Climate Action Plan of the University of Passau

Summary

To effectively address the climate crisis, a drastic reduction in global greenhouse gas (GHG) emissions is essential. The University of Passau (UP) acknowledges its responsibility to reduce its own emissions. To achieve this, a Climate Action Manager was hired in 2023, partly funded by the Federal Ministry for Economic Affairs and Climate Action (BMWK).

This climate action plan outlines the path for the UP to achieve carbon neutrality across all three scopes by 2040 and in scopes 1 and 2 by 2028, surpassing the goals set by the German and Bavarian governments. The plan serves as a decision-making and planning tool for climate action measures over the next 10 to 15 years, aiming to significantly reduce emissions and foster a sustainable mindset within the university community. To ensure broad acceptance of the plan, opportunities were provided for stakeholders to contribute. Regular formats, such as the Roundtable Sustainability, the ClimUP newsletter, and the Climate Ideas Corner, informed stakeholders, from university leadership to students, about the process and encouraged participation in shaping the measures.

Qualitative status assessment: Status quo

The status quo analysis outlines the state of sustainability and climate action efforts at the UP in 2022/2023. The UP pursues comprehensive sustainability goals through its university contract and development plan, focusing on integrating sustainability into all dimensions and achieving carbon neutrality. Efforts include promoting sustainability research, establishing sustainability-focused degree programs, expanding photovoltaic systems, and conducting regular GHG accounting. The Sustainability Hub coordinates student initiatives, supports research, and facilitates sustainable campus operations. As one of the lead universities in the Center for University and Sustainability in Bavaria (BayZeN), the UP actively participates in cross-university collaboration on sustainability. The University sources 90% of its electricity from renewable sources and is expanding its photovoltaic capacity. However, fossil fuels still dominate heating and cooling, though projects like solar thermal systems and water-based cooling are beginning to replace them in small parts. Waste separation is practiced but challenging due to low separation rates. The use of fabric towels has already significantly reduced waste. About 85% of campus faucets are equipped with water-efficient technology to reduce water usage. The UP also promotes eco-friendly mobility with bike parking spaces, 28 electric charging stations, and two electric vehicles in its fleet. Additionally, most business trips are made by train, and some are already offset. The University also focuses on environmentally friendly and resource-saving procurement for paper and furniture. In education, numerous courses and seminars equip students with awareness and understanding of climate action and sustainability.

Quantitative status assessment: Carbon footprint

Effective climate action requires a thorough accounting of one's contribution to climate change through emitted GHGs to identify improvement potentials and develop targeted reduction measures. For this step, the UP used the university-specific, Excel-based, freely accessible

["BayCalc" accounting tool](#) with its associated guideline[1]. The carbon footprint includes relevant GHG emissions from processes and services over which the UP has control or influence in the year 2022. Excluded from the analysis were the construction or purchase of buildings, vehicles, and other capital goods, excursions, travel by guests, outsourced data center services, and emissions within the purview of the Studierendenwerk Niederbayern/Oberpfalz (canteens and cafeterias) due to a lack of available data.

Energy consumption: In 2022, the UP consumed approximately 10.1 gigawatt-hours of energy. Of this, 44.7% was used for electricity, 54.6% for heating, and 0.6% for fuels. This equates to 828 kWh per university member annually. Figure 1 shows the distribution of total energy consumption by energy source. Overall, 48.4% comes from renewable sources (in orange tones) and 51.6% from non-renewable sources (in gray tones). Compared to the German national average, the UP ranks significantly higher in renewable energy use for electricity.
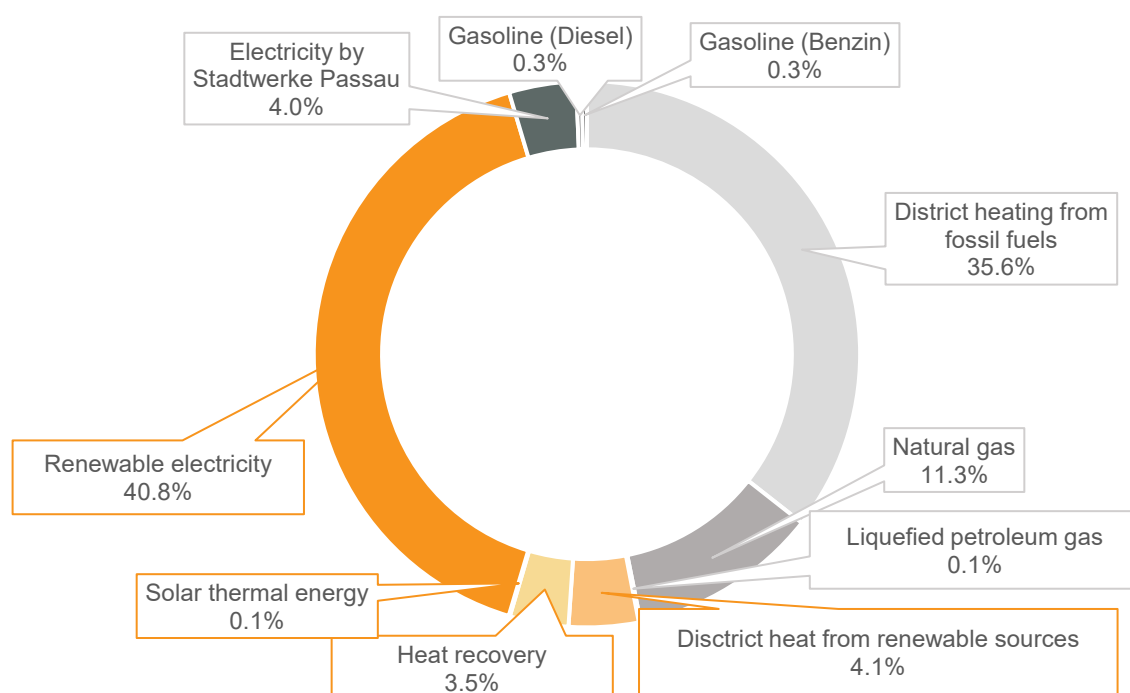

Figure 1: Distribution of energy consumption by energy sources (own representation)

Carbon footprint: In total, the UP emitted 10,175 tons of GHG emissions in 2022. Of these, 82% were attributed to mobility, 14% to energy, and 4% to operations. The commuting of university members represents the largest emission source, accounting for nearly 70% of total emissions. Per university member, this results in 0.83 tons of emissions. Figures 2 and 3 illustrate the emissions by sector, both in absolute and percentage terms.

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[1] Sargl, M., Klenge, A., Färber, K., & van Riesen, S. (2023). *BayCalc Richtlinie Version 1.6*. Netzwerk Hochschule und Nachhaltigkeit Bayern. https://www.nachhaltigehochschule.de/arbeitsgruppen/ag-thg-bilanzierung/ (last accessed Aug 13, 2024)
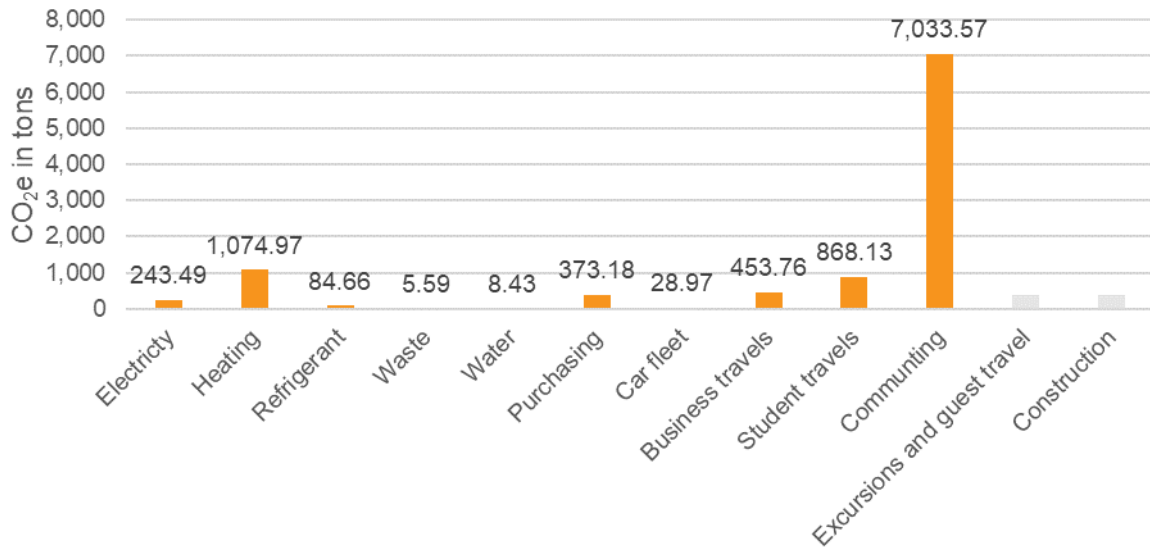
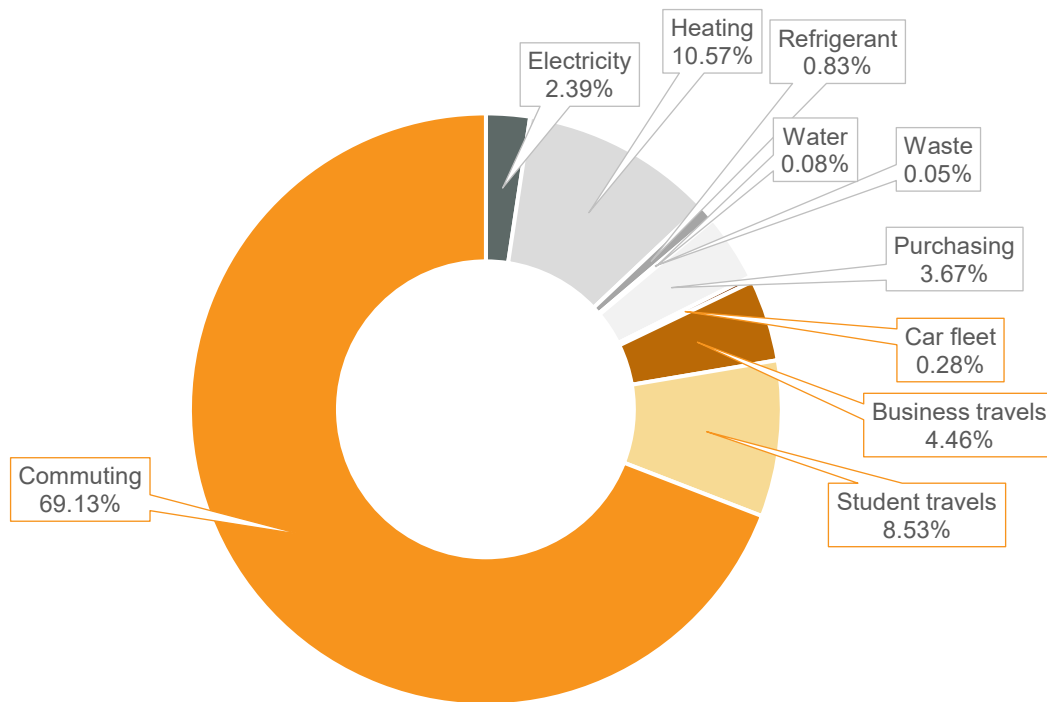*Figure 2: GHG emissions in 2022 by sectors (own representation)*

Figure 3: Distribution of GHG emissions across sectors (own representation)

The balance includes, in addition to the consumption of electricity and heat, emissions from 22 kilograms of refrigerants, 280 tons of waste, 20,032 cubic meters of water, 38.3 tons of paper for printing and hygiene, 1,109 purchased IT devices, and 1,708 purchased pieces of furniture. For business trips, approximately 2 million kilometers were traveled, while student trips abroad accounted for around 3.67 million kilometers, and the commuting of university members totaled about 63.3 million kilometers. The vehicle fleet consumed about 6,000 liters of fuel, while electric vehicles covered 107,000 kilometers.

With 82%, mobility is the largest contributor to emissions, showing significant reduction potential, especially in student trips abroad and business travel, which can be directly influenced by the University. In contrast, commuting is often affected by external factors such as public transport connections and cycling infrastructure, which limits intervention

possibilities. Energy consumption, representing the largest directly influenceable area at 14%, also offers significant saving potential. Hence, numerous related measures are planned. The areas of water, waste, and the vehicle fleet, on the other hand, have low reduction potential and are therefore not in focus.

Development of GHG emissions: Reduction potentials and scenarios

The potential analysis reveals a reduction potential of more than1,500 tons of emissions per year. This corresponds to 15% of total emissions, reducing emissions to 8.621,3 tons. To achieve this, nine potential measures are identified, each illustrated in Figure 4 with its respective saving potential. The largest potentials are associated with the introduction of hybrid teaching, the expansion of home office regulations, and the transition of heating supply to heat pumps.
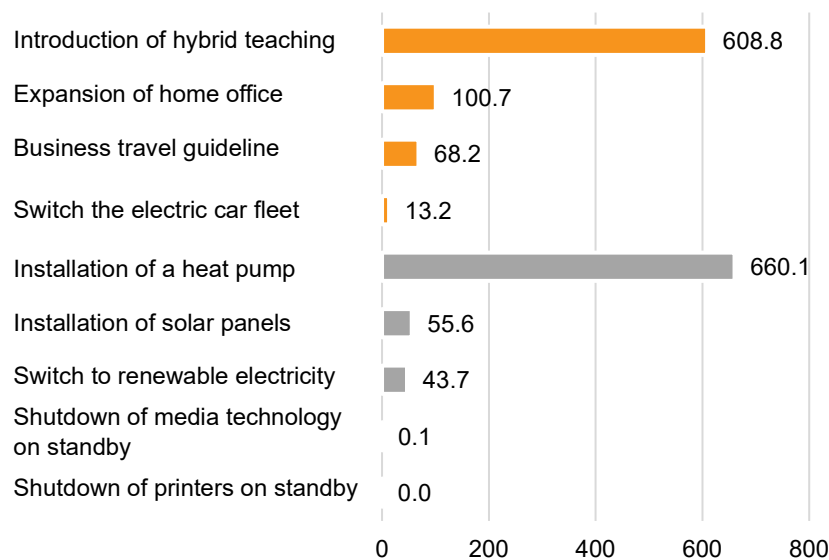
Measure	Value
Introduction of hybrid teaching	608.8
Expansion of home office	100.7
Business travel guideline	68.2
Switch the electric car fleet	13.2
Installation of a heat pump	660.1
Installation of solar panels	55.6
Switch to renewable electricity	43.7
Shutdown of media technology on standby	0.1
Shutdown of printers on standby	0.0

Figure 4: GHG savings of individual potentials (presentation by INEV)

The emissions scenarios present the evolution of GHG emissions of the UP until 2050. The scenarios are based on the 'Projection Report 2023 for Germany' from the Federal Environment Agency[2] and integrate the impacts of legal regulations, political decisions, and technological developments explicitly aimed at reducing GHG emissions. The expected development of emissions without the implementation of climate action measures (reference scenario) is compared with the expected emissions upon implementing five measures (with significant reduction potential) and addressing the nine presented potentials (climate scenario). Figure 5 shows the expected trend of GHG emissions until 2050. In 2040, significant emissions are still anticipated, which must either be further reduced or compensated. This is primarily due to the high emissions from commuting, which the UP can only influence with difficulty.

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[2] Harthan, R. O., Förster, H., Borkowski, K., Böttcher, H., Braungardt, S., Bürger, V., ... & Vos, C. (2023). *Projektionsbericht 2023 für Deutschland.* Umweltbundesamt. https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/39_2023_cc_projektionsbericht_12_23.pdf (last accessed Aug 13, 2024)
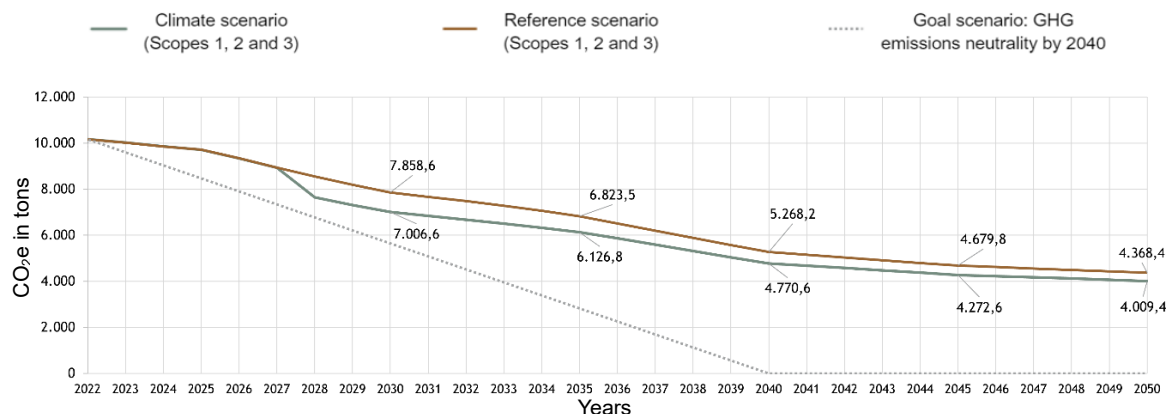
Figure 5: Development of GHG emissions in Scopes 1, 2, and 3 (presentation by INEV)

Steps for emission reduction: Measures

The measures catalog forms the core of the University's climate action ambitions, comprising 42 measures. The measures, divided into seven action areas, were developed participatively with broad involvement of the campus community. They represent the ambitions and necessary steps to reduce GHG emissions; however, their successful implementation depends on certain framework conditions: The availability of sufficient financial and human resources and the alleviation of the backlog in the renovation of state-owned buildings.

Action Area "Governance and Communication"

- GK1: Implementation of a central coordination unit for climate action and sustainability
- GK2: Continuation and structural integration of climate action management
- GK3: Incorporation of climate action and sustainability into overarching regulations and decision-making structures
- GK4: Communication and awareness-raising among university members
- GK5: Implementation of the environmental management system EMAS

Action Area "Energy and Buildings"

- EG1: Optimization and modernization of existing technical systems and facilities
- EG2: Energy optimization of lighting
- EG3: Expansion of photovoltaic systems on university-owned buildings
- EG4: Conversion of all electricity supply contracts to green electricity
- EG5: Awareness-raising and education on saving energy
- EG6: Development of a roadmap for the energy-efficient renovation of buildings
- EG7: Development of a guideline for increased consideration of climate-friendly standards in renting and new construction
- EG8: Development of a roadmap for renewable energy supply for heating and cooling
- EG9: Implementation of an energy management system
- EG10: Development of a roadmap to avoid standby consumption
- EG11: Implementation of a space management system
- EG12: Implementation of an intracting model

Action Area "Waste and Water"

- AW1: Optimization and modernization of existing building technical systems and facilities
- AW2: Development of a roadmap to reduce waste

- AW3: Development of a roadmap to improve and expand recycling options

Action Area "Purchasing"

- B1: Development of a guideline for sustainable purchasing
- B2: Development of a roadmap to extend the service life of consumer goods and strengthen communal sharing of products
- B3: Development of a guideline for sustainable event management

Action Area "Mobility"

- M1: Increase the bicycle-friendliness of the campus
- M2: Commitment to improving regional cycling and public transport infrastructure
- M3: Implementation of a commuting platform
- M4: Conversion of the car fleet to electric vehicles
- M5: Expansion of car and bike sharing options
- M6: Development of a travel policy for business trips, guest lectures, and excursions
- M7: Communication and awareness-raising for climate-friendly mobility

Action Area "Teaching and Research"

- LF1: Continuation of the sustainability lecture series
- LF2: Establishment of a field as part of the "CampusAckerdemie" project
- LF3: Expansion of research projects in the field of sustainability
- LF4: Expansion of sustainability-oriented study programs
- LF5: Expansion of support for student projects

Action Area "Climate Adaptation"

- KA1: Preservation and expansion of green spaces
- KA2: Strengthening sun and heat protection
- KA3: Examination of the expansion of water dispensers in UP buildings

Consolidating climate action: Continuity, controlling, and communication

To achieve the goals, sustainability and climate action must be permanently integrated into university structures, thus ensuring continuity. The continuation of climate action management is essential for the implementation, monitoring, and reporting of the measures. A comprehensive coordination unit for sustainability will also be established to coordinate activities. A steering committee will ensure that the perspectives of various stakeholders are considered in the implementation of the concept. Sufficient human and financial resources, especially in facility management, are crucial. Without these resources, goal achievement and measures may be delayed or only partially implemented.

Effective controlling is vital for the long-term effectiveness of climate action measures. By annually reviewing the goals and measures, the effectiveness of the measures will be ensured, and adjustments will be made as necessary. This will involve an annual carbon footprint, a set of indicators, and surveys. The results of the reviews will be published in an annual climate action report.

Clear and persuasive communication is essential to inform, raise awareness, and mobilize university members and the public. The strategy includes the creation and regular dissemination of informational materials through internal and external media and the organization of events to promote broad engagement and active participation.