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UNIVERSITÄT BERN

2024 greenhouse gas report of the University of Bern

February 17, 2026

Contents

1. Background

This report shows the greenhouse gas emissions of the University of Bern for 2024 and classifies their development since the base year 2019. The carbon footprint (GHG footprint) is used to identify material sources of emissions and to analyze structural and operational changes.

The results of the carbon footprint form a key basis for the Roadmap Climate 2030 currently being developed and support the prioritization of measures for the non-current anchoring of climate protection in university operations.

They are accounted for in accordance with the Greenhouse Gas Protocol[1] and include direct (Scope 1) GHG emissions, Energy indirect (Scope 2) GHG emissions and selected other indirect (Scope 3) GHG emissions.

Further sustainability measures and climate protection projects are described in the separate Sustainability Report 2022/2023 .

1.1 System boundaries of the GHG footprint

Greenhouse gas emissions are reported uniformly in this report in terms of carbon dioxide equivalents (CO_2e) to ensure comparability of the different greenhouse gases. The GHG footprint is based on the Greenhouse Gas Protocol (GHG Protocol), which distinguishes between direct (Scope 1) GHG emissions, energy indirect (Scope 2) GHG emissions and Other indirect (Scope 3) GHG emissions.

The University of Bern's GHG footprint includes emissions from the following sources:

Scope 1	Scope 2	Scope 3

• Heating oil
• Natural gas
• Vehicle fleet fuels
• Laboratory processes (laboratory gases, experimental areas, livestock)
	• District heating
	• District cooling
	• Electricity
		• Category 1: Purchased goods and services:
		  ○ Paper
		  ○ Water
		• Category 5: Waste from operations:
		  ○ Waste (domestic waste, special waste)
		• Category 6: Business trips:
		  ○ Air travel
		  ○ Train journeys

Emissions that arise in connection with the provision of electricity, district heating and district cooling are shown in a simplified manner in Scope 2 in the report. This procedure differs from the usual GHG protocol breakdown (Section 3.3), but allows a consistent presentation within this GHG footprint.
No methodologically consistent and sufficiently valid data is currently available for other Scope 3 emission categories, in particular commuter traffic, the procurement of goods and services, and investments. Accordingly, these emissions are not listed in this report. This procedure complies with the requirements of the GHG Protocol in terms of transparency, data quality and traceability.

[1] About us. GHG Protocol; https://ghgprotocol.org/about-us; accessed on January 14, 2026.

The “Genossenschaft ZFV-Unternehmungen (ZFV)” operates the canteens and bistros on behalf of the University of Bern Canteen Operations Foundation and keeps a record of its own GHG footprint. The emission data collected by the ZFV is therefore reported separately in Section 2.2 of this report and is not included in the University of Bern’s operating GHG footprint.

The data and sources of the emission factors used to calculate the greenhouse gas emissions of the University of Bern are listed in Notes.

2. Results of the University-wide 2024 GHG footprint

Total emissions in 2024 amounted to 8,050 tons of CO_2e. With 5,268 employees, expressed in full-time equivalents (FTEs), this corresponds to 1.53 t CO_2e per FTE[2].

Direct (Scope 1) GHG emissions account for around 10 percent of total emissions. 23 percent of total emissions were attributable to the purchase of electricity, district heating and district cooling (Scope 2), while the remaining 67 percent were attributable to other indirect (Scope 3) GHG emissions (see Figure 1).

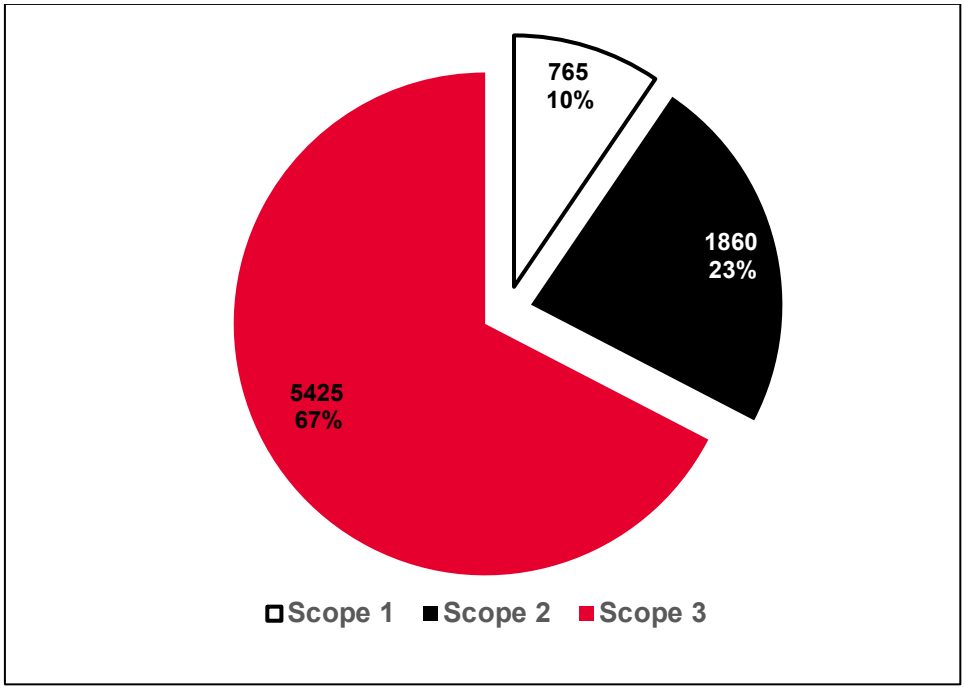

Figure 1: Greenhouse gas emissions in tons of CO_2e and percentage of total emissions, broken down by scope.

[2] The reported GHG emissions per FTE refer only to the FTE of employees. The 19,741 students were not taken into account. The main reason for this is that business flights by employees account for the lion’s share of emissions. Students have a subordinate influence on Scope 1- and Scope 2-emissions as long as the same infrastructure is operated.

Figure 2 illustrates the greenhouse gas emissions of the University of Bern in 2024, broken down by the emission sources recorded. At 61.2 percent of total emissions, air travel remains by far the largest single source.

In second place are emissions resulting from the purchase of district heating, which account for 17.8 percent of total emissions. This is followed by emissions from electricity consumption and biogas, each accounting for 5.1 percent.

Other sources of emissions contribute to total emissions to a lesser extent. These include household waste at 3.3 percent, special waste at around 1.8 percent, the use of heating oil at 1.6 percent, emissions from laboratory processes (laboratory gases, experimental areas and livestock farming) at 1.5 percent and the fuel consumption of the vehicle fleet at 1.4 percent.

Emissions from business trips by rail (reported for the first time in 2023), water consumption, district cooling and paper consumption account for a marginal share of less than 1 percent of total emissions.

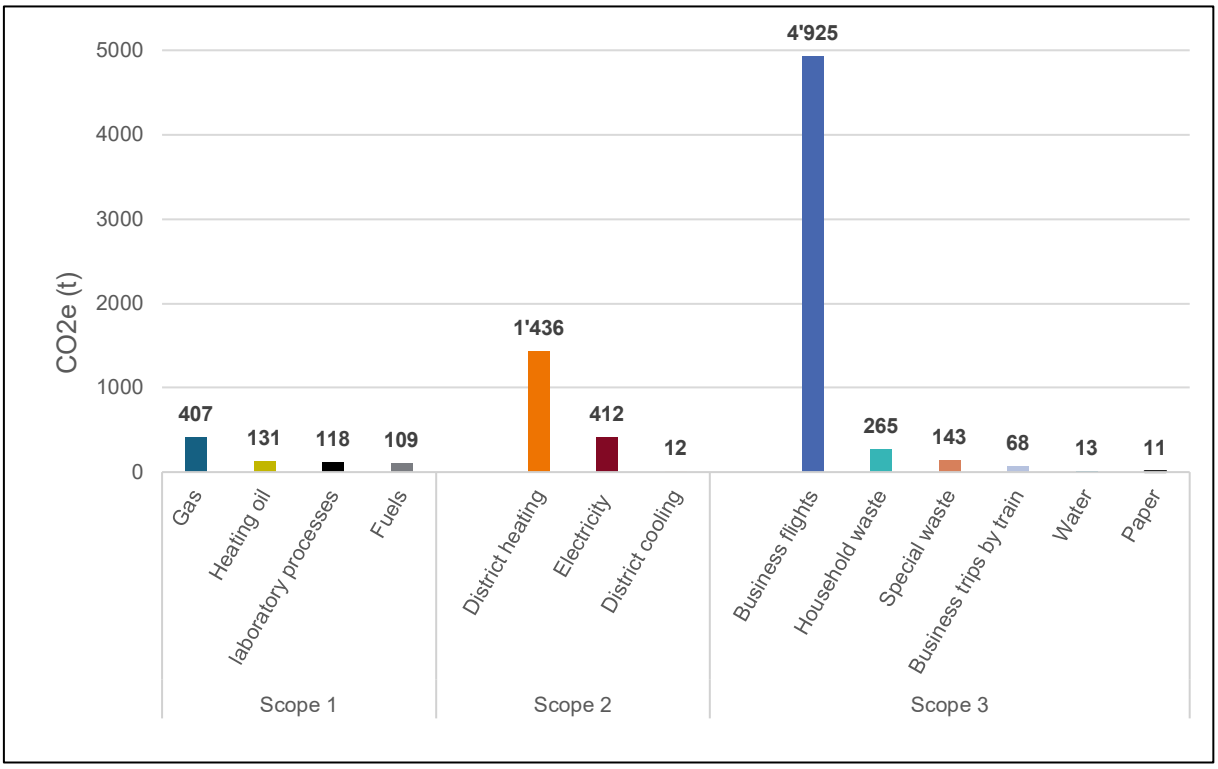

Figure 2: Greenhouse gas emissions of the University of Bern in 2024 in tons of CO_2e of the recorded sources. Electricity includes uses such as electricity for heating, for laboratories, IT and data centers, processes, office operations, air conditioning, lighting.

2.1 Development of emissions from 2019 to 2024

Table 1 shows the greenhouse gas emissions for the base year 2019, as well as for the years 2023 and 2024. Compared to the reference year of 2019, the University of Bern's total GHG emissions in 2024 were 1.2 percent higher. In terms of full-time equivalents (FTEs), however, there is a reduction of 9.4 percent.

There were no changes to the building stock in the current year of 2024 compared to 2023. The observed changes in emissions are therefore solely attributable to consumption, operating and structural effects as well as to the fact that the anesthesia gases of the veterinary clinics (Vetsuisse Faculty) and the Experimental Animal Facilities (EAC) were included in the GHG footprint for the first time.

Table 1: Multi-year comparison of greenhouse gas emissions in tons of CO_2e for the years 2019, 2023 and 2024. Business trips by train were recorded for the first time in 2023.

Scope 1: Direct greenhouse gas emissions in tons of CO_2e	2019	2023	**2024**	**Change 2024 to 2019**	
Heating oil	145	152	**131**	↓ -14	-9.8%
Gas	77	726	**407**	↑ 330	428.2%
Fuels (fleet of vehicles)	121	127	**109**	↓ -12	-10.0%
laboratory processes (Livestock, experimental areas, laboratory gases)	53	54	**118**	↑ 65	124.4%
Scope 2: Indirect greenhouse gas emissions from purchased electricity, district heating and cooling in tons of CO_2e					
Electricity	340	338	**412**	↑ 72	21.1%
District heating	1,912	1,198	**1,436**	↓ -476	-24.9%
District cooling	13	13	**12**	↓ -1	-6.6%
Scope 3: Other indirect greenhouse gas emissions in tons of CO_2e					
Paper	14	10	**11**	↓ -4	-25.7%
Water	22	16	**13**	↓ -9	-41.7%
Household waste	432	272	**265**	↓ -167	-38.6%
Special waste	94	132	**143**	↑ 49	52.3%
Business flights	4,734	4,569	**4,925**	↑ 191	4.0%
Business trips by train	0	59	**68**	↑ 68	-
Total	7,958	7,665	**8,050**	↑ 92	1.2%

2.1.1 Development of Scope 1 emissions 2019-2024

The University of Bern's Scope 1 emissions fell significantly in 2024 compared to the previous year. Compared to 2023, direct emissions fell by 27.7 percent. The main reason for this is the complete conversion of the purchased gas product to ewb.Öko.GAS as of January 1, 2024 across all sites. This means that the University of Bern used only biogas in the current year for the first time.

The increase in natural gas-related emissions in previous years is attributable to the expansion of the GHG footprint perimeter. In 2020, two additional buildings were added to the GHG footprint, resulting in a corresponding increase in emissions. In the course of 2021, the consumption data for a newly occupied laboratory building with a gas-fired autoclave were also added. The use of this autoclave has intensified since then, which is reflected in the emission values for 2023.

Emissions from the use of heating oil fell by 9.8 percent in 2024 compared to the base year and by 13.6 percent compared to 2023. This decline is primarily attributable to the reduction in heating oil consumption at the Hasli Ethological Station, where more than 4,000 fewer liters were purchased.

Emissions from the fuel consumption of the University's vehicle fleet decreased. Compared to the base year of 2019, the calculations show a reduction of around 10 percent compared to 2023 of around 15 percent. This decline could be partly due to the increasing rate of electrification of the fleet. As at 31 December 2024, the fleet consisted of 70 conventional vehicles and eight electric vehicles, while in 2019 it comprised 74 conventional and two electric vehicles.

Since 2024, the anesthetic gases from the veterinary clinics (Vetsuisse) and the Experimental Animal Facilities (EAC) have been included in the GHG footprint for the first time. This expansion of the scope of the GHG footprint explains the significant increase in emissions from laboratory processes, which increased by 124.4 percent compared to the base year and by 120.1 percent compared to 2023. Data collection in this area is not yet complete and is being continuously developed. Accordingly, there is currently a heightened level of data and GHG footprint-related uncertainty in this emissions category, which needs to be taken into account as a possible data gap.

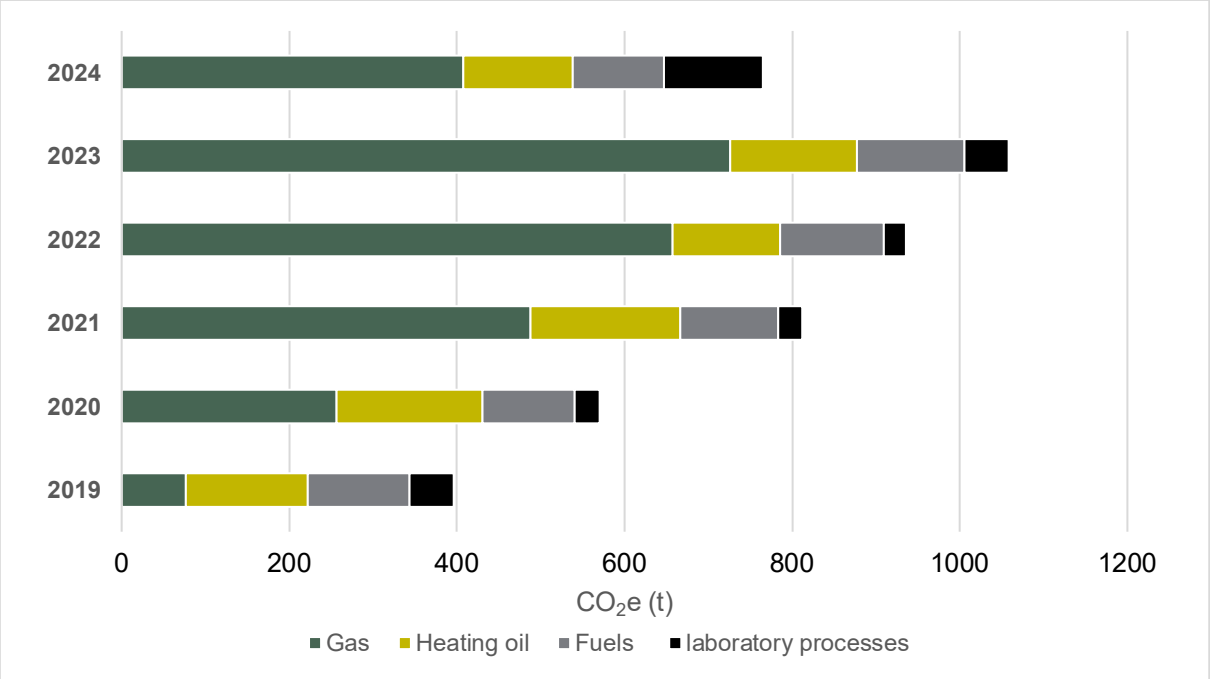

Figure 3: Multi-year comparison of Scope 1 emissions 2019-2024

2.1.2 Development of Scope 2 emissions 2019-2024

The University of Bern's Scope 2 emissions showed an increase in the reporting year of 2024, which was significantly influenced by changes in the emission factors of purchased energy sources as well as by climatic conditions.

Emissions from the purchase of district heating in 2024 were 19.8 percent higher than in the previous year of 2023, while they were 24.9 percent lower than in the 2019 reference year. The main reason for this development is changes in the emission factors of the district heating products purchased. The share of renewable energies in district heating cannot be precisely quantified, as it consists of several energy sources, including waste, wood, natural gas, waste heat and groundwater heat pumps.

The University of Bern purchases a total of five (or six, whereby the products of ewb and Inselspital, Bern University Hospital, are identical) different district heating products, some of which have variable emission factors and are recorded annually by the respective suppliers. In 2024, the emission factor of the district heating supplied by Energie Wasser Bern (ewb) was 0.040 kg CO_2/kWh, which corresponds to an increase of 0.009 kg CO_2/kWh compared to 2023.

The climatic conditions of 2024 must also be taken into account. Compared to 2023, 2024 saw a higher number of heating degree days[3], which led to a greater need for heating and – in addition to the increased emission factors – also explains the increase in district heating-related emissions.

Emissions from electricity consumption increased by 21.9 percent in 2024 compared with the previous year of 2023 and were 21.1 percent higher than the base year of 2019. This development is primarily attributable to certificates of origin of purchased electricity, which had higher emission factors in the year under review. In contrast, actual electricity consumption changed only slightly and was only 2 percent above 2023 levels, meaning that the increase in emissions is almost entirely attributable to the emission factors.

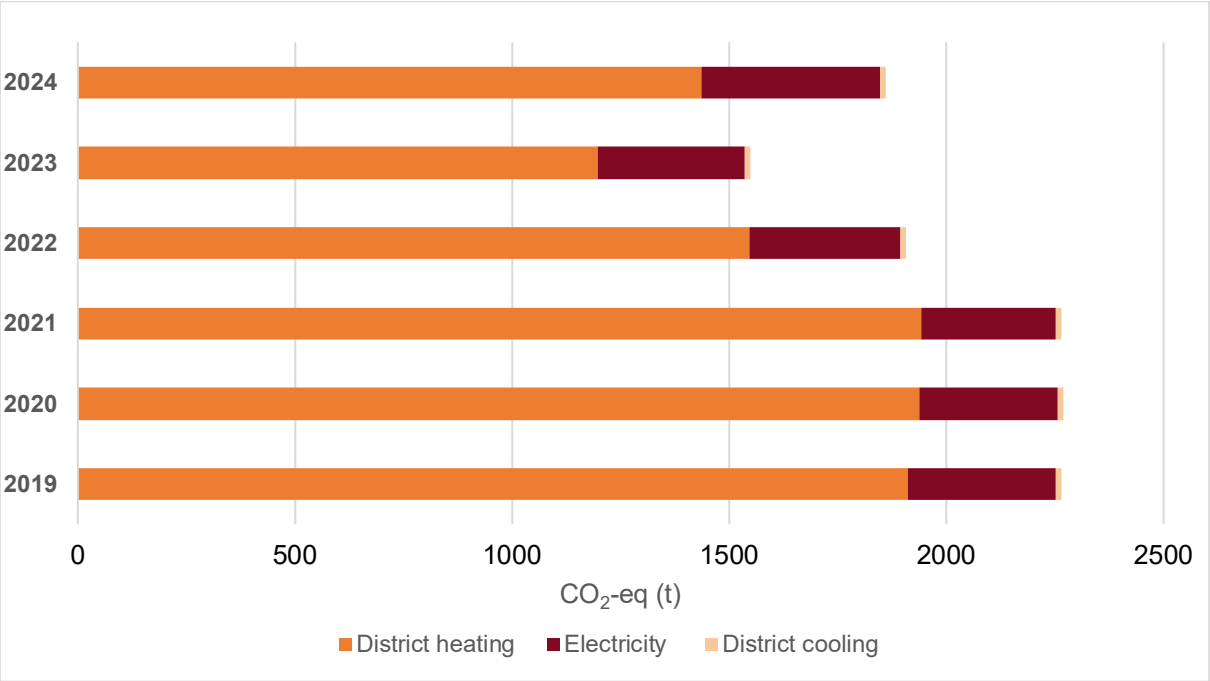

Figure 4: Multi-year comparison of Scope 2 emissions 2019-2024

2.1.3 Development of Scope 3 emissions 2019-2024

Emissions from air travel increased by 4.0 percent in 2024 compared with the reference year of 2019 and were thus again above the reduced level caused by the pandemic. Compared to the previous year of 2023, flight-related emissions increased by 7.8 per cent. To reduce emissions from business trips, the University of Bern has had a traffic light system for university business trips since 2020 that makes it mandatory to use the train for certain European destinations. This traffic light system was institutionalized in 2022 through a guideline on more climate-friendly business trips.

Emissions resulting from household waste in 2024 were 38.6 percent below the level of the 2019 base year. A significant decline was already recorded in 2020, and emissions have since levelled off at a stable

[3] City of Bern, heating days and heating degree days in 2023 and 2024 City of Bern: https://www.bern.ch/themen/stadt-recht-und-politik/bern-in-zahlen/katost/02rauumw/jahresdaten/t-02-04-030-heiztage-und-heizgradtage-2023-und.pdf/download

level. In addition, the University collects PET and aluminum separately and returns these recyclable materials to the recycling loop. The emissions avoided as a result are not reported in this GHG footprint.

Emissions from hazardous waste have increased by a total of 52.3 percent since the 2019 reference year and increased by a further 8.8 percent compared to the previous year of 2023. Since 2022, hazardous waste volumes have remained at a consistently high level compared to 2019. The exact reasons for this increase have not yet been conclusively clarified and will be further investigated as part of specific analyses.

Greenhouse gas emissions from paper consumption in 2024 were 25.7 percent lower than the reference year of 2019. Since 2020, these emissions have been at a comparable level and account for just 0.14 percent of total emissions. This indicates that paper consumption at the University of Bern has been reduced sustainably through targeted measures and active commitment.

Emissions from water consumption were 41.7 percent lower in 2024 compared to the reference year of 2019. In spite of the increasing number of employees, water consumption per person is steadily decreasing. Water-related emissions account for 0.17 percent of total emissions.

These savings illustrate the commitment of employees, who make an active contribution to the transformation towards sustainable development in day-to-day life at the University.

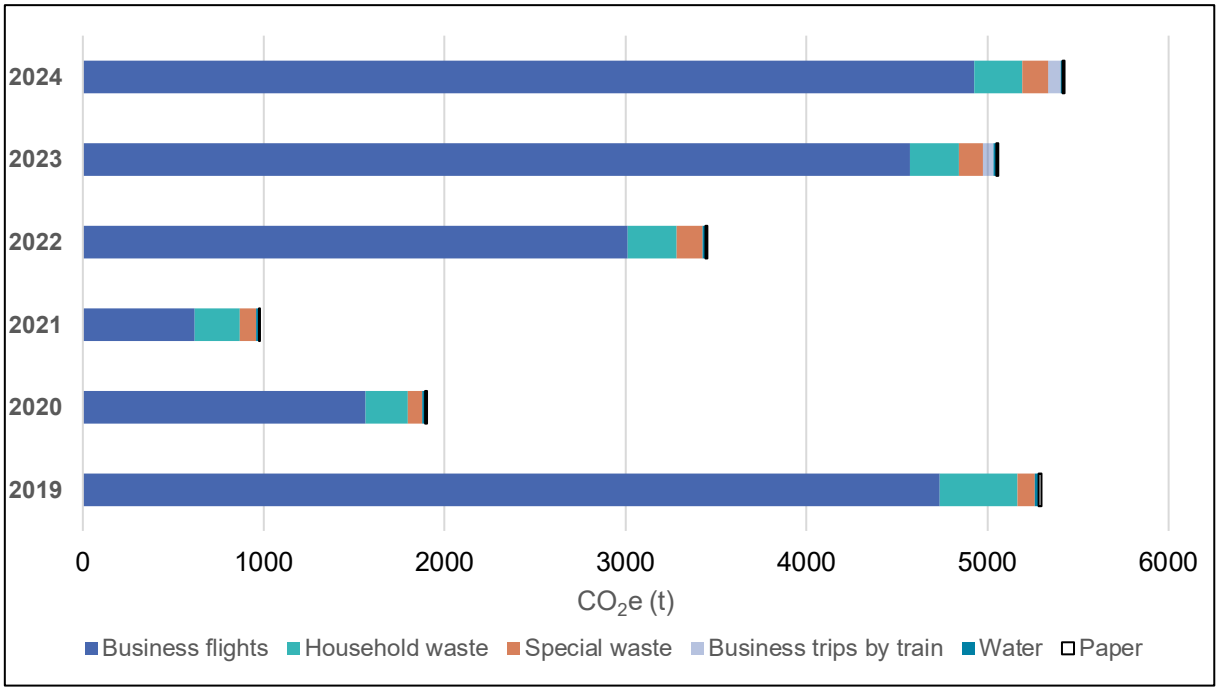

Figure 5: Multi-year comparison of Scope 3 emissions 2019-2024

2.2 Emissions from the ZFV canteens

The University of Bern Canteen Operations Foundation has commissioned “ZFV-Unternehmungen” and Bakery Bakery (located at Gertrud-Woker-Strasse) to manage its catering operations. The sustainability of catering is a key strategic objective of the Foundation. The ZFV canteens prepare their own GHG footprints; the data used here was provided by ZFV.

In 2024, emissions resulting from the ZFV mandate at the University of Bern across all three scopes amounted to 1,207 tons of CO_2e , which is 12 percent higher than the emissions of the previous year and 4 percent higher than the emissions of the base year.

The Scope 3 emissions of the ZFV are particularly relevant for the University of Bern, as they reflect the University’s indirect emissions from catering. Scope 3 emissions increased by around 13 percent between 2022 and 2024, but fell by 11 percent compared to the prior year of 2023.

Emissions from food tend to develop in line with sales. Between 2022 and 2024, they increased by 13.4 percent.

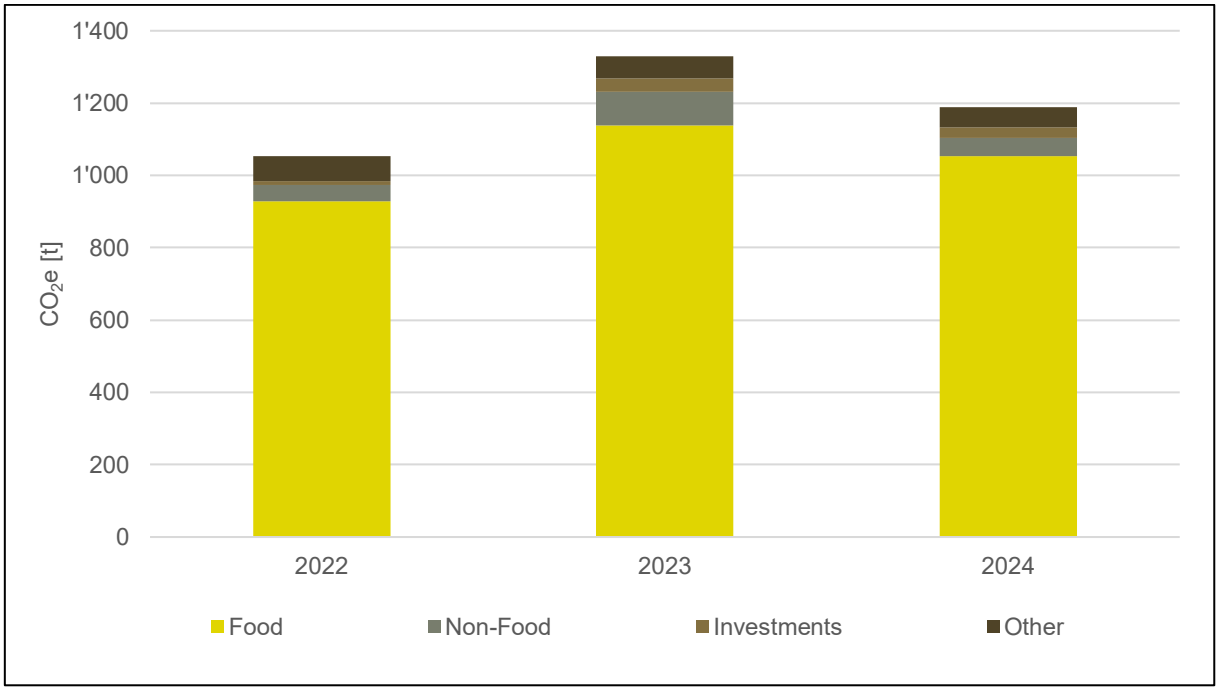

Figure 6: Scope 3 emissions in CO_2e, ZFV mandate 2022, 2023 and 2024

In 2024, purchased goods and services accounted for the largest share of emissions within the ZFV mandate at the University of Bern. Within this category, food accounted for around 87 percent of emissions, making it by far the largest source of emissions.

Around 50 percent of the total emissions of the ZFV mandate in 2024 are attributable to animal products, in particular meat, dairy products, fish and seafood. Compared to the previous year, there was a reduction in emissions from meat products, while emissions from dairy products increased over the same period.

In 2023, meat products accounted for around 30 percent of the total emissions of the ZFV mandate. This figure was around 20 percent for dairy products and around 4 percent for beverages. Within the meat category, the purchase of chicken caused the highest emissions in 2024, at around 121 tons of CO_2e.

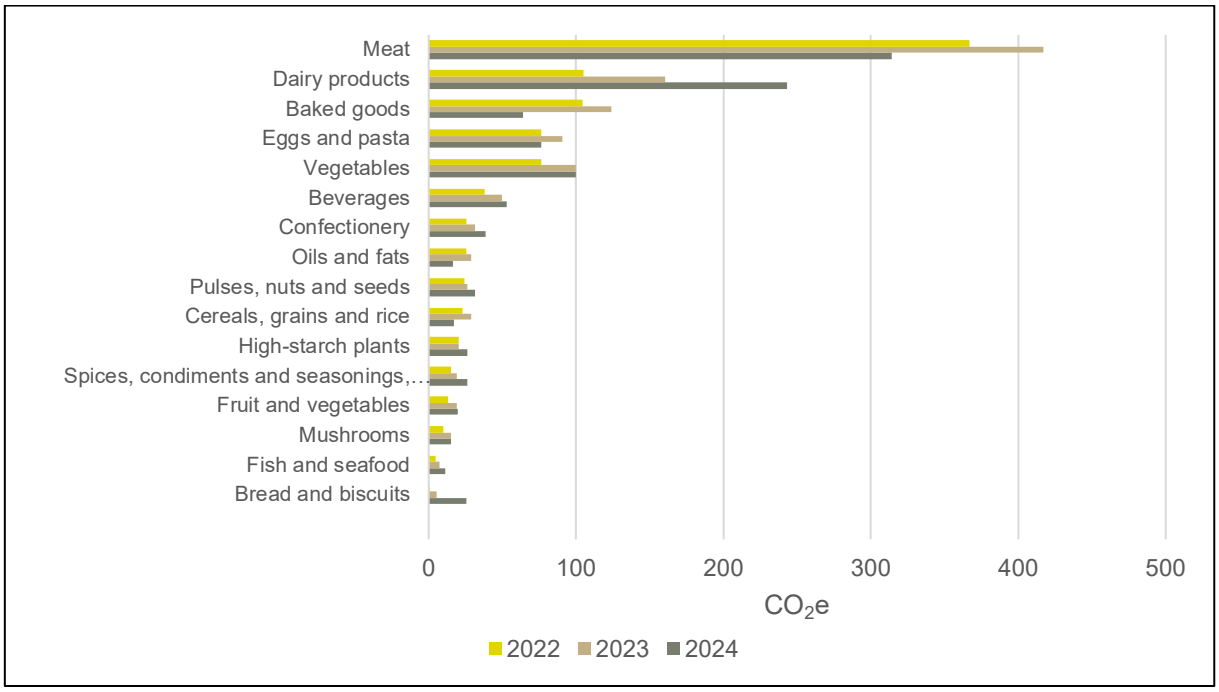

Figure 7: Greenhouse gas emissions in tons of CO_2e from different food categories (meat and fish, dairy products, beverages) for the years 2023-2024.

3. Conclusion

The development of emissions at the University of Bern reflects both regular University operations as well as structural and GHG footprint-related changes in energy procurement and data collection. Compared to the reference year of 2019, total emissions in 2024 were 1.2 percent higher, while emissions per FTE decreased by 9.4 percent.

A key driver of the lower emissions in 2024 was the complete switch to biogas, which made it possible to significantly reduce Scope 1 emissions from natural gas. As a result, Scope 1 emissions fell by a total of 27.7 percent compared with the previous year of 2023. At the same time, expansions of the data basis, in particular the first-time recording of anesthesia gases in veterinary clinics and Experimental Animal Facilities, led to a marked increase in emissions from laboratory processes. This development reflects the increasing completeness and methodological development of the GHG footprint.

Scope 2 emissions developed heterogeneously in 2024. While emissions from district heating remained significantly reduced compared to 2019 (–24.9 percent), they increased compared to 2023 due to higher emission factors and increased heating degree days for climatic reasons. The increase in electricity-related emissions is almost entirely attributable to the emission factors of the purchased electricity product, as actual electricity consumption changed only slightly.

In terms of Scope 3 emissions, air travel continues to be by far the largest source of emissions, accounting for 90.8 percent. Compared to 2019, flight-related emissions increased by 4.0 percent in 2024 and were thus again above the reduced level caused by the pandemic. The measures that have been in place since 2020 to promote more climate-friendly business trips, in particular the traffic light system including mandatory trains for certain European destinations, continue to form a key basis for the long-term limitation of this emission category.

Significant reductions compared with the reference year of 2019 are again evident in emissions from household waste, water and paper consumption, even if these only account for a marginal share of total

emissions. These developments underscore the impact of operational efficiency measures as well as the commitment of employees in day-to-day life at the University.

The emissions of the cafeterias operated by ZFV-Unternehmungen continue to be reported separately and are not part of the University of Bern's operating GHG footprint. Within the ZFV mandate, purchased food is the dominant source of emissions, with animal products accounting for around 50 percent of emissions. The reduction in emissions from meat products observed in 2024 coupled with an increase in emissions from dairy products illustrates the high relevance of the product composition for the climate impact of catering.

In conclusion, it should be noted that the University of Bern's GHG footprint has continued to develop since 2019. Expansion of the GHG footprint perimeter, improved data bases and the growing University community are influencing the development of emissions while at the same time increasing the transparency and informative value of the GHG footprint. Against this backdrop, the 2024 GHG footprint provides a robust basis for the further development of the Roadmap Climate 2030 and for the targeted prioritization of effective reduction measures.

Notes

The following table contains all activity data used for the University of Bern's greenhouse gas GHG footprint as well as the corresponding data sources for the emission factors.

Category	Quantity	Unit	Data source Emission factor
Heating oil	49,480	l	FOEN (editor) 2022[4]
Gas	3,284,907	kWh	KBOB, (2022)[5]
Fuels (fleet of vehicles) Diesel Petrol	43,143 29,886 13,257	l	FOEN (editor) 2022[4]
Total livestock Horses Cows Chickens Pigs	5,595 4 1 5,578 12	n	BUWAL 2019 (CORINAIR 2000)[6]
Experimental areas	5,000	m^2	BUWAL 2019 (CORINAIR 2000)[6]
Laboratory gases	238.56	kg	CO_2 Ordinance 2022, note 1[7]
Electricity	33,216,697	kWh	ewb.BLUE.Strom (electricity)
District heating	21,910,808	kWh	Supplier-specific information[8]
District cooling	3,644,208	kWh	ewb.NATUR.Strom[9]
Paper	14,492	kg	ecoinvent v3.9.1[10]
Water	169,698	m^3	ecoinvent v3.9.1[10]
Household waste	483,901	kg	ecoinvent v3.9.1[10]
Special waste	304,870	kg	ecoinvent v3.9.1[10]
Business flights	29,752,932	km	atmosfair – CO_2 report according to the VDR standard (incl. RFI 2)[11]
Business trips by train	3,902,927	km	Mobitool v3.0[12]

[4] FOEN (publisher) 2022: Projekte und Programme zur Emissionsverminderung und Erhöhung der Senkenleistung. Ein Modul der Mitteilung des BAFU als Vollzugsbehörde zur CO_2-Verordnung. 8th updated edition 2022; first edition 2013. Environmental enforcement no. 1315: 69 p.
[5] Life cycle assessment data in the construction sector 2009/1:2022. Coordination Conference for Public Sector Construction and Property Services (KBOB)
[6] BUWAL (editor) (2019): Handbuch Emissionsfaktoren für stationäre Quellen – CORINAIR Atmospheric Inventory Guidebook 2000. Federal Office for the Environment, Bern.
[7] BAFU (editor) (2022): Ordinance on the Reduction of Carbon Emissions (CO_2 Ordinance), SR 641.711, Note 1: GWP values of greenhouse gases.
[8] Supplier-specific emission factors were used for district heating, which were provided directly by the respective district heating providers (ewb, BEDAG, Marzili Bern district heating network).
[9] Electricity product of the station cooling system: ewb.NATUR.Strom
[10] ecoinvent (2023): ecoinvent database, Version 3.9.1. ecoinvent Association, Zurich
[11] atmosfair gGmbH: CO_2 reporting according to the VDR standard "CO_2-Berechnung Geschäftsreise" in cooperation with the German Travel Management Association (VDR). The emissions data take into account the calculation methodology of the VDR standard and radiative forcing impacts (RFI) for the recording of the extended climate impact of air travel
[12] FOEN (editor) / INFRAS (2023): mobitool – Tool for calculating greenhouse gas emissions from passenger and freight transport, Version 3.0