TU WIEN BIBLIOTHEK SUSTAINABILITY CONCEPT

(31.12.2023)

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TU WIEN Bibliothek
Your knowledge hub

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Version of 31.12.2023 (final published version created on 12.06.2024)

List of abbreviations

ClimCalc	Carbon accounting tool
CO_2 equ.	Carbon dioxide equivalent(s)
CoLAB	Digital collaboration platform at TU Wien
ENSULIB	IFLA's Environment, Sustainability and Libraries Section
ESRS	European Sustainability Reporting Standard
GHG	Greenhouse gas
IFLA	International Federation of Library Associations and Institutions
IT	Information technology
LED	Light-emitting diode
PR	Public relations
QR code	Quick response code
RFID	Radio-frequency identification
TU Wien, TUW	Technische Universität Wien (Vienna University of Technology)
UN SDGs, SDGs	United Nations Sustainable Development Goals
UZ62	Austrian ecolabel

TU WIEN BIBLIOTHEK SUSTAINABILITY CONCEPT

INTRODUCTION

Libraries, as knowledge repositories (hubs), trustworthy information providers, places of learning and social infrastructure, play a key role in the sustainability transformation by facilitating a discourse on socially relevant topics and values.

In the TU Wien Bibliothek Vision, Mission and Values Statements, we declare our commitment to creating a green library and contributing to the sustainable management of our cultural heritage. While this reflects an attitude that runs through all areas of work, it is also a commitment to proactively help protect the environment and foster sustainability. This can be achieved in different ways, from the careful use of work materials and resources to efficient work processes that may require only small changes to be made sustainable.

What is a green library?

Our definition is guided by the one used by the Environment, Sustainability and Libraries Section (ENSULIB) of the International Federation of Library Associations and Institutions (IFLA). Green sustainable libraries are described as follows:

Green and sustainable libraries take into account environmental, economic and social sustainability. They may be of any size, but they should have a clear sustainability agenda, which includes the following:

- Green buildings and equipment: Green libraries strive to cut emissions associated with the buildings and equipment.
- Green office principles: They design operational routines and processes that are environmentally sustainable.
- Sustainable economy: Green libraries take measures to restrain consumption, advance circular and sharing economy practices and make them accessible to the community.
- Sustainable library services: They provide relevant and up-to-date information that is easy to access for users, offer shared spaces, devices, and environmental education, and operations are efficient. Green libraries have a positive carbon footprint.
- Social sustainability: Good education, literacy programs, community engagement, cross cultural diversity, social inclusion, and overall participation are important. Green libraries work actively to reduce inequality.
- Environmental management: They specify environmental goals to decrease the negative impact the library has on the environment. Green libraries communicate their environmental policy, its implementation and the results of environmental work to a broader audience.
- Commitment to general environmental goals and programmes: Their commitment is guided by the UN Sustainable Development Goals, the Paris Climate Agreement and related environmental certificates and programs.

At TU Wien Bibliothek, we derive measures and activities from this definition that allow us to contribute to a sustainable society.

In addition, we consistently strive to achieve the UN Sustainable Development Goals (UN SDGs), in particular SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and with our projects contribute directly or indirectly to SDG 5 (Gender Equality) and SDG 9 (Industry, Innovation and Infrastructure).

The 17 Sustainable Development Goals published as part of the UN Agenda 2030 were taken up by the International Federation of Library Associations and Institutions (IFLA) and adapted for libraries.

IMPLEMENTATION OF THE SUSTAINABILITY CONCEPT

Figure 1: Stages on the road to greenhouse gas neutrality

Source: Roadmap zum systematischen Nachhaltigkeitsmanagement, Altenhöner, R. and M. Czolkoß-Hettwer. De Gruyter, 2021.

Responsibilities / governance

In charge of sustainability issues at TU Wien Bibliothek:

- Beate Guba, Director of TU Wien Bibliothek (project manager, concept development)
- Silvia Spitaler, head of the Services Library Unit (project lead, concept development, collection of data, coordination)
- Management team, library team, Federal Facility Management Company (Bundesimmobiliengesellschaft – BIG), Real Estate and Facility Management Division (Abteilung Gebäude und Technik – GUT), Vienna University of Natural Resources and Life Sciences (Universität für Bodenkultur – BOKU) (collaboration/implementation, project leads)

The following questions were addressed during implementation of the sustainability strategy:

Who takes decisions on the implementation of measures?	Library director	
What resources are needed for implementation?	Human resources	
Which measures involve costs, which do not?	At present low financial cost, rather high labour intensity and time commitment	
Who is in charge of what?	Library director, head(s) of service unit(s) and service group(s)	Strategic green library focus 2024–2027
	Library director	Sustainability concept long- and short-term goals
	Services Library Unit	Sustainability concept (including forecast/roadmap) project lead (data collection, implementation of measures and goals)
	Services Library Unit	Collect data on toner and copy paper use
	Library IT Unit	Compile data on the number of printers
	Library team	Generate and implement ideas
In which areas do we need partners and who could they be?	Real Estate and Facility Management Division at TU Wien, Federal Facility Management Company (> energy metering, electricity, water consumption) BOKU (> support for and provision of the ClimCalc tool) TU Wien and external units (e.g. Green Team, Wiki CoLAB, TUW researchers etc.) (> exchange, presentations e.g. on supply chain issues) Vienna Public Libraries (> collaboration, exchange on sustainability) TUW Research Unit of Process Systems Engineering for Bioresources and Sustainability (> Exchange with the Transformer Co-Creation Space team, e.g. on the circular economy) Possibly TUW Research Unit of Energy Economics and Efficiency, Institute for Software Technology and Interactive Systems (> e.g. LED lighting concept)	

The green TU Wien Bibliothek is intended to

- be an eco-friendly workplace for employees and users alike,
- perform its social and environmental responsibility and thus play its role in promoting sustainability,
- embody and proactively communicate the green concept, and
- contribute to TU Wien's sustainability concept and ensure that TU Wien Bibliothek is in line with emerging international standards.

CARBON ACCOUNTING

Guidelines on carbon accounting (ClimCalc)

Solid carbon accounting is indispensable for institutions that wish to take targeted sustainability measures. TU Wien Bibliothek relies on the ClimCalc carbon accounting tool (developed specifically for education institutions by the Alliance of Sustainable Universities in Austria) to calculate its carbon emissions associated with energy use, mobility and material use.

Carbon accounting is not an exact science, as some values may be based on estimates and assumptions (e.g. staff commuting behaviour, consumption of sanitary paper).

10–15 emission sources usually cause 95 percent of total emissions, with energy consumption and often also mobility being the key drivers. The relevance of carbon accounting lies in the conclusions we draw from it and the changes we make. The library's emissions data collected with the carbon accounting tool are energy-related indirect emissions (Scope 2, e.g. electricity, district heating) and other indirect emissions (Scope 3, e.g. transportation to place of employment), which are calculated in accordance with Greenhouse Gas (GHG) Protocol standards.

Collecting all emissions data is not possible, so system boundaries are taken into account by relevance, measurability, data availability, emission factors and control over emissions. In our case, the boundary is set at 1 percent of the library's total in-house emissions [*This means that e.g. emissions from online meetings (Zoom, Webex etc.) are not taken into account; these data are included in the library's electricity consumption data and are also included through the devices purchased*].

If preventing more than 80 percent of carbon emissions of the base year 2019 turns out to be impossible, the remaining annual emissions (to be quantified through carbon accounting) must be offset. Net zero carbon is achieved only when the reduction target has been met and the remaining emissions have been offset. To ensure the integrity and effectiveness of offsets, the climate protection projects receiving funding must meet a number of criteria set out in various recognized quality standards (e.g. the recommendations provided in the German Federal Environment Agency's guide, Voluntary CO_2 offsetting through climate protection projects).

Carbon accounting with the ClimCalc tool is undertaken annually at the library, the calculation is made ex post (with a time lag of around 1.5 years). Compiling a carbon account for the first time takes at least one to two person months; the subsequent accounting is less labour and resource intensive, depending on whether business travel and mobility data must be collected.

Initial situation and analysis of measurement data

To take sustainable, responsible action and ensure that the measures taken can be quantified, documented and communicated, the Library Services Unit has been collecting data, including internal data since 2019 and, in cooperation with the Federal Facility Management Company and the Real Estate and Facility Management Division, data on energy use (district heating, electricity and service water consumption at the Main Library (Resselgasse 4, 1040 Vienna)), mobility (per-capita business travel kilometers, staff commuting behaviour) and material use (new and existing IT equipment, copy paper, toner and hygiene paper consumption as well as the volume of printed materials (e.g. printing of books for TU Academic Press)).

An evaluation of the data was necessary already for 2019 so we could quantify and compare the effects before, during and after the implementation of COVID-19 measures from March 2020.

District heating consumption at the library did not decline in 2020 during the first year of the pandemic and rose sharply in 2021 compared with 2019 and 2020; according to the Federal Facility Management Company, this was presumably due to the below-average temperatures in the winter of 2020/2021, possibly also a higher ventilation frequency during the pandemic and above all a maintenance defect of the air circulation system. From 2022, consumption was slightly below the pre-pandemic level of 2019.

Electricity consumption fell in 2020 and reached the 2019 level again in 2022.

From 2022, **hot water consumption** was at a similar level as in 2019.

Copy paper consumption declined during and after the pandemic due to work-from-home arrangements and the switch to duplex printing.

Toner purchases decreased in 2020 and again from 2022 compared with the base year of 2019, but rose significantly in 2021 as stocks were being replenished. The decline from 2022 may be in part attributed to the change to b/w printing for desktop printers.

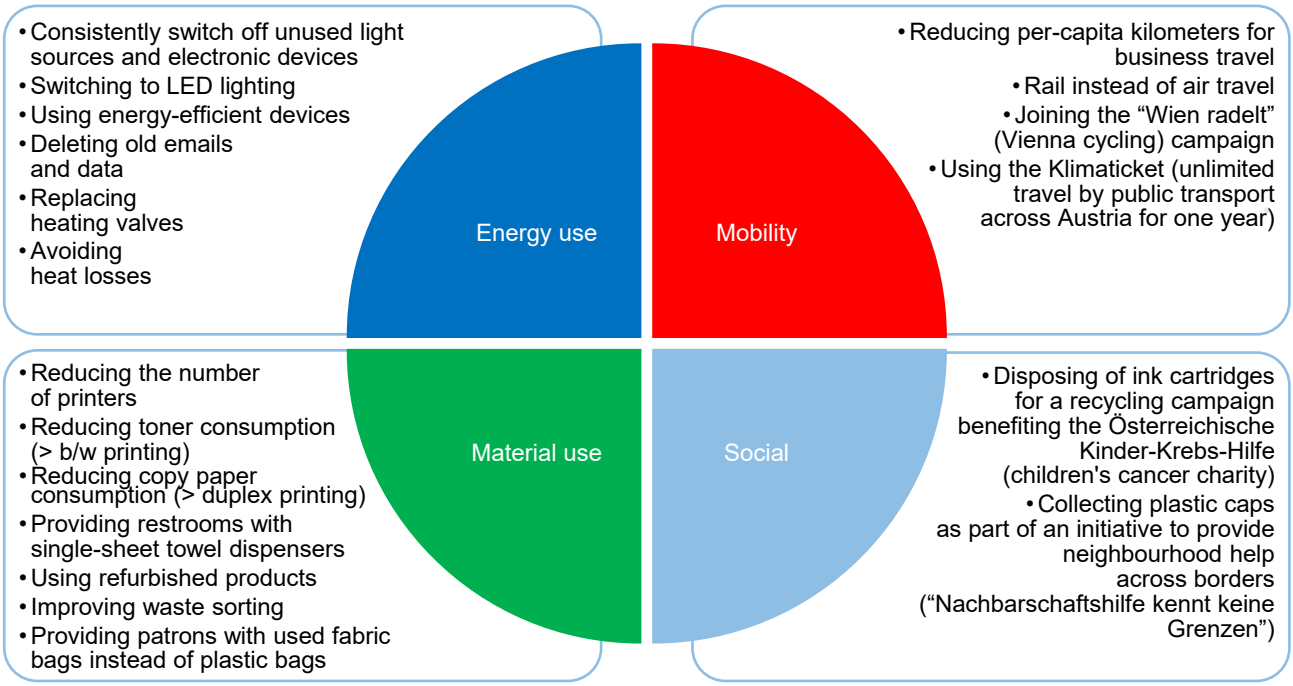
All data collected for 2019 were entered into the ClimCalc tool. For the base year 2019, CO_2 consumption at TU Wien Bibliothek was calculated at 393 t CO_2 equ.

Measures taken

Since 2022, TU Wien Bibliothek has focused on three areas – (i) energy and buildings, (ii) mobility and (iii) material use and equipment – to gradually improve the library's environmental performance. Continuous performance monitoring was implemented that same year. It should be noted that

- we used an anonymous, non-representative online survey to collect the relevant mobility data from library employees, which means no valid conclusions can be drawn about the actual per-capita kilometers travelled or the means of transport used; the figures entered into the ClimCalc tool are estimates only.
- the library's electricity consumption data also include the energy consumed by online communication systems.
- we organize events at the library as green events (to the extent possible) in line with the UZ62 Green Meetings and Green Events ecolabel in use at TU Wien.

Figure 2: Selected measures to cut emissions associated with energy use, mobility and material use as well as social sustainability initiatives at TU Wien Bibliothek



Source: Library Services Unit.

Evaluation

Every year, the library director evaluates the results and achievement of targets based on the data collected, and the annual targets are adjusted accordingly.

Table 1: Greenhouse gas emissions 2019–2023

Categories	**2019**	**2020**	**2021**	**2022**	**2023**
Energy use	301	291	316	297	277
Mobility	51	18	8	20	27
Material use	41	33	34	39	32
Carbon accounting results (t CO_2 equ.) *Results have been rounded.*	**393**	**342**	**359**	**357**	**336**

Source: Library ClimCalc 2019–2023 by category.
Note: All results in tons of CO_2 equivalents (t CO_2 equ.). Final results for 2019–2021, preliminary results for 2022–2023; base year=2019.

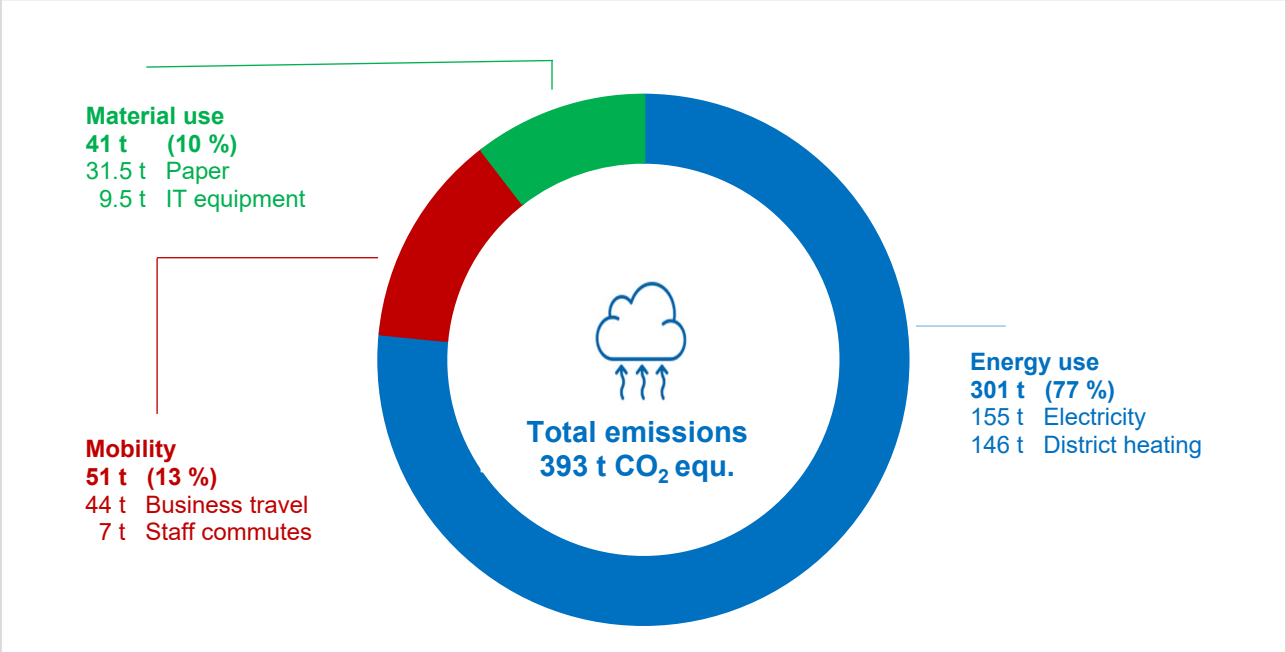
Targets

The library has committed to reducing its total carbon emissions by around 40 percent (i.e. 155 tons of CO_2 equ.) by the end of 2025 compared to the base year (2019) level. The sub-categories energy use/electricity, mobility/business travel and material use/procurement of IT equipment are expected to contribute the most to the reduction. While the sub-categories energy use/district heating and material use/paper consumption are supposed to deliver further reductions by 2027, the contribution of energy use/district heating in particular is not expected to be significant.

ROADMAP TO A GREEN LIBRARY

Based on the 2019 carbon accounting data, we drew up a roadmap to a green library for the period until 2025. This roadmap covers all three emission categories of the ClimCalc tool: energy use, mobility and material use.

Figure 3: TU Wien Bibliothek carbon account 2019

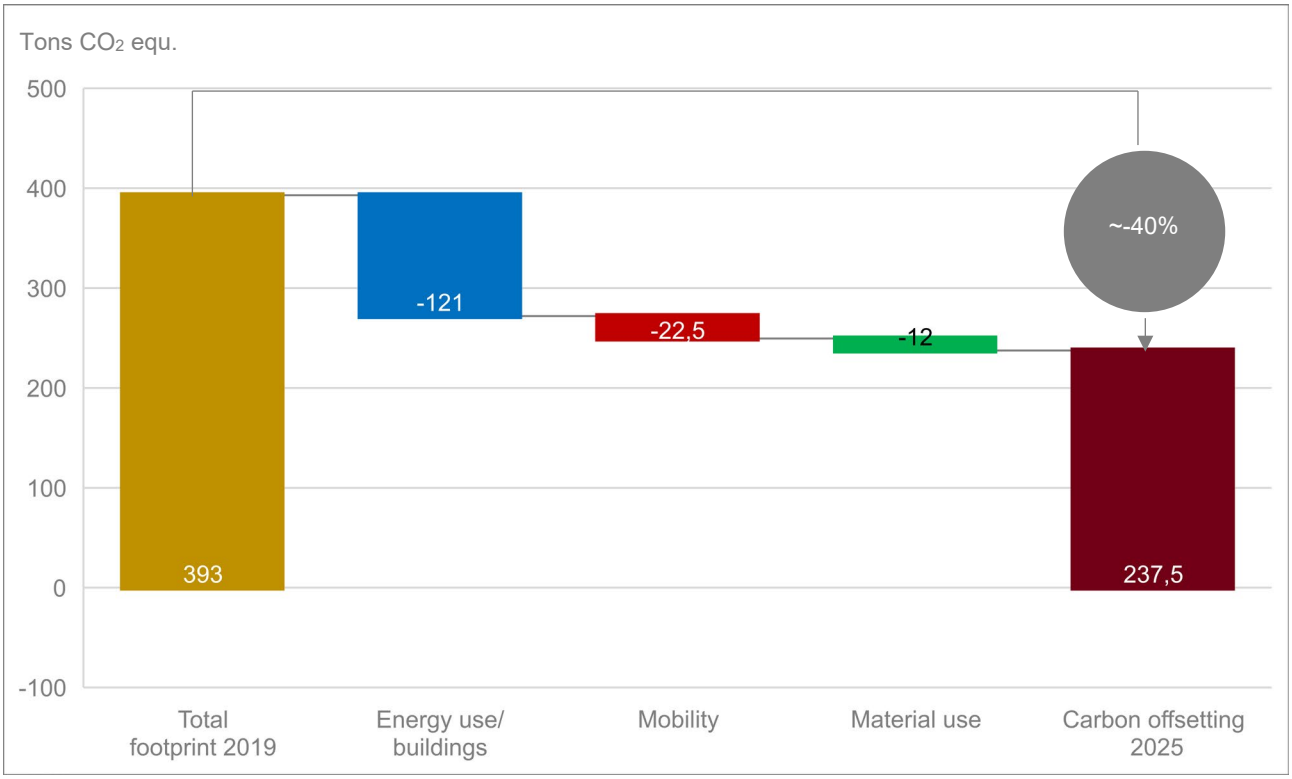


Source: Library ClimCalc results 2019 (base year).
Note: All calculation results in tons of CO_2 equivalents (t CO_2 equ.).

Here are some of the measures laid out in the roadmap:

- From 2022: Create a project for the implementation of sustainability goals at the library and decide on a strategic green library focus (2024–2027), to be implemented by the director, her team and the management team; define responsibilities.
- Draw up a draft sustainability concept, collect data and conduct an initial carbon account with the ClimCalc tool for the base year 2019 [*Note: The years of the pandemic 2020/21 are not suitable for this purpose*].
- Define and decide on measures to achieve the annual targets in the most important categories: energy use, mobility and material use.
- Create a roadmap based on the annual ClimCalc results and a CO_2 forecast for the period until 2025, consolidate the forecast on an ongoing basis.
- Translate into English and publish the TU Wien Bibliothek's final sustainability concept (version of 31 December 2023) on the library website and on Zenodo.
- Create annual progress reports on the carbon accounting results, collect data on an ongoing basis, conduct further carbon accounting and consolidate the data by 2025, exchange ideas on sustainability with TUW and external stakeholders.
- From 2026: Continue the project (carbon accounting and cutting emissions) and implement additional targets for the strategic green library focus by 2027.

Figure 4: Roadmap to a green library 2019–2025: Energy use, mobility and material use



Source: Forecast up until 2025 based on the Library ClimCalc 2019–2023.
Note: Final data for 2019–2021, preliminary data for 2022–2023.

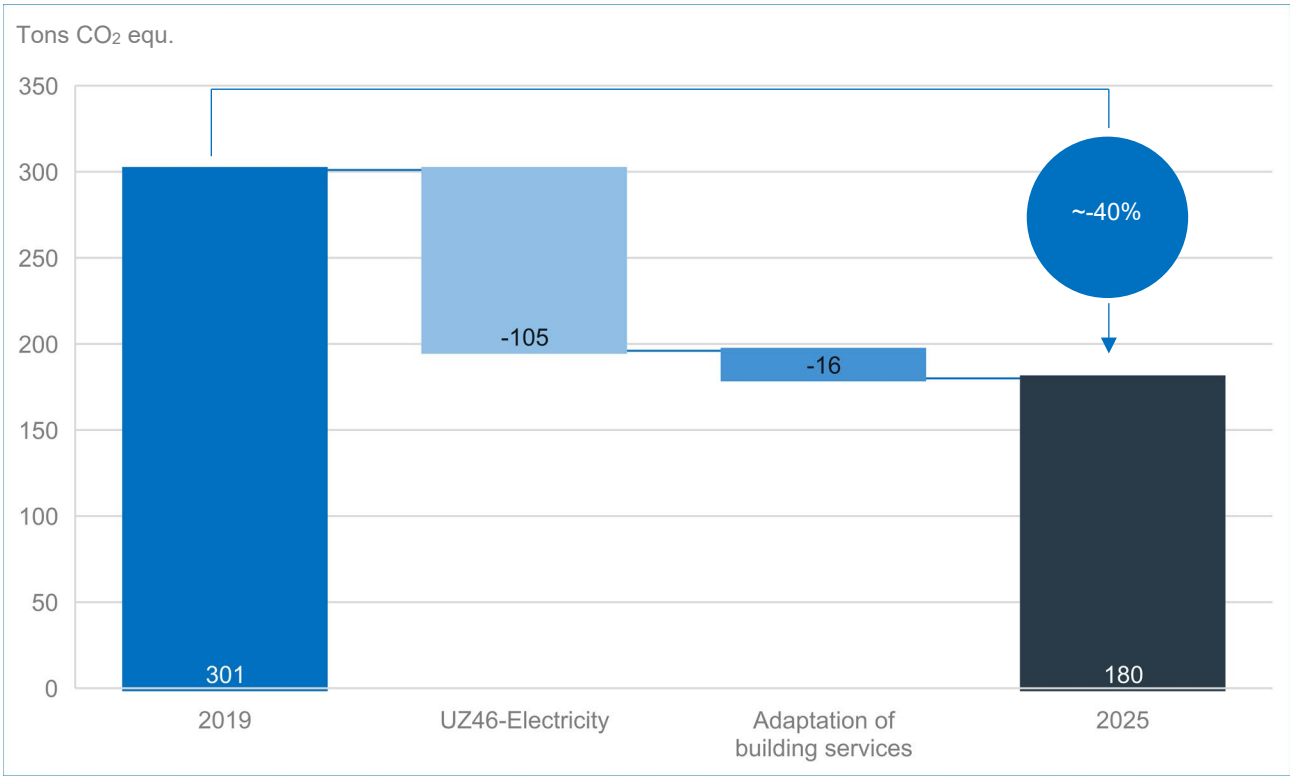
Energy use and buildings

The carbon reduction in the library's energy use has been achieved primarily through energy-saving measures already introduced at TU Wien (e.g. shorter heating periods, lower room temperatures etc.) for the years 2022–2024, maintenance of the air circulation system and the switch to 100 percent certified green electricity (UZ46) from 2025. District heating consumption is expected to fall gradually until 2027, but this decline will be insufficient to offset the high carbon losses caused by the maintenance defect of the air circulation system in 2021. Carbon savings from electricity in particular will be significantly higher than from district heating.

The library's carbon account does not include the energy used on the premises of the Chemistry and Mechanical Engineering Library, which is located in the plus energy high rise building at Getreidemarkt 9, as a breakdown of the total energy use at the building has not yet been made available by the Real Estate and Facility Management Division.

Overall, the library will reduce its energy consumption at the location at Resselgasse 4, 1040 Vienna, by around 121 t CO_2 equ. by end-2025, which is a decline by around 40 percent compared with base year 2019.

Figure 5: Roadmap to a green library 2019–2025: Energy use (buildings)



Source: Forecast up until 2025 based on the Library ClimCalc 2019–2023.
Note: Final results for 2019–2021, preliminary results for 2022–2023.

Other Measures

Implement changes to building facilities (e.g. install thermostatic valves in offices and common rooms, switch to LED lighting, reduce room temperatures at night, no mobile heating devices, measure heat losses in the main building with a thermal imaging camera etc.).

Lock windows in the open access section areas on the west side to increase the effectiveness of the air circulation system.

Estimate the energy consumption of the Chemical and Mechanical Engineering Library by breaking down the totals at the plus energy high rise (to be performed by the Real Estate and Facility Management Division).

Join the international Digital Cleanup Day, which encourages people to declutter and think twice before sending and storing emails and other data, thus improving the library's carbon handprint.

Mobility

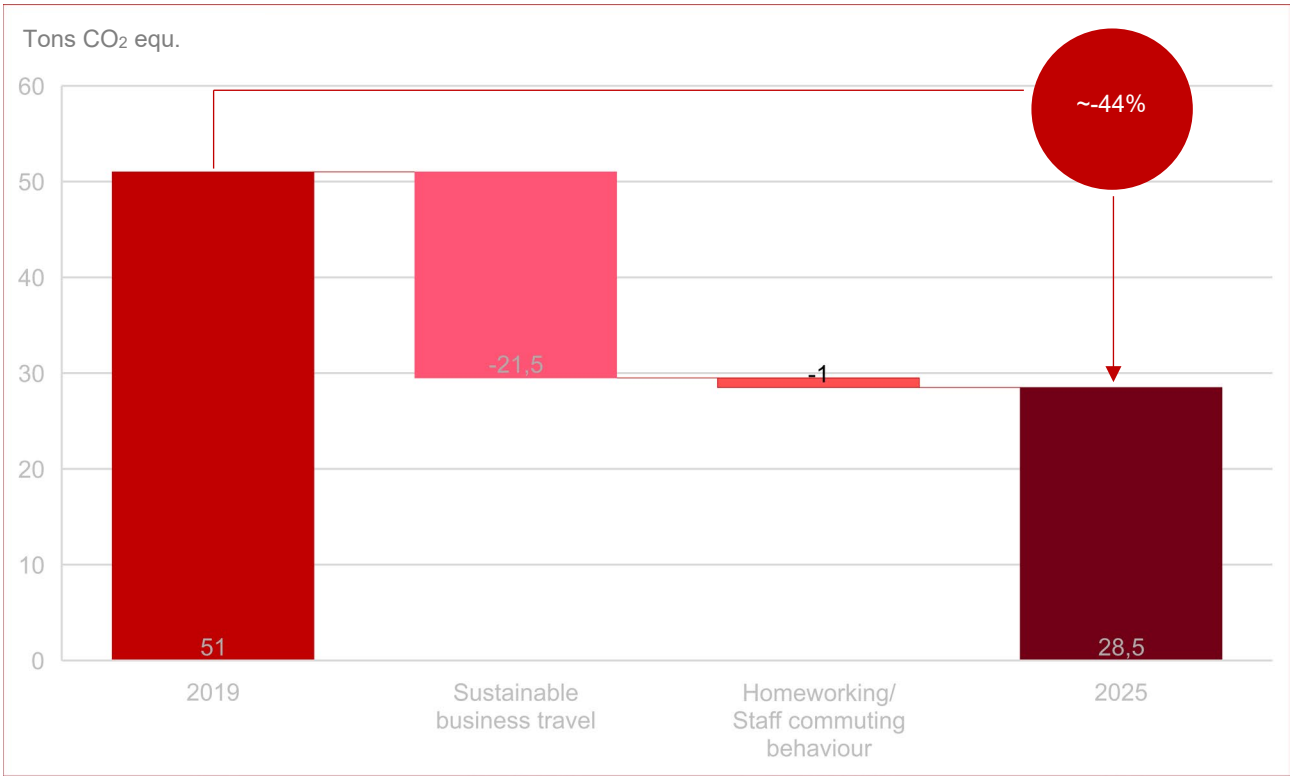
The COVID-19 years 2020 and 2021 have had a lasting impact on the mobility behaviour of the library's employees. Online events have replaced a significant share of in-person events, business trips and air travel. While mobility emissions have increased again somewhat from 2022, they have remained far below the reference values of 2019.

Now that the COVID-19 years are over, the library's employees are still relying on online communication systems and train travel for work trips. Carbon offsetting is an option when travelling by air or long-distance bus.

Since the onset of the pandemic, our employees have reduced their commutes thanks to work-from-home arrangements. Also, most members of staff use the excellent public transport network in and around Vienna. In the absence of valid mobility data, the commuting kilometers of library employees are estimates only. At present, the corresponding data for library users and TU Wien students are not included in the library's carbon account, as no pro rata figures are available.

Overall, the library will reduce its mobility emissions by around 22,5 t CO_2 equ. by end-2025, which is a decline by around 44 percent compared with the base year 2019.

Figure 6: Roadmap to a green library 2019–2025: Mobility



Source: Forecast up until 2025 based on the library's ClimCalc 2019–2023.
Note: Final results for 2019–2021, preliminary results for 2022–2023.

Other measures

Promote environmentally friendly mobility through regular participation in the “Wien radelt” (Vienna cycling) campaign, which increases the library’s carbon handprint and encourages people to engage in an active, healthy lifestyle.

Commit to work-from-home arrangements, thus reducing commutes.

Establish a carbon account for business travel to complement the existing business travel logbook.

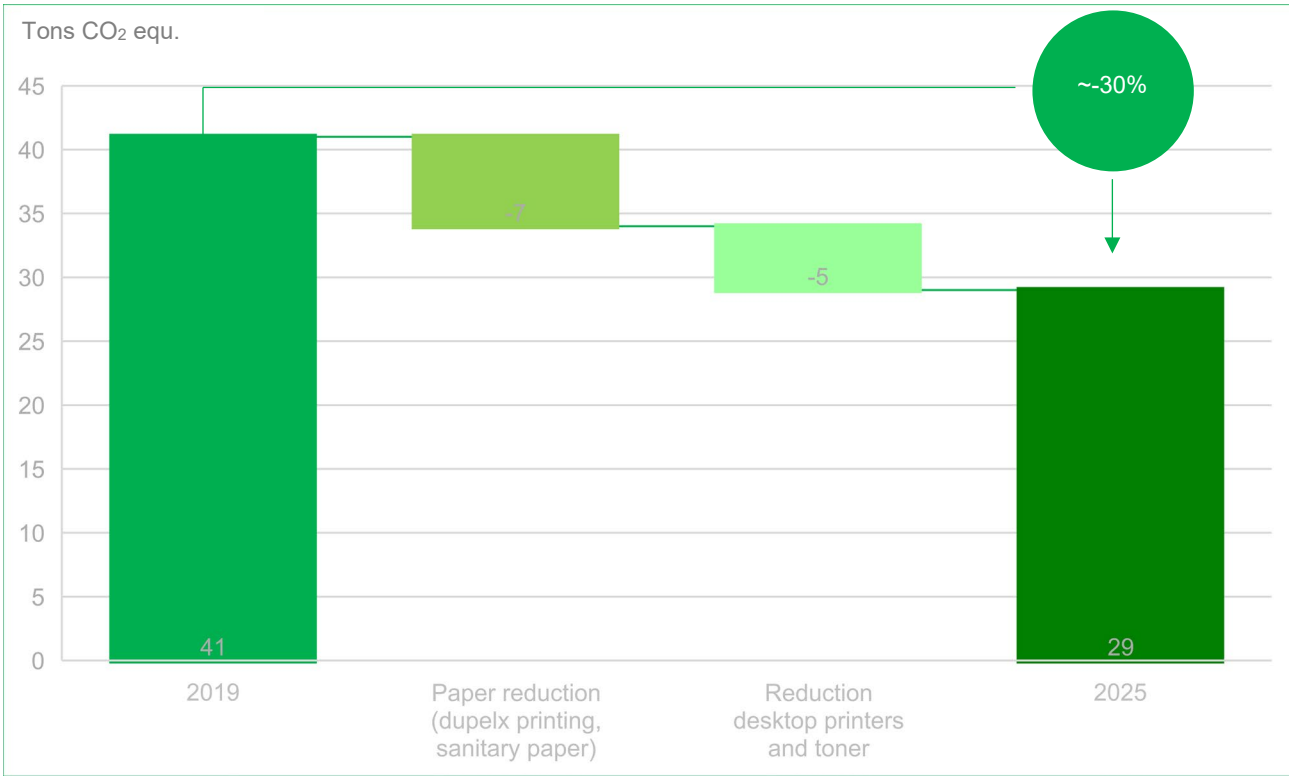
Possibly collect data on the commuting behaviour of TU Wien employees and students (to be implemented by TU Wien).

Material use and devices

Implementing the paperless office has been a high priority for the library. Paper consumption has been reduced by gradually switching to duplex printing. Digital editions are available for an increasing number of print materials, media and publications. We strive to reduce toner consumption and the number of desktop printers and photocopiers on site.

Overall, the library will reduce its emissions related to material use by around 12 t CO_2 equ. by end-2025, which is a decline by around 30 percent compared with the base year 2019.

Figure 7: Roadmap to a green library 2019–2025: Material use



Source: Forecast up until 2025 based on the library’s ClimCalc 2019–2023.
Note: Final results for 2019–2021, preliminary results for 2022–2023.

Other measures and social sustainability initiatives

Reduce hygiene paper consumption through measures taken by the Real Estate and Facility Management Division, e.g. providing restrooms with single-sheet towel dispensers

Support social projects and initiatives while at the same time contributing to the sustainable use of resources by offsetting material use, e.g. by

- collecting empty toner and ink cartridges as part of a recycling project benefiting the children's cancer charity Österreichische Kinder-Krebs-Hilfe (https://www.sozialprojekt.at),
- supporting disadvantaged children during surgery, therapies or hospital stays by collecting plastic caps (www.stoepsel-sammeln.at), and
- collecting and handing out used fabric bags to students and other library users at the circulation desk, thus making good use of an otherwise unused resource and offering a plastic bag alternative.

Summary

TU Wien Bibliothek aims to reduce its GHG emissions (in CO_2 equ.) by the end of 2025 by cutting

- energy consumption by 40 percent,
- mobility emissions by 44 percent, and
- material use by 30 percent.

Overall, this will help reduce emissions by around 155 t CO_2 equ. by end-2025 and by a total of around 40 percent as compared with the base year 2019.

The library intends to further cut emissions, in particular in the energy use/district heating and material use/paper consumption subcategories, by 2027.

Outlook and challenges

Renovation of the library buildings is not on the agenda in the medium term, so additional potent energy-reducing measures (addressing above all the library's district heating consumption) will be difficult to achieve without involving entities such as the Austrian Federal Facility Management Company or TU Wien's Real Estate and Facility Management Division. Still, from 2025, a university-wide switch to 100 percent certified green electricity (UZ46) will result in considerable carbon savings in the energy consumption/electricity subcategory. Further carbon savings can be delivered thanks to a consistent focus on sustainable mobility, especially for business trips.

The success of these measures depends both on the commitment of the library team and on the acceptance by library users. Further communication measures are needed to consolidate support among both groups. We intend to intensify the exchange on sustainability with the Vienna Public Libraries and other internal/external institutions (e.g. TU Green Team).

There are other challenges, such as the handover of the sustainability project to a new project lead by end-2026, documentation and reporting (possibly to the European Sustainability Reporting Standard (ESRS) E1: Climate Change or the European Corporate Sustainability Reporting Directive) as well as a lack of personnel and time.

PR | COMMUNICATION

The library relies above all on its website to project its public image. Presenting the sustainability efforts of TU Wien Bibliothek requires time and staff resources; at the same time, the PR work should involve minimal effort for those responsible.

Internal communication

At present, we communicate the evaluation results using familiar channels such as the library website, news items, flat screens, reports and internal presentations, e.g. at the library jour fixe.

Other options are the following PR initiatives and means of communication:

- Providing information on new measures and results and on the Sustainability Action Days on a regular basis, raising each other's awareness of energy consumption.
- Exchanging ideas with the TU Green Team.
- Exchanging ideas with organizational units at TU Wien that work on sustainability (e.g. circular economy, supply chains).
- Promoting and supporting the "Wien radelt" (Vienna cycling) campaign throughout the university.

External communication

- Publication our sustainability concept on the website and sharing it with interested parties via Zenodo.
- Showcasing the sustainability concept at international congresses (e.g. IFLA).
- Publishing measures and events on the library website, on the News page of the TUW website and on TUW flatscreens on a regular basis.
- Highlighting new acquisitions on education for sustainable development (ESD) on the library website or on a book table at the library.
- Exchanging ideas on sustainability with the Vienna Public Libraries.
- Joining external social sustainability initiatives.
- Participating in the Digital Cleanup Day.

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Note: Unless indicated otherwise, all links were retrieved during the time of writing up until March 2024.

Glossary

CLIMCALC
ClimCalc is an Excel-based carbon accounting tool that meets the criteria of the Greenhouse Gas Protocol and covers Scope 1, 2 and 3 emissions. The ClimCalc tool can be used to collect data from the following key emissions categories:

- ***energy use** (electricity and heat),*
- ***mobility** (commutes, business trips etc.), and*
- ***material use** (print products, IT equipment, refrigerants etc.).*

The tool has been tailored to educational institutions. ClimCalc is freely accessible, the current version, instructions and additional information are available on the website of the Alliance of Sustainable Universities in Austria (in German).
Source*: https://klimaneutralität.boku.ac.at/projects/climcalc/, March 2024.*

CARBON DIOXIDE, CO_2
***CO_2** is the chemical formula of the chemical compound carbon dioxide, which is made up of carbon and oxygen.*

CARBON EQUIVALENT (CO_2 equ.)
***Carbon equivalent** (or CO_2 equ.) is a unit of measurement that is used to standardize the climate effects of various greenhouse gases emitted by human activity. Other greenhouse gases are converted into carbon equivalents based on their effect on the climate.*

NET ZERO CARBON
Net zero carbon, or carbon neutrality, means reducing carbon emissions to the extent possible and offsetting the remaining emissions. While carbon neutrality means no increase in the concentration of the greenhouse gas CO_2 in the atmosphere, the climate impact of other greenhouse gases such as methane is not eliminated. Net zero carbon is not synonymous with net zero or climate neutrality.
Source: https://en.wikipedia.org/wiki/Net_zero_emissions, March 2024.

GREENHOUSE GAS PROTOCOL
***Greenhouse Gas Protocol** (GHG Protocol), is a transnational initiative to provide GHG accounting and reporting standards for business and, increasingly, the public sector.*
GHG Protocol provides the most widely used standards for GHG accounting. These standards form the basis of numerous others, e. g. ISO 14064 and many national corporate standards.
Emission scopes: *The GHG Protocol standards, like others, distinguish between three scopes of emissions:*

- *Scope 1 covers all direct emissions from sources within the system boundaries.*
- *Scope 2 refers to indirect emissions from the generation of purchased energy (electricity, steam, heating and cooling).*
- *Scope 3 covers all other indirect emissions, including those from the manufacture and transportation of purchased goods, from the distribution and use of own products, from the disposal and treatment of waste, and from business travel.*

Source: https://de.wikipedia.org/wiki/GHG_Protocol, March 2024.

GREENWASHING

*Many organizations and scientists reject **climate-neutral advertising claims** that are based on carbon offsets. They argue that businesses, unlike countries with their own territories and carbon sinks, cannot achieve climate neutrality. Such misleading claims are called greenwashing. Climate-neutral is an advertising claim that has no basis in EU law, so there are no regulations that would require businesses to reduce their emissions. Instead, they can simply buy carbon credits to offset them. The advocacy group Foodwatch has called it a modern form of indulgence trading, as climate neutral labels provide no information on the eco-friendliness of a product. This is why numerous environmental and consumer protection groups (e. g. the Federation of German Consumer Organisations and Environmental Action Germany have demanded a ban on climate neutral claims.*
Source: https://en.wikipedia.org/wiki/Net_zero_emissions, March 2024.

NET ZERO

***Net zero, or climate neutrality,** refers to a state in which emissions released by human action and removal of these gases are in balance, so there is no impact on the climate. The terms net zero emissions, carbon neutrality and climate neutrality are often used interchangeably, but they have different meanings, which also depend on the (scientific, political, corporate) context.*
Source: https://en.wikipedia.org/wiki/Net_zero_emissions, March 2024.

ECOLOGICAL FOOTPRINT

*The **ecological footprint** measures the biologically productive area needed to sustain an individual's lifestyle and standard of living (under current production conditions) in the long run. As such, it is intended as an indicator of sustainability. The concept refers to the area needed for the production of clothing and food, energy supply, waste management but also for capturing carbon dioxide from the atmosphere. Ecological footprints track how much biocapacity or productive area is needed.*
Source: https://en.wikipedia.org/wiki/Ecological_footprint, March 2024.

ECOLOGICAL HANDPRINT

*The **ecological handprint** builds on, and is intended to complement, the established concept of the ecological footprint. While the footprint concept focuses on the negative impact of individuals, organizations or countries on the environment, the handprint is intended to capture, measure and evaluate the positive impact our actions have on the planet and other people. In other words, the handprint concept also highlights the social and economic dimension.*
Source: https://de.wikipedia.org/wiki/%C3%96kologischer_Handabdruck, March 2024.

ROADMAP

*Our **roadmap** visualizes the progress made toward achieving emissions reduction targets and milestones over a strategically defined period. It covers all emissions categories for which we enter data into the ClimCalc tool.*

GHG NEUTRALITY

*The concept of **greenhouse gas neutrality** is used to refer to a state in which no greenhouse gases are released into the atmosphere or in which the emissions are fully offset by negative emissions, i. e. the removal of greenhouse gases from the atmosphere by deliberate human activities, so there is no increase in GHG concentration.*
Source: https://en.wikipedia.org/wiki/Net_zero_emissions, March 2024.