

2021

Sustainability Report

of the University of Freiburg

**UNI
FREIBURG**





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Sustainable Development Goals



1 No Poverty

Economic growth must be inclusive to provide sustainable jobs and promote equality.



2 Zero Hunger

The food and agriculture sector offers key solutions for development, and is central for hunger and poverty eradication.



3 Good Health and Well-Being

Ensuring healthy lives and promoting the well-being for all at all ages is essential to sustainable development.



4 Quality Education

Obtaining a quality education is the foundation to improving people's lives and sustainable development.



5 Gender Equality

Gender equality is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world.



6 Clean Water and Sanitation

Clean, accessible water for all is an essential part of the world we want to live in.



7 Affordable and Clean Energy

Energy is central to nearly every major challenge and opportunity.



8 Decent Work and Economic Growth

Sustainable economic growth will require societies to create the conditions that allow people to have quality jobs..



9 Industry, Innovation, and Infrastructure

Investments in infrastructure are crucial to achieving sustainable development.



10 Reduced Inequalities

To reduce inequalities, policies should be universal in principle, paying attention to the needs of disadvantaged and marginalized populations.



11 Sustainable Cities and Communities

There needs to be a future in which cities provide opportunities for all, with access to basic services, energy, housing, transportation and more.



12 Responsible Consumption and Production

Responsible Production and Consumption.



13 Climate Action

Climate change is a global challenge that affects everyone, everywhere.



14 Life Below Water

Careful management of this essential global resource is a key feature of a sustainable future.



15 Life on Land

Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.



16 Peace, Justice and Strong Institutions

Access to justice for all, and building effective, accountable institutions at all levels.



17 Partnerships

Revitalize the global partnership for sustainable development.

„Universities bear a special responsibility
for a sustainable society“



*Prof. Dr. Kerstin Krieglstein, Rektorin
der Albert-Ludwigs-Universität Freiburg*



*Prof. Dr. Daniela Kleinschmitt, Prorektorin für
Internationalisierung und Nachhaltigkeit*

Rector Prof. Dr. Kerstin Krieglstein and Prof. Dr. Daniela Kleinschmitt, Vice-President for Internationalization and Sustainability, explain in an interview what role the topic of sustainability plays for the University of Freiburg.

Prof. Krieglstein, since the beginning of your term as rector in 2020, you have been strengthening the topic of sustainability at the University of Freiburg; among other things, you have established a new Vice-Presidency for Internationalization and Sustainability. Why is this topic of such high importance to you?

Krieglstein: We are facing global challenges: The climate crisis, the depletion of natural resources and the loss of biodiversity threaten current and future generations. Universities bear a special responsibility for transforming society toward sustainable development. It is our task to provide solid knowledge, to offer solutions and to carry these into politics, business and society as a whole. In particular, we are responsible for empowering our graduates to develop solutions for both global and local problems and to work for a sustainable and just society. Our activities in this regard are consolidated in the Vice-Presidency for Internationalization and Sustainability.

Prof. Kleinschmitt, even before your time as Vice-President, you were intensively involved with the topic of sustainability.

Kleinschmitt: As a professor of forest and environmental policy, I deal with this on a daily basis. In my research on environmental and, in particular, forest ecology topics, I engage with various aspects of sustainability in research and in teaching. But networking with society and especially with politics is also a concern of mine and I actively participate in it, for example as a member of the Bioeconomy Council of Baden-Württemberg.

What was your first step as Vice-President for internationalization and Sustainability?

Kleinschmitt: Through the Vice-Presidency, the topic of sustainability is anchored at the highest level of the university. This opens up the possibility for us in Freiburg to drive sustainability holistically, both in research and in cross-curricular courses and in terms of operational sustainability. It is important to us that we involve all groups at the university in the development of concrete goals and measures.

What already achieved milestones in the area of sustainability are particularly important to both of you?

Krieglstein: One important milestone is the Sustainability Certificate that we introduced in the winter semester of 2021/22. It enables students from all disciplines to voluntarily address the sustainability issues of the 21st century across disciplines as part of their studies and to develop a sense of social re-

sponsibility. The initiative for the certificate came from the student initiative Sustainability Office and we have and we will gladly continue to strongly support this. We are constantly developing the certificate from semester to semester in the spirit of a learning organization. The program is accompanied by an interdisciplinary lecture series open to all interested parties. As a second milestone, I would like to mention the comprehensive and innovative climate protection concept for building operations, in which the university developed clear and concrete measures to achieve greenhouse gas neutrality. All of the university's status groups were involved in this process, as well as, among others, the Baden-Württemberg State Property and Building Construction Administration and Freiburg University Medical Center.

Kleinschmit: I am particularly pleased about our Young Academy for Sustainability Research, which is based at the Freiburg Institute for Advanced Studies (FRIAS) and funded by the Eva Mayr-Stihl Foundation. It is the first young academy in Germany to focus exclusively on the topic of sustainability. Its aim is to promote scientific and, in particular, interdisciplinary discourse among outstanding researchers in their early careers. I am particularly pleased about the extraordinary response, also internationally.

Prof. Krieglstein, you have already mentioned the students. What role do they play in sustainability at the university?

Krieglstein: Students play a very decisive role in driving sustainability forward at the university. Our goal is to enable them to engage with the topic in a diverse and interdisciplinary way. Many suggestions and activities also come directly from the students; I have already mentioned the Sustainability Certificate, which was initiated by the student initiative Sustainability office. There are many extremely committed students and student groups that also organize various events on the topic of sustainability. They keep challenging us as a university in a positive way.

Prof. Kleinschmit, what are your goals for the next few years?

I agree with the rector on that right away: All students should come into contact with the topic of sustainability during their studies at the University of Freiburg. Another goal is that we continue to work together with all status groups on a holistic sustainability strategy in which all fields of action are interlinked, then adopt and implement it. This also means that sustainability action at the university will be institutionalized. We also want to further distinguish sustainability research at the university, identify key areas and expand partnerships. And finally, we want to continue strengthening communication in sustainability in order to make the topic even more visible and accessible to society. A sustainability innovation campus can provide a very good framework for these different areas in the future.



Governance

connecting and shaping



Sustainability milestones

The University of Freiburg aims to be a sustainable university, which pursues ambitious objectives for sustainability in all activity areas: in research and teaching, as well as in its day-to-day operations and in relation to knowledge transfer, or the dissemination of ideas. Taking an active and responsible role in the field of sustainability is one of the objectives of the University – and has been since well before the subject gained its current popularity. For instance, there have for decades been a variety of institutions and projects designed to further the continuing development of content, structures and processes at every level of the University and establish sustainability at the University of Freiburg.

Since 2020 sustainability has been a particular ambition of the new Rectorate of the University of Freiburg. Consequently, the Vice-Presidency for Internationalization and Sustainability was established in 2021 in order to

consolidate this cross-sectional issue throughout the University. Since the 2021/22 winter semester, there has also been a new body, the Sustainability Council, which has extensive responsibility for setting strategies and objectives for all areas of activity in relation to sustainability. The University's concept of sustainability which is set out in this report for the first time was developed by the sustainability management team in a participatory process that involved every hierarchical level at the University, with the final version being revised and approved by the Sustainability Council. It not only supplies criteria for sustainability reporting, but also provides a basis for responsible action by the University as an institution, as well as a common concept for the development of a sustainable university culture. This concept will in turn be continuously developed and refined just like the processes and structures in the spirit of adaptive and forward-looking sustainable development at the University of Freiburg.

These current advances build on the wide range of activities and measures at the University in the field of environmental safety and sustainability in past years. At this point it is only possible to mention a few highlights from the many milestones in the history of the University of Freiburg, however the individual sections cast more light on each of the areas.

Today's Faculty of Environment and Natural Resources is a pioneer in the field of sustainability: in fact, in 2020 when the University of Freiburg celebrated the centenary of its comprehensive forestry education it also celebrated the 50th anniversary of forestry, geology and environmental scientific research as an independent organization. In addition, the subject of sustainability now features in all eleven faculties in one form or another, and there are numerous cooperations designed to contribute to sustainable development, with more arising all the time. As a training center for future decision-makers and experts, the University endeavors to familiarize all its students with sustainability issues. Introduced in the 2021/22 winter semester, the multidisciplinary certificate in sustainability is an important milestone towards this goal. Networking was also the guiding principle behind the foundation of the Sustainability Center Freiburg in 2015, with the aim of developing solutions for sustainable development through a cooperation between the University and five Fraunhofer institutes.

A strong example of the interdisciplinary research into sustainability at the University of Freiburg is the new Young Academy for Sustainability Research, the first young academy in Germany that deals exclusively with the issue of sustainability.

In line with the University of Freiburg's concept of sustainability, it is necessary that the University not only integrates environmental safety and sustainability in its teaching and research but also implements its expertise in its day-to-day operations, and thereby acts as a role model. One milestone, for example, is the University of Freiburg's environmentally-friendly chemical waste management system which was introduced in 2001; this makes routine use of reusables and in 2009 was awarded the City of Freiburg's environmental prize. The University of Freiburg has also received the Freiburg Eco Traffic Award several times, and in 2021 its successor, the MobilSiegel for sustainable mobility, from Freiburg's public transport company.

In addition, various groups such as the Sustainable University working group (established in 2005) dedicate their time and resources to promoting the sustainable operation of the University. Since 2019, environmental reports with the CO₂ audit for the University have been published annually, and now we are proud to present the first Sustainability Report, which will be published every three years.

Another essential element on the path to becoming a sustainable university is the social aspect of sustainability.

Important milestones include repeatedly receiving the TOTAL E-QUALITY award for exemplary commitment in the fields of equal opportunities and diversity, and the annual Diversity Day events which have taken place since 2013.

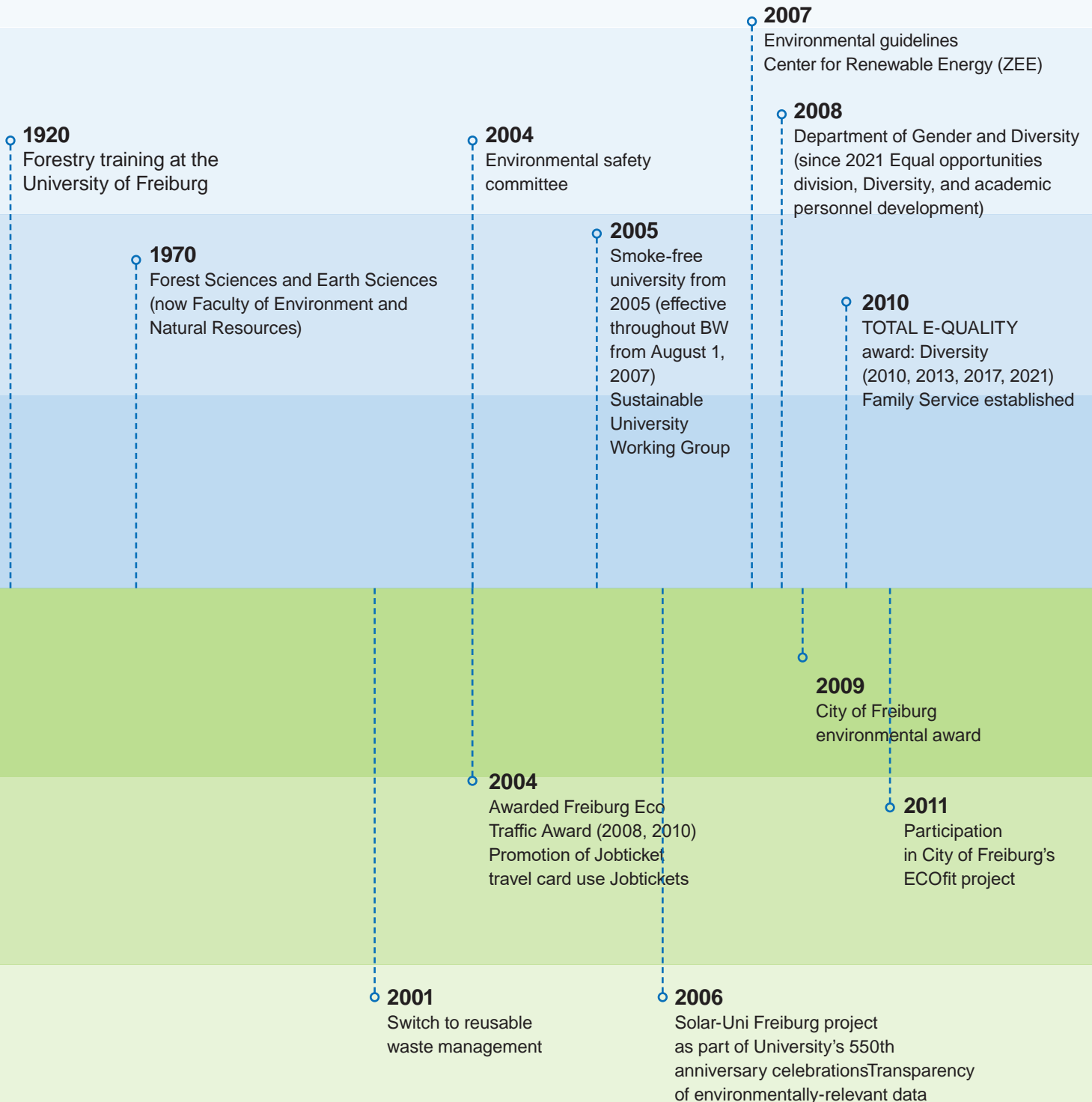
In order to integrate sustainable thinking and action in the DNA of the University, it is crucial that we at the University of Freiburg draw on the long-standing tradition and broad basis of sustainability here and embed it as a cross-sectional issue in all decision-making processes. Since 2021 the Vice-Presidency for Internationalization and Sustainability has provided a central authority for sustainability within the university management. In cooperation with the Sustainability Council, the vice-presidency endeavors to network and consolidate aspects and measures related to sustainability in all areas of activity, and to establish a comprehensive sustainability culture at the University.

In the overarching field of governance, the aim is to establish sustainable thinking and action permanently in structures and embed them in all decision-making processes.

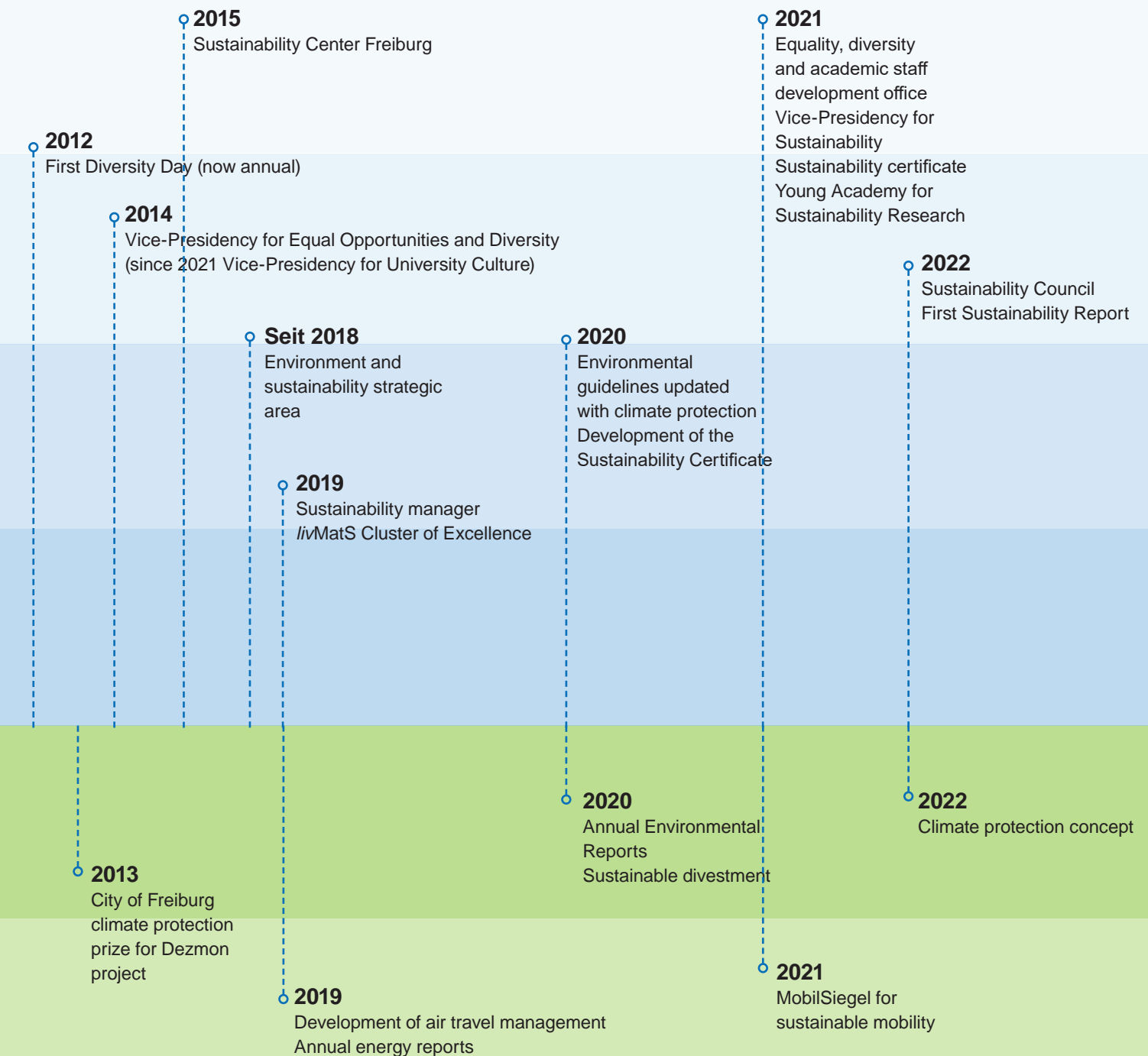
The University of Freiburg's sustainability objectives for governance:

- Developing an overarching concept of sustainability and embodying the concept of a sustainable university
- Institutionalization of sustainability action
- Developing and realizing an integrated sustainability strategy in a dialog process between every hierarchical level, which ties in all areas of activity
- Developing partnerships in relation to sustainability
- Taking stock and evaluation in an annual environmental report and three-yearly sustainability report
- Reinforcing science communication as well as internal and external communications in relation to sustainability

milestones



campus



Sustainability concept

The University of Freiburg sees sustainable development as a continuous process of becoming an ecologically viable and socially just society in a liberal and democratic order, which takes account of the needs of present and future generations. As key protagonists in the social discourse, universities have a contribution to make to the urgently-needed social transformation: in adopting a responsible approach to our planet and creating an equitable society.

For the University of Freiburg, its key task in this is to generate and pass on sound knowledge on environmental issues and social challenges, to offer and model solutions, and thus to provide inspiration for a future-proof society. At the same time, the University of Freiburg actively advocates its fundamental values of open-minded science and freedom of research.

As an educational institution, the University of Freiburg is specifically responsible for training its graduates to

- contribute to sustainable development on the basis of science,
- identify and communicate potential solutions to social challenges,
- focus on sustainability in the interdisciplinary discourse and reflect on the potential clash of objectives between the ecological, social and economic dimensions of sustainable development, and
- be able to constantly broaden and apply their knowledge.

In everyday life at the University of Freiburg, sustainable development also means

- securing teaching and research performance through the promotion of innovative capacity, interdisciplinarity and cooperation (economic sustainability);

- minimizing the negative environmental impacts of day-to-day operations. The University must itself use the knowledge it builds to achieve climate neutrality and attempt to make positive contributions (ecological sustainability);
- creating a long-term, attractive and participatory environment and an inclusive university culture. An essential element of sustainability is to support the diversity and creativity of all members of the University and enable them to reveal their full potential. Among other things this means creating a respectful, gender-sensitive, family-friendly higher education atmosphere and offering secure and healthy jobs (social sustainability).

The social, economic and ecological aspects of sustainability are indivisible. Therefore the University of Freiburg promotes scientific engagement and responsible critical thinking about all these aspects and in particular their interrelationships. It is a 'living lab', realizing findings and approaches in the best way possible, and thus acts as a model for private and public stakeholders.

The University of Freiburg aims to establish sustainable thinking permanently in its structures and decision-making processes. Students and staff must be made aware and encouraged to examine their own actions and themselves contribute to sustainable development on campus and in society.

The University is committed to the [concept of sustainability of the HOCH^N cooperative project](#), which defines the areas of research, teaching, knowledge transfer, day-to-day operations and governance and in each case sets concrete objectives and measures

“For me, the greatest pleasure in compiling this sustainability report was the dialog with staff and students from various institutions. The Discussions about their projects, the challenges they faced, and the ambitious goals they set for the future made me enthusiastic about my work. I think we are on the right path to establishing a sustainability culture at the University and am excited to see what we will achieve together in the next few years”

Lora Gyuzeleva, sustainability manager



Sustainability in the governance structures of the University

Department of Safety, Environment and Sustainability

Responsibility for operational sustainability is held by the Department of Safety, Environment and Sustainability, whose '[SUN2](#)' (environment and sustainability) office is in charge of all waste disposal, emissions prevention, protection of the soil and waterways, transportation of hazardous materials in connection with disposal and relocations, as well as the analysis of laboratory waste water. Since 2019 the office has also had a sustainability manager, who ensures extensive monitoring with environmental and sustainability reports, as well as coordinating sustainability activities and measures at the University. Together with the department management, she is active on all the sustainability bodies.

Environmental safety committee

The environmental safety committee was established in 2004 as the first body in the field of sustainability, to help with decision-making and the distribution of resources in day-to-day operations; its first milestone towards improving the health of work and learning was making the University non-smoking in 2005. The committee generally meets once or twice a year under the oversight of the head of administration, to confer on sustainability measures and projects and assess them. The members are all stakeholders with an interest in the assessment and development of such projects, from the management of the staff council through department and division managements up to experts from the faculties and the student body.



Sustainable University working group

The Sustainable University working group ([AKNU](#)) was established in 2005 with the aim of realizing projects in day-to-day operations. The group initiates and coordinates projects that have been proposed by the environmental safety committee or staff and students, and consists of members of the central administration as well as student representatives and initiatives. For example, the [Dezmon project](#) of 2007-2018, which provided monetary incentives for energy saving, came from the AKNU.

Vice-Presidency for University Culture

Since April 2021 the part-time Vice-President for University Culture, Prof. Dr. Sylvia Paletschek, has been responsible for gender and diversity, career and talent management, and the development of a mission statement at the University of Freiburg. Her goal is to create an inclusive and non-discriminatory university that recognizes the strength in the diversity of its members, and understands the importance of gender balance on its path to becoming a sustainable university. The equality, diversity and academic staff development office also deals with many aspects of social sustainability, such as equal opportunities in the development of the organization and personnel (see section on Social Responsibility).

Vice-Presidency for Internationalization and Sustainability

Also newly-established on April 1, 2021, the Rectorate was augmented with the part-time Vice-President for Internationalization and Sustainability as a central authority on governance. The vice-president is responsible for international cooperations in research and teaching as well as the sustainability agenda and activities throughout the entire university.

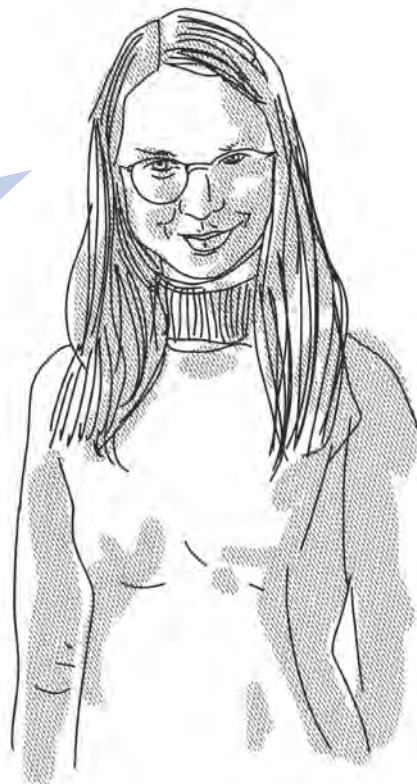


“The University of Freiburg has much to offer in the field of sustainability. The Sustainability Council ensures that the University of Freiburg develops a clear sustainability profile from the mosaic of individual elements. This cross-division and cross-hierarchical body sees to it that there is a coherent, comprehensive view of sustainability and cooperation at all levels – the faculties, central administration and students. Together, the strengths of the University are identified and challenges are tackled”

Prof. Dr. Daniela Kleinschmit, Vice-President for Internationalization and Sustainability, head of the Sustainability Council

“The Sustainability Council offers the opportunity at long last to pursue sustainability as a cross-cutting issue at the University. Cooperation between people with different tasks and perspectives throws up numerous ways to achieve a sustainable university, but this is also time-consuming. This is democratic work – time will show what influence the new body will have on the university management’s decisions.”

Helen Dörr, student, Nachhaltigkeitsbüro, member of the Sustainability Council



Sustainability Council

In the 2021/22 winter semester, Vice-President Prof. Dr. Daniela Kleinschmit set up the Sustainability Council to offer advice within the scope of the University's overall strategy and deal with every area of sustainability. The council consists of representatives from every hierarchical level (faculties, students, central university administration, staff council). Members may be proposed or offer their services independently to the council. Chaired by the Vice-President for Internationalization and Sustainability and the Head of Administration, and taking a participatory approach, the Sustainability Council develops a sustainability strategy for the University of Freiburg and recommends measures for achieving its objectives.

Divestment and Sustainable Investments

The University's efforts to ensure sustainability are reflected in its financial activities as divestments and sustainable investments. The University of Freiburg's [investment policy](#) has accordingly adopted the restriction that it will no longer invest in fossil fuel and nuclear industries or arms manufacture. A critical bond which was largely made up of such investments has already been sold. The aim is to restructure the remaining 4% of the corporate assets that are still invested in relevant securities and balanced funds by 2025 in sustainable investment products. Another step was achieved with the investment in sustainable funds, which now make up 36% of the University's security investments. One of these funds explicitly focuses on the climate crisis and also supports climate protection projects by forgoing some of its income. The remaining investments of the University of Freiburg consist of individual securities investments, which are not categorized as 'critical industries', and of real estate investments.

“The University of Freiburg stands for sustainable research across a broad palette of subject areas and disciplines; it offers degree programs with a pronounced focus on sustainability; and it is ambitiously advancing sustainability in many areas of higher education. Yet there is still a lot to do: sustainable research must be better coordinated, teaching content must be integrated in all degree programs and sustainability management must be understood in a more systemic way in order for sustainability to be part of the DNA of the University. The Sustainability Council can make an important contribution to this.”

Prof. Dr. Michael Pregernig, head of the Chair for Sustainable Governance, member of the Sustainability Council



Education

teaching and learning



Education center for forward thinkers and shapers of the future

The University of Freiburg is an education center for forward thinkers and shapers of the future of society. Therefore sustainability must be given its due importance in teaching as well. This not only means its inclusion in degree programs and courses, but also the transmission of a sense of responsibility and the realization of aspects of social sustainability in teaching activities. The University of Freiburg sees it as its duty to train graduates so they can meet the challenges of the 21st Century and contribute to sustainable development by focusing on sustainability in the interdisciplinary field of discourse, and being able to constantly broaden and apply their knowledge.

Although the University of Freiburg already offers a wide range of degree programs and courses relating to sustainability, this barely meets the high demand. Students are extremely interested in sustainability-related degree programs as well as extracurricular learning opportunities and open lectures on sustainability. The Faculty of Environment and Natural Resources is particularly strong in this area, however the Faculty of Engineering also has interesting offers.

Another milestone in the interdisciplinary range of courses in relation to sustainability is the multidisciplinary sustainability certificate that was introduced in the 2021/22 winter semester. The expansion and ongoing development of sustainability-related courses will also in future explicitly focus on a broad effect and on interfaculty cooperation. Among other things, this will be promoted with greater appreciation of the commitment to sustainable teaching in all disciplines, for example a prize for sustainable teaching is envisaged.

The University of Freiburg has also in recent years developed its services in the field of digitalization and the social sustainability of teaching, especially as a result of the challenges during the corona pandemic. This has not only led to an expansion in digital teaching formats, international cooperation on sustainability has also been strengthened, e.g. within the framework of the EPICUR higher education alliance. This is intended to promote healthy and cooperative teaching and learning in difficult times.

The University of Freiburg's sustainability objectives for teaching:

- Encouraging students' understanding of sustainability: all students should be familiar with the issue
- Creating an incentive for sustainability-related teaching (e.g. with a teaching prize for sustainability)
- Expanding the overarching sustainability certificate range of courses launched in WS 2021/22
- Expanding European cooperation in sustainability teaching



Sustainability-related degree programs

Sustainability-related degree programs are defined in this report as those which have both a thematic and a methodical approach that corresponds with the concept of sustainable development. Firstly, they inform about local and global environmental and social challenges and enable students to develop new approaches to these problems and to advocate for the creation of a sustainable, just and inclusive society. This involves the concept of sustainability being seen as an integrated approach, and explicitly addressing and reflecting on it. Secondly, they focus on interdisciplinarity, thereby sparking an individual's ability to reflect on their position and the role of their discipline.

Examples of degree programs with sustainability

Degree program	Faculty/ Institute
B.Sc. Liberal Arts and Sciences (Major: Environmental and Sustainability Sciences)	University College Freiburg
B.Sc. Nachhaltige Technische Systeme / Sustainable Systems Engineering (SSE)	Faculty of Engineering
B.Sc. Geography	Faculty of Environment and Natural Resources
B.Sc. Earth Sciences	Faculty of Environment and Natural Resources
B.Sc. Environmental Sciences	Faculty of Environment and Natural Resources
B.Sc. Forestry and Environment	Faculty of Environment and Natural Resources
M.Sc. Global Urban Health	Centre for Medicine and Society (ZMG)
M.Sc. Environmental Governance	Faculty of Environment and Natural Resources
M.Sc. Geographie des Globalen Wandels	Faculty of Environment and Natural Resources
M.Sc. Environmental Studies	Faculty of Environment and Natural Resources
M.Sc. Forestry	Faculty of Environment and Natural Resources
M.Sc. Geology	Faculty of Environment and Natural Resources
M.Sc. Hydrology	Faculty of Environment and Natural Resources
M.Sc. Renewable Energy Management	Faculty of Environment and Natural Resources
M.Sc. Sustainable Systems Engineering (SSE)	Faculty of Engineering
M.Sc. Online Solar Energy Engineering	Faculty of Engineering
M.Sc. Sustainable Materials – Functional Materials	Faculty of Chemistry and Pharmacy
M.Sc. Sustainable Materials – Polymer Sciences	Faculty of Chemistry and Pharmacy
M.A. Gender Studies	Center for Anthropology and Gender Studies



Sustainability certificate

The [sustainability certificate](#) is a voluntary certificate program which was introduced at the University of Freiburg in the 2021/22 winter semester. It aims to enable students from all disciplines to take an interdisciplinary approach to 21st Century issues of sustainability in the framework of their studies and to develop a sense of social responsibility. Drawing on the concept of sustainability as a cross-sectional issue, it bundles and expands the range of courses within the field of sustainability and thus complements the University's efforts to deliver sustainability.

The sustainability certificate is divided into three areas – fundamental principles, specialization/electives and a practical unit, in which students can acquire a total of 14 ECTS points. The fundamental principles module consists of a series of public lectures on sustainability which introduce aspects of sustainability from a variety of specialist per-

spectives, and a course on fundamental principles where students take an active role and tackle the challenges of sustainable development drawing on case studies. In the electives section, students can choose from an interdisciplinary range of existing and new courses and increase their understanding of sustainability, as well as consider and discuss it critically. The certificate is rounded off with a practical unit in which students can realize projects independently or join in civil society activities. The project workshop formats, where participants are guided by tutors through the conception and realization of their own projects, and the existing service learning opportunities provided by the Center for Key Qualifications (ZfS) should enable students to apply their knowledge practically and share ideas with civil society stakeholders.

Interview with the student initiative Sustainability Office at the University of Freiburg: History of the Sustainability Certificate



Let's start at the beginning: What led you to establish the Sustainability Office student initiative? And what does it have to do with the sustainability certificate?

The foundation of the Nachhaltigkeitsbüro, the sustainability office, in May 2018 goes back to the idea of the Studium Oecologicum, which is now called the sustainability certificate in Freiburg. At a meeting of various initiatives the idea arose of introducing this sort of certificate at Freiburg University. A group of student volunteers came together and took up this vision, and developed it through a student sustainability office. The aim is to embed students' commitment to sustainability at the University and raise the profile of students' points of view. The three key areas of our vision were: networking sustainability stakeholders, advancing the sustainability strategy and environmental reporting at the uni, and regards teaching, combining and expanding events on the subject of sustainability. This made the sustainability certificate part of our work from the beginning.

How did you address this vision? What part did the sustainability certificate play?

First of all, we had to highlight the need for courses in relation to sustainability and draw attention to our initiative. So, in the 2019 summer semester we started regular lecture series that cast light on the area of sustainability from interdisciplinary perspectives and had a different focus each semester. Our first series of lectures looked at the blind spots in the debates about sustainability in various disciplines. The next winter semester we continued with a series discussing (in-)equity. The 2020 and 2020/21

lecture series which were organized in cooperation with AK Plurale Ökonomik Freiburg took place online because of the pandemic. These focused on the themes of transformation, and sustainability & business.

And the lectures were well received...?

Yes, we were able to fill the lecture halls from the first semester and were delighted to see that the topics had a good reception and were keenly discussed. Following this, and as the first step towards the sustainability certificate, in the second semester we entered into a cooperation with ZfS to enable crediting towards studies for 50 participants. And in the semesters during coronavirus we were still able to reach a wide audience from the student body and the public despite the difficult circumstances.

After much work, the sustainability certificate was launched at Freiburg University in the 2021/22 winter semester. What was the process for successfully making the certificate part of the institution?

The success of the lecture series had shown clearly that there was interest and a need for sustainability-related events in the University's range of courses. This encouraged us in parallel to this public work to campaign in the background for the implementation of a sustainability certificate. We developed concepts, applied for funding, and from the start sought contact with the Rectorate and the Department for Environmental Protection and other stakeholders at the University. In May 2020 we got the consent of the University to introduce and finance the certificate program, once the combined student body had declared itself willing to fund the initial project phase.



The founding team behind the Nachhaltigkeitsbüro Uni Freiburg initiative; 'Identifying the Blind Spots' lecture series in 2019 summer semester. (Source: Nachhaltigkeitsbüro Uni Freiburg initiative)

That sounds like success! So was the work over for you now that the sustainability certificate was introduced?

Absolutely not! As well as continuing engagement in the sustainability certificate project team, we continue to be

engaged in networking stakeholders and promoting an integrated university sustainability strategy. Within the existing university structures, we are involved in the Sustainable University working group and this has involved us helping on the University's definition of sustainability and updating the University's environmental guidelines, for example. We have also got involved in the preparation of the Environmental Report through the emissions auditing project Flying Faculties. At a student level, we continue to support commitment to sustainability by organizing regular meetings for a variety of university groups and working on cooperation projects such as the annual university Sustainability days and the Baden-Württemberg First Semester Academy. We received the Alumni Award for social commitment in 2019 for our work at every level of the University. Next we plan to dedicate ourselves to realizing our vision of a structurally-anchored sustainability office, sometimes known as a 'Green Office'.

Objectives for the sustainability certificate by 2023

The introduction of the sustainability certificate in the 2021/22 winter semester is far from the end. First of all of course we hope that the certificate program will reach a broad range of students and be well-received in all faculties and disciplines. One of the current goals is to realize innovative teaching formats that can enrich university teaching in general in the long term. At a structural level the next steps will be to realize and expand the range of courses in the electives and a practical unit that is newly-created as part of the sustainability certificate, e.g. with project workshops and practical workshops in cooperation with companies and stakeholders from civil society. One requirement for this is making the certificate program a permanent part of teaching and long-term financing from the University. In all, the sustainability certificate will continue to be developed from semester to semester in the spirit of a learning organization.



“The themes of the sustainability certificate attract participating students and teaching staff academically and personally – how do we organize ourselves as a society, how do I organize a sustainable living environment for myself? This strong personal motivation makes it especially fun to get thoroughly involved in questions of sustainability on the courses together, to take an interdisciplinary look at connections and develop approaches in groups.”

Christoph Pfisterer, Project coordinator Sustainability Certificate



Center for Key Qualifications (ZfS)

The Center for Key Qualifications offers all students an interfaculty, interdisciplinary and demand-oriented range of courses which are strongly practical and have a wide variety of topics and areas of application. Alongside the compulsory modules for undergraduate degree programs in the field of work-related skills and supporting student teachers through their orientation internship, ZfS is responsible for the Service Learning knowledge transfer module, where students are guided through civic engagement and can obtain credits for it.

With 360 courses annually in relation to professional skills for an average 9,400 Bachelor's students, ZfS is one of the six largest teaching units. Its range of practical courses draws on more than 200 teaching staff from business, academia, schools and society, and is overseen by a quality committee. For the 2020 summer semester the teaching program was realized almost exclusively online because of the pandemic. The courses offered by the Virtuelle Akademie Nachhaltigkeit had to be removed from the program temporarily, because funding from the BMBF had run out. It is planned that they will resume from the 2022 summer semester.

“I personally am delighted that there will soon be a close link between Service Learning, the commitment to civil society which draws on reflection and learning, and the new sustainability certificate. I believe these are components for shaping the future.”

Verena Saller, head of the Center for Key Qualifications



A few of the sustainability-related courses in the reporting period:

Acting responsibly - what does that mean?
Ethical issues in everyday life and work

Responsibility in civil society: focus on technology
assessment, environmental ethics, sustainability

Economy and responsibility of tomorrow -
sustainable economic and life styles in view
of the climate crisis

Management of German nonprofit
organizations - fields of activity, function
and work

Professional field of sustainability -
design competence for sustainable
development using the example of tourism,
sports and nature conservation

Diversity competence
for a diverse working
world

Service Learning workshops:
• Climate change - consequences and risks
• Consumption styles and their consequences
• Ways to a sustainable chemistry

Moderation of conflicts in urban, regional
and environmental planning

Virtual Academy Sustainability
(in cooperation with the University
of Bremen)

Service Learning - Learning through civic engagement.

4 5 8 11 12 16 17

Through voluntary work on an initiative or a project related to the fields of 1) interculturality and migration, 2) sustainability, environment & life sciences, 3) education in democracy or 4) digitalization, the students gain practical insights into the possibilities for shaping our society and assume responsibility. The list of cooperation partners in sustainability include student groups such as the Sustainability Office initiative and the Environmental unit of the Student Council. NGOs and associations such as the Eine Welt Forum e.V., Tierschutz e.V. and local branches of NABU e.V. offer insights into civil society activities. The Öko-Institut e.V., Ökostation Freiburg and others also enable students to gain experience in advice and education. Support for engagement through workshops and supervision allows students to develop new strategies to solve challenges and realize them in practice.



The initiator Prof. Dr. Michael Müller was awarded together with Dr. Stefanie Houwaart and Dr. Dominik Baltes for the teaching concept of "Ethics and Sustainability" in 2019 with the University Teaching Award for extraordinary outstanding achievements

(Photo: Jürgen Gocke)

Award for exceptional teaching in the field of sustainability

3 4 9 12 17

The University Teaching Award is presented every two years by the University of Freiburg Senate, and in 2019 it honored the Ethic and Sustainability module from the Pharmaceutical Sciences Master's.

The importance of the integration of aspects of sustainability in teaching in all subjects and faculties can be seen from students' interest in events related to sustainable pharmaceuticals. Extra-curricular knowledge transfer-related lectures such as during the 2019 Langen Nacht der Universität (Long Night of Universities) or the Freiburg 2020 Sustainability days were not alone in being attended by many people; the new teaching modules from the Institute of Pharmaceutical Sciences in particular were extremely well-attended.

Since the 2018 summer semester the compulsory module Ethic and Sustainability of the Pharmaceutical Sciences Master's has been offered as an interdisciplinary teaching cooperation between Pharmaceuticals, Chemistry/Biology and Theology. Students engage with principles of ethics on a lecture course and then apply them to practical examples such as euthanasia, animal testing or gene therapy the next semester. For instance, they reflect on ethical aspects of medical and pharmaceutical progress and issues of ethical action in science and practice and hold nuanced discussions, all of which is often omitted in laboratory-based studies. The seminar is a beacon in the offering of scientific disciplines; the initiator Prof. Dr. Michael Müller together with Dr. Stefanie Houwaart and Dr. Dominik Baltes were presented by the Senate with the biennial University Teaching Award for outstanding performance for their 2019 teaching concept. In addition, the course serves as a model for a mandatory subject in

the new licensing regulations for the state examination in pharmaceuticals, although at present pharmaceuticals students do not receive any credits for the ethics course.

The new special lecture 'Sustainable Pharmacy' in the 2020/21 winter semester also attracted great interest and was attended by over 70 students instead of the planned 25. Half of the participants were taking the MSc Pharmaceutical Sciences and were able to obtain 1 ECTS at the class, while students who were taking the state examination took part without obtaining credits. Nevertheless, the latter made up almost all the other half of the participants, along with a few students from Chemistry, Liberal Arts and Sciences (LAS) and Sustainable Materials. In classes with the innovative 'flipped classroom' teaching format, basic knowledge and a shared language was developed through input in the form of texts, studies, videos or presentations with audio and subsequent discussions, enabling transdisciplinary analysis of sustainability. Important issues here included the life cycle of medicinal products and the role of pharmacology in the climate crisis.

Based on this experience, in the 2021/22 winter semester the special lecture 'Planetary Health – Global Illness' was offered in cooperation with University College Freiburg as an elective module for students of Pharmaceuticals and LAS. Working together with Karina Witte and Petra Mußler the concept has developed very successfully. Whether teaching on sustainable pharmaceuticals becomes a permanent part of the curriculum still has to be decided. However, the potential and the need for such an integrated treatment and interdisciplinarity for the education of those who will in future bear responsibility, and the appeal of the subject in research are undisputed.

“My motivation or goal for the future after the course ‘Sustainable Pharmacy’: therapy must serve the well-being of patients, and this is a core issue in pharmacology. Longer-term, ecological and economic aspects will also be influential. This issue, which I believe is still unanswered, motivated me to look at the subject once more from an ethical perspective.”

Pharmaceutics student



“Linking the theme in teaching and research across subjects and disciplines is in my opinion the crucial stimulus which we can give – and should embody, particularly at a comprehensive university like Freiburg.”

Prof. Dr. Michael Müller



Statistics about student satisfaction

85% of enrolled students are very happy or happy about studying at the University of Freiburg.

Roughly **70%** of those surveyed were as a whole very satisfied or satisfied with the conditions of studies.

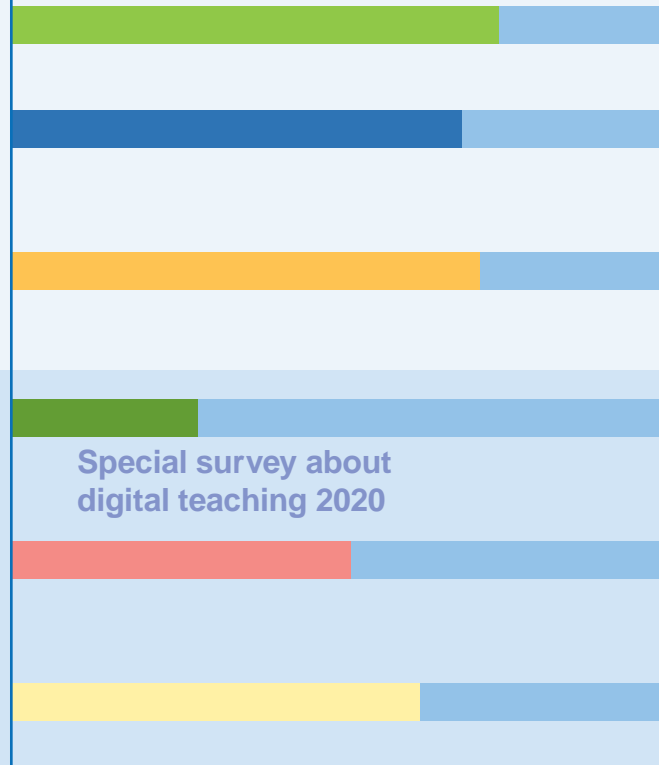
Have your studies at the University of Freiburg so far matched your expectations? Yes, completely – **76%**

I enjoy studying digitally at the University of Freiburg – **28%** completely agree

I wish classes in my subject were also offered in digital form in future – **47%** completely agree

How do you rate the realization of digital teaching at Freiburg University as a whole? – very good and good – **61%**

2019 survey



<https://www.qmlehre.uni-freiburg.de/zentrale-befragungen/befragung-der-studierenden>

Digital teaching and offerings in relation to sustainability

Switching ad hoc to digital teaching on account of the pandemic was a challenge for everyone concerned, but thanks to previous efforts and projects it was possible to do so rapidly. As a result it was possible to protect health during studies and increase the accessibility of teaching despite difficult circumstances, and with it the resilience of teaching activities long-term. Digital formats were not new to teaching at the University of Freiburg when the corona pandemic arose, but their use has increased. Students responded in contrasting ways to the switch to online teaching. This was apparent on one hand in the largely positively rated realization of digital teaching, but on the other in a basic decline in satisfaction with studies during the coronavirus semesters in comparison to 2019. Nevertheless, almost half of the students surveyed in 2020 would like online formats in future.

The provision of digital teaching material should not replace face-to-face classes, because the University of Freiburg re-

mains a real-world university. Rather, it should be used to meet the growing demand for more flexible formats. Blended learning and hybrid formats are particularly advantageous for working students or students with children; in addition they offer potential to save on mobility emissions. In contrast to the undergraduate degree programs which usually have to be attended, the University has for several years offered a number of Master's degree programs that are largely (80%) completed digitally by working students, including two related to sustainability ('Solar Systems Engineering' and 'Global Urban Health').

Additional sustainability-related courses were realized in the framework of the Digital Courses for Sustainability program by 2021 and in some cases incorporated into the EPICUR teaching:

<https://www.wb.uni-freiburg.de/wb/angebote/abschluss/mas/master>

Faculty of Environmental Protection

- Carbon Forestry
- PerForm Bioeconomy and Society – course was restructured for EPICUR
- Integrated Land Use Systems
- Tropical Forestry Ecology

UCF and EPICUR offerings

- Sustainable Cities
- Sustainable Entrepreneurship
- Mediated Modelling for Sustainability
- Sustainicum Collection
- EPIC Mission zu Sustainability

The European university alliance [EPICUR](#) is not only visible in research but is also committed to an innovative and socially-relevant digital range of courses in its teaching. One of the objectives of EPICUR in the pilot phase is to teach students the necessary skills to meet relevant 21st century challenges through collaborative teaching and learning formats. Besides knowledge about sustainability issues, courses therefore focus on competencies such as teamwork, communication skills, cooperation and collaboration, self-reliance, the ability to reflect and to change perspective.

University College Freiburg coordinates issues of ecological and social sustainability in teaching for EPICUR. Since the start of the project in November 2019, 22 digital courses have been offered via EPICUR in the field of sustainability for all nine universities in the alliance; in some cases cooperation by various teachers and team teaching formats led to entirely new lectures and seminars. University College Freiburg for example offers the 'Sustainable Cities' course (Dr. Sabine Sané), which draws on an international exchange between students to go on 'virtual excursions' and to discuss what makes up a sustainable city.

A cooperation with teachers from the University of Natural Resources and Life Sciences, Vienna and the University of Amsterdam led to the 'Mediated Modelling for Sustaina-

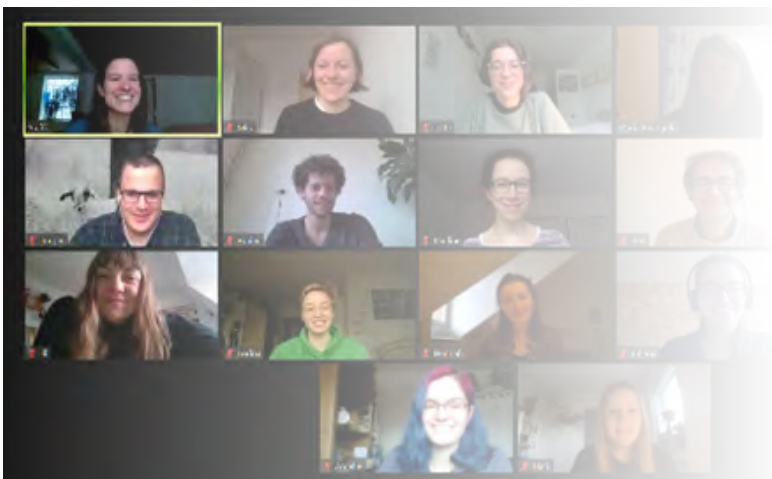
bility' seminar (Stefanie Klose, Andreas Zitek, Dr. Bert Bredeweg). This transnational teaching project examined the complexity of real sustainability problems from different international perspectives and disciplines with the aim of designing qualitative causal models of systems in relation to sustainability issues. Students selected their themes for themselves, develop models in digital group work and were provided with distance learning support by the supervisors. Besides skills in system thinking, other key aspects of the course included an interdisciplinary approach, teamwork and the differing approaches of the students, with the aim of strengthening critical thinking, as well as their ability to explain their scientific point of view and to deal with criticism.

Alongside EPICUR, the Eucor – The European Campus university grouping plays an increasing part in the cooperation, expansion and diversification of courses on offer, especially those focusing on sustainability. From 2022, teaching towards the current sustainability certificates at the universities in Basel, Freiburg and Karlsruhe will be mutually opened up to students. In addition, Eucor plans to introduce its own sustainability certificate in the long term, which will offer courses that go beyond the current certificates. The activities of the two European partnerships Eucor and EPICUR in the fields of research and knowledge transfer are described in the section on research.

“The great thing about EPICUR is seeing how new creative ideas can arise where there is opportunity, and how much commitment to sustainability-related issues there is both among teachers and students.”

Stefanie Klose, manager and teacher for the EPICUR degree program Natural and Societal Sustainability Studies

Course participants 'Mediated Modelling for Sustainability'





Research

researching and discovering



Innovative approaches and multidisciplinary cooperations

Given a sound understanding of environmental and sustainability-related issues and innovative approaches is necessary to tackle current social challenges, the University of Freiburg places particular importance on research as a means of generating knowledge in the field of sustainability using scientific methods. As one of Germany's most successful universities for third-party funding, ranked in the Top 3 in the German Research Foundation 2021 funding atlas (based on the number of research grants received per chair 2017-2019), the University of Freiburg bears great responsibility here.

With its outstanding research, the University of Freiburg has contributed for decades to generating and conveying in-depth knowledge on sustainable development. The Faculty of Environment and Natural Resources has been home to research into forestry and the environment for over 50 years. This has benefited from a mixture of natural science, social science and technological disciplines cooperating interdisciplinarily and transdisciplinarily on research across disciplinary boundaries. The Faculty of Engineering also conducts innovative research in cooperation with the Fraunhofer institutes.

Full use is made of the potential of a comprehensive university with its many disciplines in interfaculty research cooperations into sustainability, e.g. the ConFoBi project. Collaboration with other universities is also promoted at the University of Freiburg in research projects such as livMatS. For instance, sustainable energy systems have been the focus of the Center for Renewable Energy (ZEE) and the hu-

manities and social science perspectives in the Environmental Humanities network since 2007. In addition, since 2018 the Environment and sustainability strategic area has networked the activities of every discipline on this issue at the University. The newly-established Young Academy of Sustainability Research (YAS) provides a unique form of funding for the many perspectives and dimensions of sustainability research by postdocs.

Sustainability research also takes place at an international level, as shown by the European higher education alliance EPICUR and the Eucor trinational university grouping. Besides interdisciplinary work, the University identifies local and global challenges in transdisciplinary research together with social stakeholders, and in cooperation with them and other research institutes develops approaches for a future-proof society.

The University of Freiburg's sustainability objectives for research:

- Developing the profile of sustainability research and identifying key areas
- Formulating sustainability as a ubiquitous aspect in projects
- Sensibilization for responsible, sustainable research

Goals towards which the University of Freiburg makes greatest contribution through its research:



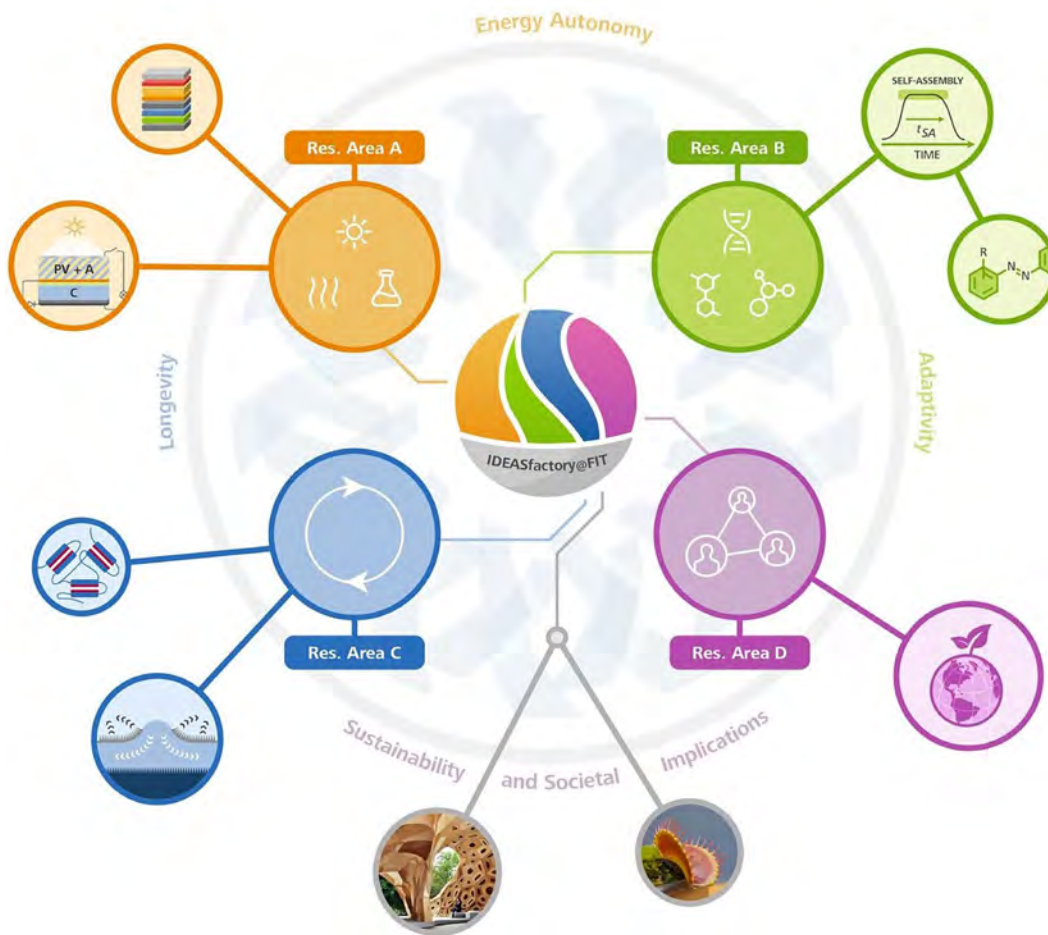


Fig. 1: Interplay of the closely interconnected Research Areas in *livMatS* (A – Energy Autonomy, B – Adaptivity, C – Longevity, D – Sustainability and Societal Implications). © *livMatS* / Daniel Hellweg.

The vision of the Cluster of Excellence Living, Adaptive and Energy-autonomous Materials Systems (*livMatS*) is to combine the best of two worlds – nature and technology. *livMatS* develops life-like materials systems inspired by nature. The systems will adapt autonomously to their environment, harvest clean energy from it, and be insensitive to damage or recover from it. The purely technical, but behaviorally quasi-living materials systems that are being developed in *livMatS* meet people's demands for future-oriented environmental and energy technologies. Research into the acceptance and social relevance of these autonomous systems and their sustainability are thus important components of development.

Energy autonomy, adaptivity, longevity, and sustainability are the core properties of the materials systems to be developed in *livMatS*. These challenging topics are investigated and combined with each other in four research areas.

Research area A – Energy Autonomy studies novel methods of energy harvesting and/or energy storage within a single highly integrated system, i.e. aims for the development of materials systems with embedded energy and energy management.

Research area B – Adaptivity develops new concepts for (self-)adaptive materials systems with complex energy landscapes that recognize and can react to sensory input from their environment.

Research area C – Longevity develops strategies that focus on the longevity and “self-control” of complex materials systems, drawing inspiration from living nature, particularly plant life, i.e. aims for the development of materials systems with embedded intelligence.

Research area D – Sustainability considers the societal dimension of autonomous, quasi-living materials systems and their sustainability. A societal discourse on disruptive technologies, such as autonomous driving or expert systems, is often conducted only after the development and introduction of these technologies.

The **livMatS Pavilion** in the Botanical Garden is a demonstrator building and a model for bio-inspired sustainable construction. It is the result of the successful collaboration of an interdisciplinary team of architects and engineers from the ITECH master's program at the Cluster of Excellence IntCDC at the University of Stuttgart and biologists from the Cluster of Excellence livMatS at the University of Freiburg. The pavilion's supporting structure is made from robotically wound flax fiber, a naturally renewable and biodegradable material. The livMatS Pavilion was inspired by the saguaro cactus (*Carnegiea gigantea*) and the prickly pear cactus (*Opuntia* sp.), which are characterized by their special wood structure.



© ICD/ITKE/IntCDC Universität Stuttgart

livMatS is based at the Freiburg Center for Interactive Materials and Bioinspired Technologies (FIT) and unites researchers from the natural, the social and the engineering sciences, as well as the humanities. The faculties involved in the Cluster are the Faculty of Engineering, the Faculty of Chemistry and Pharmacy, the Faculty of Biology, the Faculty of Mathematics and Physics, the Faculty of Economics and Behavioral Sciences, and the Faculty of Humanities. The institutional composition reinforces the university's strategic alliance with with the Fraunhofer Institute for Solar Energy Systems (ISE) and the Fraunhofer Institute for Mechanics of Materials (IWM) in Freiburg as partner institutions within the Cluster, and is complemented by the Institute for Applied Ecology (Öko-Institut e.V.).

The cluster received funding for its initial period (January 1, 2019 – December 31, 2025) from the German Research Foundation (DFG) as part of the Excellence Strategy of the federal and state governments – EXC-2193/1 – 390951807.

Department of Sustainable Systems Engineering (INATECH)

Research and teaching into the three key areas of Sustainable materials, Energy systems and Resilience have taken place at the Department of Sustainable Systems Engineering INATECH since 2015. The institute represents an equal partnership between the University of Freiburg and the five Freiburg-based Fraunhofer institutes. This basis makes INATECH unique as a structure for teaching and research within Germany, as it covers the entire spectrum from basic research through to industrial applications.

InNOSys project – How can we make the energy supply more sustainable?

Are energy systems more sustainable the greater their share of renewable energy systems? Or does a high proportion of green energy require so many technical systems and therefore also so many valuable raw materials in order to cover any level of demand for energy at any time that this is also incompatible with sustainability? How do the various conceivable scenarios for energy supply differ in relation to other criteria for sustainability than greenhouse gas emissions? Questions like these are examined in the InNOSys project. A sustainability comparison of ten different energy scenarios for Germany, including five with moderate climate protection objectives (80% greenhouse gas emissions compared to 1990) and five with ambitious objectives (95-100% reduction) showed that every scenario performed better than the current system in most criteria for sustainability. Ambitious scenarios however could not be described as more sustainable than the 80% scenarios. Every scenario performed worse on the aspect of use of resources and land. This makes it even more important to consider energy technology-related materials cycles more intensively in future, and therefore to combine different INATECH topics more intensively. The effects of the scenarios on economic benchmarks such as gross domestic product (GDP) and the creation of jobs was similar for every scenario. Studying popular preferences, by contrast, showed that aspects such as equity and distribution effects play an important part in the assessment of energy scenarios, and taking them into account could totally change the comparison and rating of the scenarios. Other aspects of sustainable energy systems are studied in current projects, e.g. the electrification of energy consumption in industry (IND-E project together with the Fraunhofer ISE and other partners). This is important because renewable energy is mainly usable in the form of electricity. This promotes one aspect of the objective to combine industrial production more with sustainability.

“My focus is on sustainable energy systems, a subject that has fascinated me most since my student days. I find energy systems particularly exciting because they are essential to every society and are closely linked with their industrial and economic development, and because at present they cannot be described as sustainable, and we need to change this.”

Prof. Dr. Anke Weidlich, Chair for Control and Integration of Grids, INATECH



7 9 12 13



Planting of the first experimental trees on 05.11.2013 by the rector of the university at that time, Prof. Dr. Dr. Hans-Jochen Schiewer.

Geobotany

Dr. Forest research project

The [Dr. Forest](#) project studies the role played by the biological diversity (or biodiversity) of forest ecosystems in human health. The question is not whether forests – in contrast to urban environments – have an effect on health, but whether the diversity of organisms in a forest has an effect. Above all, it is about the diversity of tree species. Biological diversity can have a variety of effects on human health and well-being. It can reinforce positive effects and diminish negative effects. Dr. Forest researches in both directions, with a focus on the following questions:

1. Effects that contribute to improving mental and physical health: to what extent does the acoustic and visual diversity of forests affect these two aspects of relaxation and the associated reduction in stress? What is the effect of tree species diversity on the microclimate of a forest, and how do the presence and contents of medicinal plants, berries and fungi change in forests? What effects do they have on the relaxation and health of visitors to the forest?

2. Effects that lead to reduced symptoms, e.g. those caused by allergies, infections or chronic diseases: How does a change in forest diversity affect the availability of sources of food and habitat or the control by natural adversities of disease carriers such as ticks or processionary caterpillars? Does this influence the incidence of these disease vectors? What are the effects of tree species diversity on the absorption of ozone, filtration of fine particles and the reduction of pollen load? Does this mean that biodiversity in the forest contributes to cleaner air?

Dr. Forest is an international project with researchers from France, Belgium, Germany, Austria and Poland representing the fields of ecology, medicine, biology, forest sciences and psychology. It is funded by the European BiodivERsA program and coordinated by the Chair of Geobotany at the Faculty of Biology in Freiburg.

Dr. Forest is an international project with researchers from France, Belgium, Germany, Austria and Poland representing the fields of ecology, medicine, biology, forest sciences and psychology. It is funded by the European BiodivERsA program and coordinated by the Chair of Geobotany at the Faculty of Biology in Freiburg.

“Biological diversity is incredibly fascinating and simply beautiful. Biodiversity in its many forms is however also the foundation for the functioning of ecosystems and for the well-being of all of us. I find studying this really exciting.”

Prof. Dr. Michael Scherer-Lorenzen, Project Manager



Conservation of Forest Biodiversity in Multiple-Use Landscapes of Central Europe (ConFoBi)

The **Conservation of Forest Biodiversity in Multiple-Use Landscapes of Central Europe (ConFoBi) Research Training Group**, which is being funded by the German Research Foundation (DFG) for the period 2016-2025, combines ecological studies on biodiversity with social sciences and economic studies on the protection of biodiversity. While junior ecologists undertake a model system study based on the Black Forest, which has the structural diversity necessary for the survival of a wide variety of groups of organisms, from fungi through insects to bats, junior researchers from social sciences and economics examine the conditions for forestry operators to allow such structural diversity. ConFoBi studies how effective structure-retentive measures such as enrichment with habitat trees and dead wood are for maintaining biodiversity in commercially-managed forests, and how protecting biodiversity can be effectively integrated into other forest functions, e.g. timber production and recreational use. The graduate school works closely with the Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg and ForstBW.

Key areas of its research program include:

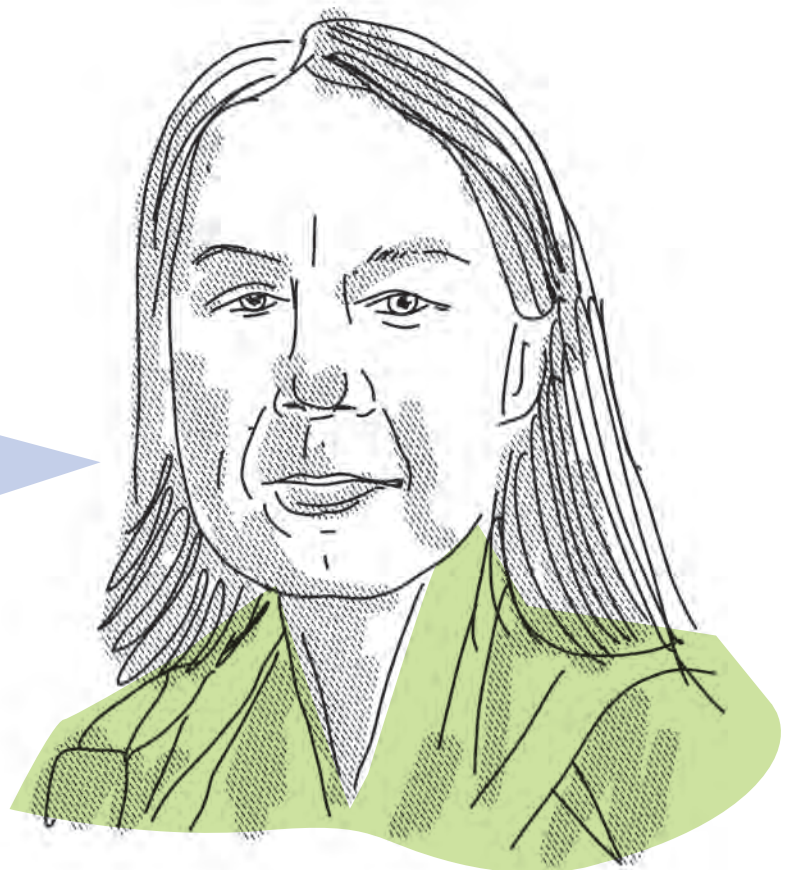
- Generating know-how for the assessment of structure for scales from microhabitats to landscapes;
- Researching interconnections of structures and biodiversity along forest structure and connectivity gradients;
- Assessing social aspects of forest biodiversity using economic and social science approaches, and
- Researching at the interface between science and society into the integration of support for biodiversity into forest management.

The first doctoral students focused on patterns of biodiversity in relation to forest and landscape structure, and on the knowledge underlying the protection of biodiversity. Drawing on this, their successors worked on ecological functions and processes to explain these patterns of biodiversity as well as the protective measures that had been applied and their effects. The ConFoBi research process culminates in an interdisciplinary scientific and practical synthesis of the findings that identifies biodiversity protection objectives based on numerous groups of organisms, and options for their integration into forest management.



“More effective biodiversity protection calls for a broad spectrum of views. So I value the cooperation with people from diverse disciplines and geographic backgrounds at ConFoBi. Our principle ‘All measurements on all test areas’ not only provides ConFoBi with a unique dataset, but also guarantees an ongoing exchange between disciplines, projects and the scientists who are involved. This leads to networked thinking.”

Prof. Dr. Ilse Storch, Coordinator of the Research Training Group



Environmental Humanities

[Environmental Humanities](#) is a highly-topical, socially-relevant field of research combining humanities, cultural and social sciences. It deals with ecology and sustainability issues as well as the plurality of ways in which they are conveyed culturally, in response to the insight that it is not enough to describe ecological problems and the development of new technology scientifically; the humanities are also necessary for an integrated understanding that considers causes and effects on cultures. It seeks a dialog with natural and environmental sciences in order to respond jointly to the global ecological crisis through interdisciplinary research and new ways of cooperating.

The initiative and the network around Environmental Humanities arose at the University of Freiburg within the scope of FRIAS's Research Focus Building and Researching Resilience in the Environmental Humanities. It is supported by Prof. Dr. Evi Zemanek from the Institute of Media Studies (coordinator), historians Prof. Dr. Sabine Dabringhaus and Prof. Dr. Melanie Arndt, and Prof. Dr. Hartmut Fünfgeld from the Institute of Geography, who form a core team in charge of exchange and cooperation with Freiburg and international researchers. This initiative ties in with sustainability research at the University and thus shifts the focus towards interdisciplinary research into resilience. The goal is to contribute to societal transformation, firstly by promoting research into resilience and expanding it to incorporate humanities perspectives, and secondly by helping humanities to develop resilience as well, so that it can respond to changes in higher education policy. This can currently often be seen in research and allows among other things ongoing development of approaches from the [Upper Rhine Cluster for Sustainability Research](#).

Since the 2018/19 winter semester, various courses in the field of Environmental Humanities have been offered and can be credited to specific degree programs. These include, for example, Media Ecology: Media Culture and Natural Resources (Prof. Dr. Evi Zemanek, 2018/19 winter semester) and Actor-Related Adaptation to Climate Change: Action Spaces and Planning Processes in Southern Baden-Württemberg (Prof. Dr. Hartmut Fünfgeld). Other courses include the Lunch Lectures on resilience and environmental humanities (2020/21 and 2021/22 winter semesters) as well as various international workshops and other formats.

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“Based on our FRIAS Research Focus we have succeeded in recent years in building up a vibrant network of humanities and social science experts at Freiburg University, who bring together a variety of environment-related research and teaching. Since we formed Environmental Humanities, there has been a more productive exchange with many other environmental humanities initiatives in the region, as well as nationally and internationally.”

Prof. Dr. Evi Zemanek, Network Coordinator



Gendering MINT Digital

As part of the BMBF cooperative project Gendering MINT digital. Open Science aktiv gestalten from 2018-2020, natural science and technologically-oriented findings from gender research in MINT were presented with a practical application, and prepared for open science modules with didactic concepts as well as participatory and collaborative electronic tools (e-tools). The modules provide an innovative basis for discussion and stimulus for reflection in research, teaching and gender equality work within the field of MINT and at its interdisciplinary interfaces.

There are three subprojects focused on different key areas: using interactive web documentation, Subproject I of the University of Freiburg in cooperation with Subproject III of the University of Applied Sciences Offenburg have gauged the extent to which artistic and medial methods encourage a (self-)reflective exchange to promote dialog between gender research and MINT. The web documentation developed tackles forestry and environmental science themes, among other things.

In parallel with this, Subproject II at the Humboldt University Berlin created the Gendering MINT Digital portal, which uses digitalized teaching units to enable easy access to the terms and principles of gender research. The aim is also to expand on subject specific themes, raise awareness of gender research issues in MINT, motivate and encourage reflection.



Dr. Marion Mangelsdorf, Gender Studies coordination office management, Center for Anthropology and Gender Studies (ZAG), University of Freiburg

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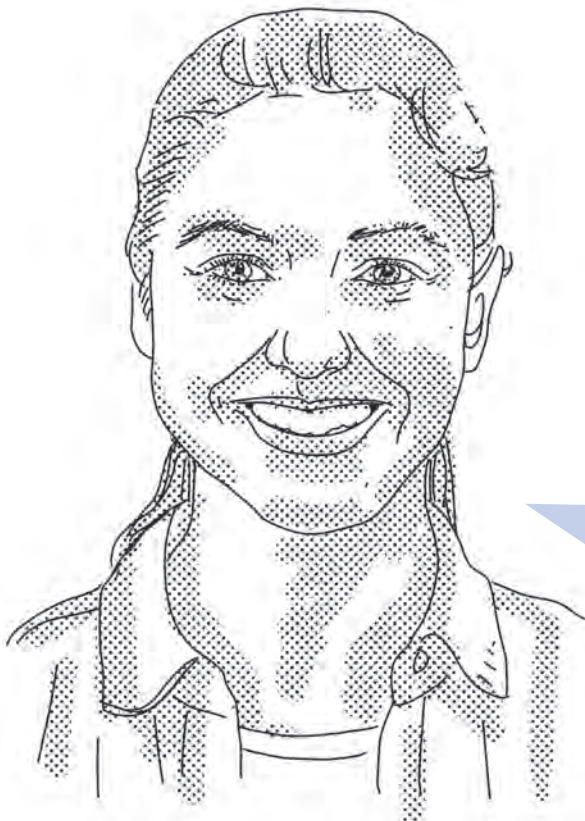
Young Academy for Sustainability Research

The Young Academy for Sustainability Research ([YAS](#)) is funded by the Eva Mayr-Stihl Foundation and is based at FRIAS. The objective of YAS is to further academic and in particular interdisciplinary discourses among outstanding early career researchers. It also promotes initiatives at the interfaces of science and society in the field of sustainability. YAS consists of 16 postdocs who come from different countries and disciplines, with half of them being members of the University of Freiburg. Membership is for three years (October 2021 to September 2024), with the Academy meeting quarterly for three days in Freiburg and working on joint research projects, interdisciplinary projects and publication in the field of sustainability research. Its members autonomously organize scientific conferences and workshops. In addition, YAS aims to connect with a broad public and investigates ways of conveying the scientific results of research to social stakeholders in a manner appropriate to each target group.

YAS is run by the members themselves, with organizational and administrative support from the FRIAS team. Furthermore, YAS is the first Young Academy in Germany working exclusively on the subject of sustainability, so it explicitly promotes interdisciplinary and transdisciplinary research in this important future-oriented field. In this way, YAS complements and advances efforts in sustainability research at the University of Freiburg, and represents an incubator for innovative networking activity as well as strengthening international and interdisciplinary networking between scientists.

“To me, sustainability is about the transformation into an energy democracy, in order to enable a new social, economic and ecological future.”

Dr. Benjamin Schütze, International Relations



At YAS I focus on how urban green areas – such as parks, street trees and gardens – promote public health, increase diversity of species and can moderate the effects of climate change, to make our cities more sustainable and more livable.”

Sousa Silva, Urban Ecologist

European associations in the field of sustainability

The University of Freiburg participates actively in European associations and also cooperates in the field of sustainability with other member universities in research, teaching and knowledge transfer. In the trinational association Eucor – The European Campus, the University of Freiburg is leading the focus area of sustainability (has the ‘pilotage’). In the European higher education alliance EPICUR, junior researchers from all nine partner universities are supported with networking and research initiatives towards three EPIChallenges, which include sustainability. The teaching activities of both European partnerships, Eucor and EPICUR, can be found in the section on teaching.

Eucor’s Focus Area: Sustainability

[Eucor](#) is a trinational association between the universities of Freiburg, Basel, Haute-Alsace, Strasbourg and the Karlsruhe Institute of Technology. Drawing on shared strengths and pooling expertise is the goal of the four focus areas of Eucor – The European Campus. Its broad agenda in sustainability, in which the University of Freiburg has pilotage, aims to develop interdisciplinary and multidisciplinary cooperation between Eucor universities on issues of sustainable development.

There are already numerous research cooperation projects, some making up the Upper Rhine Cluster for Sustainability Research ([URCforSR](#)). These look for instance at regional energy supplies (RES-TMO), sustainable mobility (SuMo-Rhine) or biocidal depositions in ground water (NAVEBGO). Until early 2022 there was a feasibility study into the ongoing development of the area around the former nuclear power plant at Fessenheim. This involved the URCforSR developing concrete options for investment in the areas of expertise green batteries and battery recycling, intelligent electricity grids and green hydrogen. Further cooperations and courses in relation to this focus area are planned, e.g. two summer schools for doctoral students in 2023 and 2024. Other options include a Science Slam on the theme, and forming a sustainability forum to act as a committee or work group that unites Eucor university members and could help to shape the approach to sustainability.

Knowledge transfer activities involved the focus area being introduced to the public at the Freiburg Science Market 2021. In the future it is planned to expand the cooperation between Eucor partner universities and ‘their’ cities in the field of sustainability. In addition, in 2023 there will be city tours across the Eucor area to spread information.

“Working for the focal theme of sustainability in the trinational university association Eucor is extremely interesting: supporting the Upper Rhine cooperation in this fundamental future-oriented subject is the driving force behind my work as an Eucor consultant at the University of Freiburg. There are so many motivated people in the field of sustainability in the Eucor region. We can learn a lot from each other and create added value in research, teaching and knowledge transfer through innovative formats.”

Sofia Ganter, Eucor consultant



EPICUR

EPICUR is a European higher education alliance of a total of nine partner universities in Germany, France, the Netherlands, Poland, Austria, Denmark and Greece. Since January 2020 the development of a common research agenda under the name EPICUR Research has been funded by the European Commission along with the German federal and state governments. The agenda's objectives are the creation of a European educational region, the funding of junior researchers, and the strengthening of challenge-oriented interdisciplinary and transdisciplinary research.

The social relevance of the research agenda is guaranteed by its orientation to three fields of research, known as EPIChallenges, including sustainability. Sustainable networking within and beyond the EPICUR higher education alliance will be ensured by the EPICUR networks EPICommunity and EPIConnect; the former networks junior researchers and promotes their visibility and autonomy with a new database and opportunities for mobility, while the latter establishes connections with other European university alliances.



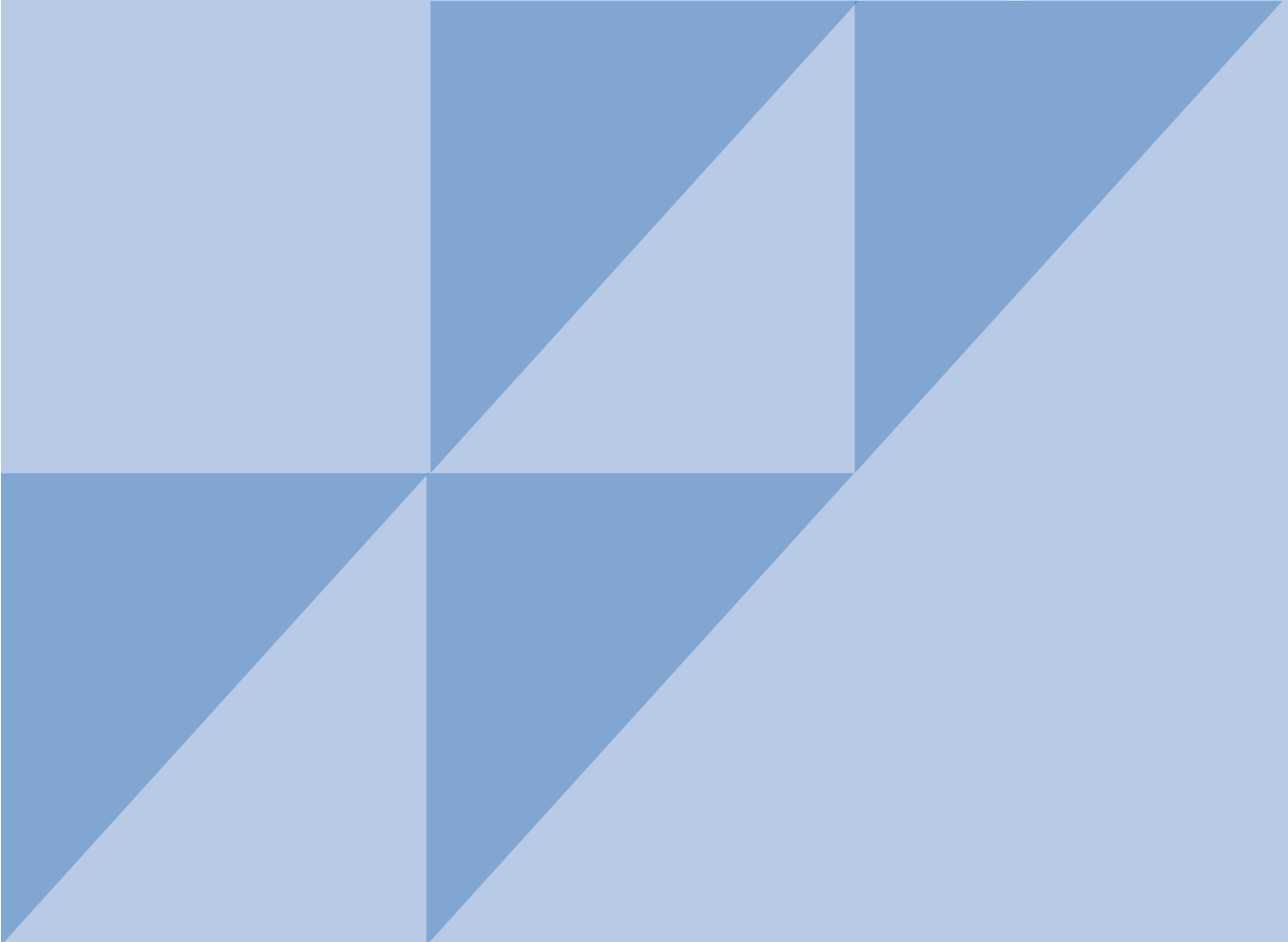
Co-funded by the
Erasmus+ Programme
of the European Union

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Transfer

inventing and exchanging



A dialog with society

Knowledge transfer is one of the purposes of a university, alongside teaching, research and professional development. It is characterized by the exchange of knowledge, ideas and experiences between a university and external partners from business, politics and civil society. The dialog with society is crucial to our ability to answer questions about the future. As a comprehensive university, the University of Freiburg can contribute to the public good in relation to sustainable development, by resolutely providing knowledge about sustainability. This involves both the transfer and communication of knowledge, technologies and methods to external stakeholders, and a proactive assimilation of society's demands as regards to social, economic and ecological questions. This provides added value for all those involved and gives rise to a reciprocal process with the goal of jointly finding suitable approaches to the many local and global challenges while drawing on all relevant resources.

The University of Freiburg's concept of knowledge transfer is divided into three aspects, as set out in this section: scientific knowledge transfer, technological knowledge transfer and educational knowledge transfer.

- **Scientific knowledge transfer:** Scientific knowledge is generated and taught at the University in its entire teaching and research output, so science communication with the aim of knowledge transfer is a central activity at the University. This scientific outreach makes fact-based information and scientifically-garnered advice available to the general public, as well as taking up their questions about research and demands for education. Besides everyday teaching and research, it also specifically includes advice provided independently to politicians by members of the University on issues of sustainability. In addition, the University consistently pursues an open science policy, which in the areas of research and teaching results in a firm commitment to open access.
- **Technological knowledge transfer:** Technological knowledge transfer ensures that new knowledge and associated technologies are passed on, in order to make them available for new products or services and in the end for future-proof jobs. The Center for Technology Transfer (ZFT) and the Sustainability Center Freiburg are two key bodies responsible for promoting a start-up culture at the University.
- **Educational knowledge transfer:** Educational knowledge transfer places the focus on opening up teaching and university courses and methods to society. There are many and diverse offerings, more information on this can be found in the sections on teaching and social responsibility. Studium Generale in particular is an opportunity to learn that is open to anyone who is interested in current issues.

The University of Freiburg's sustainability objectives for knowledge transfer:

- Strengthening communication on the subject of sustainability
- Reciprocal knowledge transfer and communication with society, in particular in the field of sustainability

Knowledge transfer

At the start of 2021, the University of Freiburg was the first university in Germany to have established the subject of science communication with a communicator within the Rectorate. This was the University of Freiburg's response to long-standing political demands for science communication to be strengthened because of its importance to academia and society. Since then, other universities have followed this governance model. Sustainability is now not only important to the Office of University and Science Communications team, but also within the Rectorate as a central theme in communication.

Studium Generale & Colloquium Politicum – Public Events for All

[Studium generale](#) and Colloquium Politicum at the University of Freiburg have enhanced the range of courses at the University for over 70 years and offer members of the public the opportunity to engage with science and art. Besides knowledge transfer and outreach at the University, the interdisciplinary dialog of the humanities and social sciences with natural sciences and technological disciplines plays a crucial part. The varied events do not form a single degree program but are purely voluntary and a matter of personal interest, as a result of which they attract not only students and teachers from the University but also locals from the city and the region.

There are three aspects to the offer: The academic events provided by Studium Generale and Colloquium Politicum offer a broad analytical view, with lectures by Freiburg scientists as well as by prestigious guest speakers from Germany and abroad. In addition there are other Studium Generale events such as concerts, readings and panel discussions on issues from literature and culture. The program also includes a small program of musical/artistic courses and guided tours of the University of Freiburg.

Each lecture series and set of courses that make up Studium Generale and Colloquium Politicum is on a different theme each semester. Switching to a completely digital offering on account of the pandemic in the 2020 winter semester and in the two subsequent semesters did not affect the variety of topics or audience numbers. Naturally, not all formats are suited to the digital space, and as a result discursive formats in particular represented a smaller part of the program during this period.

Questions about sustainability and the future are a regular part of the program. Examples include lectures on individual responsibility in the climate crisis (Jun.Prof. Dr. Stefan Pauliuk, 2019/20 winter semester) and on conflicts in the use of natural resources (Prof. Dr. Daniela Kleinschmit, 2021/21 winter semester), on an Unconditional Basic Income (Prof. Bernhard Neumärker, 2020/21 winter semester), on an 'Externalization Society' (Prof. Dr. Stephan Lessenich, 2017/18 winter semester) and on a new Enlightenment for balance and sustainable development (Ernst-Ulrich Weizsäcker, Club of Rome, 2017 summer semester). Aspects of sustainability are a systematic theme, e.g. as part of the ongoing lecture series Konturen der nächsten Gesellschaft (since 2018 summer semester), which has already looked at topics ranging from Smart Cities and digitalization through migration, decolonialization and feminism to inequalities and sustainability, as well as in a series of talks on Agenda 2030 (2017/18 winter semester) or in a recent Saturday Uni series on climate change (2021 summer semester, in cooperation with the Faculty of Environment and Natural Resources).

Since 2018 the City of Freiburg and the Faculty of Environment and Natural Resources have jointly organized the Environmental talks in Freiburg's Jazzhaus. The aim of this lecture series is to make the latest information on protecting the environment and the climate directly accessible and easily comprehensible to the public, and to encourage discussions on the subject. INATECH at the Faculty of Engineering also began another public lecture series in 2018 – the Sustainability Talks, which take place in English every year. Prominent experts from other universities, institutions and industry are invited to talk on sustainability-related topics.



Policy advice

As a historic science institution and comprehensive university that has shaped the local area, the University of Freiburg gathers under one roof expertise from a wide range of disciplines and subjects. This makes up a large pool of knowledge that can benefit politics, business and society. A list of [expert services for journalists](#) accessible on the University website offers an initial outline. Advice for politicians, including on environmental and sustainability issues, is one of the University's strengths.

The University is active and provides expertise at various political levels, both as an institution and through its individual members. At regular events in Berlin and Stuttgart, researchers provide information on relevant topics and results, in particular from the areas of the environment and sustainability, to politicians from the federal government and the Baden-Württemberg government. It is impossible to portray the entire range of activities and positions of individuals and institutes/facilities on the topic of sustainability here, so just a few highlights are given below.

Local politics:

The cooperation with the City of Freiburg is an important and varied aspect of knowledge transfer activities at the University of Freiburg. For instance, in 2011 the **Innovation Charter** was signed, thereby establishing the cooperation between the University, the city and Freiburg Wirtschaft Touristik und Messe GmbH to build up Freiburg as a place of science and industry.

As the largest educational institution and second-largest employer in Freiburg, the University not only delivers various knowledge transfer and advice activities but also makes a direct contribution to achieving [Freiburg's sustainability objectives](#), in particular in the areas '8) Economics and Science' and '10) Life-long Learning', but also in areas such as mobility, climate and energy, and social equity (see sections on Research, Teaching, Day-to-day Operations and Social Responsibility).

Also as a science institution, the University is represented on the [Freiburg Sustainability Board](#) by Vice-President for Internationalization and Sustainability Prof. Dr. Daniela Kleinschmit (formerly by Rector Prof. Dr. Hans-Jochen Schiewer). The board is an advisory body supporting the development and realization of a local sustainability strategy with recommendations and opinions. In this way it ensures that scientific expertise is brought in to decision-making structures and the public discourse.

One example of a tangible cooperation is the transdisciplinary project [Zukunftsstadt Freiburg](#) of the City of Freiburg and the Sustainability Center of the University of Freiburg, which was realized under the umbrella of a competition targeted at civic authorities by the Federal Ministry for Education and Research (BMBF). Between 2015-2018, the cooperation developed 'Vision 2030' for the City of Freiburg with the aid of people from academia, industry and society in general.

Institutionalized cooperations like this between the University and the City of Freiburg can in the long term offer a basis for cooperation to be consolidated and made permanent, thereby making the extensive expertise from the different faculties and institutes at the University accessible to civil society as well as for political implementation and projects, and so fulfil its educational objective in varied and inclusive ways.

The Federal State of Baden-Württemberg:

At a federal state level, several members of the Faculty of Environment and Natural Resources advise political parties; a few examples of their activities are outlined here.

The **Council for Sustainable Development** of the Baden-Württemberg government has been supported by University of Freiburg expertise from Prof. Dr. Alexandra-Maria Klein (Chair of Conservation and Landscape Ecology) since 2019, likewise the State Advisory Council on Nature and Environmental Protection (**Landesbeirat für Natur- und Umweltschutz**) since 2018.

Since 2020, Prof. Dr. Daniela Kleinschmit (Chair of Forest and Environmental Policy) has contributed her expertise to the Beirat **Nachhaltige Bioökonomie Baden-Württemberg** (Sustainable Bioeconomics council), which was established to provide scientific advice to the federal state government on the implementation of the regional strategy on sustainable bioeconomics and deals with issues relating to sustainable and circular bioeconomics.

In addition, Prof. Dr. Dirk Schindler (Chair of Environmental Meteorology) was appointed one of six scientific representatives on the newly-established **Climate-advisory council** of the federal state government in 2021, providing advice on the issues of climate protection and adapting to climate change and assisting with writing a climate report and sector-specific measures for achieving the regional climate targets.

The Federal Government:

National politicians also receive eminent advice from members of the Faculty of Environment and Natural Resources on the scientific advisory committee for forest policy, the **Wissenschaftlicher Beirat für Waldpolitik**: Prof. Dr. Jürgen Bauhus (Chair of Silviculture) chairs the committee and along with Prof. Dr. Friederike Lang (Professur für Bodenökologie) offers scientific perspectives on sustainable, multifunctional forest management at both national and international levels and develops proposals and reports on the realization of the federal government's Forest Strategy 2020.

In the forward-looking field of technological sustainability, Prof. Dr. Hannah Bast (Chair of Algorithms and Data Structures) was since 2018 an expert on the federal government's **select committee on artificial intelligence** looking at social responsibility and economic, social and ecological potential in the period 2017-2021.

As a decisive voice in the field of economic policy and sustainable public finance that considers the burden on future generations, Prof. Dr. Lars P. Feld (Chair of Economic Policy and Constitutional Economics) was from 2011 to 2021 a member of the German Council of Economic Experts, known as the economic sages. He now provides advice on other bodies such as the minimum wage commission.

International:

Scientists from the University of Freiburg are also engaged in international bodies, such as the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)**, which issues scientific information on the status and development of biological diversity and its ecosystem services to political decision-makers. For instance, Prof. Dr. Alexandra-Maria Klein (Chair of Conservation and Landscape Ecology) was a lead author on the IPBES pollinators report.

“I believe it is important that some scientists explain their field of research and latest findings to politicians and the wider society in a factual and neutral way. So I have always been committed to science communication and advising politicians. Producing advisory papers like the one for IPBES takes a lot of time. In order not to neglect my teaching and research it means hard work at weekends, in the evening and occasionally at night.”

Prof. Dr. Alexandra-Maria Klein, head of the Chair of Conservation and Landscape Ecology



Technological knowledge transfer

Center for Technology Transfer (ZFT)

Technological development and innovation are essential in order to tackle modern challenges and achieve sustainable development. With the Center for Technology Transfer ([ZFT](#)) acting as an interface between the University, University Medical Center, and business, the University of Freiburg has since 1995 had a potent infrastructure for technological transfer, start-ups and innovations. Important sections of the ZFT are the contract office, the patent office, the innovation office and the start-up office which all aim to spread progress in the field of sustainability to business.

In the period between 2015 and 2020 around 1,100 new research contracts and clinical study contracts were drawn up and/or concluded annually by the contract office in practically every project category. In recent years, the patent office has received on average around 80 notices of an invention annually, and around one-third of these have started the patenting procedure. In total, over 1,500 patents have been issued to the University and University Medical Center since the ZFT arose. About half of the patents registered and issued in the period 2017-2020 have been licensed.

Inventions and patents are another important benchmark of the innovative capacity of an institute. The University of Freiburg has been one of the universities with the highest output of patents in Germany for many years. This is documented in rankings of the innovative capacity of universities. The Thomson-Reuters 100 Most Innovative Universities, which was released annually between 2015 and 2019, constantly featured the University of Freiburg. In their German listings, the University of Freiburg has always held a place in the Top 10 in the past decade.



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“Inventions and the resulting innovations are an important part in the achievement of a sustainable future. The patent office will support you with the protection of your ideas and together with the team from ZFZ guide you on the path from invention to innovation. Don't be shy about approaching us.”

Dr. Torsten Schmidt (ZFT patents office)

Support for start-ups at the University of Freiburg

In 23 years of institutional support for start-ups from the University of Freiburg's start-up office, which was founded in 1999, some 2000 people with about 1200 start-up projects have received advice. This has resulted in 330 companies being set up, 230 (70%) of which are still active on the market. The qualifications and courses that are offered relating to starting your own company are especially worth noting, with options such as the business plan course at the Center for Key Qualifications and the entrepreneurship lecture series. These, together with the WeTell start-up, have advised and supported other sustainability-related projects.

The significance of the start-up office is growing, and as a result resources in this area have increased in recent years.

Projects to strengthen technological knowledge transfer

Since the start of 2019 the University of Freiburg has been a partner in the Interreg-funded project KTUR (Knowledge Transfer Upper Rhine), which promotes the development of a cross-border network that unites all stakeholders who are involved in knowledge transfer – from research and academia through intermediaries (e.g. business development) up to start-ups and companies. The University of Freiburg oversees the Gründen am Oberrhein work group and concentrates on several subprojects offering support for start-ups. These include the development of a regional platform for the exchange of ideas, networking projects (e.g. between SMEs and start-ups or with the relevant student university groups) and linkups with professional development options.

The Start-up|Energy platform which was jointly initiated by the University of Freiburg and the Solarenergie 2020 foundation is intended to promote the exchange between start-ups working in the field of decentralized and renewable energy supplies in Germany and East Africa. Focusing on the University's strategic area of the environment and sustainability, this will strengthen Freiburg as a region that pioneers the expansion of decentralized energy sources regionally and nationally.

WEtell: Using university expertise for sustainable start-up companies



The sustainable mobile communications start-up WEtell is a success story in knowledge transfer:

Founded in 2019 by graduates from the University of Freiburg and others, the company claims to be the first mobile communication provider in Germany that is climate neutral throughout the entire value chain (according to the Greenhouse Gas Protocol Standard in Scope I-III). This has been made possible by the construction of 570kWp photovoltaic systems and investments in vegetable carbon, among other things. In addition, the digital service, mobile communications at standard market rates, are rigorously provided in accordance with eco-social aspects, i.e. public good-oriented standards are followed, including in the fields of data protection, fairness and transparency.



“With the experience gained from solar cell research at the Fraunhofer Institute for Solar Energy Systems and the support of the University of Freiburg's start-up office for the Exist start-up grant we turned an idea into a successful new company in Freiburg. Our team is driven by a very idealistic motivation and we want to dedicate our energy to solving the climate crisis.”

Alma Spribille (founder of WEtell)

Sustainability Center

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Founded in 2015, the Sustainability Center Freiburg ([LZN](#)) is a cooperation between the University of Freiburg and the five Freiburg Fraunhofer institutes (Ernst-Mach-Institut, Institute for Applied Solid State Physics, Institute for Physical Measurement Techniques, Institute for Solar Energy Systems, and the Institute for Mechanics of Materials). Scientists at the LZN jointly research into solutions for sustainable development, in particular of technical systems, from basic research through to application-ready. The goal of the LZN is to implement the results of sustainability research in Freiburg in innovations, and support their development for practical use. In its pilot phase the Sustainability Center Freiburg successfully established itself as a key participant in technological sustainability research in Germany.

In the period 2019-21, the focus was on developing the Sustainability Center Freiburg into a knowledge transfer infrastructure. LZN aims to support the transfer of scientific results from the field of engineering science sustainability research. As part of research projects, ten demonstrators were successfully developed and the underlying technology was protected with patents. The demonstrators were then further developed in contract research projects in close cooperation with industry. In addition, it was possible to successfully support start-up teams as well as intensifying cooperation with partners from the innovation sector, and to jointly develop and implement formats for start-up entrepreneurs, e.g. the Innovation Bar.

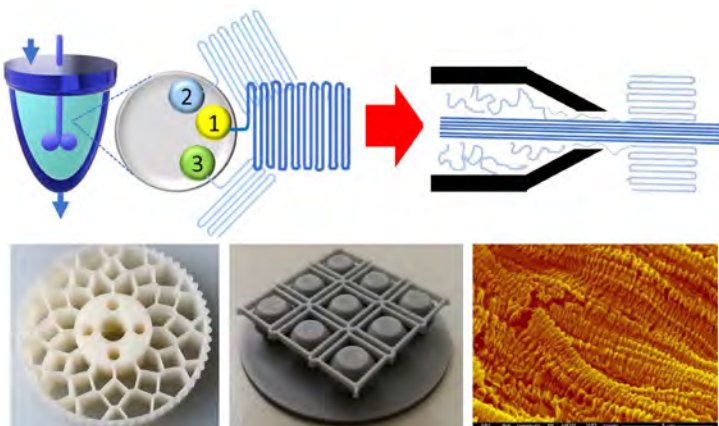
The engineering science heart of the Sustainability Center Freiburg is the Department of Sustainable Systems Engineering (INATECH), which was also established in 2015. INATECH has strong roots as the third institute at the University of Freiburg's Faculty of Engineering with the successful and popular Bachelor's and Master's in Sustainable Systems Engineering, as well as embodying a longstanding close cooperation between the Freiburg Fraunhofer institutes and the University of Freiburg.

Since its foundation in 2015, eight of the eleven faculties and central university institutes have become involved in LZN as well as the five Freiburg Fraunhofer institutes. Consequently, the LZN has succeeded in invigorating the strategic alliance that was established between the Fraunhofer Society and the University with the 2005 cooperation agreement.

3D-printing of pure composite materials for sustainable lightweight construction and the closed-loop economy – one of the ten Demonstrator projects at the Sustainability Center Freiburg

One of ten demonstration projects by the Sustainability Center

Fibers strengthen plastics in lightweight construction and help to reduce weight and therefore energy and greenhouse gas emissions in transport. Recycling these multi-component systems is complex. The Freiburg Materials Research Center (FMF) together with the company LyondellBasell opened up access to pure composite materials made of hydro-



carbon. These single component raw materials are self-reinforcing, also use biomass and used plastics as raw materials, and unlike traditional composite materials can be mechanically recycled without residues. Since they, like mineral oil, only consist of carbon and hydrogen atoms, they have a similar energy content to mineral oil. Polyethylene is produced in just one step using high-efficiency catalysts without solvents, and high-strength nanofiber-like structures are formed when shaped using injection molding and extrusion and material recycling with specific crystallization; these nanofiber-like structures very efficiently strengthen the raw material. In addition, recycling does not require problematic fiberglass additives, toxic nanoparticles or other foreign matter. While injection molding was

only capable of forming nanostructures in one direction (unidirectional), using computer design specifications 3D-printing can form specific nanostructures and the digital production of controllable multidirectional composite materials is possible for the first time.

At the Sustainability Center Freiburg (3DsusCOMP cooperative project) this approach – with great potential for the closed-loop economy – was brought to demonstrator maturity working with the Freiburg Fraunhofer Institute for Mechanics of Materials (IWM), LyondellBasell and Arburg. As well as gears that can be lubricated with water instead of oil, connectors designed by IWM have been 3D-printed. To date five patent applications have been filed by LyondellBasell and the University of Freiburg.

Prof. Dr. Rolf Mülhaupt, Freiburg Materials Research Center (FMF) in cooperation with Dr. Raimund Jäger, Fraunhofer Institute for Mechanics of Materials (IWM), Dr. Erik Licht, LyondellBasell and Lukas Pawelczyk, ARBURG GmbH + Co KG.

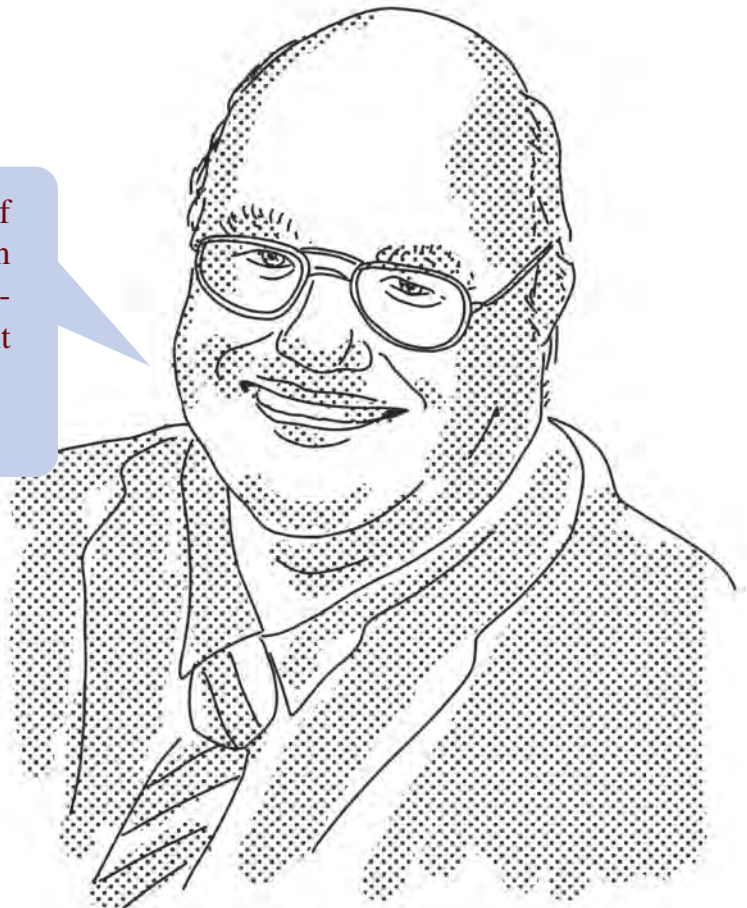


Photo of Prof. Dr. Rolf Mülhaupt with colleagues Dr. Timo Hees and Dr. Carl G. Schirmeister

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“Self-reinforcing and 3D-printing of mechanically-recyclable hydrocarbon materials open up entirely new possibilities for sustainable lightweight construction.”

Prof. Dr. Rolf Mülhaupt





Social Responsibility

fostering and engaging



Shaping a participatory and inclusive university culture

The social aspect of sustainability, alongside the ecological and economic aspects, is an essential component on the path to a future-oriented university. As an educational establishment and employer, the University of Freiburg focuses on inclusion, equal opportunities and diversity, family support, occupational health and safety and professional development. A consistently attractive teaching, learning and work environment, as well as a participatory and inclusive university culture, enables every member of the University to realize their individual potential. The diversity and creativity of each and every individual is valued and supported by a gender-sensitive, non-discriminatory and family-friendly atmosphere.

These objectives have since 2021 been given high-profile support by the Vice-Presidency for University Culture and associated institutions such as the Department of equality, diversity and academic staff development. Specifically, there are many projects and services implementing social sustainability at the University of Freiburg, e.g. the Family Service, internal professional development, the promotion of health, and various advisory services for staff and students.

The corona pandemic was a huge challenge for every member of the University. The coronavirus coordination office and the safety department helped to manage adjustment to pandemic conditions as well as possible. This new situation particularly highlighted the high social value of the University as a place for meeting and cooperation. Creating an enduringly inclusive and respectful culture here is a continuous process and the University constantly endeavors to improve the conditions of study and work with this in mind.

The University of Freiburg's sustainability objectives for social responsibility:

Sustainable staff structure and attractive working conditions:

- Anchoring management guidelines in the academic field
- Developing meetings with staff to discuss careers
- Establishing a transparent procedure for recruitment to academic non-professorial teaching staff
- Improving the welcoming culture

Achieving gender equality, diversity and inclusion at all levels:

- Establishing a pro-diversity staff selection procedure
- Continuously increasing the ratio of female professors
- Enduring incorporation of gender studies in research and teaching
- Creating an action plan for inclusion

Antidiscrimination:

- Expanding support and advisory services
- Establishing anti-bias training for management

Improvement and ongoing development of family-friendliness:

- Expanding services for emergency/flexible child care
- Establishing family and people-friendly work hours



Gender & diversity

The University of Freiburg regards the inspirational diversity of people and subjects as a strength. It works to implement gender and diversity themes in all its areas of activity and processes in a cross-cutting way, based on an understanding of equal opportunities which as well as taking into account sex-based equal opportunities also considers other aspects of inequality, in particular those named in the Allgemeines Gleichbehandlungsgesetz (General Equal Treatment Act, AGG): age, (ethnic and social) origin, religion and ideology, disability, sexual orientation and gender identity, and allows for the complex intersectional interrelationships of these aspects. Gender equality and diversity work operates in a field of tension between the statutory remit to ensure equal opportunities for women and men and an integrated approach to diversity that aims to create equal opportunities by raising awareness and cultural change. In 2010 the university management signed the [Diversity Charter](#) thereby committing to ensuring a greater awareness of diversity and the creation of a work environment free of prejudice and discrimination.



Equal Opportunities

The University of Freiburg's [Equal Opportunities Officer](#) guides and advises staff in the areas of administration, service and technology and deals with questions of gender equality and ensuring a work-life balance. In accordance with the law on gender equality, she is elected by the group she represents, i.e. all women who work in academic management or an academic support area, and as a legally and democratically elected representative is free to act according to her own judgment.

Her duties include assistance at job interviews for posts predominantly occupied by men/women and advising the university management on implementation of professional equality, but also, working with the Family Service, the organization of the [Girls' and Boys' Days](#), which once a year allow school children to learn about male/female-dominated professions, and the Bring your children to work day for staff (MiKi Tag) where children learn about their parents' jobs. The aim is to go beyond simply making discrimination against women at work visible and taking suitable measures to tackle it; instead, the issue of gender together with the potential effects on women and/or men, as well as on parents, should be proactively taken into account in all decisions at the University.

Although direct discrimination against women and parents is already legally barred and therefore very rare, aspects of indirect discrimination and unconscious bias continue to exist. For instance, women and parents are more likely to work part-time or to fulfil family duties. On top of there is the issue of multiple disadvantage, such as with women with a migration background, but also where there is a lack of female role models in technical careers with good earning potential and correspondingly few female applicants for these jobs.

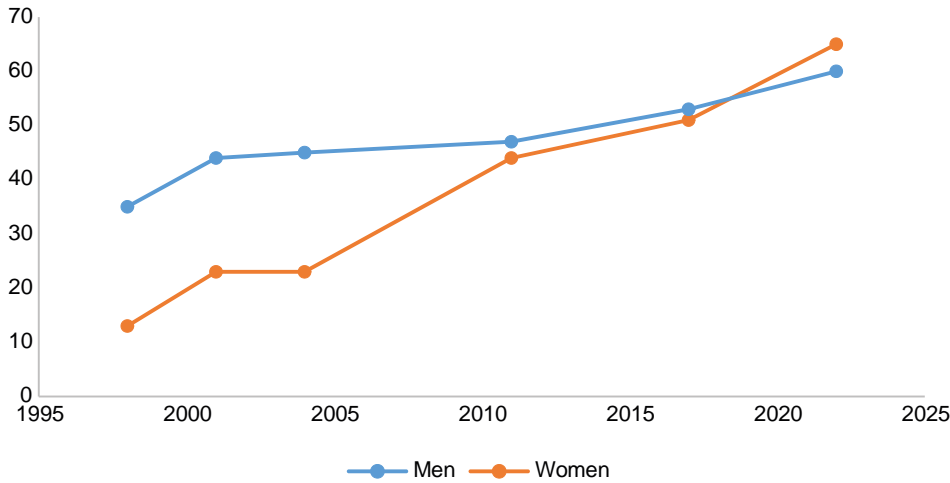
Successes that she has achieved include the promotion of women to managerial positions in the areas of administration, service and technology, which can be seen from the fact that absolute figures on management are converging.

“Enabling career development, regardless of personal characteristics, is important to me. To do this, the basic conditions need to change, so that people can combine their individual lifestyles with professional success. Then equal opportunities will have been achieved.”

Katharina Klaas, Equal Opportunities Representative, member of Sustainable University Working Group



Senior executives in absolute figures



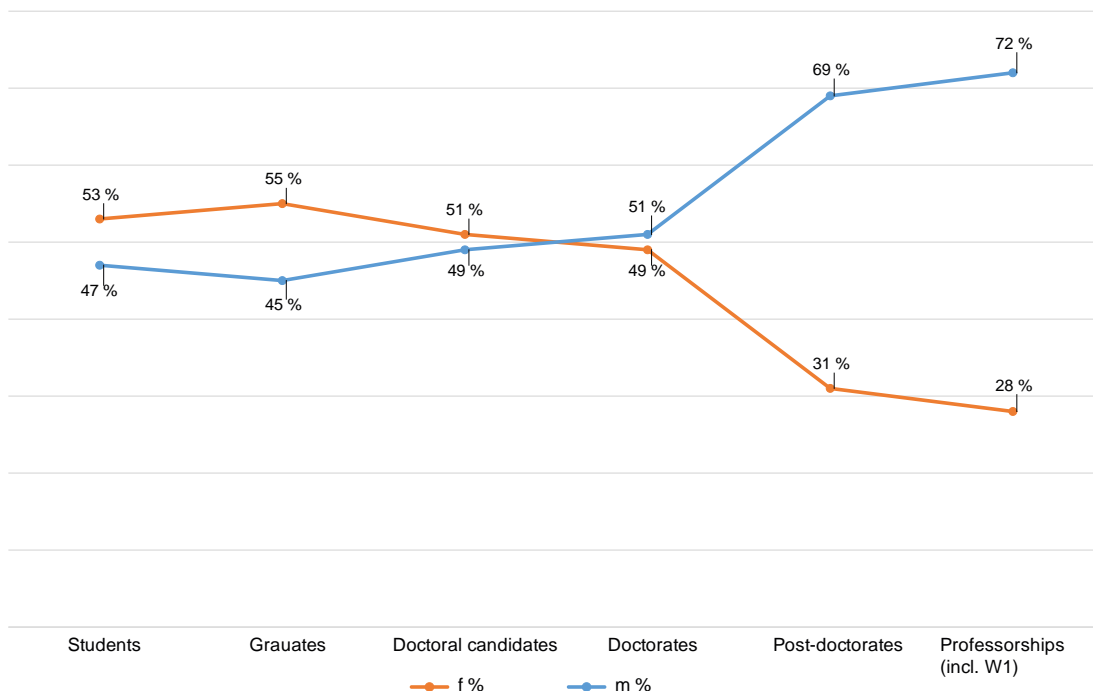
Data are gathered roughly every five years. Source: Equal opportunities statements from 1998 to 2019

Gleichstellungsbeauftragte

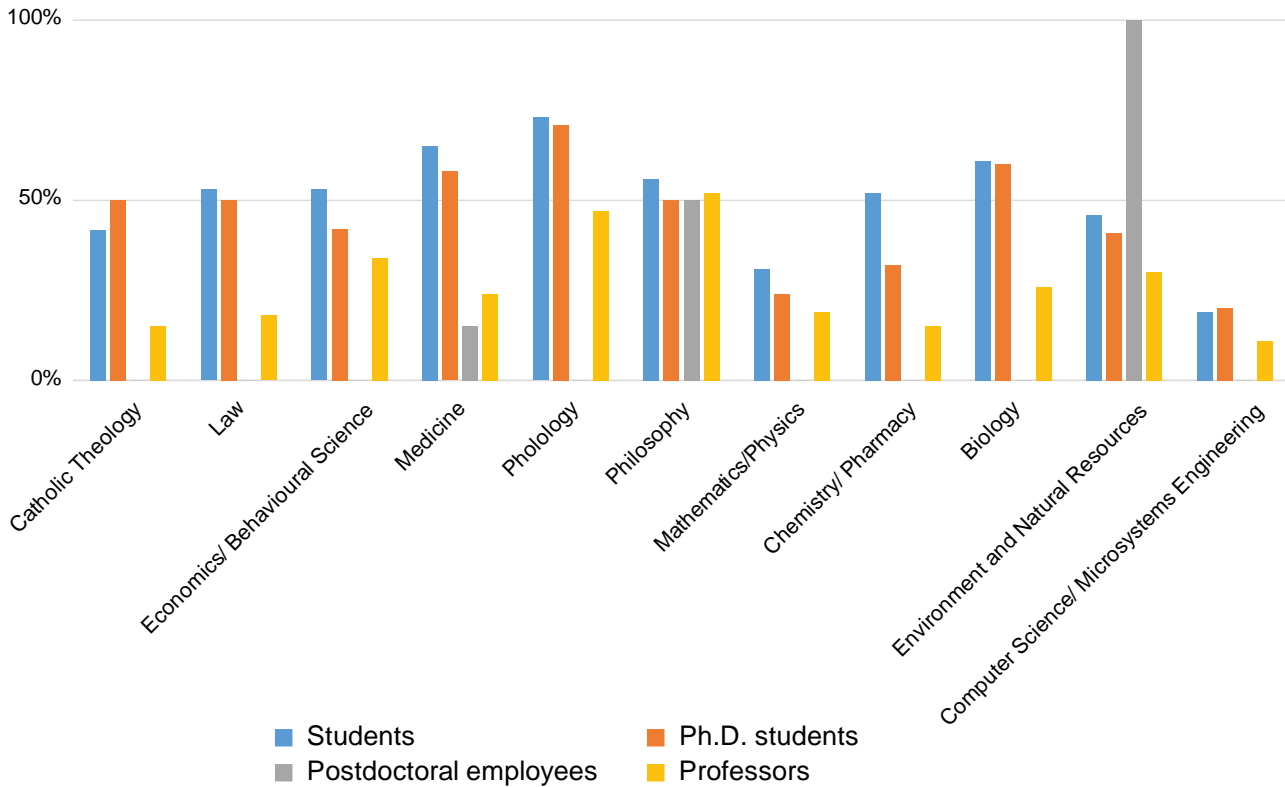
The University of Freiburg's gender equality representative fulfils a similar role for academics and students. They are elected for four years by the Senate in accordance with the State University Law and are organizationally subordinate to the Rectorate. Their tasks include support for appointment procedures, advising and raising awareness among academic staff and students, and the creation of an annual equal opportunities report. The improvement in the ratio of female professorships shows a significant increase from 20% in 2012 to 28% in 2021. While the ratio of female professors was above the regional and national average at 28% in 2021, it is still clearly too low. This is because of what is known as the 'leaky pipeline effect': although women make up about half of the students, after gaining a PhD they are more likely to leave an academic career than men. As a result it is still an important objective to increase the ratio of female professors at the University.

The University is taking several measures to reduce existing disparities. For instance, since 2010 women have actively been called on to apply in the advertisement of professorships and managerial positions, and given preferential treatment when equally qualified. A gender-sensitive approach to prospective students is ensured in the marketing of degree programs. For a holistic approach, the awareness of decision-makers at the University of Freiburg for the diversity of the workforce should be increased through training and other interventions.

Career stages of women and men 2021



Proportion of women by faculty and career level



“For an integrated and comprehensive approach in academia, it is important that the female perspective penetrates every field in a lasting manner and that women significantly help to shape the academic and research landscape as the heads of research groups and in managerial positions.”

Dr. Regina Herzog, Gender Equality Representative



Office of Gender and Diversity

The [Office of Gender and Diversity](#) (since 2021 part of the new Department of equality, diversity and academic staff development, GDaPE) is the strategic body overseeing issues of gender equality and diversity. Its core task is advising the university management on various decision-making, planning, implementation and assessment procedures in relation to gender equality and diversity. It also advises university institutes on the practical realization of gender equality and diversity as well as on planning gender equality measures, such as in third-party funded projects. The office (and GDaPE) develops tools and materials for measures to raise awareness about gender and diversity at the University. It is working on establishing a gender and diversity database and incorporates the office of the Permanent Senate Commission on Equal Opportunity. As a result, and unlike the elected positions of the equal opportunities and gender equality representatives, its remit goes beyond the aspects of gender equality and family-friendliness.

Some measures designed to achieve the above objectives by changing the structure and culture at the University that are being realized by the Office of Gender and Diversity or GDaPE are described below.

TOTAL E-QUALITY award

For its exemplary commitment in the fields of equal opportunities and diversity, the University of Freiburg was presented with the [TOTAL E-QUALITY](#) award for the fourth time in 2021 (previously 2010, 2013 and 2017). As in 2017 the award also given with the Add-On Diversity. Institutions are presented with the TOTAL E-QUALITY award for successfully realizing equal opportunities and supporting diversity in their HR and organizational policies. The distinction is given for three years by the non-profit association TOTAL E-QUALITY Deutschland e.V.

(Source: <https://www.total-e-quality.de/de/das-praedikat/uebersicht/>)



Diversity Day

The plurality of lifestyles, the various intellectual, cultural and social backgrounds of students and staff, and diversity in actions and thought all require the University and its members to be free to make the most of their potential. To raise awareness of the issue among staff and students and establish a pro-diversity organizational culture, the University of Freiburg has put on an annual [Diversity Day](#) since 2012. This is in pursuit of its objective to encourage diversity-sensitive higher education management, research, teaching, human resources policy and basic conditions and to present the University of Freiburg as an attractive place to work and study, both to its members and to a wider world. In May 2020 and for the first time in virtual form the University of Freiburg held its 9th Diversity Day with the focus on 'diversity and pandemic'. As part of the German Diversity Day under the Charter of Diversity, the European Diversity Month, and its application to the Eine Uni – ein Buch competition, the 10th Diversity Day took place on May 18, 2021. The Office of Gender and Diversity presented a range of events intended to present the University's activities to counter hatred and promote respect and antidiscrimination, including four anti-bias-workshops. Naturally because of the pandemic these were in online format. All members of the University of Freiburg were invited.

“Universities bear a special responsibility to their members - students and employees - as well as to society when it comes to sustainability. To consider this as a cross-sectional issue not just in ecological and economic terms, but also in societal, gender equality policy and social issues and to take it into account is for me an essential part of this responsibility.”

Felix Wittenzellner, Department of equality, diversity and academic staff development



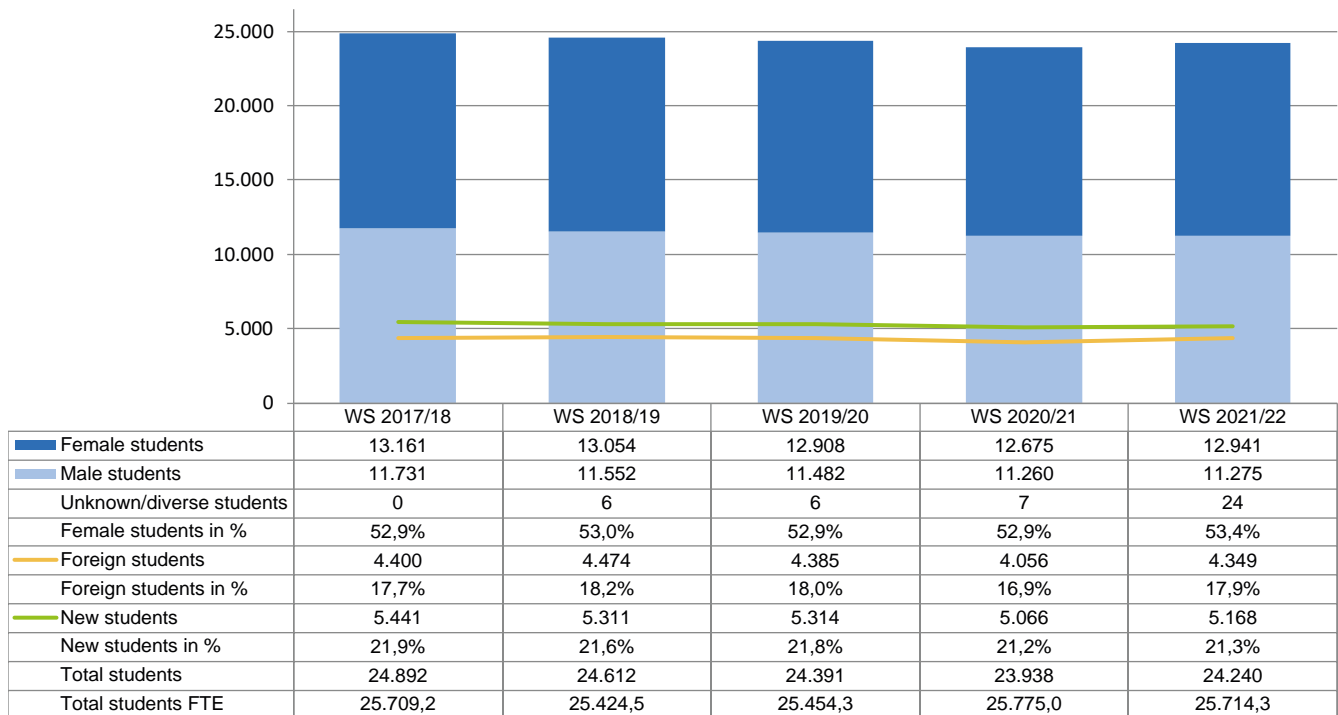
Diversity in teaching and learning and in education and training

Following on from the University of Freiburg's Diversity awareness project (2015–2018) at the Office of Gender and Diversity, an introduction to diversity and diversity management has been offered as a work-related skills course every semester since the 2016/17 winter semester. Teachers are offered specific gender and diversity training and an online toolbox for diversity-sensitive teaching – now also available in English. In addition, the University of Freiburg has established a regular professional training on gender and diversity themes for all target groups at the University, and in particular management; however resources for the actual training are limited. The aim is to permanently anchor gender and diversity as a cross-sectional issue and as a competence in all areas of activity by 2023.

Advice options for staff and students

There are numerous offices at the University of Freiburg which offer [services and advice](#) for staff and students, e.g. concerning discrimination, legal questions about employment, or information on studying with disabilities or chronic disease. The Vice-President for University Culture, Prof. Dr. Sylvia Paletschek, and the head of the HR department, Ursula Seelhorst, also serve as contacts in the event of discrimination or as an office for equal opportunities-related complaints for students and staff. The [Student Service Center](#) is the first point of contact where prospective and current students as well as guest students can obtain information and advice about studying.

Development of student numbers
(headcount, FTE)



* First-time enrollees and newly enrolled students are summarized as new students. First-time enrollees are students who have enrolled at a university for the first time. New enrollees are students who have enrolled at the University of Freiburg as university transfer students or re-enrollees. Source: Student statistics, SuperX, as of 15.11. of a year from WS 2021/22 01.12. of the year.

Freiburg Gender Circle

The [Freiburg Gender Circle](#), a union of all the institutions at the University of Freiburg that primarily deal with issues of gender and equal opportunities, has existed since 2015. The group meets once or twice a semester to discuss information and experiences and confer on strategic matters. Members of the Gender Circle – currently the Vice-President for University Culture, the department of equality, diversity and academic staff development, the gender equality representative and their speakers, the equal opportunities officer, the Gender Equality Office at the Faculty of Medicine and Gender Studies in the Center for Anthropology and Gender Studies – work together for a gender-sensitive and non-discriminatory university.



Transfer Knowledge Gender und Diversity Forum

With the [Transfer Knowledge Gender und Diversity Forum](#), established in 2019, the interface between gender and diversity research and gender and diversity practice is revealed as an area of interdisciplinary and transdisciplinary knowledge transfer, and professional communication between the different areas of the University is strengthened. Its aim is to create a digital database to enable knowledge on gender and diversity themes to be transferred from research into (gender equality) practice at the university. The database is currently being developed and will contain practically-oriented examples of best practice from research and teaching as well as digital didactic tools and thus promote interdisciplinary and transdisciplinary dialog. The Office of Gender and Diversity and the the Center for Anthropology and Gender Studies have oversight.

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Promoting academic careers

Specifically targeted at female scientists who wish to pursue an academic career in the critical phase after their PhD when many women leave university and academia, the career advancement programs STAY! / Come and STAY! and CORA (Coaching Women for Research and Academia) offer funding to help them on their path to becoming professors.

The University of Freiburg and the New University Endowment Freiburg support three female academics with a STAY! / Come and STAY! bridging grant each year. This is designed to attract female postdocs who want to continue their academic career but have not yet ensured follow-up funding. Since 2010, 35 scientists have received funding from STAY! / Come and STAY!

Since 2016 the University of Freiburg has offered the CORA (Coaching Women for Research and Academia) program for ten female scientists in the qualification phase. The objective of the program is in the long term to increase the ratio of women at various qualification levels after their PhD. The program, which is coordinated by the department of equality, diversity and academic staff development, aims to help female academics at the University of Freiburg who have submitted dissertations, female postdocs, female junior professors and female team leaders from all faculties. The CORA program provides one-to-one coaching with up to eight meetings per participant and exclusive training to complement the training already offered at the University, and to boost motivation with regular meetings of the peer group and formation of a network of academics.

“The CORA program is powerful because it combines topical workshops with one-to-one coaching and the building of a new network. Reflecting on micro-politics in committee work, leadership strengths and the role of women in universities should not however in my opinion simply be regarded as the ‘promotion of women’. A program like this is also extremely valuable for other ‘groups’ at the University!”

Dr. Sarah May, postdoc at the Institute of Cultural Anthropology and European Ethnology, research fellow at FRIAS with her project Bioeconomy as cultural transformation.



Family Service at the University of Freiburg

The [Family Service](#) creates reliable structures designed to combine family and work for staff and doctoral students. The University runs four kindergartens providing child care. These are organized to meet the demands of members of the University, for example offering longer and more flexible opening hours than other kindergartens. One special feature is the quota of places reserved for staff from research associations and centers of excellence and which support gender equality and development of new talent in this area. A family-friendly infrastructure with nursing and changing spaces, parents' rooms and separate children's areas make it easier for parents to spend time on campus. The University also offers a varied holiday program for children and every two years arranges a 'bring your children to work' day for staff (MiKi Tag). To meet changing demand and prepare child care to be future-proof, the Family Service has set itself the objective of introducing support for emergencies and a flexible care service; this offer is already secured for 2021 to 2023.



Sustainability in the university child care centers

The university child care centers have explicitly engaged with the issue of sustainability, both operationally and educationally, since 2020. Staff pay attention to the sustainable use of energy in their work. Where possible, the university child care centers use environmentally-friendly materials, for instance many of the toys are made of wood. We avoid items that are made of plastic or that are disposable. Lunch consists of exclusively organic regional food, and the appropriate amount is ordered for the number of children in order to avoid food waste. Specialists from the Department of Environmental Protection inspected Kita Murgelgarten's premises in 2020 so as to assess the sustainability of their use and suggest improvements. The plan is to fit translucent sun-screen film on the windows to prevent the rooms from overheating in summer and thereby create a healthy indoor climate.

In addition, the children learn about acting responsibly towards one another and towards society, and gain skills enabling respectful treatment of the environment. In order to show the children how to use resources carefully, their water consumption, for example, is monitored. We also teach them to reuse waste paper for scribbling or for the hole punch – these are just a couple of examples from day-to-day activities at the child care centers. Outdoors, the kindergarten Zauberergarten children together with the teaching staff have created a nesting box for birds such as tits from a kit and painted it in bright colors. In parallel they were taught about birds. The nesting box was hung out in the garden in autumn 2021. Activities like this arouse the children's interest in protecting nature from an early age.

Furthermore, some university child care center staff attended a course in education on the subject of sustainable development in 2021 and then each center appointed a team member as a sustainability officer. The aim of this was to realize further measures in the day-to-day activities at the child care centers and offer the children education about sustainable development. In order to bring the plant and animal kingdom even closer to the children in a more diverse way, some employees of the university daycare centers are planning to take part in the advanced training course "Gardening practice with children".

“We use resources such as energy and water economically and avoid waste and plastic at the university child care centers. In this way we make the kindergartens as sustainable as possible and are a role model for the children. Our far greater task, however, is to enable and encourage the children in our care to shape the world sustainably. For this they need individual responsibility and a sense of community, optimism and a belief in their own effectiveness.”

Ellen Biesenbach, head of the Family Service



Interview with Jasmin Anders, representative for staff with severe disabilities

1. What are your tasks as a representative for staff with severe disabilities?

The representative for staff with severe disabilities is elected by the staff concerned to promote the integration of staff with severe disabilities (and those with equivalent status) at work, and to represent their interests at work. The office for staff with severe disabilities (SBV) in particular provides advisory and support services for individuals with severe disabilities and offers information about opportunities relating to severe disability.

2. Who are the contact persons for severely disabled employees at the university? What issues can people obtain advice on?

Both the office for staff with severe disabilities and the staff council offer points of contact for colleagues with severe disabilities. But the external advisory service and the medical service also offer advice. Colleagues who are affected are helped with everything to do with disability support. This applies to workplace design and problems at work as well as to issues such as partial early retirement, rehabilitation, early retirement and reduced-earning-capacity pension. The SBV and the staff council also support staff with disabilities in conflict situations.

3. What are the major successes and milestones of the past few years for you?

I'm particularly pleased about having established reasonable efforts to ensure employees can continue working. The aim is to ensure that long-standing staff who – because of disease or disability – are no longer able to carry out their former duties, are able to continue working for as long as possible, by undertaking the tasks that they can still manage.

4. During the corona pandemic people with disabilities were prioritized for vaccination by the University. In the process, many people reported a disability who had never previously reported before. Could this mean that people still fear that this could have a negative effect on their career? What can the University do here?

It's extremely important that the University management signals very clearly that having a severe disability does not have negative consequences for a career. This is especially relevant in relation to academia and the associated fixed-term contracts. We must understand that disability only exists if someone is made disabled, and that the key to this is meeting on an equal footing and with respect. The shame of being "severely disabled" must disappear from our minds. Offering the same possibilities shouldn't mean anything other than that everyone is allowed to need something different. In order to better recognize these needs and respond to them, a severe disabilities file will be established from 2023. This will only be available to the representative for staff with severe disabilities and is designed to assist with day-to-day work and map out key areas in the SBV's work.

5. What other projects are there to empower people with severe disabilities at the University of Freiburg and increase their visibility?

The first inclusion day at the University of Freiburg was organized in February 2020. As a result, the inclusion and accessibility activist Raul Krauthausen came to the University of Freiburg. As a wheelchair user he knows how important an accessible and inclusive society is. His lecture Nothing about us - without us, in which he discussed issues relating to inclusion, was very well received. The subsequent panel debate with Head of Administration Dr. Matthias Schenek, Raul Krauthausen, Ramon Kathrein (City of Freiburg councilor) and Zeno Springklee from Studying without hurdles (SoH) was another highlight of the day. Because of the importance of this issue, the SBV wants to hold an inclusion day every other year.



“I'd like to live in a world in which to be different is normal.”

Jasmin Anders, Representative for staff with severe disabilities

6. What are your goals and vision for opening up the University more to people with severe disabilities?

I'd like to reach the stage where inclusion is no longer necessary, because inclusion is a concept which I believe makes itself irrelevant. A university that does not exclude, does not have to include. It's far more important to ask: How can we really make use of the diverse characteristics that people bring with them as resources at our university? We can no longer afford to focus on the difference. If we focus on the things we have in common, we can be confident that we at the University will solve the really large questions of our time here.

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Reaction to the corona pandemic

Sustainable development means the creation of a dynamic and resilient system which can anticipate risks and adapt to shocks, as well as coping with crises. From the end of February 2020, the University of Freiburg had to cope with just such a crisis, the global spread of the SARS-COV-2-virus, and in the shortest time possible arm itself against what were still largely unknown dangers, take extensive security measures and continually adapt at short notice. Many procedures were completely altered, and new means of communication had to be established in order to ensure that the work and learning environment was healthy and accessible.

Looking back, we can say that on the whole the University of Freiburg overcame these unprecedented challenges well, even if the unfortunately necessary withdrawal from face-to-face teaching and the restriction on direct personal contact was a significant loss. First of all, given the number of staff and students there were only relatively few cases of coronavirus and no large outbreaks at the University in comparison to the incidence rates in the surrounding area. We also succeeded in maintaining operations at the University despite the restricted circumstances. This was possible thanks both to rapid implementation of measures and to staff, students and guests at the University responsibly carrying them out.

Particular mention should be made of the coronavirus coordination office, which was set up at the start of the pandemic to help with information, questions and measures, and the Department of Safety ([SUN1](#)), which developed hygiene regulations and an incidence-related phased plan, organized among other things medical masks and a testing system, checked the requirements for courses, was in charge of contact tracing with the health authority and together with the University Medical Center provided vaccinations. At the same time, the overwhelming majority of the university gave a visible sign of what orientation to scientific knowledge and its reflected implementation can achieve.

Valuable experience from this period is being used to prepare the University even better for future challenges and improve the resilience of structures. For example, digitalization and the organization of teleworking alternately with face-to-face have gained momentum.

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“Corona has totally changed our work within a very short period of time. It is very motivating to be able to experience the active solidarity and flexibility of the vast majority of university members. Only in this way were we able to implement successful protective measures.”

Uwe Tonndorf, Personal Assistant to the Chancellor



Promotion of health and disease prevention

In order to provide its staff with the best possible support for healthy living, the University of Freiburg funds a variety of programs. Mental health is promoted by advisory offices and measures to prevent and deal with the symptoms of physical and mental disorders. The external advisory service is there to help in crises, conflicts, addiction problems, as are the prevention programs offered by the Deutsche Rentenversicherung (DRB, German pension insurance union). Despite the pandemic, use was made of the services in 2020.

Physical health is the focus of many services too, whether internal e.g. UNIFIT at the University Medical Center, or through the funding of membership with external providers. Freiburg's [university sports](#) center's activities are open to students and staff at the University. PausenExpress, which is provided by the University's health management in cooperation with the Institute of Sports Science and Physical Education, promotes health through movement at work. During the pandemic this took place digitally. A similar activity, [Aktive Pause](#), was offered to students by the [student health management](#) team along with a variety of other information and activities while teaching continued online during the pandemic.

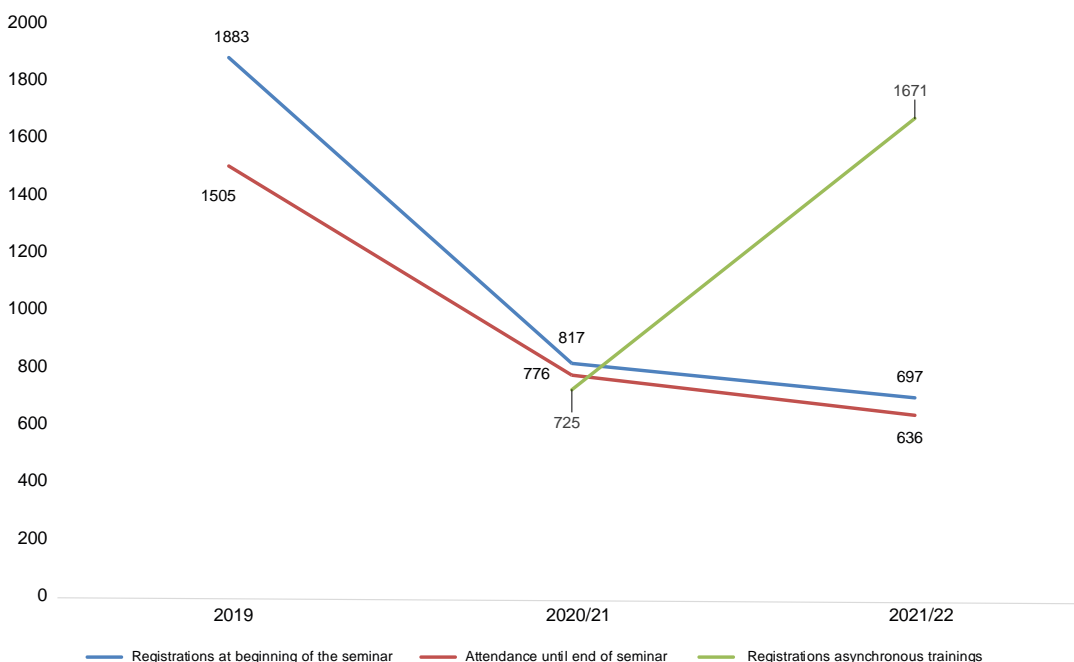


Internal professional development

There were numerous internal training opportunities enabling both non-academic staff at the University and academics to develop professionally in a range of fields. As well as internal know-how/administrative practice, communication & management or technology, laboratory and occupational health and safety, seminars and workshops on management development, media & IT, language skills and health are conceived, organized and coordinated. In addition, an independent study area was set up with online services, including language skills, data processing skills and communication. This enables staff at the University to improve their qualifications in specific areas. There are also two certificates to build competence, e.g. for international exchange with the Intercultural Competence certificate. Furthermore, the IWB team supports leadership circles and coordinates coaching services for central university administration management and training in managerial skills for professors.

The program included 123 courses in 2019, which were attended by over 1,500 members of staff. On account of the pandemic, many synchronous events had to be canceled in the 2020 summer semester. Switching to online formats also led to lower participation. An increasing provision of asynchronous options for independent learning was able to close the gap over the course of 2020. In the 2020 summer semester and 2020/21 winter semester, 72 mainly virtual events took place with 776 participants, in the 2021 summer semester and 2021/22 winter semester, there were 83 events with 636 participants. The decline in synchronous events (face-to-face or virtual) was compensated by an increase in participation in online training courses, which can be taken at any time and place. Participation rose from 2020/21 from 725 to 1671 over the two 2021/22 semesters.

Number of registrations and attendance



Staff sustainability workshop

The first workshop [Sustainability: What can we do as employees of the university?](#) offered by the Department of Environmental Protection took place digitally in October 2020. The five participants were taught an understanding of sustainability at the University and the efforts that had been made to date in various areas of activity, inc. operations and teaching. This was followed with an opportunity to discuss ideas for improvements in the workplace, aspirations for the University, and networking of engaged staff members. As well as potential synergies regarding the range of courses in relation to sustainability and practical ideas about information campaigns and challenges, there was a wish for a sustainability culture, in real terms an overall concept and representatives in every university body.

This first SUN2 workshop led to the aim to expand the courses on sustainability offered by IWB for staff, including internal and external experts giving regular workshops on e.g. sustainable strategies in the workplace.



Beteiligung: Das Projekt Connected Services

The demands on the university administration have changed significantly in recent years and as a result also require that an administration's understanding of itself and the underlying processes change. This calls for participatory formats and other flat hierarchy tools and more efficient processes, in order to establish the University as a sustainable, inclusive and solution-oriented employer. [The Connected Services](#) program attempts to meet these demands by the following means:

- Intensification of cooperation: a university administration can only be an equal partner with academia (and effectively support it) if it acts as a single entity and does not divide itself into central and decentral units;
- A rules-oriented and participatory revision of the central work processes: work processes must be efficient, transparent and quality-assured. Systematic digitalization of essential processes is as crucial to this as jointly developing these processes in the form of manageable projects.

Since the opening event in October 2021 and other well-attended major events (Connected Services: Einblicke und Ausblicke) staff have been routinely informed about projects, whether planned, ongoing or completed, and have also been able to engage actively in themed workgroups. In addition, since the start of the Connected Services program in 2019, there have been projects to analyze and improve various administrative processes. For example, digitalization of requests for and administration of physical keys has made key management far more efficient; the option of online application not only simplifies the request process for everyone, it is also an initial, crucial step towards professional key request management. On account of the pandemic, the numerous requirements associated with working from home were analyzed and suitable arrangements made. All these projects were realized across all departments, in recognition of the declared purpose of Connected Services to strengthen cooperation in the university administration. This expectation applies similarly to the planned projects, e.g. systematic digitalization of business processes or the introduction of a university-wide document management system. The improvement projects which are jointly realized with the aim of making administration future-proof allow the Connected Services program to contribute to a sustainable administration which is not ordained but actively embraced.



Student initiatives at the University of Freiburg



There are more than 50 student groups – many with a focus on sustainability

Student initiatives are an important part of university life, allowing students to make an independent, participatory contribution and develop a sense of their own power. There are more than 50 active student initiatives covering among other things a broad spectrum of sustainability-related issues, with the aim of promoting sustainable development and social-ecological transformation; a few are introduced below. They divide into groups, initiatives and projects with various specialist, thematic, political or cross-sectional focuses, and are therefore active on several levels. Furthermore, via the AStA (Allgemeiner Studentenausschuss, General Students' Committee) and the StuRa (Studierendenrat, student council), student self-government offers a central hub for communication with the university management. So student engagement makes a significant contribution to the University's efforts to deliver sustainability, which is evident in particular through the Sustainability certificate initiated by the student group Sustainability Office Uni Freiburg. The dialog on the subject of sustainable

investment between the University and students from the Fossil Free Freiburg initiative was also constructive: the group presented proposals for a university catalog of criteria for sustainable funds.

One outstanding feature of Freiburg's network of initiatives is the close cooperation between university groups with a focus on sustainability, and this is apparent from the regular networking meetings and joint projects such as the annual sustainability days, the Critical Introduction Days Freiburg or the Baden-Württemberg-wide First Semester Academy. Networking was increased and there was greater use of synergies especially using online formats and events because of the pandemic. The effects of student groups were not however limited to the University. Events organized by students are mostly open to the public, and general networking opportunities such as the monthly 4netzen and the Climate Action Alliance Freiburg also involve student initiatives.



Die studentische Selbstverwaltung: StuRa und AStA

The students' representatives are responsible for presenting student interests to the University and the wider world. Their supreme decision-making body is the Studierenderrat (StuRa), to which 34 representatives of the disciplines and ten delegates from various university initiatives are elected. In the period covered by the report, the lists from campusgrün Freiburg and the Juso university group, which are explicitly active in sustainability issues, received the most votes. StuRa decides on every matter that concerns students.

The General Students' Committee (AStA) consists of up to 21 units, whose representatives are elected by StuRa, and implements the decisions of StuRa. Each of the units works

independently on a long-term area of responsibility. For instance, there is an antidiscrimination unit, a higher education policy unit, a social unit, and an environment unit. Five of the units are 'autonomous units', which represent minorities and are engaged in reducing discrimination, e.g. the rainbow unit.

All students are also entitled to exercise direct democratic influence through the annual general meeting or a ballot vote. Here too, sustainability issues can be addressed, which can be seen from the symbolic climate emergency declaration and the passing of other climate-related demands on the University, as well as in the expansion of the definition of diversity in 2019.

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“The general meeting calls on the Baden-Württemberg government, the Ministry of Science and the Ministry of Finance, to create the basic conditions so that universities can rapidly be adapted to be climate-friendly. (...) The general meeting calls on the University, the Student Council and the City of Freiburg, to set climate targets that will achieve climate neutrality by no later than 2030.”

(Extract from the resolution of the general meeting of the student body, November 2019)





Environmental unit

AStA's [Environmental unit](#) tackles various environmental questions that concern the University and students. At the heart of this are ideas for how the University can contribute to making the world more sustainable and better, and what each individual can do. Organization of events on environmental themes, DIY workshops and clothes exchange parties create a platform for anyone who is interested to contribute and join in. The Environmental unit is also an important cooperation partner in joint projects with other university groups, cooperating for instance on the Sustainability days at Freiburg University. The Environmental unit also shares information and tips about sustainability via its Instagram account.



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“I am dedicated to sustainability at the University because I believe that the University can and must be a driving force and pioneer for changing society into a socially and ecologically sustainable society. Also, as a student, it is the place that I spent most of my time and where I can get directly involved with changing things – even if the processes are sometimes long and tiresome, we’re happy when we reach our goals together with the university management.”

Teresa Ziegler, Environmental Representative, MSc Geography of Global Change



Rainbow unit

The [Rainbow unit](#) represents the interests of the queer student body to the University, within student government and to a wider world. With its goal of a university and a society that is free of discrimination and barriers on account of sexual orientation and gender identity, the unit organizes events to raise the profile of queer issues and spread information. Examples include campaign weeks with workshops and lectures, as well as oral history meetings, social gatherings for first semester students, and ‘Pink Partys’. During the corona pandemic, it was possible to continue most of these activities digitally. In addition, the rainbow unit takes part in various events that bring together the queer scene, e.g. Christopher Street Day and the International Day Against Homophobia, Biphobia, Intersexism and Transphobia. On top of this, the rainbow unit undertakes work within the community, by organizing safe spaces for a relaxed exchange between people from the queer community.



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Student initiatives and university groups

– a selection

Plurale Ökonomik Freiburg work group

The [Plurale Ökonomik Freiburg](#) (Plural Economics) work group was founded in July 2019 with the aim of making the teaching of economics at the University of Freiburg more critical and pluralist. The idea was that, besides common economic theories, ecological, feminist or complexity economics approaches should be included. The work group consists of Bachelor's and Master's students from economics and other disciplines. They tackle subjects such as the post-growth economy, unconditional basic income, care work, economics in literature, the environmental problem from a neo-classicist perspective, and self-organization approaches in business management. Furthermore, the work group organizes public lectures and workshops on pluralistic economics such as an

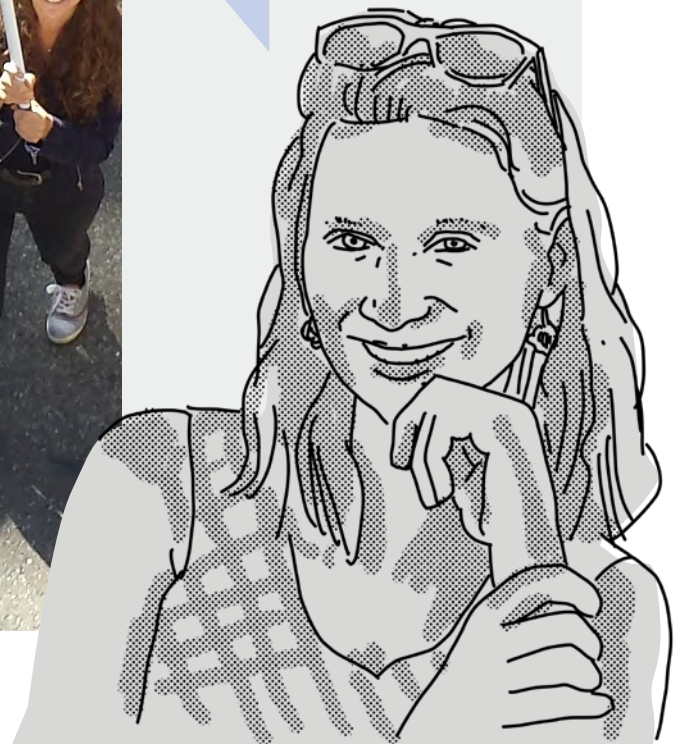
online lecture on the subject of Transformation - from idea to implementation (2020 summer semester) and the Is this economics or can this go away? lecture series that took place in winter 2020 in cooperation with the Sustainability Office Uni Freiburg initiative). As part of its networking and efforts to influence higher education policy, the work group conducts talks at a state-wide political level, as well as with economics faculty student associations and teachers from the University of Freiburg about the possibilities for helping to shape a future pluralist economics introduction event.

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“Given the context of the economic, ecological and social crises of our time, we need economic solutions that look beyond the neo-classicist mainstream. Where better to discuss such solutions than in a university group that brings together students from all sorts of disciplines and backgrounds?”

*Tabea Heppner, AK Plurale Ökonomik Freiburg,
BA Political Science*



Foundersclub Freiburg

[Foundersclub](#) is a group of students who are interested in and committed to social and sustainable entrepreneurship. There is a special focus on sustainability-related start-ups and entrepreneurship in Freiburg.

The aim of the group is to expand the network, the horizon and the skills of students and to inspire them to realize their own projects. Workshops about prototyping and CO₂-reduction, as well as talks by entrepreneurs and tours of start-ups are just a few of the activities that are organized by Foundersclub. Besides participating in the international start-up contest SPARK and a series of events on the subject of 'Women in Leadership', Foundersclub also took part in realizing projects that involved multiple university groups such as the sustainability days and the sustainable First Semester Academy in 2020.



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Sustainability Office Uni Freiburg initiative

The [initiative Sustainability Office Uni Freiburg](#) was founded in 2018 and is committed to the institutionalization of sustainability at the University of Freiburg. The long-term goal of a sustainability office as a coordination point for student and university sustainability efforts is being advanced through exchange with actors from the rectorate, the university administration, as well as teachers and students in and outside of committees. The initiative also contributed to the formulation of a sustainability understanding for the university and participated in the working group Flying Faculties and the monitoring of flight emissions of one faculty. The students organized the precursor to the sustainability certificate, a lecture series on sustainability, from 2019, and since the 2021/22 winter semester the certificate has been offered to all students as an interdisciplinary course. The networking of student groups was also ensured in a sustainable manner through regular networking meetings and cooperation projects such as the University Days for Sustainability and the sustainable First Semester Academy.



Nachhaltigkeitsbüro
Uni Freiburg



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German Medical Students' Association human rights initiative (MIO)

The human rights initiative of the [German Medical Students' Association](#) (MIO) consists of medical students from various semesters. They are dedicated to increasing openness and solidarity in society, and where necessary in their area undertake activities to uphold human rights. Each semester they tackle a new theme at group meetings and by organizing workshops and lectures. For example, the group advised on the effects of the climate crisis and among other things organized a workshop on planetary health as part of the 2020 sustainability days. The group also deals with social aspects of human rights, with a lecture on Female Gender Mutilation (FGM) and on medical care for migrants and homeless people. Besides their regional focus, the students aim to support international human rights projects with fund-raising campaigns.

Working in cooperation with the refugee hostel at Schlierberg, they also offer monthly leisure activities for the children who live there, such as making Halloween pumpkins or hospital visits with a teddy bear (unfortunately this had to be limited to contact by letter during the pandemic).



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Weitblick Freiburg and the sustainability work group

[Weitblick](#) is a student initiative dedicated to equal opportunity in education both locally and worldwide, and is structured into several work groups. Their areas of activity cover the promotion of locally-initiated educational projects at home and abroad, an exchange between people from different backgrounds, cultures and generations, and the provision of after-school classes. With this in mind, the Freiburg sustainability work group has organized clothes exchanges, a guided tour of the Freiburg waste management site and in 2018 put together a calendar of regional and seasonal food. In addition it organizes regular workshops and lectures, e.g. on human rights and environmental protection in global industries, on sustainable food, and on the link between gender-sensitivity and climate policy. These took place as part of events, including the sustainability days which Weitblick has been involved in organizing since the start.

Weitblick 
FREIBURG



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Projects and events involving multiple groups

The following projects took place at the University and were chosen because of their direct relevance to sustainability.

Sustainable First Semester Academy

Baden-Württemberg's sustainable [First Semester Academy](#) is an orientation week for first semester students which focuses on education for sustainable development and a commitment to sustainability at universities. The pilot project started in October 2020, taking place at six universities in Baden-Württemberg. The local team at the University of Freiburg, consisting of various dedicated student initiatives (Foundersclub, Greenpeace Freiburg, Health For Future, MIO, Sustainability Office and Weitblick), organized a week with lots of workshops, a simulation game, a city tour, an excursion to Freiburg's Lokhalle, and digital panel debates, all designed to encourage students to become active. The hybrid format meant it was possible to tackle a variety of sustainability issues and locations, and involve several groups from Freiburg. There were also opportunities to get to know one another. This introduced 50 of the new Freiburg students to the wide range of sustainability activities of the various initiatives in and around Freiburg's higher education institutions.



“The First Semester Academy was groundbreaking for me. The week not only gave me an overview of where and how people can get involved in Freiburg; it motivated me to become active myself and I got to know people that I could join initiatives with.”

Sophie Oettli, participant in the 2020 First Semester Academy, BSc Geography



Sustainability days

The [Sustainability days](#) are a week of events organized by students, designed to cast light on various sustainability themes. Although primarily for students, the events are also open to others. The Sustainability days were launched in Freiburg 2017 and since then have taken place every summer semester.

The Sustainability days program includes workshops, lectures, debates, and cultural and creative events, bringing together science and practical activities and giving students the opportunity to become actively involved. Their themes cover various aspects of sustainability, such as climate protection, city planning, post-growth, the mobility transition and various levels of socio-ecological change, from the individual up to society.

The scope of the sustainability days has also continued to evolve: what was once a three-day program has now expanded to two weeks, and the originally largely face-to-face activities were entirely realized digitally in 2020 and 2021 because of the pandemic.

In recent years the sustainability days have been a voluntary and cooperative project of the student initiatives Weitblick, campusgrün, the environment unit, the Sustainability Office, EcoAlas, the Foundersclub, Health for Future, MIO, Fossil Free and Students for Future Freiburg. So they not only contribute to the visibility of sustainability issues, but also encourage students and activists to network. The University too, with its faculty and central institutions, contributes to the success of the sustainability days by providing both substantive input and financial support, as in 2020, for example.



“I find the sustainability days are a great opportunity to get to talk with one another on the subject of sustainability.”

Björn Spiegel, 2019 organization team, philosophy & economics teacher training

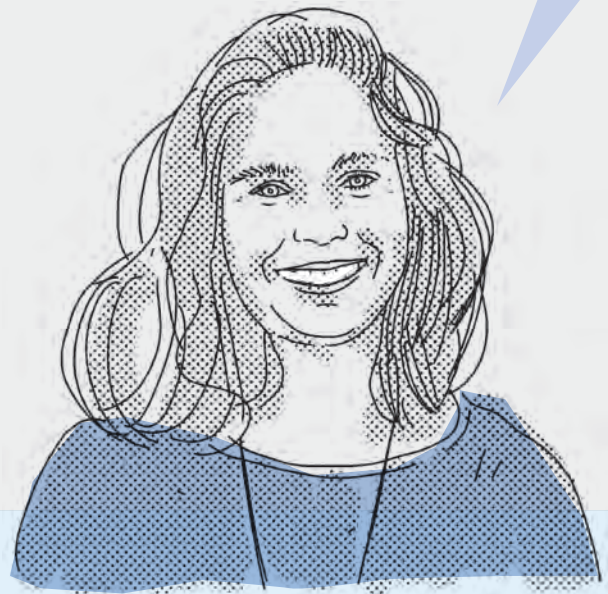


European Week for Waste Reduction

The [European Week for Waste Reduction](#) is Europe's largest campaign for waste reduction and recycling. Thanks to an initiative by students of the Environmental Governance Master's degree, supported by the Department of Environmental Protection (SUN2), since 2019 it has also taken place at the University of Freiburg. The week of events in November 2019 consisted of a film screening about microplastics, guided tours of the Freiburg biogas plant and the University's canteen, a workshop on creative solutions for waste problems, and a lecture on the subject of recycling e-waste. The project continued in 2020 with a [competition for ideas](#) on how to reduce waste in the dormitories and the everyday activities at the University, run in cooperation with the Studierendewerk (SWFR) and the packaging-free shop Glaskiste. Six student proposals won prizes, including for ideas related to the utilization of biowaste in a wormery or a rapid composter, encouraging waste reduction through education about the environment by use of information boards and quizzes, reduction of plastic packaging with a detergent dispenser placed in the halls of residence washroom, and converting use of paper and cellulose at the University to 100% recycled. A cooperation involving SUN2 and SWFR is looking into the possibility of implementing these projects. The student initiators of the project are now hoping that the European Week for Waste Reduction will become an annual tradition at Freiburg University.

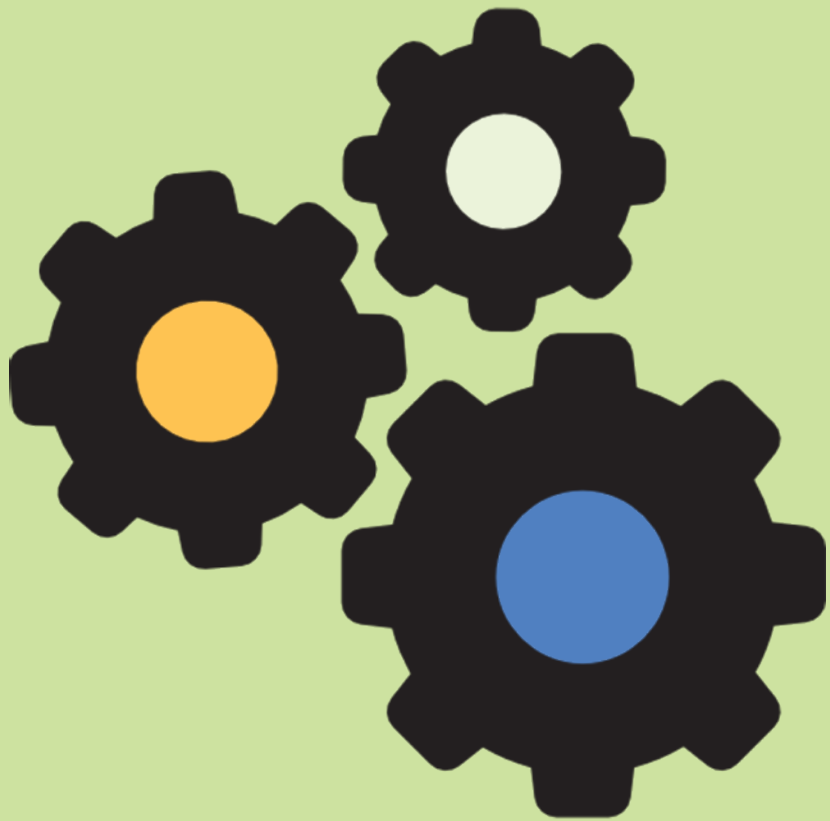
“We initiated the European Week for Waste Reduction at Freiburg University because we didn't just want to study ‘sustainability’, but also urgently to work actively for greater climate protection, conserving resources and sustainable action. Every one of us can do something positive! Now we know that nobody is too young or too inexperienced to do so.”

Margaux Savin, MSc Environmental Governance



Campus

experiencing and participating



The ambitious path to climate neutrality

Universities have a special responsibility to contribute to sustainable development not just through research and education, but also through their own actions as a public institution. With more than 24,000 students, over 6,600 members of staff and around 170 buildings, the University has a significant impact on the environment in many regards. It is the responsibility of the University to minimize the infrastructural burden on the environment as far as possible, without interfering with the quality of teaching and research – and to endeavor in having a positive impact on the living planet.

Considerable savings can be achieved through numerous measures and long-term efforts, e.g. a well-below average specific energy consumption in comparison with other universities and university hospitals in Baden-Württemberg (2019/2020 Environmental Report), a 75% reduction in consumption of drinking water in the past 30 years and the introduction of an efficient and environmentally-friendly special waste management system. Given the current situation of multiple crises, we must push on resolutely with this reduction of our ecological footprint and its direct and indirect environmental impact.

This ambitious path to climate neutrality in 2022 involved the Rectorate passing a comprehensive and innovative climate protection concept for buildings management, with clear and practical measures. To complement the climate protection concept, a mobility concept is being developed for the University of Freiburg as well as a guide on traveling sustainably and reducing flight emissions.

Despite its clear goal and the desire to realize it, there are numerous challenges on the path to climate neutrality and sustainable university operations. Since the university buildings are the property of the Baden-Württemberg finance ministry, cooperation with the regional ministries and the real estate management authority is crucial in achieving the objective of climate neutrality for all federal state premises by 2030. Consequently, the University maintains close contact with stakeholders who are relevant to realizing measures. One thing is clear: we must do all we can in order to achieve these ambitious and necessary goals, and cannot remain in our comfort zone.

The University of Freiburg's sustainability objectives in day-to-day operations:

- To improve the use of resources and protect the climate in its operations
- To implement the climate protection concept with the aim of achieving climate neutrality
- To create incentives for sustainable practices
- To boost sustainable mobility incl. use of more sustainable means of transport for commuting to work (public transport, bicycle) and the reduction of emissions on business trips
- To improve sustainable procurement and the recycling of resources (closed-loop economy)

The University's carbon footprint 2021

To obtain a better overview of the entire emissions and effects of the University, since the 2018/19 Environmental Report we have not only assessed energy emissions, but also emissions from all Scopes 1, 2 and 3 including waste, water, business trips and procurement. Thorough monitoring of all sources of emissions is crucial to efficiently reducing the effects and contributing to the recent objective of climate neutrality by 2030 for all state institutions. A comprehensive audit of greenhouse gas emissions for 2017 was also published in 2021.

Areas previously covered were expanded in order to take the complete carbon footprint into account and so make it possible to tackle emissions reduction in a sensible and targeted way. For example, emissions from staff commuting were recorded for the first time. This was based on a mobility survey of staff carried out in 2021 asking about how they traveled before and during the corona pandemic.

The University of Freiburg's reports basically distinguish between two types of carbon footprint scenarios, one considering the purchase of certified green energy since 2013 (excluding Faculty of Engineering at Campus Flugplatz) and one with the actual supply of conventional 'Bundesmix' electricity in practice. In comparison to 2019 the greatest reductions in emissions were recorded for flying (-95%) and waste (-19%), which is mainly due to the restriction in mobility and face-to-face activities due to the corona pandemic.

Scenario 1: Conventional Electricity 2021

In the carbon footprint scenario with conventional 'Bundesmix' electricity, electricity emissions make up the largest share with almost 37% (calculated using the emissions factor for national electricity sources 2021 issued by the Federal Environment Agency). Energy for heating and cooling contributed 30% and procurement approx. 29%. Mobility makes up 3.5% for commuting, flights and car journeys.

Scenario 2: Green electricity 2021

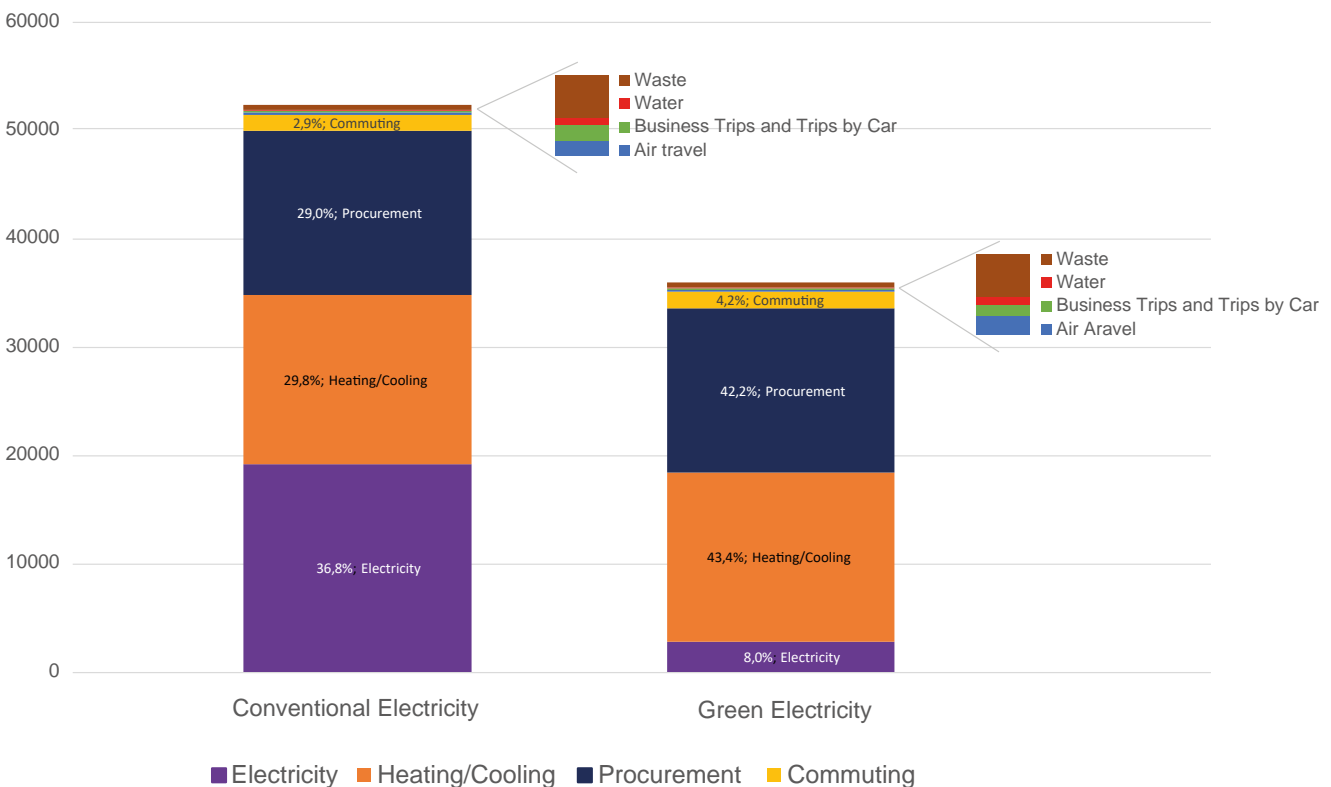
By contrast, certified green energy from hydropower stations only makes up approx. 8% in the carbon footprint audit where electricity certificates are considered. (calculated using the 2020 emissions factor 'from hydroelectric' issued by the Federal Environment Agency). This changes the proportions: energy for heating and cooling totals approx. 43% of emissions, procurement 42% and mobility as a whole over 5%. This points to other options for reduction and shows that the theoretical green energy carbon footprint scenario is over 30% lower than the realistic electricity carbon footprint scenario.

As a whole, emissions per member of the University, depending on source of electricity, amounted to 1.7 t and 1.2 CO₂-eq respectively in 2021. Furthermore, emissions from private life should also be added, to record all the emissions that are released. In comparison, the average German produces 11.2 CO₂-eq tons per year (UBA), while the CO₂ budget to achieve the Paris Agreement on limiting global warming to 2°C is only 2.3 t CO₂/a per person (IPCC).

Data basis

The emission factors for electricity and the fleet derive from Federal Environment Agency sources. The emissions for energy for heating and cooling were calculated using GEMIS and the emission factors of the thermal power station as provided by the University Medical Center. The life cycle inventory database Ecoinvent 3.6 was used to calculate emissions for waste and water. Emissions for business trips and journeys by car result both from diesel and petrol company car emissions and from records of kilometers traveled by private car. Unfortunately there are no concrete data for flight emissions for 2021, therefore an estimate was made on the basis of data from the travel agency and using the emissions factors from atmosfair. A pilot project on emissions from business trips in a faculty in 2018 showed that only 46% of all journeys were booked via the travel agency. Emissions from procurement for 2017 were analyzed in Marcel Eichler's Master's thesis. This analysis was used to produce an estimate for 2021.

CO₂ balance scenarios Conventional- and Green Electricity



Freiburg University's climate protection concept

In the 2021/22 winter semester, on its ambitious path to climate neutrality the Rectorate passed a comprehensive [climate protection concept](#) for buildings management at the University of Freiburg. It included clear and concrete measures enabling the objectives set out in the German climate protection law to be reached. The scenarios in the climate protection concept address the demands of national and regional policy for the reduction of climate-related emissions until 2030 respectively 2045 and set them out in real terms in the form of a climate protection plan 2030/2045 for the University of Freiburg. The concept was developed in 2021 on the basis of new national objectives, so the four scenarios presented for the achievement of climate neutrality are laid out until 2045. At the end of 2021, the Federal State of Baden-Württemberg set the goal of making its regional administration climate neutral by 2030. This means that all the measures proposed in the concept have to be realized in a far shorter period.

The concept was developed with the involvement of every hierarchical level at the University (students, research assistants and administrative staff), as well as others from outside the University, e.g. Baden-Württemberg State Property and Building Construction Administration and the Freiburg University Medical Center, through stakeholder workshops and interviews. As regards its infrastructure, the University is largely dependent on others, such as the real estate management authority and the University Medical Center. The University Medical Center operates the thermal power station that supplies the University with heat and in some cases also electricity. Incorporating these partners from the start is crucial to the creation and continued implementation of the University of Freiburg's climate protection concept.

The strategies and measures for mobility and procurement are being planned and implemented by the University in a second phase.

The University's energy and CO₂ audit

Energy audits have been recorded and documented annually since 2009 at the University of Freiburg, with retroactive data to 2004. Data for the years 2004 and 2006 were determined from available statements, data for the reference year of 1990 were determined by estimates and by reference to the areas used at this time by the University of Freiburg. The estimated consumption was based on the consumption recorded for 2004. Until 2004, CO₂ emissions rose by about 23% since 1990 on account of increased primary energy consumption. Compared to 1990, the CO₂ emissions fell by 34% in 2020.

Since 2013, the University of Freiburg has received electricity emissions certificates from TÜV SÜD. Taking the the emissions certificates for electricity into account, CO₂ emissions have fallen by 63% in 2020 compared to 1990.

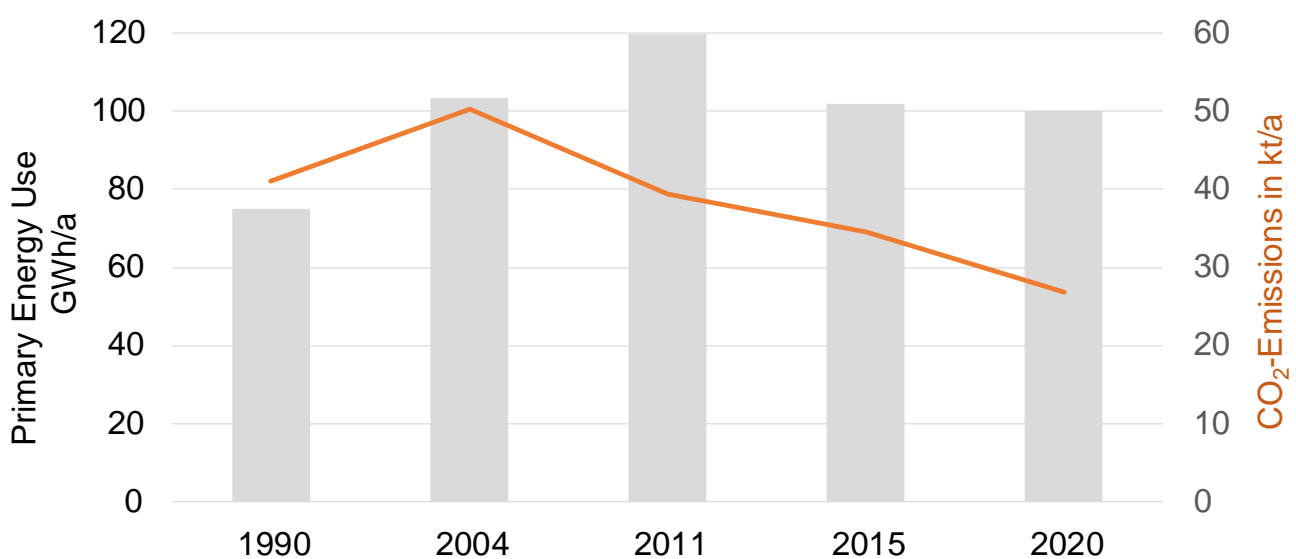


Figure 1: Development of primary energy consumption (GWh/a) and CO₂ emissions (kt/a) from 1990 to 2020 (excluding electricity emission certificates)

Between 1990 and 2020 the usable area of the University of Freiburg grew by almost 100,000 m² (roughly +45%). In this context it is worth taking a general overview of the specific changes in energy consumption and emissions: CO₂ emissions in relation to area stagnated until 2004, since then emissions have fallen steadily to a level of 87 kg/m² a usable area in 2020 (baseline 1990: 197 kg/m² a), if the electricity emissions certificates are considered, this even falls to just 49 kg/m² a (almost -75%).

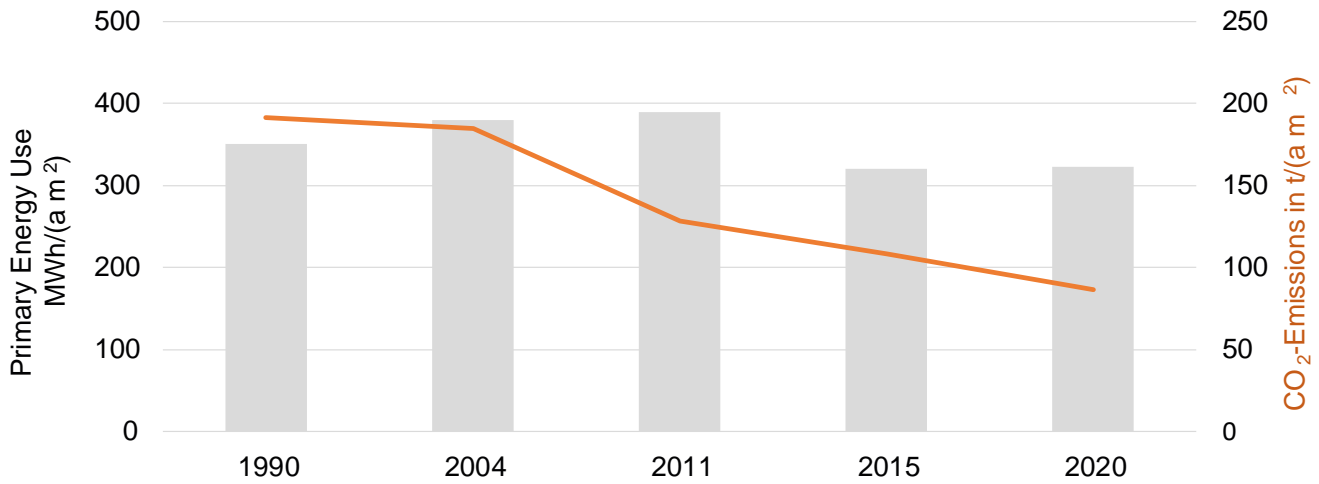


Figure 2: Development of specific primary energy consumption and specific CO₂ emissions from 1990 to 2020 (excluding electricity emission certificates)

Scenarios

The climate protection concept presents four scenarios forecasting the future growth in use of primary energy and CO₂ emissions at the University of Freiburg. All the scenarios assume that the upstream electricity grid achieves the national objectives to meet the demand for electricity with renewable energy.

Scenario 1: Implementation of investment and non-investment building-related measures to reduce emissions (base scenario) Regardless of the procurement of green electricity certificates, by 2045 there will be a reduction in CO₂ emissions compared to 1990 of 72%. On a like-for-like basis, the reduction in CO₂ emissions will be almost 82% in this scenario.

Scenario 2: Implementation of investment and non-investment building-related measures to reduce emissions and gradual adaptation of procurement of gas for Freiburg University's Medical Center thermal power station with up to 50% emissions-free fuel in accordance with the gas mix currently expected in the supply network beginning from 2030

Scenario 3: Implementation of investment and non-investment building-related measures and emissions-free heat supply, e.g. using geothermal energy

Scenario 4: Implementation of investment and non-investment building-related measures, gradual adaptation of procurement of gas for Freiburg University Medical Center's thermal power station with up to 50% emissions-free fuel and procurement of emissions-free electricity

By 2045 there will be a reduction in CO₂ emissions compared to 1990 of about 86%. On an area-adjusted basis, the reduction in CO₂ emissions will be 91% in this scenario.

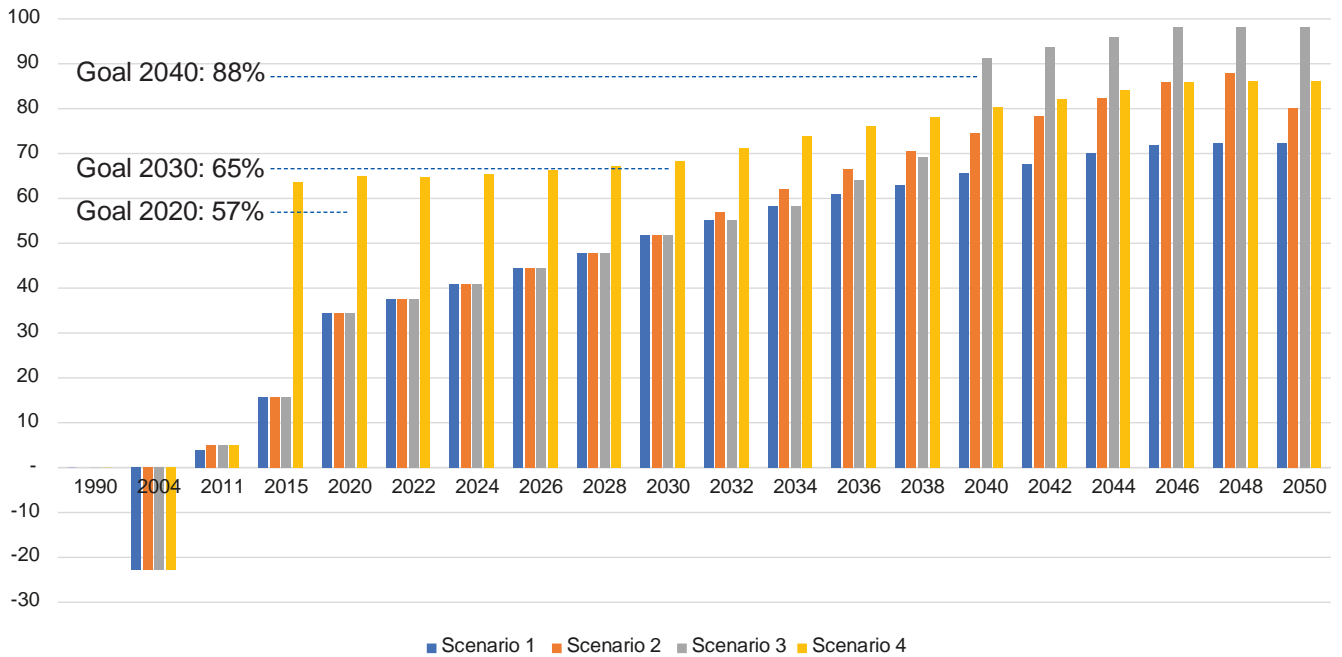
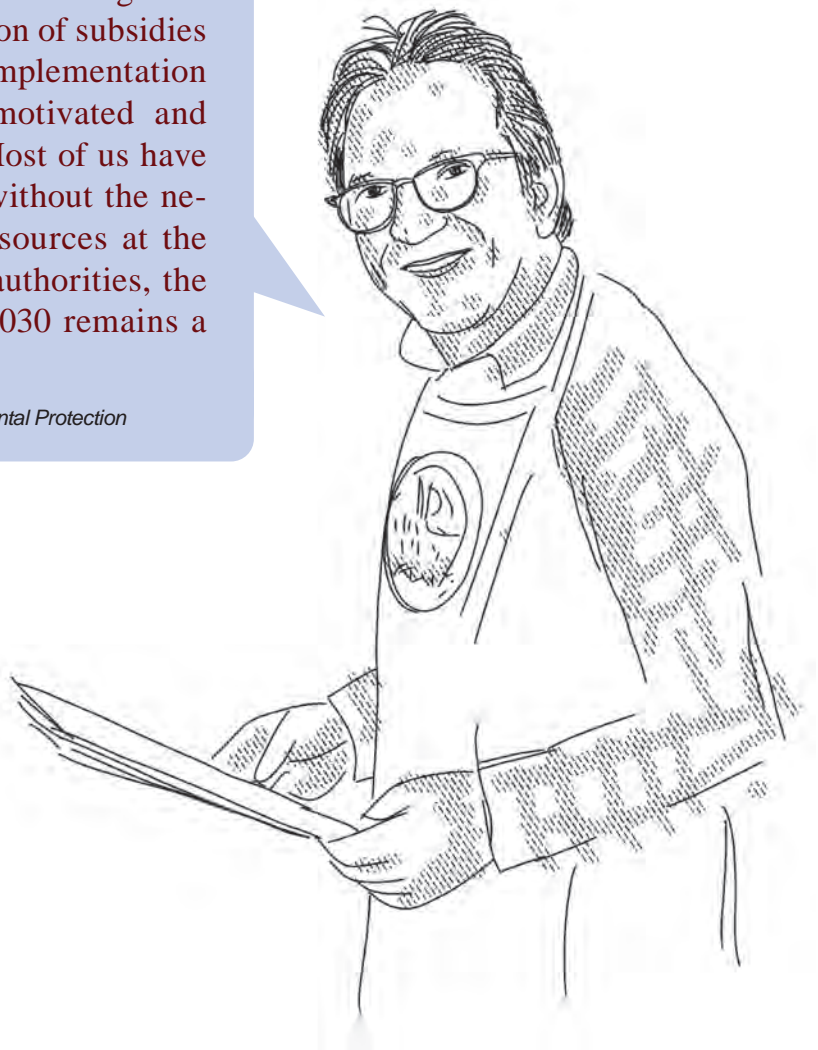


Diagram 3: Emissions reduction 1990-2050 in %, scenarios 1-4 (absolute)

“Climate protection is the topic for the future. Without a complete system change in buildings and construction and in the administration of subsidies in national and regional politics, implementation cannot succeed, regardless how motivated and committed a university is to this. Most of us have drawn up ideas and concepts, but without the necessary personnel and financial resources at the universities and the local building authorities, the objective of climate neutrality by 2030 remains a pure Utopia.”

Dr. Jürgen Steck, head of the Department of Environmental Protection



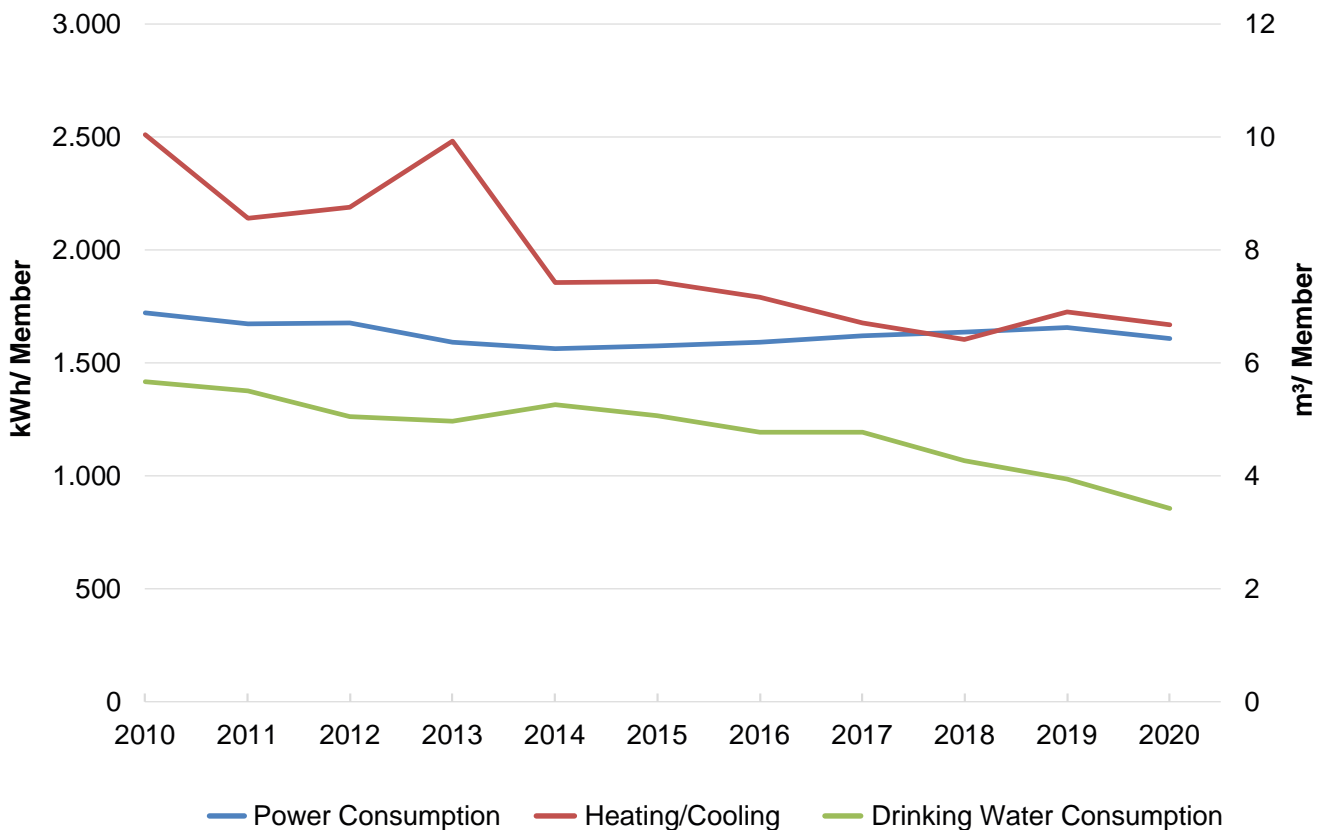
Energy

The University of Freiburg's total energy consumption is largely influenced by buildings' technical features and use. The number of technical facilities has grown steadily in recent years, however they have brought with them greater efficiency than many of the older systems. There are a number of reasons for the decline in heating consumption: e.g. a result of one-off efficiency improvements connected with heating, from renovation and modernization measures, and from reduced use of steam for chilling in absorption chillers. To ensure that chilling is as efficient as possible, the cooling circuit system in the Institutsviertel district has been gradually expanded. It is mainly stored in a central cooling unit, which uses groundwater to chill. This chilling process warms the ground water slightly, after which the circuit pumps it back into the ground. As well as this central system, additional decentral units that chill using electricity or steam can also be fed into the circuit.

The operating concept envisages that the chilling required in the supply network is always generated using the most efficient unit available. Systematic use of groundwater in this type of refrigeration enables a large saving compared to purely decentral generation of energy production in the form of steam and electricity for chilling. The outage of the central, groundwater operated chiller in the period 2012/13 can be clearly seen in the sudden rise in the heating/chilling energy curve as a result of steam consumption in the same period, as chilling using steam-operated absorbers largely had to be used in compensation.

2018 was one of the warmest years since weather records began, and as a result, heat consumption at the University was significantly lower than other years. The slight rise in electricity and heating energy consumption in the subsequent year was, besides changes in the structure of the areas in use and a relatively lower temperature, also due to technical problems and building work which meant that the central groundwater chiller system once again was inoperable in the relevant period, and less efficient, decentral units again had to be used for chilling. On account of the weather, and in particular the very cold spring when the heating was on until May, consumption of heating energy rose drastically in 2021.

Specific Energy and Water Consumption per Member



Measures

For many years the University of Freiburg has continuously realized a number of measures to improve energy efficiency and, as a result, the specific energy consumption by usable area has fallen steadily and is below the average specific energy consumption in comparison to other universities and university hospitals in Baden-Württemberg (see 2019/2020 Environmental Report). This is in particular the result of numerous renovation and modernization measures commissioned and overseen by the Baden-Württemberg State Property and Building Construction Administration. Central elements of this are new control technology, heat recovery, more energy-efficient units and external building insulation. This was complemented by many of the measures undertaken by the University, e.g. LED projects, solar power generation on the roof of the University Library (since 2014/15), more efficient pumps, insulation of pipes, environmental bonus schemes.



In 2018-21 the technical buildings management resumed the previous years' ongoing retrofitting of room lighting and safety lighting to LED. In 2019 there was a pilot project trialing the closure of the University Library overnight. Overnight closure significantly reduced energy consumption. In particular, far less energy was used for air conditioning and ventilation in the summer months, and this resulted in the greatest reduction. Closure at night is ongoing and the active technical systems are continuing to be monitored and their control technology optimized, with a view to achieving further savings.

Photovoltaic systems

As part of its 550th anniversary celebrations, the University of Freiburg and the Freiburg University Medical Center made suitable roofs available to the 'Solar-Uni' public project in 2007. To create a photovoltaic system with a total output of 550 kW, approx. 5,000 m² were covered with solar panels. At this time, the Solar-Uni was the largest solar roof program of the Federal State of Baden-Württemberg. The photovoltaic systems installed through this program have generated 514,000 kWh electricity in 2021, which was fed into the electricity grid. These systems are now being operated by Regiosonne, a subsidiary of badenovaWÄRMEPLUS.

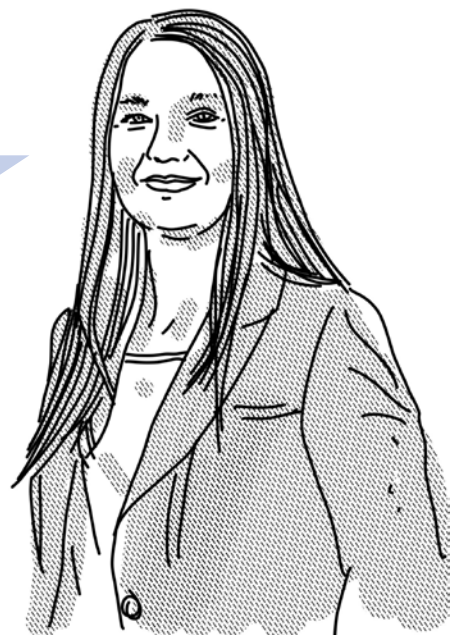
The PV system on the University Library was installed in 2014 at the initiative of the University and produced over 175,000 kWh in 2021. The system was financed by the University and the electricity is entirely used by the University. The PV system meets on average up to 8% of the electricity consumption in the library building.

In cooperation with the Baden-Württemberg (Freiburg) real estate management authority another PV system to generate electricity for own use was installed on the roof of the Institute of Mathematics in 2021. Half of the roof was already used for a system from the Solar-Uni program, so it was only possible to use the remaining half for the system to generate electricity for use at the University when the roof was being renovated. The system was brought into operation in 2022.



“Collectively and individually, we must assume responsibility for our actions and their effects on humans and the environment. In doing so, we must not be too shortsighted in this rapidly moving age, and must be open to change, even if it is sometimes uncomfortable. I enjoy working on these issues with the team at the Department of Environmental Protection, even if the interplay between personal and financial resources and environmental protection isn't always easy.”

Dr. Sabrina Oppermann, Head of the Department for Environment and Sustainability

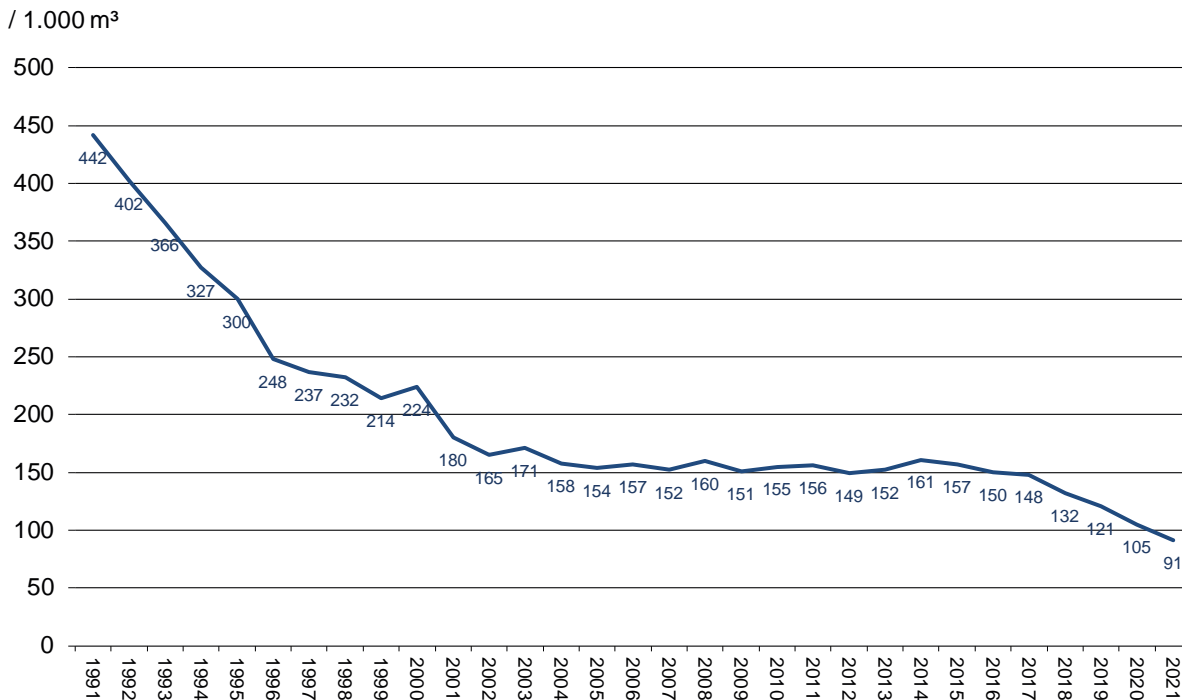


Water

In the past 30 years, numerous water consumption reduction measures have led to a steady decline in use at the University even though the number of people employed, students and the area itself have grown significantly. In this period, the University together with the Baden-Württemberg (Freiburg) real estate management authority have consistently implemented effective long-term investments in measures to save drinking water, e.g. use of groundwater instead of drinking water for cooling, water-saving fittings and urinals, and vacuum pumps instead of water jet pumps in the laboratories. In the Otto-Krayer-Haus, rainwater is supplied to the toilets. The renovations that have been ongoing for over more than five years in the chemistry laboratories have also significantly contributed to reducing water consumption. As a result, drinking water is only used for cooling in laboratories where this is technically unavoidable.



Annual Drinking Water Consumption



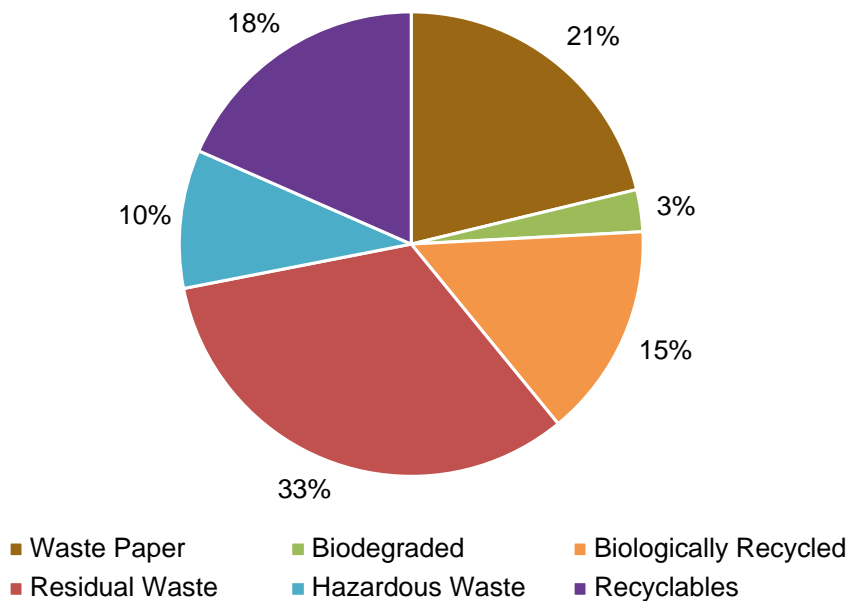
Waste

In 2020 the volume of waste was 1080 t and therefore 2% lower than the previous year (1107 t). In 2021 the effects of the pandemic led to a further reduction in the total quantity of waste, which at 855 tons was 22% lower than in 2019. Due to social and ecological reasons, the University's e-waste is not recycled overseas but only in Germany, France or Switzerland. Thermal utilization of biowaste takes place in a biogas plant that only produces electricity from this (and not from energy crops) and that uses all the excess heat to dry out compost. Garden and park waste are composted.

The reusable special toxic waste management system at the University of Freiburg was introduced in 2001 and has resulted in major ecological and economic benefits and significantly fewer accidents at work in this area. By using reusable canisters and reusable barrels for hazardous waste, this system saves a considerable amount of material and at the same time reduces CO₂ emissions. The University of Freiburg's environmentally-friendly special waste management system was described in an [article in the Journal of Environmental Safety](#).

Collection boxes for empty ink and toner cartridges from office printers are set up in every area of the University, for recycling instead of disposal. Ink and toner cartridges are collected and where possible refilled. In 2020 and 2021 over 1100 ink and toner cartridges were returned to the recycling company for refilling, with roughly 80% being refilled and the remainder recycled or disposed of.

Amount of Waste by Type of Waste in 2021



Procurement

Paper consumption is steadily declining, and at the same time the share of Blauer Engel certified recycled paper is growing. The corona pandemic accelerated the digitalization of many processes at the University, and this can be seen in the decline in paper use. By using Blauer Engel recycled paper, the University of Freiburg has saved over 1.6 million liters of water, approx. 370,000 kWh energy and over 6 tons of CO₂ in 2021 (in comparison to virgin fiber paper). For the next few years, the University of Freiburg has set itself the goal of using 100% recycled paper, preferably with the Blauer Engel mark.

The University's procurement guidelines stipulate that recycled products are purchased to cover demand for paper and for packaging materials made of paper and cardboard. For a product to be deemed recycled, it should have Blauer Engel certification or meet similar criteria, provided recycled paper is available that meets DIN 9706. Suppliers must also use Blauer Engel marked packaging material.

The University of Freiburg re-tendered all of its office materials purchasing for 2020/21 and developed a new system for the assessment of products that considers environmental aspects seriously and awards additional points for environmental aspects. As a result, the decision is based not just on the price and properties of products, but approx. 30% on environmental aspects. For example, the Blauer Engel environmental label receives the maximum number of points (5). There are additional points for other environmental labels, climate neutrality or for products that contain at least 70% recycled material.



Mobility

On the way to work

In 2021, the Sustainable Mobility work group carried out a [mobility survey of staff](#) at the University of Freiburg. The aim of the anonymous online survey was to gain a better understanding of how staff travel to and from work, and to record any mobility-related suggestions, in order to develop suitable measures. In all, the 1424 participants – more than 20% of all staff – offered useful insights into their mobility patterns and what they wanted from the University, in particular regarding sustainable mobility.

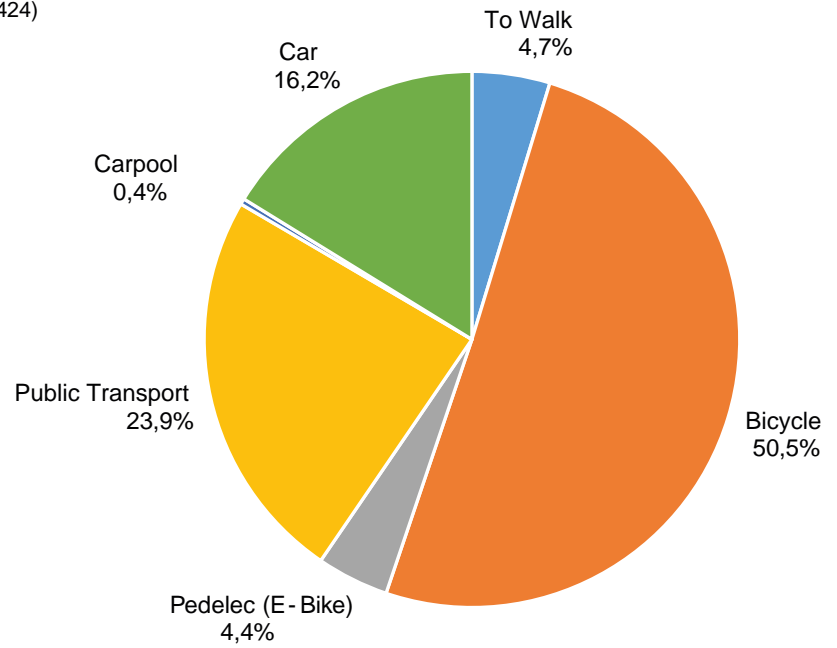
The data obtained were extremely useful in estimating the emissions that are generated by commuting and to develop an overall mobility concept for the University of Freiburg. This mobility concept, which will shortly be finalized, follows the current national and regional climate protection objectives and complement the climate protection concept. A second mobility survey is planned for students.

Primary means of transport for commuting

More than half of the staff surveyed at the University of Freiburg get to work in a CO₂-neutral way.

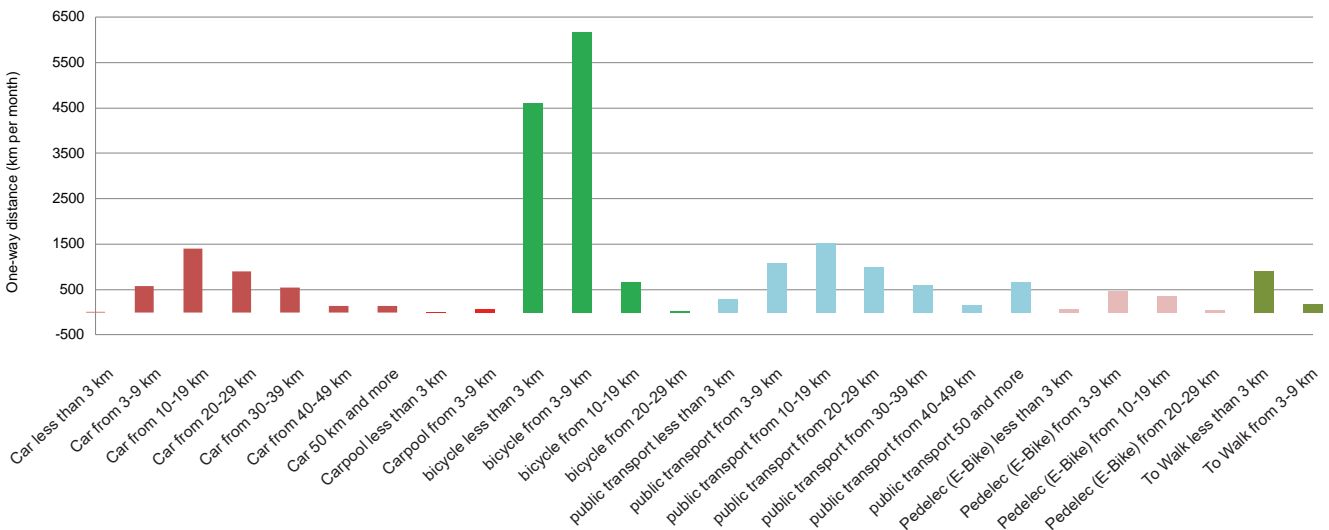
(n = 1424)

Main Means of Transport



Verkehrsmittel der Beschäftigten mit Wegstrecken

Result Poll - Transport employees (one-way distances per month)



Werden die durch Corona-Pandemie hervorgerufenen Veränderungen eine langfristige Auswirkung auf Ihr Mobilitätsverhalten haben?

The results on the long-term effects of the corona pandemic on mobility patterns were revealing. The survey showed that more staff work from home as a result of the pandemic, and this has had a fundamental effect on mobility with some favoring the bicycle or car over public transport. Nevertheless, 72% stated that their mobility patterns had not changed. Since the pandemic, university staff have worked from home on average seven days a month in comparison to just 1.5 days before the pandemic. Calculations based on the mobility survey showed that the emissions from commuting fell by 18% during the corona pandemic in comparison to 2019. This is above all due to reduced use of public transport. The amount of kilometers traveled by car was only reduced by 1%, since the increase in car traffic because of the pandemic offset the savings in mobility emissions from working from home.

In addition, the many comments made by participants revealed diverse points of view regarding the subject of mobility. These ranged from criticism for the lack of safety checks for cars as a counterpart to the free bicycle check, through to enthusiasm for sustainable mobility.

What would it take for you to switch to cycling or public transport?

"Fresh air and movement – you don't need anything else!"

"Free bicycle check offered! What offers are there for cars?????????"

"Coronavirus showed that with the right clothing the bicycle almost always works."

"Really I'm a train user. The pandemic made me a car driver."

"I love my bike. It can take me anywhere."

"Nothing, I like using public transport – bicycle (with helmet) not an option because of my hairstyle. :-)"

"Cycling is sport and transport for me."

E-mobility at the University of Freiburg

Replacing combustion engine vehicles with e-mobility is an important step towards climate protection and is given as a measure in the University's mobility concept, which is currently being developed. The University replaced three diesel-engine service vehicles with [electrical in 2021](#), since low emission drives are a key factor for new acquisitions in the fleet.

In April the first e-charging station exclusively for university staff was built at the Department of Psychology as a result of interest expressed by people employed there. Further stations for staff are planned for the BIOS Centre for Biological Signalling Studies buildings (in Schänzlestraße) and in Katharinenstraße. Another charging station for the University's e-bus has been requested from Baden-Württemberg's parking space management service. There are also charging stations in the University's basement garages, which are available to everyone.

Flight emissions

Business trips and flights in particular make up a considerable part of the University's total emissions. Initial calculations show that before the pandemic business trips caused more than 10% of the University's total emissions, and more than 90% of these emissions were from flights (2018/19 Environmental Report). Therefore, since 2019, the University of Freiburg has been actively engaged with the issue of emissions from business trips. In June 2019 the interdisciplinary work group Flying Faculties was formed, and undertook a pilot project analyzing a faculty's emissions from business trips for 2018. The results of the pilot project are presented in the Environmental Report 2018/19. These data have been used to estimate the University's entire emissions for flights. An Intrex application to record emissions from flights is currently being developed and will shortly be in use. All staff who apply for travel authorization will then have to input data about their flight into this app and analyze their own emissions.

Within the scope of the Baden-Württemberg higher education funding agreement 2021-2025, the University of Freiburg has undertaken to pay a climate levy on flights from 2021. However, the University regards compensation for flight emissions as just an additional measure and is endeavoring to reduce flight emissions as much as possible, without harming the quality of research and international cooperation. With its new air travel guidelines, the University wants to achieve significant reductions in flight emissions. The Flying Faculties work group has made specific recommendations on reducing flight emissions, including a ban on short haul flights, defined as destinations that can be reached by train within eight hours. Exceptions to this rule for e.g. family or logistical reasons must be justified. The impact on the climate from business trips is given high priority in the list of decision-making criteria for business trips. The air travel guidelines will be brought in over the coming years and should increase awareness of the effects of flying on climate change among members of the University.

Flights will always remain an essential part of university life and research, for example for field research, conferences and co-operations with other universities. However, the corona pandemic has shown that routine meetings, many lectures and some conferences can easily be conducted virtually. Other advantages of these digital solutions besides savings on emissions include a better work/life balance and the opportunity for researchers from financially less well-off countries to take part in events and discussions.



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