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UNIVERSITÄT BERN

2023 greenhouse gas report of the University of Bern

Tuesday, 18. February 2025

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1. Background

The University of Bern is known worldwide for its research and teaching on the topics of sustainable development and climate studies. The University of Bern is aware of its responsibility and, in addition to its contributions to research and teaching, is continuously working to reduce its greenhouse gas emissions during operations.

A carbon footprint was created for the first time for 2019, which serves as a reference footprint for reviewing progress. Since then, the data has been continuously expanded and refined. For example, other buildings were recorded and emissions from recorded train travel were added in 2023.

Other sustainability measures and climate protection projects are described in the separate Sustainability Report 2022/23.

1.1 System boundaries of the carbon footprint

Greenhouse gases (GHG) are reported uniformly in this report in terms of carbon dioxide equivalents (CO_2-e) to ensure comparability of the different greenhouse gases. The GHG footprint is based on the Greenhouse Gas Protocol[1], which distinguishes between direct emissions (Scope 1), indirect energy-related emissions (Scope 2) and other indirect emissions (Scope 3). The GHG footprint of the University of Bern includes emissions from the following sources.

Scope 1	Scope 2	Scope 3
• Heating oil • Natural gas • Vehicle fleet fuels • Laboratory gases, experimental areas, livestock	• District heating/cooling • Electricity	• Paper • Water • Waste (domestic waste, special waste) • Air travel • Train travel (for the first time in 2023)

The “Genossenschaft ZFV-Unternehmungen (ZFV)” operates the canteens and bistros on behalf of the University of Bern Canteen Operations Foundation and creates its own GHG footprint. For this reason, the data provided by ZFV is reported separately in section 2.2. There is currently a lack of meaningful, reliable data for emissions from commuter traffic, procurement (goods and services) and investments.

[1] About us. GHG Protocol; https://ghgprotocol.org/about-us; accessed on February 4, 2025.

2. Results of the University 2023 carbon footprint

Total emissions in 2023 amounted to 7,665 tons of CO_2-e. With 5,141 employees expressed in full-time equivalents (FTE) and 19,640 students, this corresponds to average emissions of 0.31 t CO_2-e per capita or 1.49 t CO_2-e/FTE.

Direct emissions (Scope 1) account for around 14 per cent of total emissions. 20 per cent of total emissions are related to district heating, electricity and district cooling (Scope 2), while the remaining 66 per cent can be attributed to other indirect emissions (Scope 3, see Figure 1).

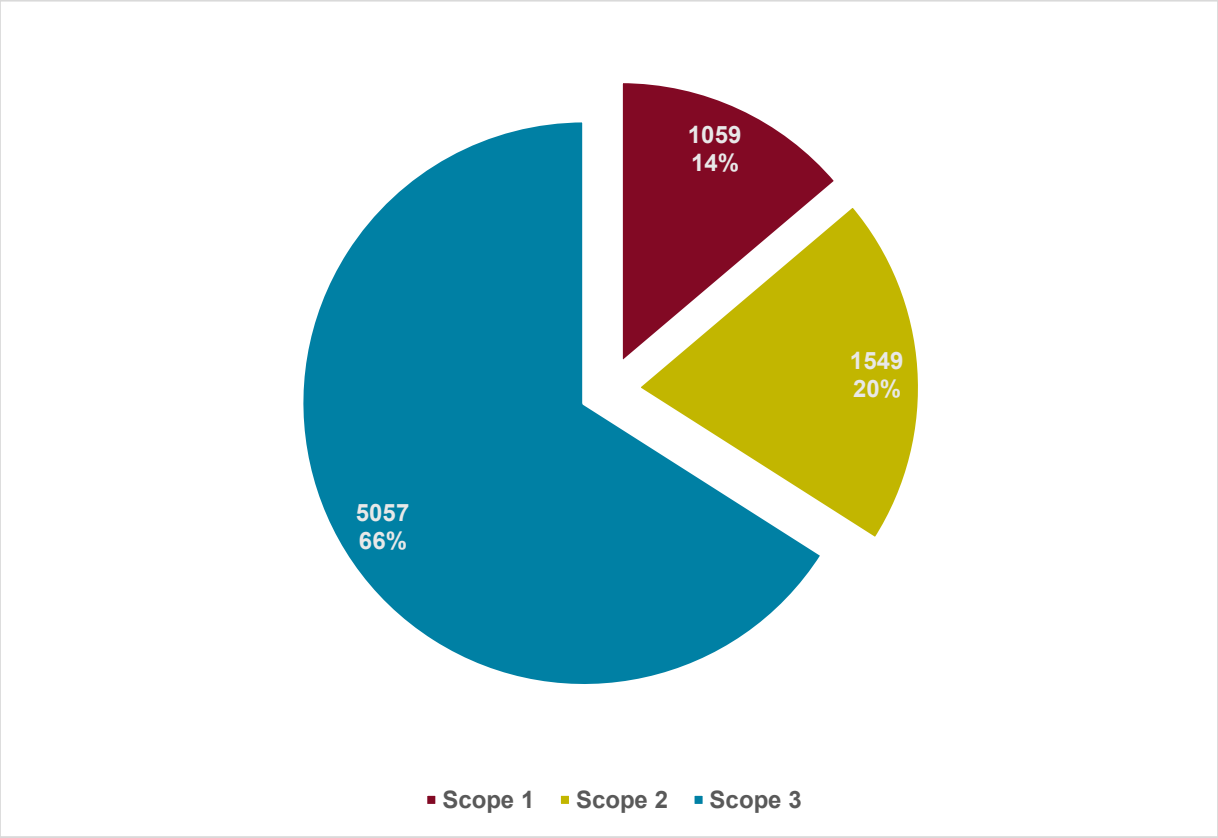

Figure 1: Greenhouse gas emissions in tons of CO_2-e and the percentage of total emissions broken down by scope.

Figure 2 illustrates the GHG emissions of the University of Bern in 2023, broken down by sources recorded. Emissions from air travel continue to be the largest single source, accounting for almost 60 per cent of total emissions. At 15.6 per cent, emissions from district heating suppliers come in second place, followed by 9.5 per cent of emissions caused by the natural gas supply. Slightly smaller proportions are accounted for by electricity (4.4 per cent), household waste (approx. 3.5 per cent), heating oil (2 per cent), fuels from the vehicle fleet (1.7 per cent) and hazardous waste (1.7 per cent). Emissions from business trips by train (recorded for the first time in 2023), laboratory gases, experimental areas, livestock farming, drinking water, paper and district cooling account for a marginal share of less than 0.8 per cent each.

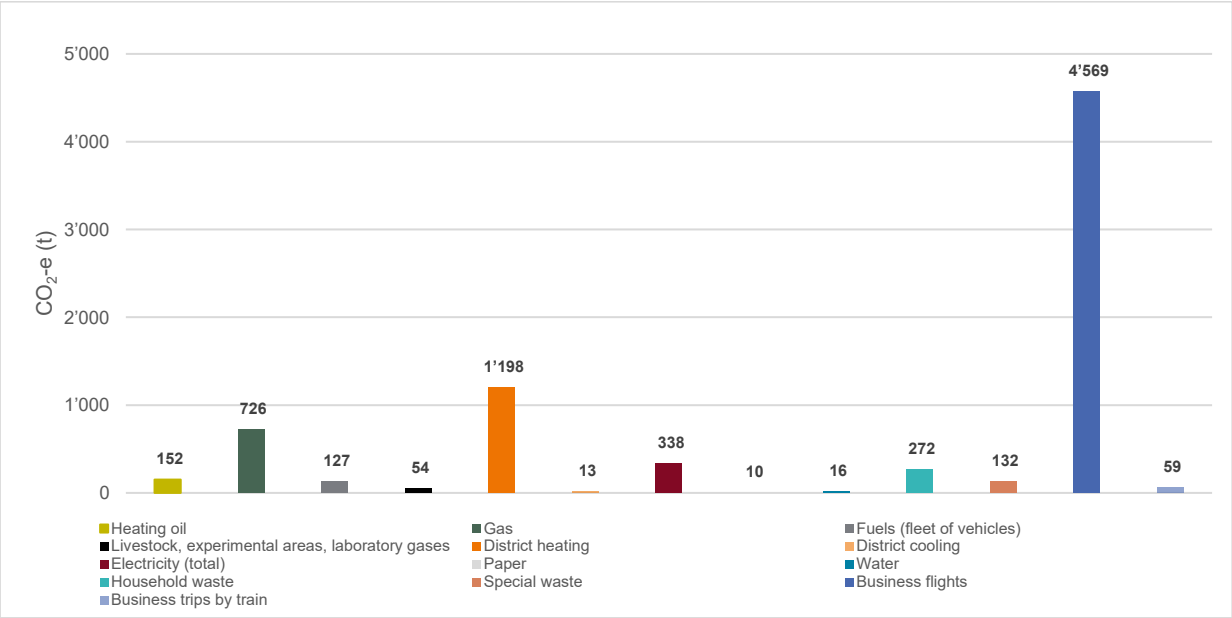

Figure 2: Greenhouse gas emissions of the University of Bern in 2023 in tons of CO_2-e from the sources recorded. Electricity includes uses such as electricity for heating, for laboratories, IT and data centers, processes, office operations, air conditioning, lighting. The district heating comes from four different sources.

2.1 Development of emissions from 2019 to 2023

Figure 3 shows GHG emissions for the period from 2019 to 2023. Compared to the reference year of 2019, GHG emissions in 2023 were 2.5 per cent or 10.5 per cent lower overall per FTE and 8.8 per cent lower per capita (FTE plus students). Emissions from air travel are no longer affected by the pandemic and are around 52 per cent above the 2022 value and 3.5 per cent below the 2019 value overall. The data for emissions from business flights for 2019 were incomplete, as some of the business flights were only recorded late in the following year and allocated to the year 2020. A larger decline in emissions can therefore be expected in 2023 compared with the reference year. In order to reduce emissions in this area, the University of Bern has had a Traffic light system for University business trips since 2020 that determines which European destinations have to be traveled to by train. In 2022, guidelines on University business trips with regulations on more climate-friendly business trips were introduced, which are enshrined in the traffic light system.

Emissions from the second-largest source of district heating were around 22.5 per cent lower in 2023 than in the previous year of 2022, 37.3 per cent lower than in the 2019 reference year. This reduction in emissions was influenced by various factors. This includes the demolition of the property at Erlachstrasse 9a. Another reason relates to the Engehalde site. Due to an instrumentation and control problem, less district heating was consumed there and more natural gas was used for heating instead. This shift is reflected in the natural gas footprint. In addition to the aforementioned reasons, some of the measures taken to contain the impending energy shortage in the autumn and winter of 2022 had an impact, as this heating period lasted until around April 2023. It should also be noted that fluctuations in emissions, especially from district heating, result from different emission factors that vary annually for the calculation of emissions in CO_2-e.

In 2020, two other buildings were included in the footprint, which explains the increased emissions from natural gas. In the course of 2021, the consumption data of a newly occupied laboratory building with a gas-fired autoclave were also added, the use of which has intensified since then. Compared to 2022, natural gas consumption increased by 10.5 per cent.

Emissions resulting from household waste have fallen by around 37.1 per cent since 2019. However, these had already fallen drastically in 2020 and have not changed significantly since 2022. Although emissions from hazardous waste have risen sharply by around 40 per cent since 2019, they have fallen by almost 9 per cent compared to the previous year of 2022.

GHG emissions from paper printing in 2023 were 31.6 per cent lower than in the reference year of 2019. These have been at a comparable level since 2020 and account for only 0.13 per cent of total emissions.

GHG emissions from water were 26 per cent lower than the reference year of 2019. In spite of the increasing number of employees, water consumption per person is steadily decreasing. The proportion of emissions from the use of water account for 0.2 per cent of total emissions.

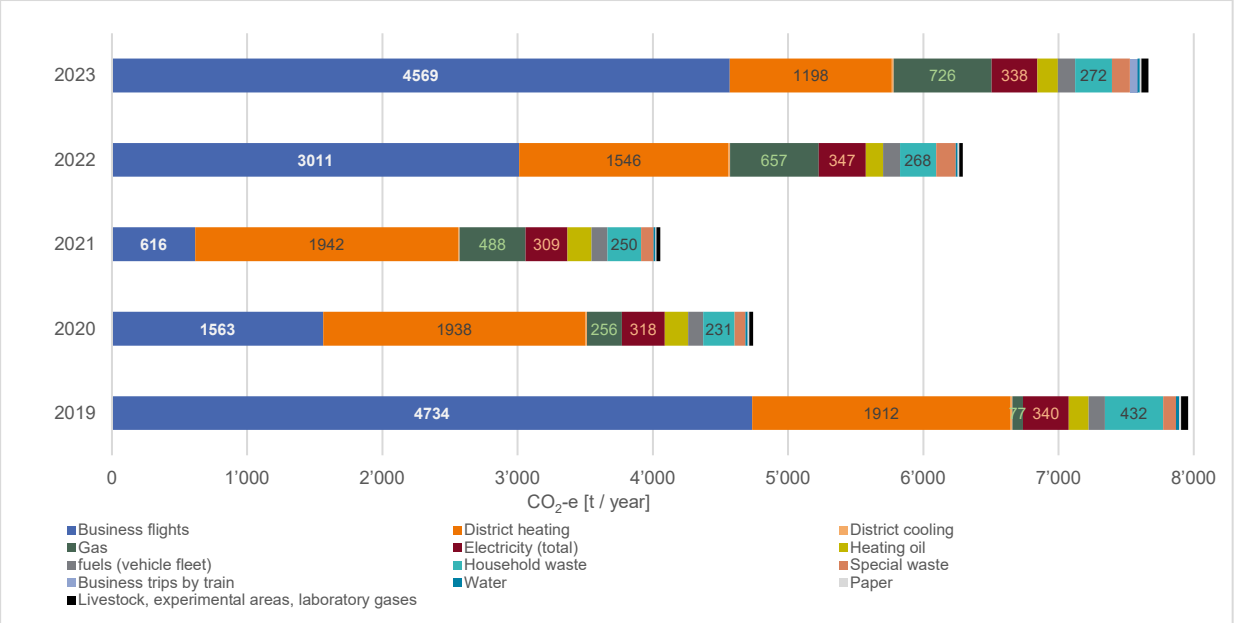

Figure 3: Multi-year comparison of greenhouse gas emissions in tons of CO_2-e from 2019 to 2023. Business trips by train were recorded for the first time in 2023.

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 the catering industry. The sustainability of catering is a key strategic objective of the Canteen Operations Foundation. The ZFV canteens create their own GHG footprints. The illustrations and data used here were provided by ZFV.

As disclosed in Figure 4, the total emissions of the ZFV mandate at the University of Bern amounted to 1,370 tons of CO_2-e in 2023. They have increased by 18 per cent compared to the previous year of 2022 (1,160 tons).

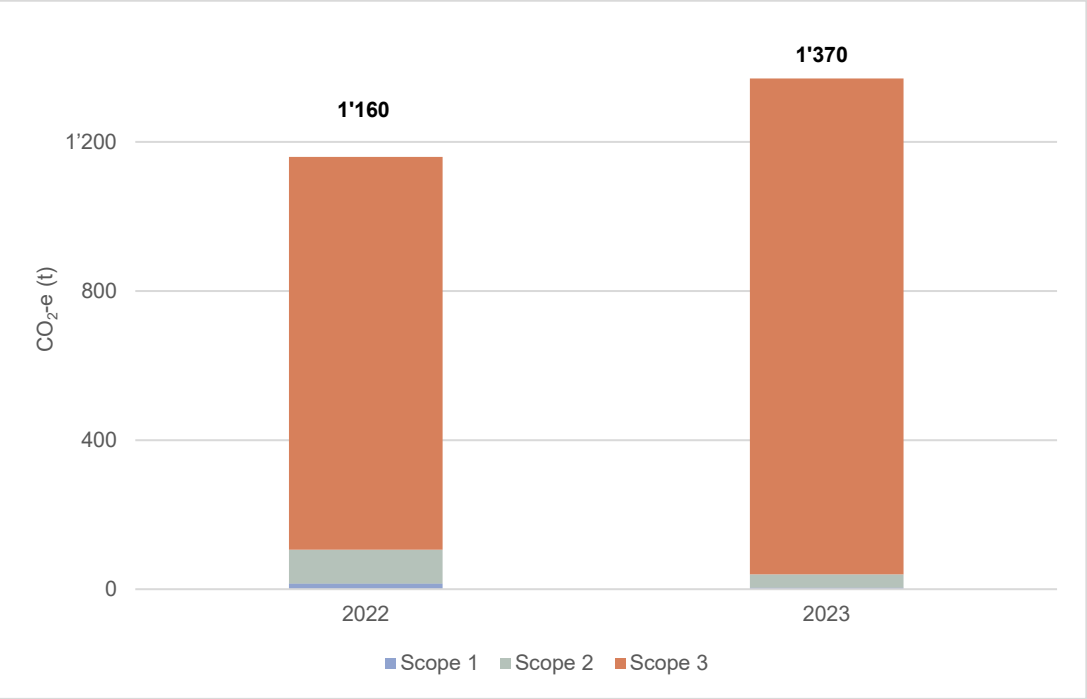

Figure 4: Greenhouse gas emissions in tons of CO_2-e of the ZFV mandate in 2022 and 2023 by scope

At around 90 per cent, purchased goods and services accounted for the largest share of emissions from the ZFV mandate at the University of Bern in 2023. Of these, food is the largest emission category, accounting for around 83 per cent of total emissions, while non-food items accounted for around 7 per cent of total emissions.

In 2023, animal products such as meat, fish and dairy products accounted for 43 per cent of total emissions. In the meat sector, most emissions (approx. 142 tons of CO_2-e) were caused by beef. In 2023, dairy products accounted for 12 per cent of emissions, while beverages accounted for around 3 to 4 per cent of total emissions (see Figure 5).

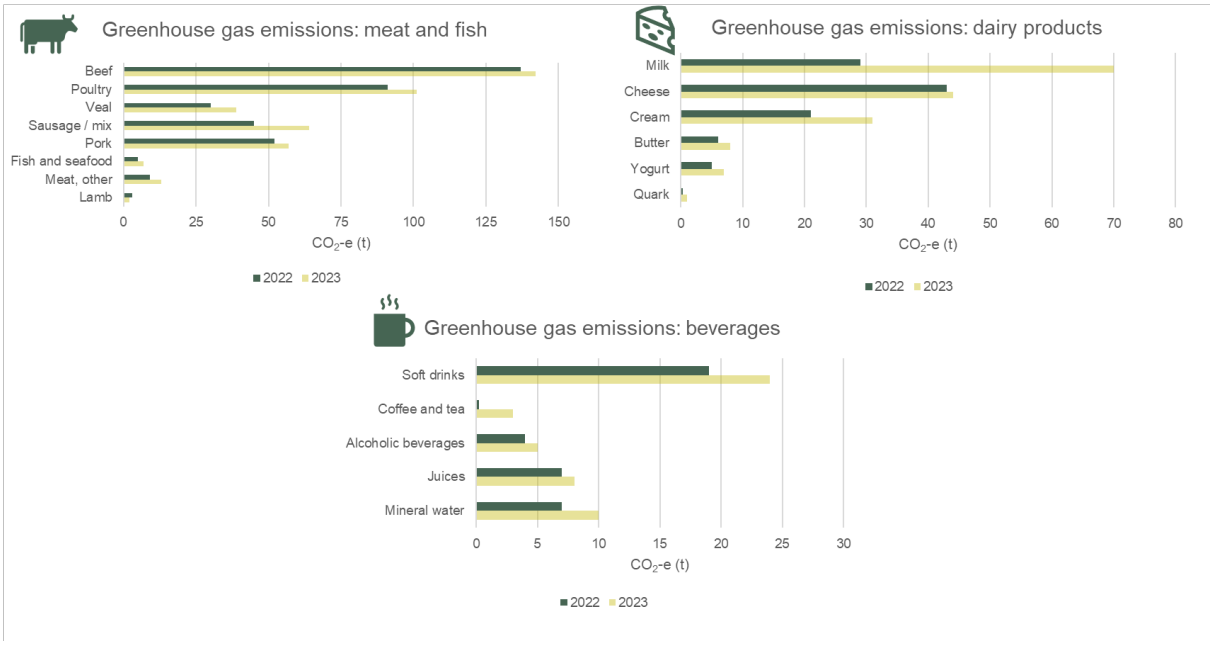

Figure 5: Greenhouse gas emissions in tons of CO_2-e from different food categories (meat and fish, dairy products, beverages) for the years 2022 and 2023.

3. Conclusion

The carbon footprint for 2023 is virtually no longer influenced by the restrictions of the coronavirus pandemic and is only partially influenced by the measures taken to contain the threat of energy shortages in the autumn and winter of 2022, which lasted until around April 2023. Compared to 2019, total emissions in 2023 are around 2.5 per cent lower. This is primarily due to the decline in emissions from district heating (minus 37.3 per cent), which remains the second-largest source of greenhouse gases. Emissions from air travel, the University of Bern's largest source of emissions accounting for 60 per cent of total emissions, increased by 52 per cent compared to the previous year, which was still impacted by the pandemic. Compared to the reference year of 2019, these emissions fell by 3.6 per cent in 2023. As mentioned, it should be noted that the emissions from business flights in the reference year of 2019 were incomplete and some were allocated to the year 2020.

Emissions from household waste, water consumption and paper also decreased. In contrast, emissions from natural gas and hazardous waste have increased significantly. For the first time, the emissions of the canteens operated by ZFV were made available for the years 2022 and 2023 but are not part of the University's footprint. Animal products account for the majority of emissions (43 per cent). It can be assumed that part of the increase in emissions from 2022 to 2023 is due to normalization following the coronavirus pandemic.

In conclusion, it should be noted that the recording of GHG emissions has continued to develop since 2019 and new buildings and other sources have been added, among other things. The University of Bern also has a growing number of employees and students. Since 2019, the number of students has increased by 5.7 per cent and the number of employees in FTEs by 8.9 per cent. Year-on-year increases of 1.3 per cent and 1.8 per cent, respectively, were recorded for the previous year of 2022. This growth has an impact on the University's emissions.