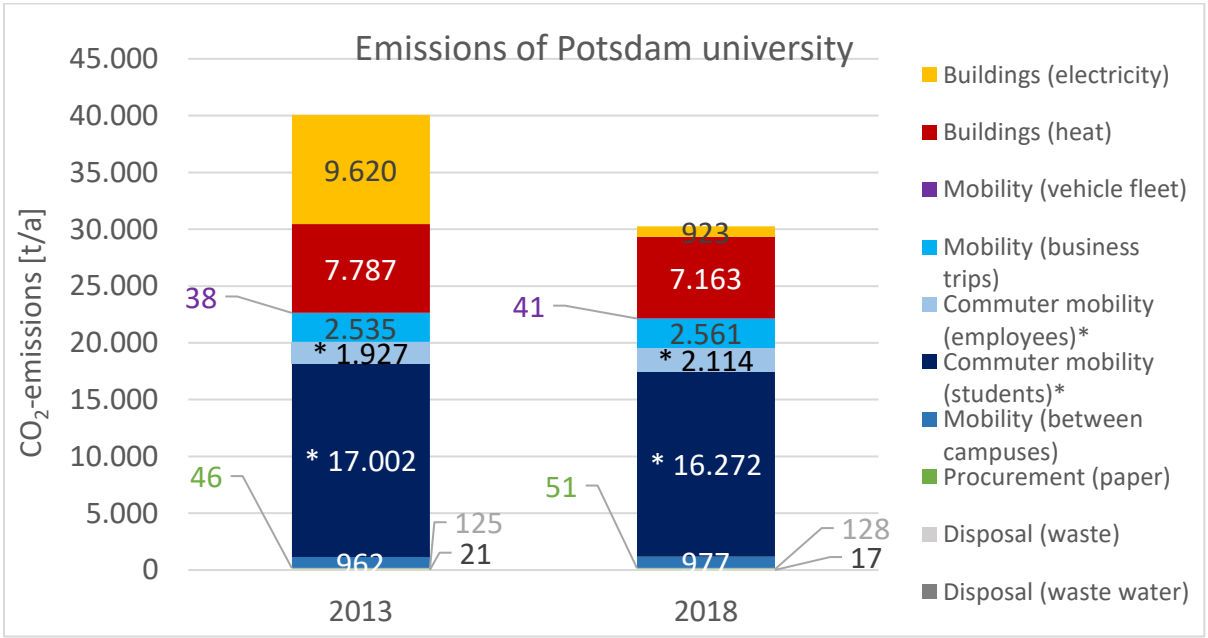
Summary of the Climate Protection Concept of the University of Potsdam

This summary is based on the summary contained in the Climate Protection Concept (Klimaschutzkonzept - KSK) of 2020, and was supplemented in May 2023 by the Climate Protection Management of the UP with some information from other chapters of the KSK (especially with example measures and the descriptions of the framework conditions). Moreover, the calculations of the CO_2 balance and, as a result, the graphic of the scenarios were corrected.

The existing integrated Climate Protection Concept (KSK), which was prepared in the period between March 2019 and January 2020 with the support of Arcadis Germany GmbH, clarifies the University of Potsdam's ambitions to sustainably integrate climate protection in all matters related to the university. It takes into account all of the university's major campuses as well as the topics of buildings, energy efficiency and renewable energies, teaching, green IT, nutrition, mobility, procurement and waste disposal.

CO_2 Balance

The main part of the KSK is an energy and CO_2 balance by sector and energy source. The overall view shows that the CO_2 emissions of the university are mainly caused by the transport sector and the buildings. A total of **33,923 tons of CO_2 equivalents** were emitted in **2018**. In the reference year **2013**, CO_2 emissions amounted to **42,803 tons of CO_2 equivalents**. In absolute terms, this represents a **reduction of 20.7%**. In relation to university employees (staff and students), the specific CO_2 emissions in the balance year 2018 were 1.48 t/person; in 2013, 1.91 t/person (reduction of 22.5 %).



A detailed potential analysis was carried out to determine the specific fields of action and their effects on the energy and CO_2 balance. Based on the energy and CO_2 balance, as well as the potential analysis, proposals for measures were developed together with the UP in workshops and discussions.

Emissions, potentials and measures in the focus fields

Buildings: **Energy Efficiency and Renewable Energies**

Emissions:

Based on the assessment of all consumption data, **electricity consumption** within the University of Potsdam's balancing boundaries in **2018** was **17,650 MWh** and **heat consumption** was **29,024 MWh**. This results in a total final energy consumption of 46,675 MWh in 2018, which corresponds to **8,087 t of CO_2** emissions and **24 %** of UP's total emissions.

Impact/Framework Conditions:

The university's buildings are owned by the state of Brandenburg. The university is responsible for operation and minor structural maintenance, while the state's building service (Bau- und Liegenschaftsbetrieb Brandenburg – BLB) is responsible for new construction, renovation, and major structural maintenance.

Potentials:

By the year 2050, there is a **reduction potential** of CO_2 emissions of **5,240 t/a**. This corresponds to an annual reduction of at least **2.2 %.** This means that by taking appropriate measures, buildings could be operated in a climate-neutral manner by 2050.

Measures:

- The properties are essentially supplied with heat via a **local heating network**. **Modernization measures** such as renewing boilers and the use of a combined heat and power plant could achieve the following potential savings: About 1,497 MWh in Campus I, about 3,880 MWh in Campus II, 1,120 MWh in Campus III, and 500 MWh in Campus V.
- The university's **central building control system** (Gebäudeleittechnik - GLT) regulates and controls the heating and ventilation systems and, in some cases, the refrigeration and lighting systems. Based on experience, **optimizing** the GLT could save about 5% of the energy consumption at all campuses. This is equal to about 2,334 MWh/a.
- Other **technical equipment** in laboratories and workplaces accounts for about 37 % of the total energy consumption of the facilities. Modernization in this area results in a reduction potential of 8 %, corresponding to 1,382 MWh/a.
- A rough potential analysis of the roof areas of the buildings at Campus III was carried out for the installation of further **photovoltaic systems**. According to this analysis, two thirds of the roof surfaces would be suitable for this purpose. If this result is extrapolated to the other university sites, the total potential is 13,601 MWh, which corresponds to 77 % of the total electricity consumption in 2018. It is still necessary to determine the buildings that come into question from a building planning point of view and to carry out a detailed potential analysis for them, taking into account the building statics.
- Energy consumption is massively influenced by **user behavior**. Optimization of user behavior could save up to 15 %; in particularly energy-intensive locations such as the laboratory buildings in Golm, about 8 % of energy consumption could be saved. Possible measures include energy-saving consultations, greater promotion of the bonus model, as well as poster and awareness campaigns. Savings through optimized user behavior amount to approx. 4,076 MWh/a.

Mobility

Emissions:

Approximately **76% of total CO_2 emissions** are attributable to the transportation sector at the University of Potsdam. In 2018, around 5,047 tons of CO_2 were caused by **business travel** (just under **15 % of total CO_2** emissions). Air travel contributes the largest share here at approximately 99 %. **Commuter traffic** causes about 19,600 t CO_2 annually (share of total CO_2 emissions **58 %**).

Impact/Framework Conditions:

Many framework conditions, especially in commuter traffic, are given by external actors (transport companies, municipalities, Student Union). In addition to implementing its own measures, the university uses its influence on these actors to achieve its climate targets.

Potentials:

Specific measures in the area of mobility result in a savings potential of around 36.7 t CO_2 in the area of vehicle fleet, 947 t CO_2 for business trips and 3,083 t CO_2 for commuter traffic, which considers motorized private transport, public transport and bicycle traffic. In addition, further CO_2 emissions could be offset by compensatory payments into a climate protection fund.

Measures:

- **Reduce business travel, especially air travel**
  - Public relations work on sustainable alternatives: Publicize the digital conference rooms
  - Carbon mitigation fund: Payment into fund for air travel and disbursement for sustainable travel
- **Reduction of fossil fuel consumption in commuter traffic**
  - Gradual conversion of the vehicle fleet to alternative drive systems
  - Installation of charging points at the campuses to support the e-mobility of UP employees
- **Reduction of motorized individual transport in commuter traffic**
  - Campus bicycles, repair stations and covered parking spaces for bicycles on campus
  - Charging points for e-bikes
  - Improved version of the corporate ticket and CO_2-free semester ticket (AStA)
  - Better public transport connections to the campuses by public transport companies

Teaching

Emissions: none/not measurable

Impact/Framework Conditions:

A number of courses in various bachelor's and master's degree programs and initiatives cover topics related to climate protection, thus promoting education in this area. Many professorships at the university, often in collaboration with institutes, deal with climate change or sustainability.

Potentials:

The visibility of these courses and credits for students in different degree programs should be increased in the spirit of interdisciplinarity, which is particularly important in this topic.

Measures:

- Own course catalog on the topic of "Sustainability & Climate".
- Organization of lecture series
- Crediting of these courses in the Studium Oecologicum

Procurement and disposal

Emissions and potential: Emissions of approx. **196 t CO_2** per year are attributed to the procurement and disposal sector (approx. 0.6 % of total emissions). This means that the reduction potential in this sector is comparatively low.

Impact/framework conditions:

Due to the lack of information on the greenhouse gas emissions generated in the production of most consumer goods, there is not only a lack of data for a comprehensive CO_2 balance of the UP in this sector, but also often a lack of information about alternative products for the implementation of climate-conscious procurement and disposal. The sphere of influence and reduction potential is thus limited.

Measures:

- Switch to recycled paper
- Creation of guidelines for sustainable procurement

- Improvement of waste separation

Green IT

Emissions and potentials: The annual electricity consumption in the area of information and communication technology amounts to about **30 % of the electricity consumption** of the UP. The IT sector offers a large number of potentials for saving energy and resources over the entire life cycle.

Impact/framework conditions:

Centralization of IT can be implemented by the IT department of the university administration (ZIM) if the respective departments decide to do so. The purchase of energy-saving technology is simplified by appropriate labels, but otherwise the same framework conditions apply as for procurement in general (see above).

Measures: By using **centralized computing technology,** around 1,412 MWh of electricity could be saved annually. This results in a CO_2 reduction potential of approx. 74 t CO_2.

Nutrition

Emissions: According to Germany's Federal Center for Nutrition, each person produces an average of about 2 t CO2 per year due to their diet.

Impact/framework conditions: The canteens belong to the administration of the Studentenwerk and are therefore not within the direct area of influence or footprint of the UP.

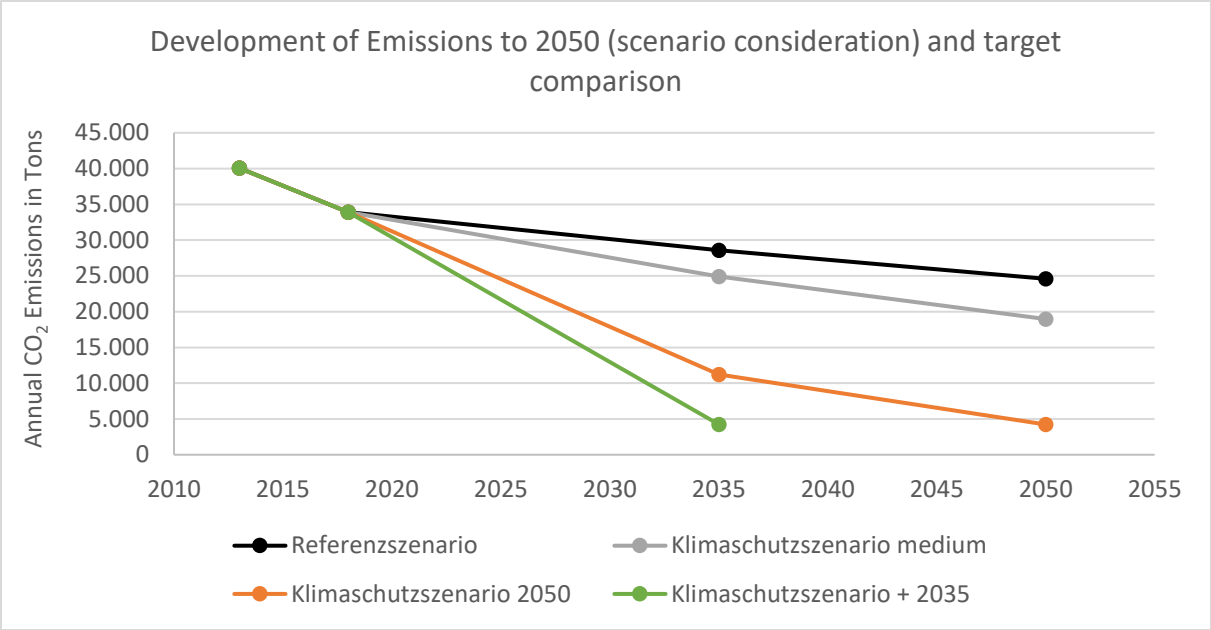
Potentials: There is a large savings potential here, which can be further exploited by changing the menu of the canteen. Vegetarian and vegan dishes are already offered here.

Measures:

- Collaborate with the canteens to implement
  - Public promotion of climate-friendly/sustainable nutrition (e.g., campaign week).
  - Larger selection of climate-friendly meals (e.g. vegan/vegetarian)
  - Reduction of waste (reusable packaging, salad counters by weight, etc.)
- Construction of drinking water fountains

Scenario analysis

Based on the identified potentials and measures, a scenario analysis (Chapter 7) was carried out in order to assess where the University of Potsdam can develop in the area of climate protection. A total of four scenarios were considered: The Climate Protection Scenario 2050, the Climate Protection Scenario+ 2035, as well as a Reference Scenario and a Medium Climate Protection Scenario.



With the **Climate Protection Scenario 2050**, the German government's[1] target of reducing annual CO_2 emissions by 80 - 95 % by 2050 compared to 1990 can be achieved for the University of Potsdam. The **Climate Protection Scenario+ 2035** would be a path towards achieving these targets as early as 2035, but assumes that all measures would take effect on an accelerated timeline by 2035. This depends on the committed participation of all cooperation partners and an improvement of further framework conditions. In this context, there is a particular dependence on the implementation of construction measures by the state-owned building services (BLB). The **Medium Climate Protection Scenario**, on the other hand, is less ambitious, particularly with regard to buildings and the reduction or compensation of CO_2 emissions from air travel. Finally, the **Reference Scenario** confirms that none of the targets at global, national or regional level can be met without actively taking targeted measures under the Climate Protection Concept.

Between the Climate Protection Scenario+ 2035 and the Medium Climate Protection Scenario, there is a range of possibilities that the University of Potsdam must explore in the coming years. The university will first address the priority measures that it can implement on its own, and at the same time seek the involvement and committed participation of its cooperation partners, especially the BLB, in the climate protection goals in order to be able to achieve the Climate Protection Scenario 2050. It will enter into a process of continuous review of its climate protection targets, press for changes in the framework conditions, and, in the event of such changes, examine whether and how an earlier date of climate neutrality can be achieved even before 2050.

Communication and controlling

Both parallel to and supporting the development of measures, a wide-ranging communication strategy was developed with the aim of successful communication with people at the UP and further active involvement of relevant parties. This strategy has already proven very successful in the creation of the present Climate Protection Concept.

In order to ensure the continuation of climate protection and the continuation of the Climate Protection Concept with the documentation and analysis of energy consumption and CO_2 emissions, possibilities for controlling and continuation of climate protection are also explained. One of these is the establishment of a climate protection management unit at the UP.

[1] The federal government's target for climate neutrality was set at 2045 by an amendment to the law on August 31, 2021.