

2021 greenhouse gas report of the University of Bern



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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. Yet sustainability and climate protection aren't just topics addressed in the University's research and teaching – they're actually a matter of special concern with respect to its operations, as well: the University is aware of its responsibility and makes every effort to minimize its operations-related CO₂ emissions. It has therefore set itself the goal of becoming a climate-neutral institution by 2025 in all areas in which it has direct influence.

The University of Bern calculated its carbon footprint for the first time in 2019 to take stock of where the University stands on the matter and to establish a base year for measures implemented in the future to reduce and offset carbon dioxide emissions. The carbon footprint for 2021 described below is the university's third carbon footprint and, like the carbon footprint for 2020, is shaped by the repercussions of the coronavirus pandemic, making comparability difficult.

2. 2021 carbon footprint of the University of Bern

2.1 System boundaries of the carbon footprint

The University of Bern's carbon footprint considers all relevant greenhouse gases and expresses them in terms of carbon dioxide equivalents (CO_{2eq}).¹

The carbon footprint is geared toward the GHG Protocol, which distinguishes between direct emissions (Scope 1), indirect energy-related emissions (Scope 2) and other indirect emissions (Scope 3).² The University's carbon footprint factors in emissions from the following sources:

- Scope 1:
 - Heating oil
 - Natural gas
 - Fuels (university's fleet of vehicles)
 - Laboratory gases, experimental areas, livestock

- Scope 2:
 - District heating
 - District cooling
 - Electricity

- Scope 3:
 - Paper (Uniprint)
 - Water
 - Waste disposal (garbage and special waste)
 - Air travel

¹ All greenhouse gases were converted to carbon dioxide equivalents (CO_{2eq}) based on their specific global warming potential and using a time horizon of 100 years.

² The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard, Revised Edition. World Business Council for Sustainable Development (WBCSD), and World Resources Institute (WRI).

Due to a lack of available data, the footprints for 2019 to 2021 do not yet include business travel via public transportation and by car. Going ahead, the University aims to document these emissions as well and report them in its carbon footprint.

Emissions generated through the procurement of consumables and furnishings (laboratory equipment, furniture, IT devices, laboratory and office consumables) were not included in the carbon footprint due to a lack of data.

Operation of the student cafeteria, which is managed by an external company – ZFV-Unternehmungen – was excluded from the carbon footprint of the University of Bern since ZFV-Unternehmungen prepares its own carbon footprint.

2.2 Results of the 2021 carbon footprint

The University of Bern produced a total of around 4,094 tons of CO_{2eq} emissions in 2021. With around 5,050 employees expressed in terms of full-time equivalents (FTE), this corresponds to average emissions of roughly 0.81 t CO_{2eq} / FTE per year.

The direct emissions (Scope 1) of the University of Bern account for around 20% of total emissions. Nearly 56% of overall emissions are related to district heating, electricity and district cooling (Scope 2), while the remaining approx. 24% can be attributed to other indirect emissions (Scope 3).

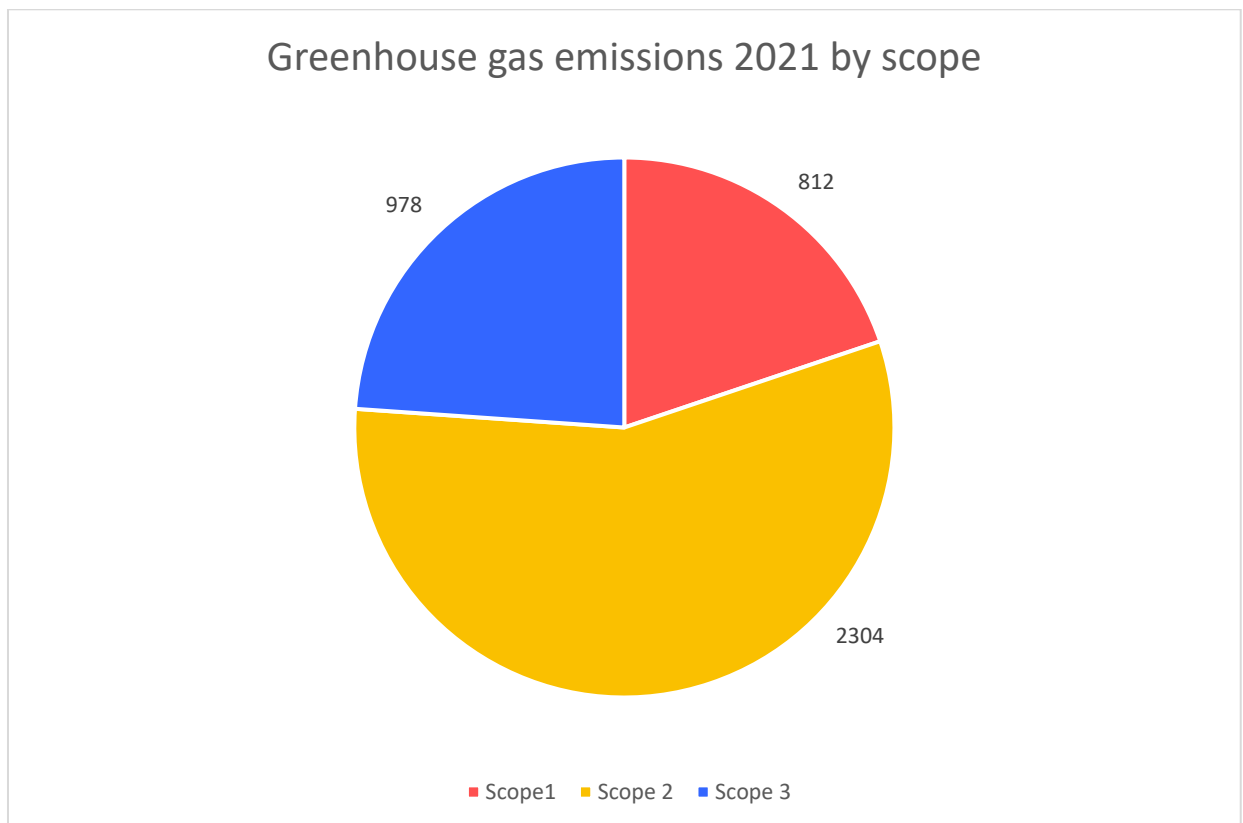


Figure 1: Greenhouse gas emissions of the University of Bern, 2021. Scope-based presentation of greenhouse gas emissions in t CO_{2eq}



Some 15% of total emissions were caused by work-related air travel (616 t CO_{2eq}), about 12% were caused by the natural gas supply. The vast majority of emissions (approx. 48%) are generated by the suppliers of district heating. Unlike in the 2019 base year, business travel no longer represented the largest source of emissions, a fact attributable to travel restrictions related to the coronavirus pandemic.

Expressed as a percent of total emissions, smaller shares are produced in connection with electricity procurement (approx. 7%), the disposal of garbage (approx. 6%), heating oil consumption (approx. 4%) as well as the operation of the vehicle fleet and special waste disposal (approx. 2% each). Emissions from laboratory gases, experimental areas, livestock farming, the purchase of drinking water, the use of paper and the purchase of district cooling only account for a marginal share of the overall footprint, which amounts to less than 0.7% in each case.

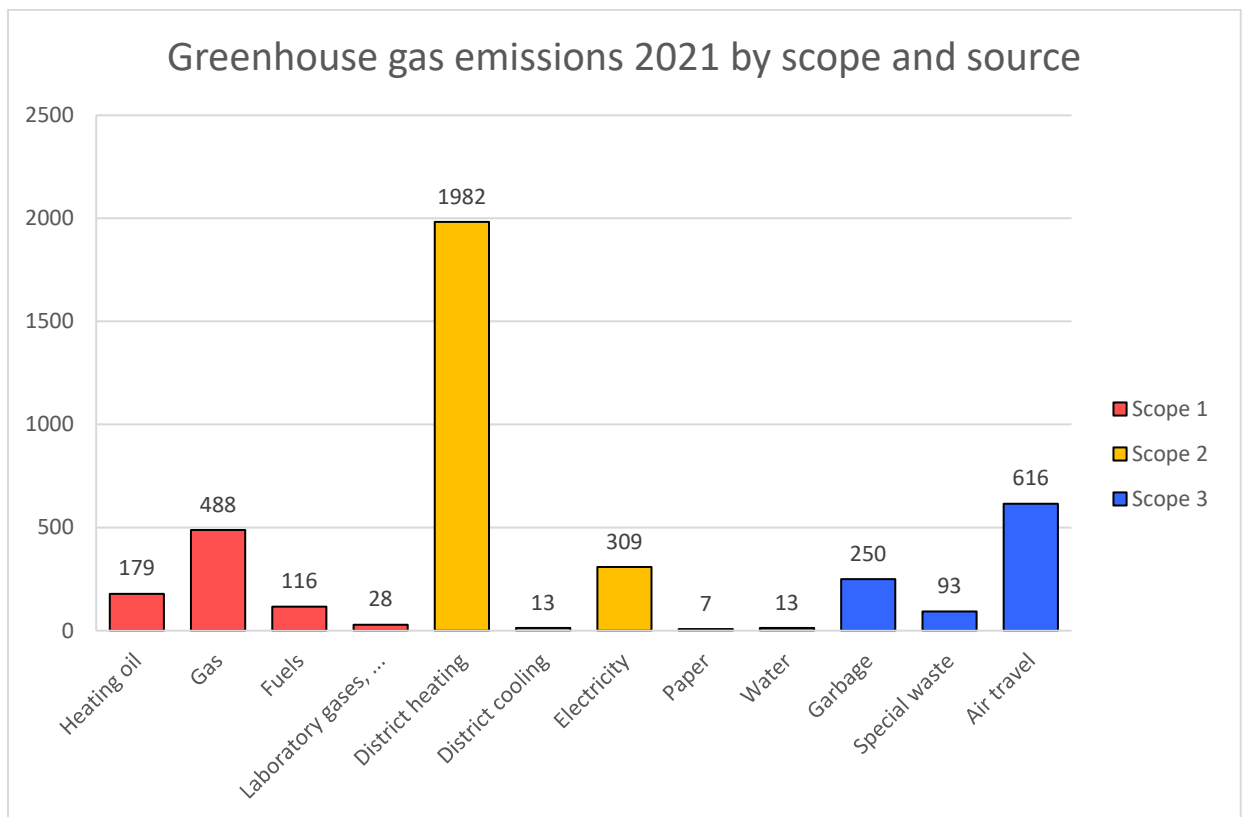


Figure 2: Greenhouse gas emissions of the University of Bern, 2021. Greenhouse gas emissions shown by source, expressed in t CO_{2eq} and attributed to the various scopes by color.

3. Conclusion

Because of the coronavirus pandemic, the carbon footprint for 2021 paints a very different picture than the carbon footprint from the 2019 base year.

Taken together, total emissions in 2021 amounted to over 4,094 t CO_{2eq} (compared to 4,700 t CO_{2eq} in the previous year and 7,800 t CO_{2eq} in 2019). The decline is attributable to the decrease in air travel due to the coronavirus pandemic: in 2020, flight-related emissions declined to around one third of the previous figure (from 4,734 t CO_{2eq} in 2019 to 1,563 t CO_{2eq} in 2020) and then by more than half again in 2021 (from 1,563 t CO_{2eq} in 2020 to 616 t CO_{2eq} in 2021). Since flights accounted for a smaller share in 2021, the percentage of emissions allocated to Scope 3 was also smaller than in the previous years.

Direct emissions (Scope 1) rose compared to the previous years. This is due to the fact that no data regarding natural gas consumption was available for a few buildings in the 2019 carbon footprint as well new buildings that were added to the footprint's scope in 2021. Data for two more buildings was added in 2020 that had not yet been included in the 2019 footprint. Consumption data for a newly occupied lab building with a gas-fired autoclave was included in 2021. This data was incorporated into the footprint for 2021, which resulted in a corresponding increase in the figures for natural gas.

The other figures contained in the carbon footprint remained relatively stable. Changes compared to the 2019 base year are particularly evident as a result of differences in how university buildings were used in response to the requirements and recommendations that were put into place nationwide from March 2020 onward in an effort to contain the coronavirus pandemic.

Buildings were still heated with heating oil, natural gas and district heating. In fact, compared to the previous years, there was actually a slight increase in greenhouse gas emissions in these areas. As described above, this is mainly due to the higher natural gas values (Scope 1) based on additional data and a newly occupied building. Similarly, further buildings with district heating (Scope 2) were added for the 2021 carbon footprint, which resulted in a slight increase in emissions attributable to district heating. The increase in consumption related to natural gas and district heating was also attributable to the colder winter and the increase in the number of heating degree days reported.

Like in the previous year, direct emissions from the vehicle fleet, laboratory gases and experimental areas as well as indirect emissions that arise in connection with the purchase of drinking water, the use of paper and garbage disposal were at a lower level than in 2019 since employees and students were on site less frequently due to the coronavirus pandemic.

The figure below shows a multi-year comparison for 2019-2021 to highlight both the sharp decline in the share of emissions attributable to air travel as a result of the pandemic as well as the increase in emissions related to the natural gas supply, which is attributable to more precise data collection and the addition of new buildings. Because the general scope has changed so much, any comparison between the carbon footprints or assessments regarding the effectiveness of measures aimed at reducing air travel, in particular, would be meaningless.

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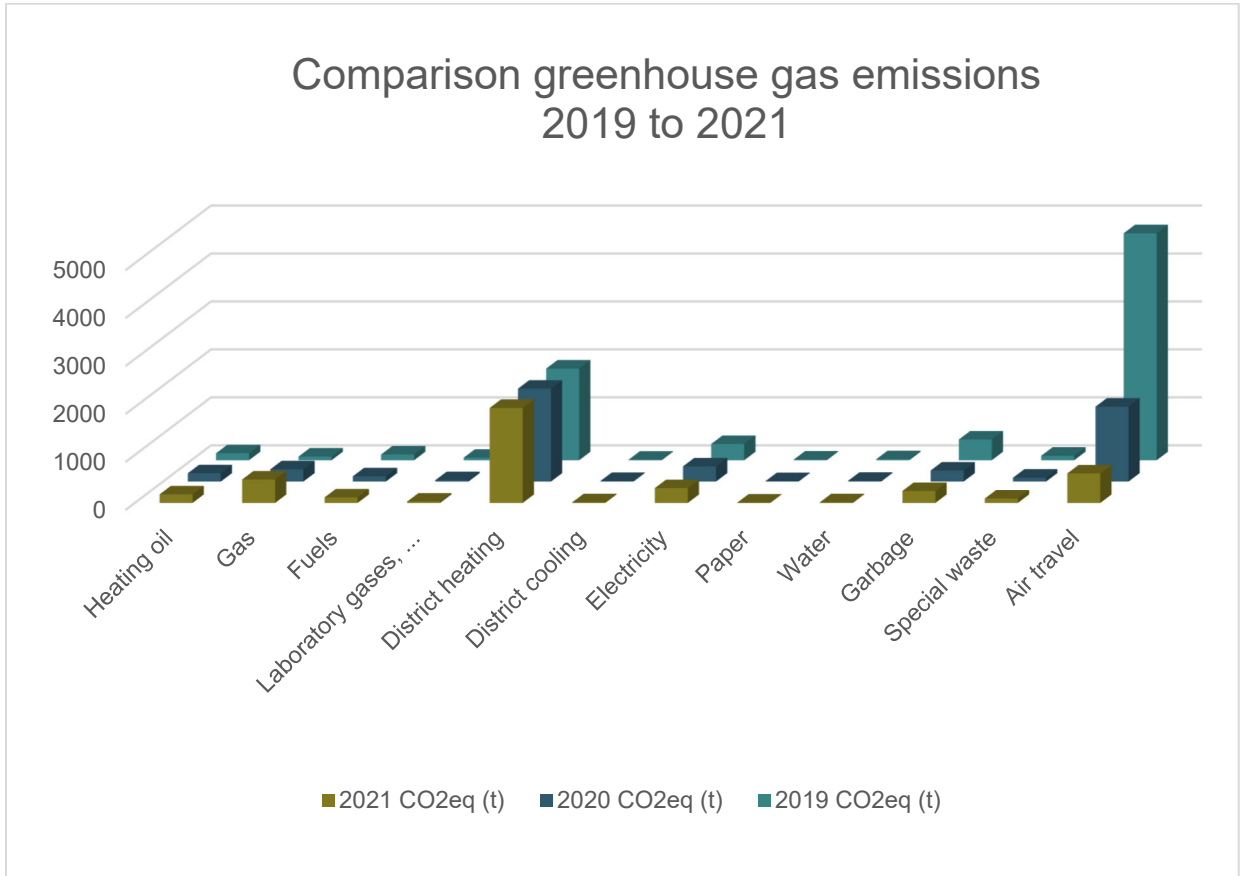


Figure 3: Greenhouse gas emissions of the University of Bern, 2021. Greenhouse gas emissions shown by source, expressed in t CO_{2eq} and attributed to the various years by color.