plant (TERSA) and natural gas. The emissions value fluctuates depending on the combination of the two sources every year. Cold is generated from renewable electricity, and therefore does not count as an emission. In 2024, 1407 MWh of heat were consumed, generating 21 t CO_{2e} compared to 12 t in 2023, quite a significant increase in terms of the amount of energy and the increase in the conversion factor.

Data origin and availability

The Districlima company issues invoices that indicate the emissions conversion factor of CO_{2eq}. For 2024, this was 15 g CO_{2e}/kWh for heat. For more information on the company and the operation, see [this public document](#).²

² http://www.districtlima.com/districtlima/uploads/PDF/2012_Guia_de_l_Usuari_Districtlima.pdf

D. C. INDIRECT EMISSIONS OF TRANSPORT

Indirect emissions of transport are the indirect emissions related to mobility and transport. Although the protocol includes a source associated with the distribution of products, this does not apply to the UPC. We count four elements: work-related trips, mobility of administrative staff and teaching and research staff to and from work, mobility of students to and from the University, and international mobility programmes for studies.

As the various emission sources and the corresponding consolidation of data collection and analysis have been incorporated gradually, it makes no sense to make comparisons between years. It is more prudent to take the data for 2022 as the new baseline and state that **transport emissions represent 75% of total UPC emissions**. The year 2022 was the first in which emissions from UPC mobility programmes were included.

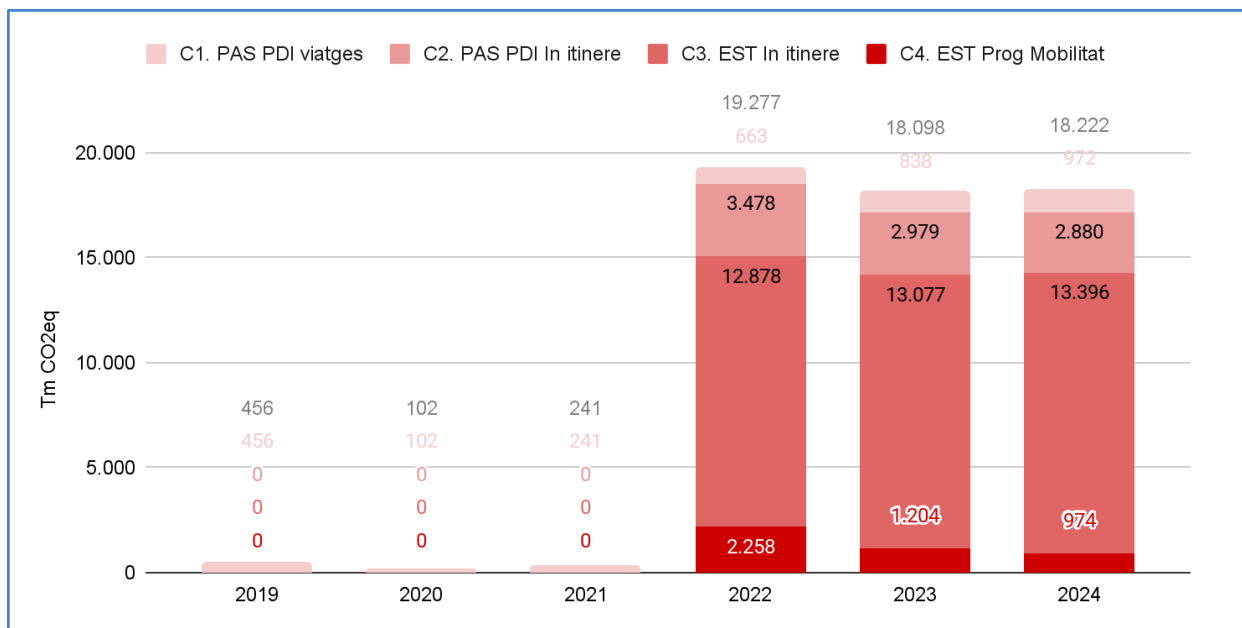


Figure 5. Evolution of indirect emissions from transport

The steps taken over these years to **improve the inventory** in this category are the following.

- **2019** First collection of mobility data on journeys of administrative staff and teaching and research staff.
- **2020** Consolidation of the model of collecting mobility data for journeys of administrative staff and teaching and research staff.
- **2021** First collection of data on travel to and from work, based on the survey of 2022.
- **2022** First data collection from mobility programmes.
- **2023** Consolidation of mobility programme data.

C1. Mobility: work-related trips of administrative staff and teaching and research staff

This element includes trips that are part of work activities, such as flights or trains to a conference or research meeting. The 2019 inventory established a baseline at around 450 tonnes. However,

this figure was not very reliable, as some travel agents did not provide the necessary information. Using the same methodology but with more consolidated data from the various travel agencies, in 2024 a total of **972 t CO_{2e}** were generated by journeys of administrative staff and teaching and research staff, an increase of 16% from 2023 and 47% from 2022.

Data origin and availability

The data on the distance travelled, the type of flights, the associated emissions and other data of interest were provided by the travel agencies and include the methodology used by each agency. The data are provided in an individualised way for each trip (with the associated transport mode) or accommodation. Car rental and hotels are not included, just train and air travel.

C2. Mobility to and from work (teaching and research staff, administrative staff)

This concept is defined as the emissions generated by UPC staff in their journeys to and from work on the campus where their activity is centred. It is generally measured from home and back home. In 2022, a survey was administered to the entire community in which information on mobility was requested for the first time, and an estimate of **3478 t CO_{2e}** was made. These data include emissions from telework using the emission factor provided by the OCCC.

For 2024, as was already done in 2023, a correlation was made with the variation in the UPC workforce by the total emissions result, and the 2024 teleworking factor provided by the Catalan government was also applied. Emissions due to mobility to and from work of administrative staff and teaching and research staff were **2879 t CO_{2e}**, in line with those of the previous year.

Data origin and availability

The data were obtained from a survey of satisfaction with UPC services, which is carried out every three years. A new survey will be conducted in 2025. There are other ways of obtaining this information that should be worked on in coming years. These include the Mobilitapp or the usual place of residence combined with teleworking data.

C3. Mobility of clients and visitors (students)

Based on the same survey, the UPC's global emissions could be estimated. In the case of clients and visitors (students) when the corresponding correlation of number of students is applied, the total was **13,396 t CO_{2e}**.

Data origin and availability

The mobility survey, which includes teleworking days, provides an initial idea of emissions. However, it is carried out every three years and the student sample is too small. Enrolment data often do not correspond with students' real journeys because they indicate the family home or do not consider journeys at the weekend, for example.

C4. Mobility programmes (students)

In line with EU policies, the UPC encourages students to complete learning periods abroad during their studies (this is often referred to as Erasmus but goes beyond the Erasmus programme). Calculations for the year include outgoing student emissions, because incoming students are

accounted for by the university of origin. The total emissions for this concept in 2024 were 974 t CO_{2e}, a decrease of 19% compared to 2023.

Data origin and availability

The first data available and analysed correspond to 2019. They only indicate the dates of the stay and the host university. They are from the survey administered by the EU and should be complemented to obtain the financial contribution associated with the stay. Some people do not complete this survey, and in any case it should be improved to obtain the number of journeys and the mode of transport. For the first estimation, a simple model was used in which it is assumed that a return trip is made between the UPC and the closest airport to the host university, and that this journey is made by airplane. The data are collected by the International Relations Bureau (GRI).

E. D. INDIRECT EMISSIONS OF PURCHASED SERVICES

This group includes the emissions sources of services that are contracted. It is a section that contains little information. This is because it is the supply companies that have to pass on the information, there is no law that obliges them to do so and therefore this factor cannot be made compulsory in tenders, and because in many cases the methodology has not been published by the OCCC.

Currently, three sources of emissions are gathered for the UPC: waste management, drinking water consumption and other services (courier, cloud, cleaning and maintenance services). The emissions are not significant and are collected more for the purpose of control and reduction than to submit them to the bodies responsible.

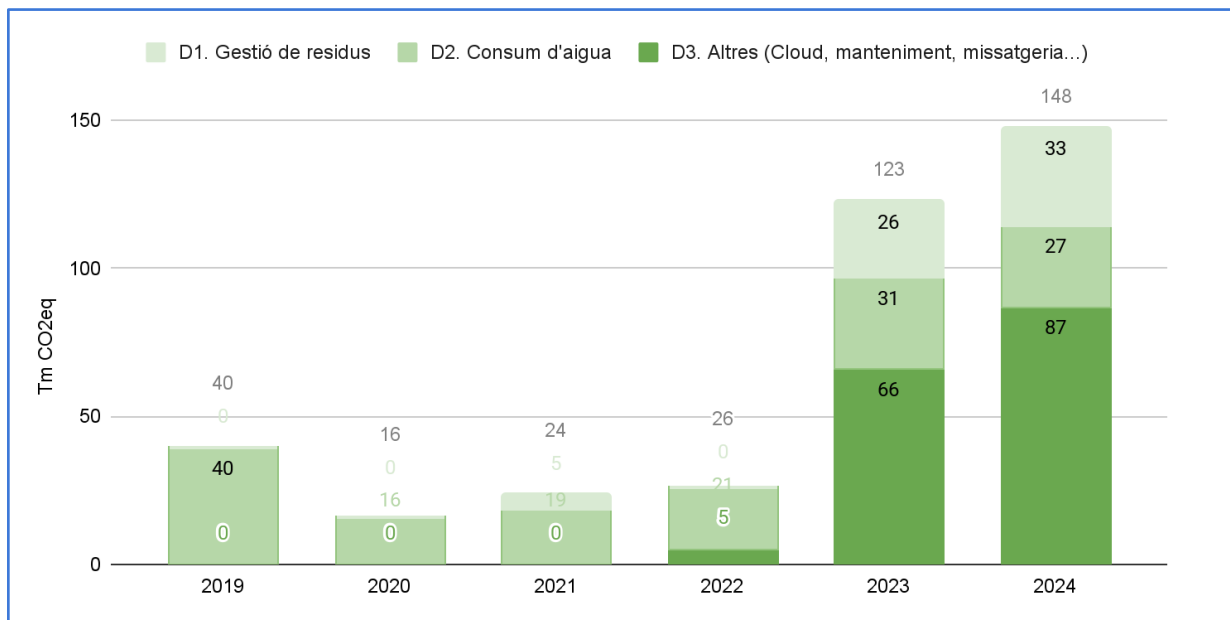


Figure 6. Evolution of indirect emissions from the use of services

The steps that have been taken over these years and the actions planned in 2023 to improve the inventory in this category are the following.

- **2019** Collection of data on water consumption and external courier service.
- **2020** Verification of 2019 data.
- **2021** First estimate of municipal waste management emissions.
- **2022** Verification of data gathered on waste.
- **2023** GHG cloud and waste collection services.
Improvement of remote water management data.
Incorporation of carbon footprint of ISS España (cleaning company).
- **2024** Incorporation of hazardous waste.
Incorporation of Serveo (maintenance company).

D1. Purchased services: waste treatment

For the second year running, the **volume of waste generated** by the UPC was known and added to the inventory. The total calculated for 2024 is 29 t CO_{2e}, a figure that is similar to but higher

than that for 2023 because of the increase in waste generation. For the first time, hazardous or laboratory waste was incorporated into the inventory following the methodology proposed by the OCCC, which adds **4 t CO_{2e}** to this section.

Data origin and availability

The companies providing cleaning and hazardous waste collection services report on the quantity in kilograms collected for each fraction and for each campus. These values are multiplied by the emission factors published by the OCCC.

D2. Purchased services: water consumption

The **water consumption** of UPC campuses in 2024 was 70,862 m³, which generated 27 t CO_{2e}. This value is once again lower than the previous year, which was already lower in 2022, with a positive line in emissions reduction but with little impact by order of magnitude.

Data origin and availability

In the case of water, emissions are estimated from the consumed volume stated on invoices and the conversion using the tables of the Catalan government's guide. This information is available for each campus and new measurement sensors are being installed for more accurate real-time data on water consumption and associated emissions.

D3. Purchased services: other services

Courier service: The courier service between campuses is provided by a company. It has a vehicle that travels established, fixed routes throughout the year. As the model of vehicle (Citroën Berlingo) and the kilometres travelled (37,000, on a similar route and fixed days every year) are known, the emissions can be estimated at around **5.7 tonnes per year**.

Cleaning services: Cleaning services were provided by the company ISS España in 2023 and 2024. The emissions associated with providing services to the UPC are calculated by multiplying the company's total scope 1 and 2 emissions by the ratio between the company's overall revenue and the revenue generated from the UPC. The emissions in this case were 34 t CO_{2e} in 2023 and 36 t CO_{2e} in 2024.

Maintenance: The maintenance service is provided by the company SERVEO España. The emissions associated with providing services to the UPC are calculated by multiplying the company's total scope 1 and 2 emissions by the ratio between the company's overall revenue and the revenue generated from the UPC. The emissions to be attributed in this case for 2024, the first year with data provided by the procurement service, were 27 t CO_{2e}.

Cloud ICT: Google and Microsoft

F. E. INDIRECT EMISSIONS OF PURCHASED GOODS

This group includes the emissions generated in the manufacture, use and end-of-life treatment of products purchased by the UPC, whether they can be inventoried or are perishable. At this time, we have data on the purchase of paper and copying services, the annual purchase of ICT equipment (laptops, monitors, etc.) and the 50-year amortisation of emissions due to the construction of UPC buildings. These emissions are quite high and significant.

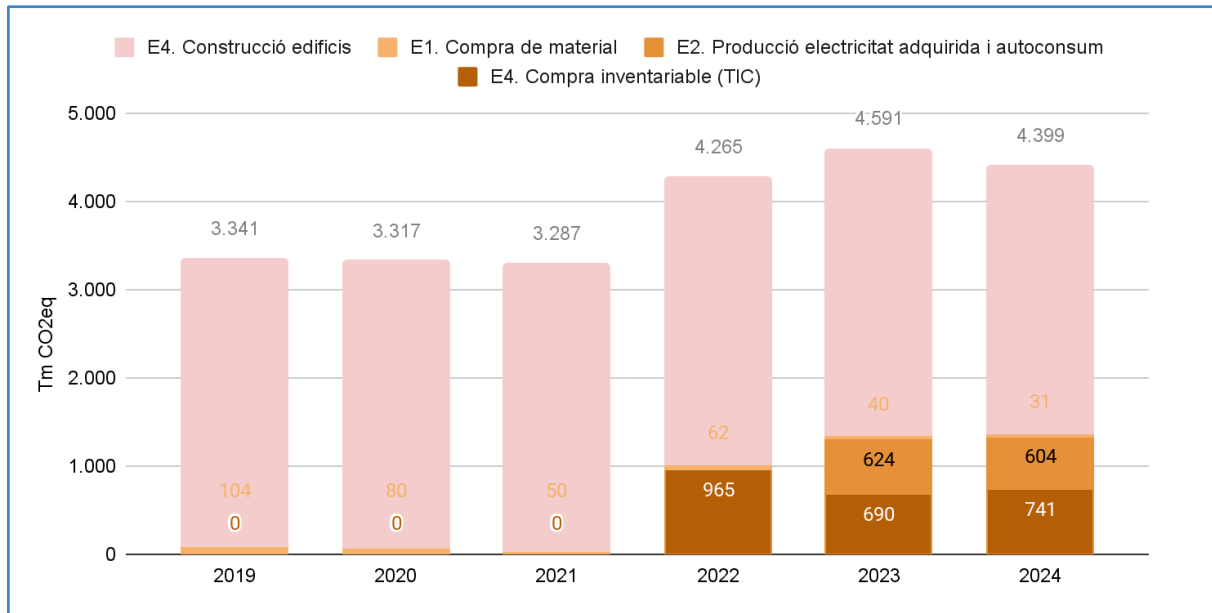


Figure 7. Evolution of indirect emissions from the purchase of goods

The steps that have been taken over these years and the actions planned in 2023 to improve the inventory in this category are the following.

- **2019** Collection of data from all buildings with their year of construction. Incorporation of paper purchase data.
- **2020** Estimation of building emission data, based on the MIES report.
- **2021** Data collection and procedure for purchasing ICT equipment.
- **2022** Incorporation of emissions from purchase of ICT equipment.
- **2023** Improvement of inventory of ICT equipment.

E1. Purchased goods: paper consumption

Despite the process of digitalisation that is under way, the use of paper is still considerable at the UPC. In 2024, about 30 tonnes of new and recycled A3 and A4 size paper were purchased from the concessionaire, including copying paper. We take as a reference the OCCC information that the production of 1 kg of virgin paper generates 3 kg CO_{2e}, and 1.85 kg CO_{2e} in the case of recycled paper. The emissions from this source in 2024 were **31 t CO_{2e}**, a significant reduction from 2023, in which these emissions were **40 t CO_{2e}**.

Data origin and availability

In the case of paper, the data are provided by the procurement service and the suppliers.

E2. Purchased goods: production of electricity purchased and self-supply

This emission source was incorporated in 2023 and corresponds to the emissions generated in the manufacture of assets to produce this electricity. It is an indirect upstream source. The emission factor is 0.025 kg CO_{2eq}/kWh for electricity purchased with a GdO certificate of renewable origin (which includes solar photovoltaic, solar thermal, wind and hydraulic), approximately half the factor for non-renewable sources. The total emissions from this indirect source were **593 t CO_{2e}** in 2024.

Emissions from the manufacture and transport of photovoltaic panels are also attributed to self-supply in the case of the UPC. These are estimated at 0.0135 kg CO_{2eq}/kWh, which generate indirect emissions of **11 t CO_{2e}**.

Data origin and availability

The origin of the data is the same as for the purchase of electricity in Section B. The data are multiplied by these emission factors.

E3. Purchased goods: ICT equipment

Each year, the UPC renews part of its ICT equipment through the ICT Plan. The suppliers are preestablished by the CSUC. The UPC can define stricter criteria but the choice must be made from among approved suppliers (similar to the policy for contracting trips). Emissions resulting from the purchase of this equipment were **741 t CO_{2e}**.

Data origin and availability

The data are provided every year by the UPC's ICT Service, and the conversion is made based on the emission factors of the OCCC or suppliers in some cases.

E3. Purchased goods: construction of buildings

This section corresponds to the assignment of emissions to the construction of buildings. We take as an approximate reference that published by the [MIES report](#) of the UPC, which assigns a value of 500 kg CO_{2eq}/m² to construction materials in general. These data must be divided between the 50 years of life of a building to obtain a value for each year. The UPC has around 500,000 m² divided between around a hundred buildings, some that are over 150 years old and others that are only 4 years old. In total, buildings that were less than 50 years old in 2024 accounted for **3023 t CO_{2e}**, a figure that is clearly significant.

Data origin and availability

The building data are provided by the Infrastructure Service and can be consulted at upc.edu/indicadors.

G.F. INDIRECT EMISSIONS OF SOLD PRODUCTS

The last category of the inventory covers emissions related to the sale of the University's products in a broad sense. Four sources are included in the methodology of the OCCC.

- **Emissions from assets leased downstream:** assets that belong to the organisation but are leased to other organisations. In this case, the UPC must calculate and eventually report these emissions, given that it has spaces rented to other institutions or companies such as spin-offs and affiliated schools.
- **Emissions from investments:** this refers mainly to those associated with private or public financial institutions. They may be generated by four types of operations: equity debt, investment debt, project financing and others. The UPC participates in various legal forms such as consortia, associations, foundations and companies, each of which must report its emissions.
- **Emissions or removal from the use stage of the life cycle:** to calculate these values, scenarios of the use of products must be considered. In the same way that the UPC does not have a production process, it does not emit carbon from this source. We could consider UPC merchandising (folders, clothes, etc.) but the first estimates indicate that the contribution is not significant.
- **Emissions from the final stage in the product's life:** these tend to be emissions associated with how products are managed when they become waste. As in the previous case, it is not incorporated into the inventory.

The actions taken in 2023 to improve the inventory were the following.

- **2022** Study of the protocol and identification of significant sources.
- **2023** Inventory of rented spaces, property and legal entities by campus.

F1. Emissions from leased assets

This source covers emissions generated in leased spaces. The UPC manages approximately 500,000 m² directly, of which it leases 10,000 m², although some of the leases are through the UPC Group. In 2023, work was done on an inventory of leased spaces, property and the various contractual formulas, especially regarding the impact of consumption on the tenants, to avoid duplicating the accounting of emissions. The conclusion was that they were not significant.

Data origin and availability

The data are obtained from the information provided by the Infrastructure Service.

F2. Emissions from investments

This source only covers emissions generated by participation in the shares, capital or patronage of entities, as the University does not fund projects or have investment debt. In any case, the figure is not significant, unlike universities in the English-speaking world. We can distinguish three groups of entities associated with the UPC:

Entities of the UPC Group such as the Fundació Politècnica de Catalunya or UPCnet. These are entities in which the UPC has direct or indirect majority shareholding in the capital or an endowment fund. The rector presides over the entities and their decision-making bodies. These entities have the obligation to render accounts under the same terms and conditions and according to the same procedure as the University. As of September 2023, the entities in the UPC Group are the FPCAT-UPC Sustainable Mobility Campus (Martorell); CIM UPC; b_TEC Foundation; Innovation and Technology Centre Foundation (CIT UPC); Fundació Politècnica de Catalunya; Mediterranean Technology Park (PMT); UPCnet and IThinkUPC.

Associated entities such as the Barcelona Supercomputing Center (BSC-CNS) or the CSUC, entities in which the UPC has a minority shareholding and whose aim is to undertake academic tasks or support these entities.

Technology-based companies or spin-offs: Technology-based companies or spin-offs: entities promoted and, where appropriate, with minimum shares owned by the University, to financially benefit from the research, development and innovation results obtained in research projects.

In all these cases, the inventory should include emissions and shares in capital or decision making. Therefore, in the technology-based companies or spin-offs in the UPC Group, all the emissions should be incorporated into the UPC inventory. In the rest of these entities, only the proportional part of the emissions should be incorporated.

In 2023, a pilot was carried out with the CIT UPC Foundation and the company UPCnet and their direct emissions. For the surface area leased to the UPC (less than 100 m²) and as these are new buildings with electric air conditioning with GdO, the emissions calculated are not significant.

Data origin and availability

The shareholding data are obtained from the information published in [UPC Transparent](#) and by the [Innovation Management Service](#) in the case of technology-based companies. The emission data are obtained from the entities or the inventory published in any of the records of the administration.

H. APPENDIX I. METHODOLOGY

Since 2020, the UPC has adhered to the Catalan government's Voluntary Agreement Programme. The programme is the responsibility of the Ministry of Climate Action and, ultimately, the Catalan Office of Climate Change (OCCC) of the Catalan government. This entity annually publishes the [Greenhouse Gas Emissions Calculation Guide](#) with updated or new conversion factors for sources and their associated emissions.

The geographic scope of the UPC inventory includes the activity carried out on nine physical campuses of the University that are present in six cities, and all of the virtual activity. Regarding activities, all the direct emissions sources are included and all the indirect emissions sources that are significant, that is, those that represent over 5% of the direct sources. The scope of the inventory does not include entities in the UPC Group (owned 100% by the UPC) or other entities associated with the UPC such as spin-offs or participation in consortia. These entities should be incorporated between 2025 and 2026.

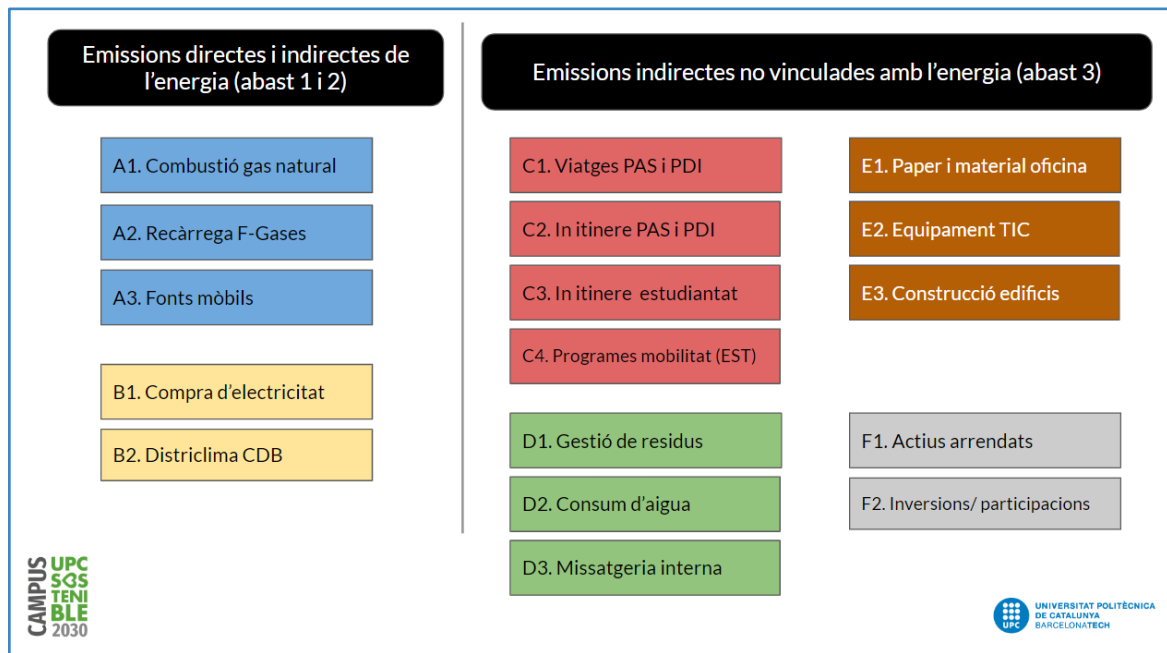


Figure 8. Categories and sources of emission

The sources of emission have been grouped according to the six categories recommended in [the OCCC methodology](#) to which we have adhered, which are the following.

- A. Direct emissions (Former Scope 1)
- B. Indirect emissions of purchased energy (Former Scope 2)
- C. Indirect emissions of transport (Former Scope 3)
- D. Indirect emissions from the services used by the organisation (Former Scope 3)
- E. Indirect emissions of goods purchased by the organisation (Former Scope 3)
- F. Indirect emissions from the use of products sold by the organisation (Former Scope 3)

Category A corresponds to direct emissions: the sources of GHG that can be controlled by the organisation). The other five categories, from B to F, fall within indirect emissions, which are all

sources that cannot be controlled by the organisation. They correspond to Scope 2 (category B) and Scope 3 (categories C to F).

To compare the evolution of buildings, campuses or universities, it is very useful to use figures such as the constructed area, enrolled ECTS credits, number of members of the community (or the staff that work there) and the institution's budget. The working group of the Catalan Association of Public Universities of which the UPC is part works with a joint proposal of indicators so that actions can be shared and efficiency pursued.

An initial proposal included five university activity indicators: ECTS credits enrolled, constructed area, management and academic staff and university budget. If we divide Scope 1 and 2 emissions between these indicators we obtain the following table, in which we can see a significant decrease in the ratios.

	2019	2020	2021	2022	2023	2024
Bachelor's students		23,786	24,215	24,576	25,335	25,917
Master's students		5369	6001	6107	6176	5516
ECTS credits bachelor's degrees	1,013,854	1,064,846	1,087,798	1,116,262	1,322,249	1,355,945
ECTS credits master's degrees	202,931	206,998	223,249	226,552	268,605	240,551
ECTS credits (bachelor's + master's)	1,216,785	1,271,844	1,311,047	1,342,814	1,590,854	1,596,496
Constructed area (m²)	498,188	506,232	507,156	447,608	447,748	449,689
Full-time equivalent teaching and research staff	2300	2337	2374	2358	2341	2375
Technical, management, administrative and service staff	1511	1488	1481	1487	1532	1574
Research staff and research support staff	973	1045	1064	1094	1236	1307
UPC staff	4784	4870	4919	4939	5109	5256
Budget (k€)	294,965	303,892	294,654	317,312	348,863	371,923
Emissions Scope 1 (kg CO ₂)	2,737,337	2,432,473	3,178,682	2,401,666	1,575,247	1,753,147
Emissions Scope 2 (kg CO ₂)	20,000	192,470	844,334	69,610	12,883	21,119
Emissions Scope 1 and 2 (t CO₂)	2,757,337	2,624,942	4,023,016	2,471,276	1,588,130	1,774,265
UPC operational GHG KPI	2019	2020	2021	2022	2023	2024
GHG Scope 1 and 2 / ECTS credits enrolled	2.27	2.06	3.07	1.84	1.00	1.11
GHG Scope 1 and 2 / surface (m ²)	5.53	5.19	7.93	5.52	3.55	3.95
GHG Scope 1 and 2 / k€ budget	9.35	8.64	13.65	7.79	4.55	4.77