Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Climate Action Report

UNIVERSITÄT HAMBURG 2023

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A sustainable vision for Universität Hamburg's future

Introduction

As a University of Excellence, Universität Hamburg sees itself as a flagship university and follows the guiding principle of "Innovating and cooperating for a sustainable future" in its strategic development. The topic of sustainability therefore does not only play a central role in research, teaching, and knowledge exchange. We also aspire as an organization to proactively contribute to a climate-positive future for our society. This means that the topic of sustainability, which also includes climate action and environmental protection, is relevant to all areas of activity at the University. We have set ourselves the goal of establishing a culture of sustainability in all areas of our University.

In order to achieve this goal, Universität Hamburg has initiated many activities in research, teaching, knowledge exchange, governance, and administration in recent years. The University makes its scientific findings and expertise on sustainability and climate change available to the public and politicians, trains the next generation of academics and professionals for the relevant areas of activity, and strives to become more sustainable itself.

Building on the many years of pioneering work carried out by the Center for a Sustainable University, the climate and environment representative and, most recently, the climate protection manager, the Sustainability Office, and Prof. Dr. Laura Marie Edinger-Schons in her role of chief sustainability officer (appointed December 2022) are today responsible for the strategic area of sustainability. Their goal is to achieve University-wide impact and national appeal. Motivated by the need for climate action, the findings from our own research, and the impetus from students, employees, and society, we are committed to being a forward-looking university for a sustainable future. We wish to live up to this responsibility and draw on this Climate Action Report in order to provide an evidence-based assessment of the current situation to determine future opportunities and measures.

As every path is traveled by taking many small steps, we call on all members of the University to integrate climate action into their research, teaching, studies, and work as well as their daily activities. This requires the courage to implement new strategies, question the status quo, and develop processes further. With over 40,000 committed students, researchers, teaching staff, and employees, I strongly believe that we at Universität Hamburg will achieve our climate goals and make a significant contribution to society.

On behalf of the entire Executive University Board, I would like to thank all those at Universität Hamburg who are actively committed to sustainability and climate action. I wish us all every success on our shared journey to becoming a climate-neutral university.

Prof. Dr. Hauke Heekeren
President, Universität Hamburg

Universität Hamburg's role in the sustainability transformation

Humanity is facing existential challenges in the area of sustainability—above all the climate crisis and the extinction of species. These challenges must be addressed proactively in order to preserve a livable planet for the current and future generations. Universities have a central role to play in addressing these challenges. They can contribute to sustainable development through their research, teaching, and knowledge exchange by focusing on their footprint, handprint, and brainprint. The footprint of a higher education institution is the negative impact it generates, for example, in the form of greenhouse gas emissions. The handprint can include teaching and knowledge exchange activities that may make a positive contribution to sustainable development. The brainprint of a higher education institution is the result of research activities on the topic of sustainability that contribute to the transformation toward sustainability. The development of our sustainability strategy follows a broad understanding of sustainability that is based on the 17 Sustainable Development Goals (SDGs) of the United Nations and a whole-institution approach in whose development and implementation all members of the University are involved across disciplines, status groups, and areas of activity. Sustainability management thus does not serve as a reactive means of minimizing negative effects, but rather as a driver of innovation and a platform for dialogue. It is also of central importance that the two major transformations of our time—sustainability and digitalization—are not considered and shaped in isolation from one another. We are working closely with the Digital Office to leverage synergies between the two.

Prof. Dr. Laura Marie Edinger-Schons
Chief Sustainability Officer, Universität Hamburg

Sustainability begins with our own activities

Universität Hamburg is considered a university for a sustainable future and has performed pioneering work in this area in recent years. The University wishes to continue to live up to this responsibility in the future by practicing and actively shaping sustainable action within its own four walls. Sustainability should not be superficial, but rather deeply anchored in the University's core activities. The aim is to create a vibrant culture of sustainability that includes all University members and in which each and every individual acts as a sustainability manager. As a University of Sustainability, we want to create a sustainable campus and make sustainability a tangible experience for everyone. It should be possible to experience sustainability at all key contact points, such as campus life, housing, dining, and infrastructure. As effective management requires measurement, we see the collection, analysis, and interpretation of comprehensive data as a key success factor. The insights gained allow us to prioritize activities and allocate resources in the most effective way. As a university, we have ambitious goals that we wish to achieve. These include developing an integrated manageable data infrastructure, providing sustainability data on a daily basis, establishing a structure that enables building-specific measurements, and making selected data available for research projects.

Dr. Martin Hecht
Head of Administration, Universität Hamburg

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A	ADFC	German Cycling Association (Allgemeiner Deutscher Fahrrad-Club)
	AStA	Student council
B	BAföG	German federal student loan scheme
	BMBF	Federal Ministry of Education and Research
	BMI	Federal Ministry of the Interior and Community
	BWFGB	Hamburg Ministry of Science, Research, Equalities and Districts
C	CAFM	Computer-aided facility management
	CDP	Carbon Disclosure Project
	CEN	Center for Earth System Research and Sustainability
	CLICCS	Cluster of Excellence Climate, Climatic Change, and Society
	CSS	Center for Sustainable Society Research
D	DG HOCH-N	German Society for Sustainability at Higher Education Institutions
	DKRZ	German Climate Computing Center
	DNK	German Sustainability Code
G	GHG-Protocol	Greenhouse Gas Protocol
	GMH	Gebäudemanagement Hamburg GmbH
H	HIC	Hamburg Institut Consulting GmbH
	HOCH-N	Sustainability at Higher Education Institutions
	HS-DNK	German Sustainability Code in Relation to HEIs
K	KEN	Knowledge Equity Network
	KNU	Center for a Sustainable University
	KSG	Federal Climate Change Act
M	MVM	Tenant-landlord model
N	NAP-ESD	National Action Plan on Education for Sustainable Development
P	PRME	Principles for Responsible Management Education
S	SBTi	Science Based Targets initiative
	SDGs	Sustainable Development Goals
T	GHG	Greenhouse gas
U	UN	United Nations
	UNESCO	United Nations Educational Scientific and Cultural Organization
W	WBCSD	World Business Council for Sustainable Development
	WCED	World Commission on Environment and Development
	WRI	World Resources Institute
	WWF	World Wide Fund for Nature

Fact Sheet

Consumption and GHG emissions

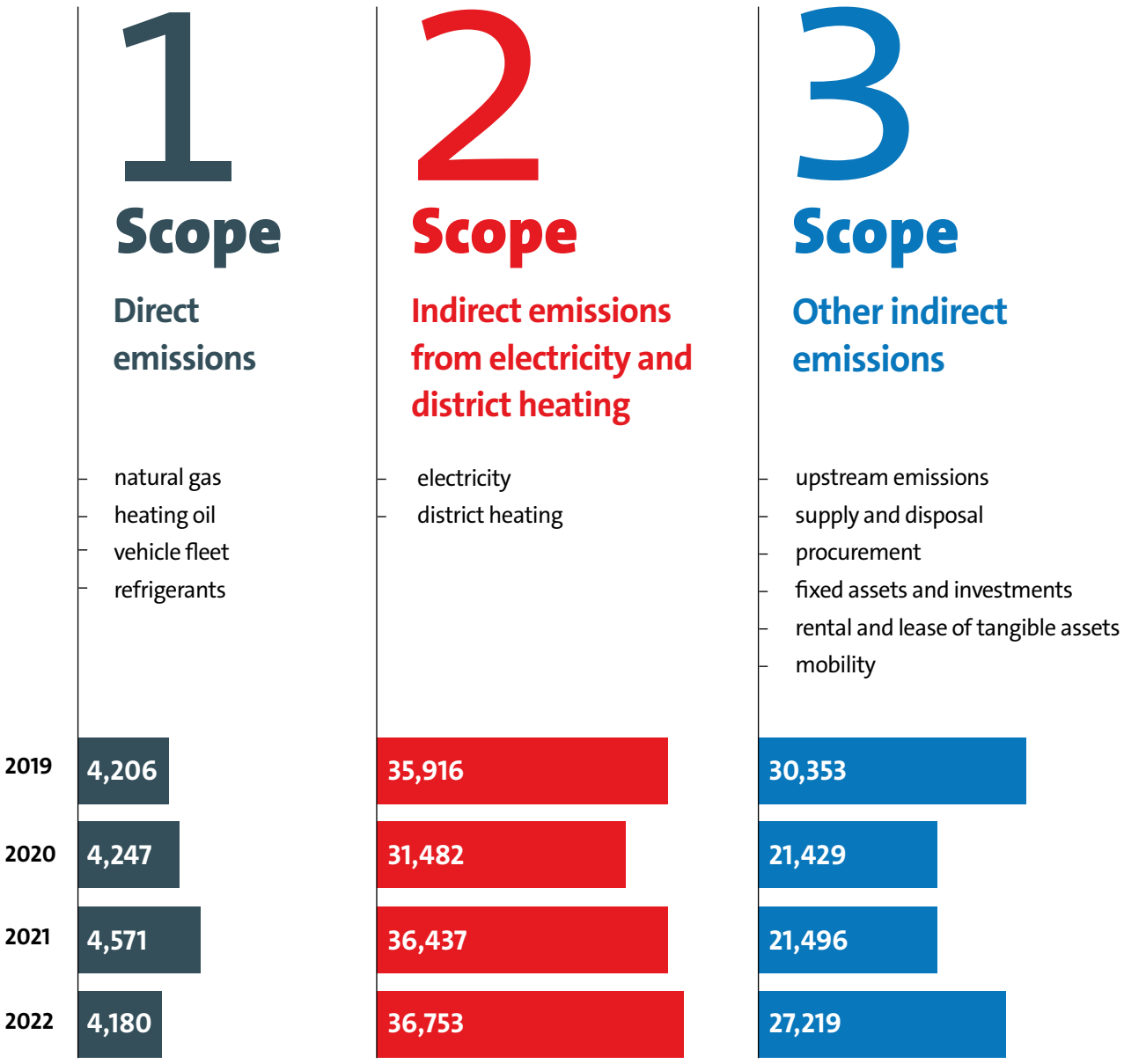


Figure 1: Overview of the relevant emissions areas and of GHG emissions for Universität Hamburg, 2019–2022

Pathways to achieve GHG neutrality

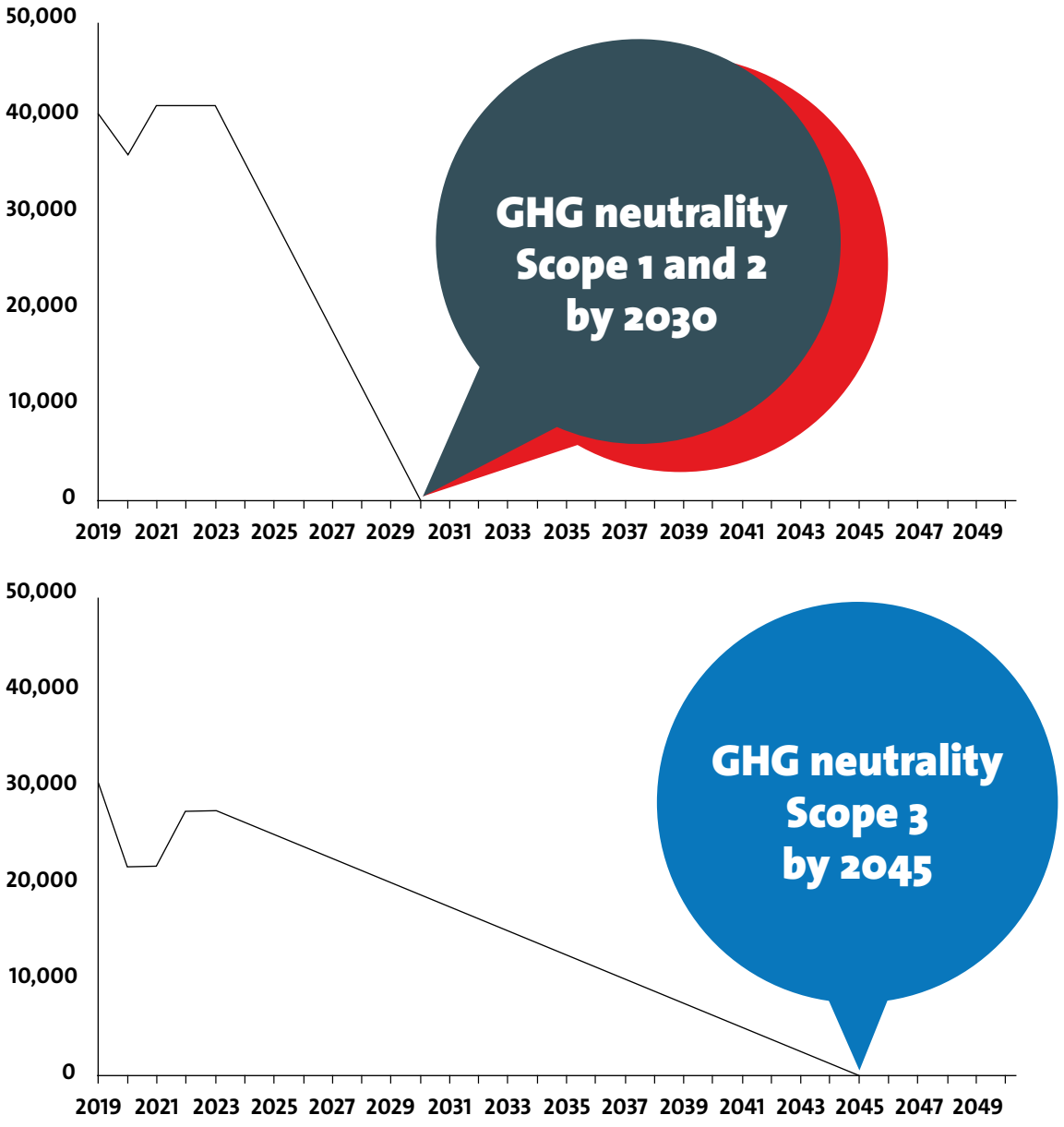


Figure 2: Pathways to achieve GHG neutrality at Universität Hamburg

Executive Summary

In November 2023, Universität Hamburg published its Climate Action Report for 2019 to 2022, which followed on the heels of the University's sustainability report for 2015 to 2018. The Climate Action Report is based only on greenhouse gas (GHG) emissions and not on the entire spectrum of sustainability. A comprehensive report on sustainability in research, teaching, knowledge exchange, and administration will be published in 2024. Universität Hamburg sees sustainability in accordance with the UN Sustainable Development Goals as a comprehensive strategy that includes ecological and societal goals. Universität Hamburg distinguishes between its sustainability concerns as follows:

- **footprint**, meaning the negative impact such as GHG emissions;
- **handprint**, meaning teaching and knowledge exchange on sustainability;
- **brainprint**, meaning research activities relating to sustainability.

The present Climate Action Report focuses on one aspect of sustainability: our footprint. Universität Hamburg does not ignore the other dimensions, however. In 2023, a variety of activities in the field of sustainability were implemented, including participatory formats such as the open plenum and a biodiversity lab. Listen to the recording of our open plenum on 13 November 2023 for an overview of activities: **uhh.de/offenes-plenum-3**

1

The Climate Action Report was developed according to the internationally recognized standards of the Greenhouse Gas Protocol. Emissions were measured extensively in Scopes 1 (University's own direct emissions), 2 (indirect emissions from electricity and district heating), and 3 (e.g., mobility and procurement; only external services have been omitted). Very few organizations have calculated emissions this extensively, especially those relating to Scope 3.

2

In 2019, the University generated 70,476 tons of CO_2; in 2020 57,157 tons of CO_2; in 2021 62,504 tons of CO_2; and in 2022 68,152 tons of CO_2. The University Medical Center Hamburg-Eppendorf (UKE) and DESY do not form part of the accounting, because they publish their own reports and are therefore outside the system boundaries.

Key points in the Climate Action Report for 2019 to 2022

3

For Scopes 1 and 2, the University is aiming for greenhouse gas neutrality by 2030 in line with the GHG Protocol, provided external circumstances allow for this. An important factor here will be climate neutrality with regard to district heating in Hamburg. If this is mostly climate neutral by 2030, then the University can achieve its climate goals in this area.


01

Sustainability at Universität Hamburg

About this report

Scientific findings show that our global greenhouse gas emissions budget to meet the 1.5°C target will only last for a few more years at the current emissions levels. The serious environmental damage and increasing climate change, which have been widely reported on by global media, underscore the urgent need for action. At the Paris Climate Change Conference (COP21) held in December 2015, 195 countries committed to a legally binding global climate change agreement for the first time. The agreement sets out a global action plan to limit global warming to well below 2°C (Federal Ministry for Economic Cooperation and Development (BMZ), 2015). On 31 August 2021, the German government passed the amended Federal Climate Change Act (KSG). According to Section 3 subsection 2 of this act, Germany should achieve greenhouse gas neutrality by 2045 (KSG, 2021). The federal administration is to lead by example and become climate neutral by 2030. In this context, the federal states

increasingly see the need to adapt their climate legislation (Nußbaum, 2023). While nine federal states have formulated specific targets, Hamburg's climate act is currently being amended (Free and Hanseatic City of Hamburg, 2023) with the prospect of a 70 percent reduction by 2030 compared to the base year of 1990.

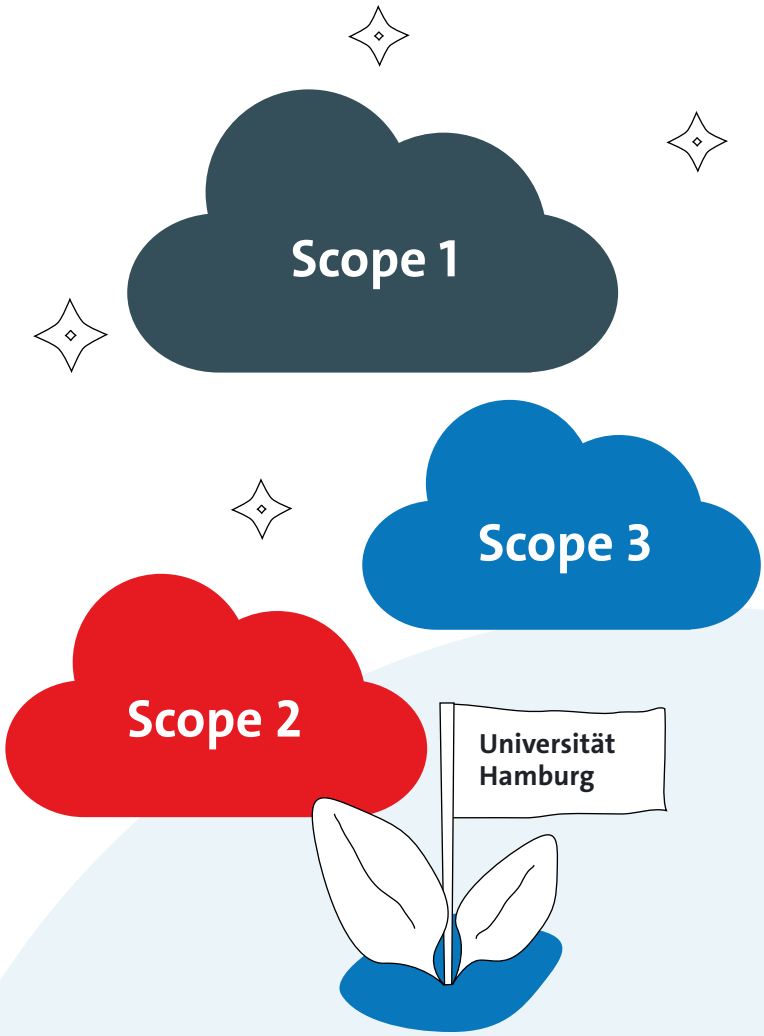
Universität Hamburg has long been committed to sustainability and climate action. In recent years, a regular and growing discourse on the sustainability focus of the University has emerged. This started with the Center for a Sustainable University (KNU), the Excellence Strategy with the guiding principle of "Innovating and cooperating for a sustainable future," and the increasing institutionalization of sustainability. The establishment of the KNU anchored the process of making Universität Hamburg a university for a sustainable future across the faculties and administration. This led to the development of internal and national projects that resulted in the further development of sustainability at higher education institutions. In addition, the structural anchoring of research through the Cluster of Excellence Climate, Climatic Change, and Society (CLICCS), the university network KlimaCampus Hamburg, and its two centers (Center for Earth System Research and Sustainability [CEN]) and Center for Sustainable Society Research [CSS]) established the relevance of sustainability throughout the University.

The Sustainability Office and the position of chief sustainability officer were created as a way to continue on the path to becoming a sustainable university. Based on the KNU projects and the Sustainability at Higher Education Institutions (HOCH-N) project, an integrated and holistic sustainability strategy is to be designed and implemented, taking global challenges and planetary boundaries into account. The topics of sustainability and digitalization are to be aligned and linked in the sense of a twin transformation in order not only to make digitalization sustainable, but also to use it in the interests of sustainability. Furthermore, various participatory formats are to be introduced and a culture of participation and cocreation established at the University. Based on these goals, the Sustainability Office includes the key areas of impact measurement and reporting, community management, and education for sustainable development and, as such, reinforces the importance of managing sustainability based on evidence, creating transparency, and involving University members holistically. These elements are needed in order to create a vibrant culture of sustainability.

To live up to its social responsibility, Universität Hamburg aims to use the Climate Action Report to build a bridge between the current situation and future transformation. The Climate Action Report first focuses on the current situation and then outlines the path of transformation that Universität Hamburg intends to pursue. Based on this initial situation, the existing potential is to be determined and appropriate economic, environmental, and social measures for a sustainable university established and implemented. The goal is to become greenhouse

gas (GHG) neutral in Scopes 1 and 2 by 2030 according to the Greenhouse Gas Protocol (GHG Protocol), provided external circumstances allow for this. And in Scope 3, which is more action oriented and less investment oriented, process-related changes are to be implemented to ensure a climate-friendly transformation of the University as soon as possible. In order to achieve this ambitious goal, Universität Hamburg has already recorded all Scope 3 emissions (with the exception of contracted services) and included them in its GHG accounting. This is in addition to the Scope 1 and 2 emissions that many organizations typically record. In doing so, Universität Hamburg is setting new standards and demonstrating that comprehensive recording of GHG emissions is possible and effective.

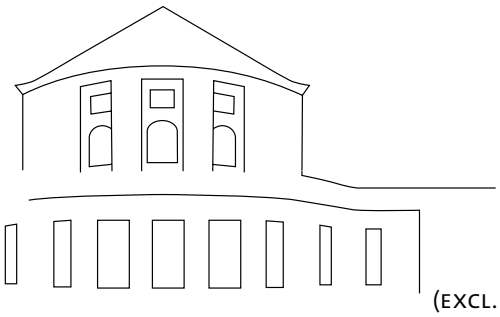
In line with our participatory approach, the Climate Action Report was prepared with the involvement of numerous interest groups at Universität Hamburg. In addition to the individuals responsible—the chief sustainability officer, Sustainability Office staff, and the climate action manager—students, researchers, administrative staff, and the Executive University Board were involved in preparation of the climate action report. Students were included through the working group on climate (Resonanz-Arbeitsgruppe Klima), which was set up for this purpose and provided ongoing feedback on the content of the report throughout the preparation process. In addition, students, researchers, administrative staff, and the Executive University Board were actively involved in the planning and design of the Climate Action Report through the working group on climate-neutral use of resources (Arbeitsgruppe Klimaneutrale Ressourcennutzung). This report follows on from Universität Hamburg's last sustainability report for 2015 to 2018. The next step will be reporting on sustainability, which will include contributions to sustainability in the areas of research, teaching, and knowledge exchange.



Universität Hamburg in figures

678,003 M²

GROSS FLOOR SPACE
(WITH REGULAR BUILDING MANAGEMENT COSTS EXCL. FACULTY OF MEDICINE / UKE)



7

FACULTIES
(EXCL. FACULTY OF MEDICINE / UKE)

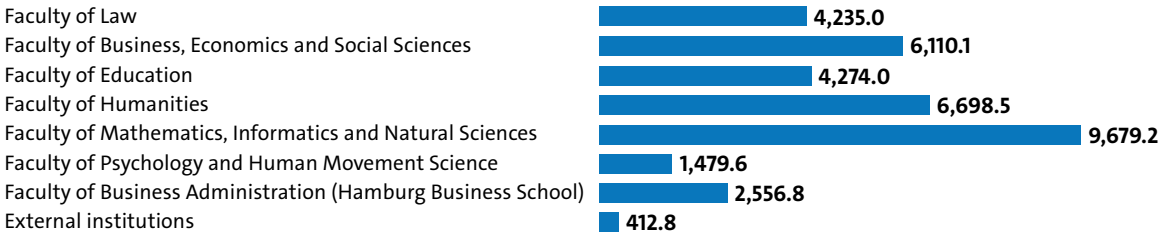
138

BUILDINGS
(WITH REGULAR BUILDING MANAGEMENT COSTS EXCL. FACULTY OF MEDICINE / UKE)

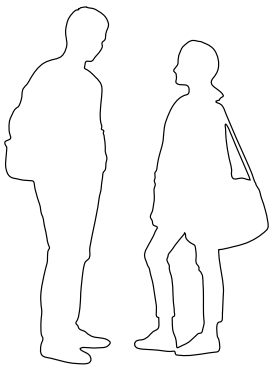
37,946 STUDENTS

(EXCL. FACULTY OF MEDICINE / UKE)

STUDENTS PER FACULTY (IN FULL-TIME EQUIVALENTS)



Source: Student statistics on 1 December 2022.
Comments: Doctoral researchers are not included in the above figures. In 2022 the full-time equivalents excluding the Faculty of Medicine totaled 35,445.7. The information on the full-time equivalents deviates from the counting method based on persons, as the subject count is prorated to the faculties depending on students' enrollment in the major, minor, and teaching subjects. In case of parallel enrollment, both degree programs are taken into account.



	TOTAL EXCL. FACULTY OF MEDICINE / UKE
Applicants	40,601
First-year students	9,533
Of which master's students	2,962
Academic degrees	5.497
Doctorates	478

WOMEN

Students
56%

Academic staff (incl. professors)
41%

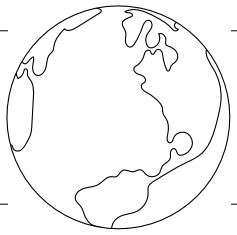
INTER-NATIONAL

Students
14%

Academic staff (incl. professors)
23%

5,422 INTERNATIONAL STUDENTS AND DOCTORAL RESEARCHERS (EXCL. FACULTY OF MEDICINE / UKE)

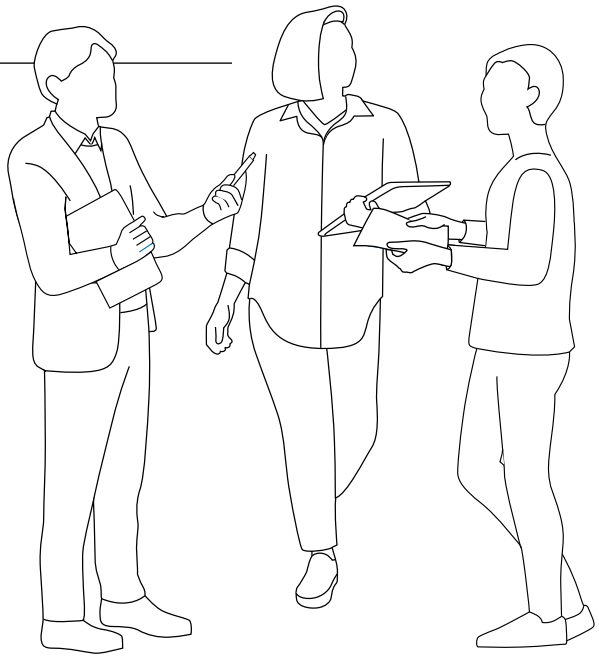
FROM **143** COUNTRIES



4 ONGOING CLUSTERS OF EXCELLENCE

- CUI: ADVANCED IMAGING OF MATTER
- CLIMATE, CLIMATIC CHANGE, AND SOCIETY (CLICCS)
- QUANTUM UNIVERSE
- UNDERSTANDING WRITTEN ARTEFACTS

	TOTAL EXCL. FACULTY OF MEDICINE / UKE
Collaborative research centers (CRCs) (spokespersons)	3
Research training groups (spokespersons)	7
DFG research units (spokespersons)	6



4,592.1 EMPLOYEES (IN FULL-TIME EQUIVALENTS)

	TOTAL EXCL. FACULTY OF MEDICINE / UKE
Professors	512.4
Academic staff (excl. professors)	2,098.3
Technical, administrative, and library staff	1,981.4

	TOTAL EXCL. MED/UKE
State funding in 2022 (incl. investments)	391 million
Third-party funding[1] in 2022	197 million

The data does not include forwarded funds.[1] This corresponds to the sum of third-party funding [Dr1b] according to the Research Core Dataset (KDSF) and additional third-party funding.

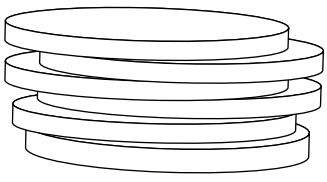


Figure 3: Key figures for Universität Hamburg

Since 2011

History of sustainability at Universität Hamburg

Universität Hamburg has a long history of sustainability activities, which are summarized in the following milestones.

Center for a Sustainable University (KNU)

The Center for a Sustainable University (KNU) was established in 2011 to anchor sustainability at Universität Hamburg across the faculties and administration and worked until 2019 to support the process of shaping Universität Hamburg into a university for a sustainable future. Three sustainability reports have also been prepared since 2012—initially supported by student initiatives. In 2016, the University strengthened its sustainability strategy with the adoption of a sustainability commitment by the Executive University Board and was the first research university to issue a declaration of compliance with the German Sustainability Code (DNK) in Relation to HEIs. In addition, Universität Hamburg joined several sustainability-related partnerships and initiated the nationwide research alliance Sustainability at Higher Education Institutions (HOCH-N), in which it assumed the role of spokesperson. In 2017, Universität Hamburg participated in the development of the National Action Plan on Education for Sustainable Development (NAP ESD) of the Federal Ministry of Education and Research (BMBF).

Since 2021

Climate and environmental protection management

After many years of advancing sustainability activities and measures, the Center for a Sustainable University (KNU) set up working groups on relevant areas of activity and an overarching coordination group under the leadership of the members responsible of the Executive University Board. Within this framework, the working group on the climate-friendly use of resources (Arbeitsgruppe Klimaorientierte Ressourcennutzung) deals with the issue of climate action. A climate and environment representative and a climate protection manager were appointed to coordinate these activities and measures.

Since 2022

Chief sustainability officer and the Sustainability Office

Universität Hamburg has had a Chief sustainability officer since December 2022. Together with her team from the Sustainability Office, which is made up of students and staff, Prof. Dr. Edinger-Schons wishes to build on the existing projects initiated by the KNU and HOCH-N and design and implement an integrated sustainability strategy for the University. The goal is to closely link sustainability and digitalization, introduce a variety of participatory formats, and establish a culture of participation and cocreation. The key areas of impact measurement and reporting, community management, and education for sustainable development were established based on this goal.

Since 2019

Excellence Strategy at Universität Hamburg

With its successful application for the Excellence Strategy of the Federal and State Governments, Universität Hamburg has committed to making sustainability a guiding principle for further development of the University and, as such, a central strategic goal. The guiding principle of “Innovating and cooperating for a sustainable future” was created to this end. The Cluster of Excellence Climate, Climatic Change, and Society (CLICCS) is dedicated to the topic of the climate.

Our understanding of sustainability

In line with the goal of reducing the negative and maximizing the positive impacts of the University activities, Universität Hamburg's sustainability strategy is based on a holistic understanding of sustainability. The strategy is based on the 17 Sustainable Development Goals (UN, 2015), an understanding of social and intergenerational justice, and a whole-institution approach that includes the University's areas of activity (research, teaching, knowledge exchange, governance, and administration), involves all members of the University in the development and implementation of participatory formats, and implements sustainability in the dimensions of ecology, social issues, and governance. As a result, sustainability should be practiced every day and throughout the entire University, across all offices and institutions.

The Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 are a universal and global call to action to address the world's most pressing social, economic, and environmental challenges. Consisting of 17 interlinked goals, the SDGs aim to achieve the following by 2030: eradicate hardships such as poverty and hunger, promote quality education, ensure gender equality, and tackle issues such as climate change and inequality. These goals emphasize the importance of partnerships between governments, businesses, and civil society as they are needed to create a more equitable and sustainable future for all. Through their comprehensive approach, the SDGs provide a road map for global efforts to create a world that is livable, inclusive, and environmentally sustainable.

As part of our understanding of sustainability, we see sustainability as a social and intergenerational transformation process. The report entitled *Our Common Future* published in 1987 by the World Commission on Environment and Development (WCED) aligns with our University's understanding of sustainable development as it emphasizes the need to reconcile economic growth, social justice, and environmental protection. This report, which also came to be known as the *Brundtland Report*, inspires us to ensure the well-being of present and future generations by integrating the principles of social and intergenerational justice into all areas of activity at our University.

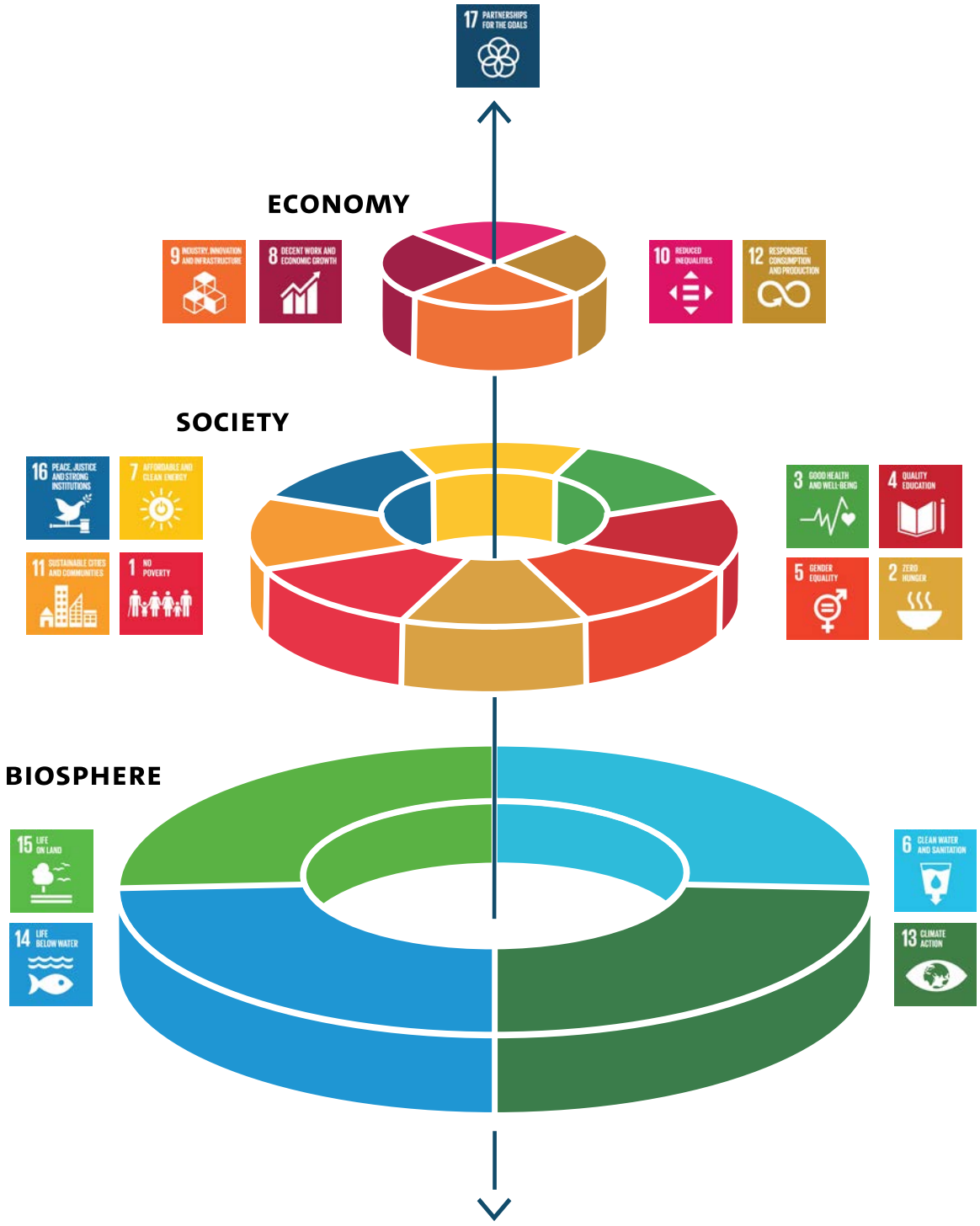


Figure 4:
Sustainable Development Goals (Stockholm Resilience Center and Stockholm University, 2016)

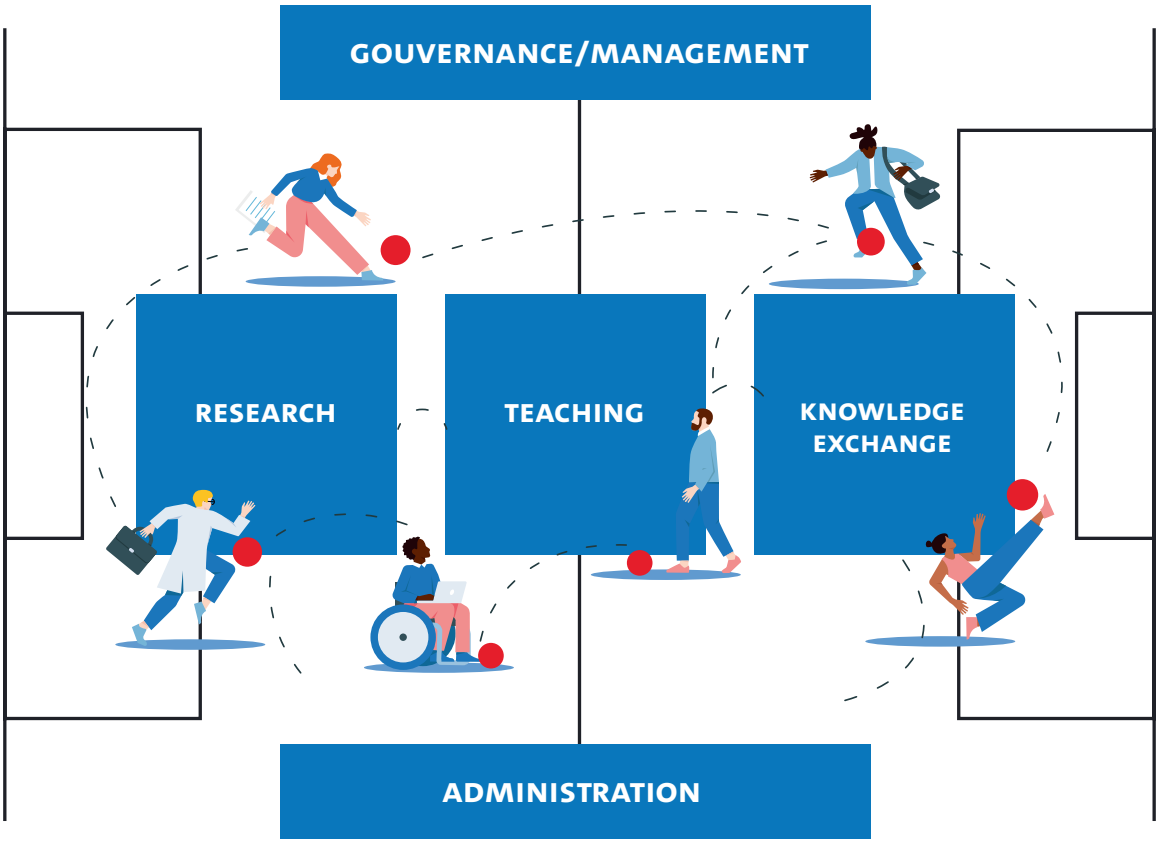
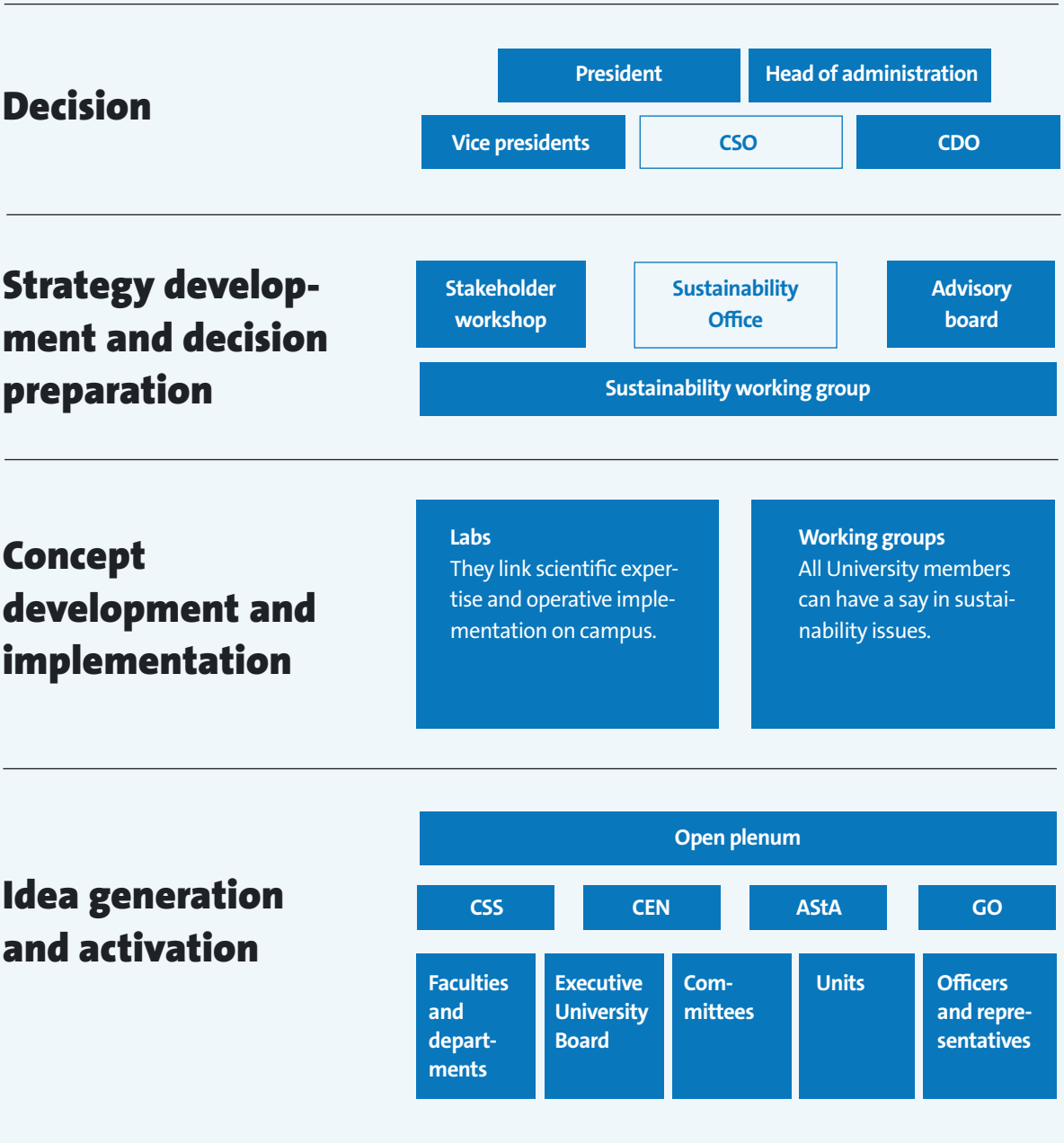


Figure 5:
Universität Hamburg's understanding of sustainability

Just as in a **team sport** where good performance can only be achieved if the entire team works together, an authentic sustainability strategy requires a holistic understanding of sustainability. A forward-looking sustainability strategy for the University should include all areas of activity and involve all members of the University. On the way to becoming a climate-friendly university, we wish to tackle existing challenges together and value the goals we achieve at a university-wide level.

To implement this approach, it is important to have the support of the **University management** and to involve all **members of the University**. The chief sustainability officer anchors sustainability centrally in the Executive University Board and thus at the management level. The Sustainability Office and its key area of community management is tasked with implementing a participatory approach at the University.



Key:

VPs: vice presidents
CSO: chief sustainability officer
CDO: chief digital officer

CSS: Center for Sustainable Society Research
CEN: Center for Earth System Research and Sustainability
AStA: student council
GO: Green Office

Figure 6: The participatory approach at Universität Hamburg

Participation for a sustainable university

Universität Hamburgs aims to promote sustainability throughout the University via the Sustainability Office and to report on the sustainability transformation on an ongoing basis. The Sustainability Office acts as a central link between the University management and operational implementation and is intended to facilitate a smooth transition and active cooperation between all involved. The following examples introduce the participatory approach taken to involve all members of the University.

An open plenum was integrated into the semester program in order to give members of the University direct access to sustainability issues and to keep them updated on the status of the University's sustainability transformation. Once a semester, the Sustainability Office invites all members of the University to take part in the open plenum to report on the status of work and working groups as well as on future projects. The format also provides space for an open discourse and, as such, for ideas, suggestions, and positive feedback.

In addition to the open plenum, the first sustainability-focused Campus Fest took place in Summer Semester 2023. The primary goal of the Campus Fest is to bring together members of the University across institutions and disciplines. The additional focus on sustainability is intended to give participants the opportunity to experience the importance of being a sustainable university. To this end, members of the University, guests from the city, and visitors are offered a varied program of informational events, entertainment, and hands-on activities.

Furthermore, the Sustainability Village is being created on the central Universität Hamburg campus as a meeting place for all those interested in sustainability. The first tiny house in the Sustainability Village was built in the spring of 2023 and since then has been used as a meeting place for the Sustainability Office and the Green Office team as well as for the working groups. The tiny house also hosts a variety of sustainability-related events. The central location means it is great for spontaneous and informal meetings and direct exchanges.

In order to ensure comprehensive participation, the first open plenum in January 2023 called for university-wide participation in **sustainability working groups**. Several cross-status and cross-faculty working groups have since been formed to address issues such as green IT, sustainable furniture use, fair trade, biodiversity, and a bicycle-friendly university. To provide an overview of the working groups, the following profiles highlight teams that are making a difference in reducing GHG emissions.

1

Campus Greening

Goal: Producing knowledge is most fun when you can apply it directly. The Campusbegrünung project began with two term papers about making the Von-Melle-Park campus greener and introducing climate adaptation measures. Heat and extreme precipitation are two consequences of the climate crisis for which the University campus is not sufficiently prepared. Thanks to AStA (student council), the term papers quickly reached Eimsbüttel district office, which organizes climate action and adaptation projects as part of its "Ideenschmiede Klima" workshop. The Eimsbüttel district office, the Sustainability Office, AStA, and the Green Office are a good team that combines many skills and has together identified areas that can be made greener. In the first round, the flower beds around the AStA wing are to be made biodiverse, and a raised flower bed is to be installed in the courtyard of the WiWi-Bunker. In this greening project, we learned a lot about monument protection, administrative procedures, and bureaucracy.

2

Responsible Green IT

Goal: Digitalization can be a key driver of sustainability. For this to really happen, it is important to take a holistic view of sustainability transformation and to integrate environmental, economic, and social interests. As a working group, we are committed to the goal of making IT usage sustainable. Pragmatic approaches involve recycling used equipment but can also be linked to innovative digital solutions. Specifically, the working group aims to promote the sustainable design of reuse and recycling processes for existing IT infrastructure, the raising of awareness for the sustainable use of IT infrastructure, and the development of new designs and technologies to strengthen sustainability (ecological, social, and economic).

3

Bicycle-Friendly University

Goal: The Bicycle-Friendly University (Fahrradfreundliche Uni) working group concerns itself with mobility at the University. The focus is on sustainable mobility—regardless of which mode of transportation (or even without). The group is made up of various sections such as Building and Health Management as well as Campus Development, University Sports, the Work-Related Travel Team, AStA, the Vehicle Fleet and Parking Lot Management Team, and members of various faculties. The working group aims to increase the use of bicycles and other forms of sustainable mobility, whereby the focus is on active mobility. The group was established by former KNU colleagues in connection with the first online survey on the mobility behavior of members of Universität Hamburg.

4

Sustainable Food

Goal: The Sustainable Food working group joined with an existing group coordinated by AStA and the Green Office at Universität Hamburg. Last year, this group presented a number of suggestions to Studierendenwerk Hamburg and has since held many discussions with the goal of making the food offered in the student dining halls more sustainable. Together, they organized a day of action on World Vegan Day and joint action weeks during Veganuary. It is also thanks to their dedication that all of the dining halls now offer a vegan dish each day, the Pottkieker (Low German: look in the pot) dish. Next on the agenda is to work for more vegetarian or even completely vegan dining halls and an increase in the proportion of vegan dishes and snacks offered.

5

Furniture Rescue

Goal: The Furniture Rescue (Möbelrettung) working group was founded during the first meeting at the Sustainable Office's tiny house on 30 May 2023. The group is committed to the sparing, sustainable use of durable goods at Universität Hamburg. One first concern is to rescue discarded but well-preserved furniture. To date, discarded furniture was largely disposed of as the University has virtually no storage facilities. We wish to create other options here and thus help reduce the amount of furniture that is thrown away. People from all status groups at Universität Hamburg are welcome to join the working group.

In addition to the cross-faculty and cross-status working groups, there are also units at Universität Hamburg that are specifically geared to the interests of students and that deal specifically or through special sections with the topic of promoting sustainability at the University. These include the Green Office and AStA, which are introduced in the following profiles.

Green Office

Goal: The Green Office at Universität Hamburg was established in February 2022. It currently consists of a team of six students from different faculties.

The Green Office is committed to promoting sustainability and climate justice at the University. By working with various stakeholders at Universität Hamburg and throughout Hamburg, the Green Office aims to raise awareness of sustainability issues and change structures to facilitate sustainable behavior on the individual level, and ensure that the University as a whole acts responsibly. In addition, the Green Office acts as a low-threshold contact point for students who wish to contribute their ideas and thus serves as a liaison between students and the University administration.

AStA

Goal: AStA represents the interests of students at Universität Hamburg and is elected annually by the student parliament. Through our political work—such as negotiations on the semester public transport pass, campaigns on the federal student loan scheme, and our wide range of advisory services—we strive to improve the socioeconomic situation of students at our University.

In the climate and sustainability section, AStA has been advocating a climate-friendly University since its first climate plenum in 2019. To this end, AStA has organized the largest climate lecture in the city for several semesters now, campaigns for vegetarian and vegan dining halls, and supports social movements such as Fridays for Future. For change to succeed, everyone needs to be involved. Which is why it is so important to us that as many people as possible participate in the Climate Action Report.

Sustainability in research, teaching, and knowledge exchange

Universities can support sustainable development through their research, teaching, and knowledge exchange activities and make a significant contribution to society through their footprint, handprint, and brainprint. The **footprint**, **handprint**, and **brainprint** correspond to the central functions of a university, as can be seen from the explanations of these terms below.

The **footprint** aims to show the ecological impact human activities have on the earth (Moffatt, 2000). Based on this concept, scientists have developed methodological explanations and accounting tools that make it possible to estimate resource use for populations or economies in relation to the corresponding productive land area (Wackernagel/Rees, 1996). The estimates quantify the amount of biologically productive land and water area required to support a given population at its current level of consumption (Moldan et al., 2011). This approach is now recognized by scientists, businesses, governments, and institutions that are committed to monitoring ecological resource use and promoting sustainable development.

The **handprint** is understood as a holistic approach to identifying, measuring, and evaluating positive sustainability impacts. The concept was introduced in an educational context at the 4th United Nations Educational, Scientific and Cultural Organization (UNESCO) International Conference on Environmental Education in India (International Handprint Network, 2007) and has since evolved to include various aspects such as the impact of work and lifestyle on people's well-being, respect for human rights, creating social justice, ensuring gender equality, and recognizing that our lifestyles influence the climate crisis (Husgafvel, 2021). While the ecological footprint focuses on the negative impacts of daily activities, the handprint concentrates on the positive impacts (Norris, 2017).

The purpose of the **brainprint** is to convey the intellectual contribution of universities to reducing GHG emissions through research and educational activities (Chatterton et al., 2015). The aim is to quantify higher education activities for reporting, explore the challenges involved, propose methodologies, and establish potential brainprints (Chatterton/Parsons, 2011).

The following examples illustrate how the concepts of footprint, handprint, and brainprint can be applied to the university context at Universität Hamburg.

Research

To achieve a higher level of sustainability and climate action, many things have to change: we have to live differently, do business differently, and make different decisions. Research has a central role to play. Even if more knowledge does not automatically lead to action, reliable information is a basic prerequisite for action. The University's Cluster of Excellence **Climate, Climatic Change, and Society (CLICCS)** focuses on the future of the climate—what we can expect in concrete terms and which changes are possible and plausible, not only physically but also socially.

For example, it is currently not plausible that we will be able to limit global warming to below 1.5°C. Much more and, more importantly, much faster change would be needed to bring about the societal transformation required for decarbonization. Climate policy, protests, the Ukraine crisis—more than 60 scientists examined the extent to which social changes are on the way for the Hamburg Climate Futures Outlook, a key study in the cluster. They also analyzed physical processes that are seen as tipping points.

Against this backdrop, adaptation to climate impacts also needs to be approached differently. Researchers are examining possible scenarios. What could climate-adapted agriculture look like? How can our cities remain livable in the future? How much coastal protection do we need? What can be funded and what is feasible for society? Researchers from the natural sciences, social sciences, and economics are working together closely within the CLICCS cluster to answer these questions. CLICCS researchers advise the German government as well as the Hamburg Senate on implementation of the Hamburg Climate Plan. They contribute to reports issued by the Intergovernmental Panel on Climate Change (IPCC) and are active in the World Climate Research Programme (WCRP). Researchers from our University provide their expert opinions in the media and thus contribute to the active discourse on the subject. For example, they join the conversation when it comes to what the unusually warm ocean temperatures are all about, whether a meat tax is acceptable, and what the Fridays for Future movement has achieved.

www.uni-hamburg.de/newsroom/exzellenzstrategie/2023/0502-halbzeit-cliccs

Sustainability is a key development issue for society and the economy, and universities have an important role to play in equipping students with the skills needed to actively shape this transformation. In the university context, this means that it is particularly important to achieve a positive **handprint** and **brainprint**. In order to incorporate these future topics in the teaching at Universität Hamburg in an interdisciplinary and cross-faculty manner and to enable students to access such topics independently of their faculty, the **Sustainability Certificate** will be established starting in Winter Semester 2023/24. The interdisciplinary certificate program is intended to bring together bachelor's and master's students from all faculties and help them acquire a holistic view of sustainability that goes beyond their field of study.

Since Summer Semester 2021, AStA's Fridays for Future committee has organized a **lecture series** on the climate crisis together with Jun. Prof. Dr. Franziska Müller. With more than 2,500 students from Hamburg's five universities participating, the lecture series is the largest of its kind in Hamburg—providing climate policy and climate science education for students of all disciplines and semesters. The interdisciplinary lecture series examines the climate crisis from a variety of perspectives: whether contributions from the activists Luisa Neubauer and Peter Emorinken-Donatus or natural and social science contributions from leading scientists such as Dirk Notz, Julia Steinberger, Mojib Latif, and Antje Boetius—all disciplines are represented. Hamburg's climate research has gained greatly in visibility as a consequence. It is also important to bring decolonial and Black perspectives on the climate crisis to the fore and to focus on the concept of climate justice. Another special feature of the lecture series is that it is organized independently by students in AStA. This ensures proximity to the participants and that the interests of young people are taken into account. The lecture series team was awarded the Hamburg Teaching Prize in 2022 for their commitment.

Teaching

Knowledge exchange

Particularly in view of current challenges such as climate change, cooperation with nonuniversity stakeholders, knowledge exchange beyond the academic context, and a capacity for innovation in science are essential. Cooperation between science and society plays a fundamental role here and is bidirectional—findings from science must be applied to society and challenges from society must become the subject of research. This interaction is the basis for our modern understanding of knowledge exchange and ultimately means **science for, in,** and **with society**.

Since Universität Hamburg is a research university with a diverse academic culture, the understanding of knowledge exchange is also very broad. In addition to the three areas of activity of **innovation and entrepreneurship, education and training**, and **civic and cultural responsibility**, the area of **co-creative research** exemplifies the involvement of stakeholders beyond the traditional academic context. Three centers support members of Universität Hamburg in knowledge exchange activities under the umbrella of the Knowledge Exchange Agency in the areas of innovation and entrepreneurship, career and training, and collaborative research and responsibility—each with a specific connection to sustainability and climate action.

Almost all challenges on the path to achieving the SDGs benefit from inter- and transdisciplinary cooperation. The **Co-Creation and Engagement Center** helps researchers and nonuniversity stakeholders to identify relevant research questions, integrate various types of knowledge, and develop practical solutions for daily life, for example. The sustainability project that strives to make Hamburg more resilient for the future (Gemeinsam nachhaltig

gestalten—Hamburg macht sich resilient für die Zukunft!), which received the Hamburg ESD Sustainability Award 2022, is deliberately moving out of the University and into the city. From 1 October to 31 December 2023, the Jupiter Campus will offer a space for innovative and transdisciplinary teaching and research formats on sustainability topics that are relevant locally.

www.uni-hamburg.de/transfer/aktuelles/2023-10-05-jupiter-campus

(Social) innovations can be decisive drivers for sustainable development and climate action by creating new standards for the economy, society, and our actions that are relevant to the environment. It is with this conviction that the Innovation and Entrepreneurship Center advises entrepreneurs on sustainability and supports innovations, patents, and start-up projects.

Equal opportunity as a goal of sustainable development is central at the Career and Qualification Center—as is raising awareness for sustainability in professional fields of activity. The current focus on climate action takes the form of a microdegree currently being developed on knowledge exchange skills based on the example of climate technologies.

Real-world laboratories to support the University's sustainability transformation

In April 2023, a workshop was held with around 50 sustainability experts and department heads from Universität Hamburg to discuss key issues such as the governance of sustainability at the University and the wide range of work packages. A key outcome of the workshop was that science will be more involved in the sustainability transformation at Universität Hamburg through **real-world laboratories**. Two such sustainability labs already exist (for sustainable conferences and biodiversity), and two more are currently being established (for open education and sustainable mobility). The biodiversity lab is presented here as an example.

Close cooperation between research, teaching, and administration is crucial in the development of a biodiversity strategy. Particularly in the field of biodiversity, close integration of the latest findings is essential for the practical design and implementation of measures to promote biodiversity. This ongoing exchange ensures that the measures developed by the administration have a positive impact on biodiversity, while the findings are at the same time incorporated into the scientists' research. Scientific knowledge and subject knowledge come together in our biodiversity lab so that appropriate goals and effective measures can be developed to reduce negative impacts on biodiversity. Researchers have the opportunity to propose activities and provide critical feedback here. As both a research center and an administrative institution, this creates an interaction in which innovative solutions can be directly tested and integrated into scientific findings. The involvement of students and early career researchers in the biodiversity strategy allows researchers to engage intensively with the wide diversity of genes, species, and habitats and incorporate their own ideas into practical applications at the University. At the same time, the researchers benefit from working with the administration as they can use the University as a case study. Universität Hamburg

thus serves as a testing ground for research and provides excellent basic data for researchers who are preparing scientific papers. In addition, the dissertations and bachelor's and master's theses with a practical orientation completed here are an important contribution to Universität Hamburg's educational mission, as doctoral researchers and students can experience the relevance of science to the environment and society firsthand.

Partnerships and certification as success factors

The transition to sustainability is not only a major challenge for universities, but also for national and international institutions. As such, it is extremely important that higher education institutions network both with one another and with various partners beyond the university context and enter into partnerships to promote sustainable development. Universität Hamburg recognizes the importance of **networking**; hence, it participates in sustainability **networks** as well as in **certification processes**.

Participation in networks

To successfully implement the sustainability transformation in society as a whole, it is important to already equip future leaders with the skills they need to implement changes in companies during their studies. Universität Hamburg is aware of this responsibility, which is why it signed the **Principles for Responsible Management Education** (PRME) in July 2023. This voluntary initiative was established in 2007, is supported by UN Global Compact, and now has more than 800 signatories. UN PRME aims to promote and develop the teaching of sustainability issues that focus on business and management in higher education institutions. Particular attention is paid to the individual commitment in order to increase the integration of the United Nations SDGs in research and teaching. In addition, signatories to the initiative have the opportunity to participate in a number of sustainability-related projects and networking events in which a wide range of stakeholders from business and academia are involved as well as students.

www.unprme.org/about

www.bwl.uni-hamburg.de/ueber-die-fakultaet/aktuelles/2023/prme

In addition to the UN PRME initiative, Universität Hamburg has been part of the **Knowledge Equity Network** (KEN) since 2023. The network was founded in 2022 at the University of Leeds, which is one of Universität Hamburg's strategic partner universities, with the aim of making knowledge generated by institutions and organizations as accessible as possible and enabling an exchange of ideas and experiences. Universität Hamburg signed the KEN Declaration on Knowledge Equity in June 2023 and is now also a network member. The core goal of the network is to promote cooperation between members by sharing knowledge in order to tackle globally relevant issues such as the climate crisis, poverty, and inequality as effectively and collaboratively as possible. In the long term, the network strives to change the way individuals and institutions work together within the scientific system.

knowledgeequitynetwork.org

www.uni-hamburg.de/newsroom/im-fokus/2023/0619-knowledge-equity-network

National networking is also extremely important in order to holistically promote sustainable development at higher education institutions. This is one of the reasons why Universität Hamburg participated in the joint project **Sustainability at Higher Education Institutions: develop—network—report** (HOCH-N), which was funded by the Federal Ministry of Education and Research (BMBF) from 2016 to 2021. The KNU at Universität Hamburg was responsible for the project management and overall coordination of the project. HOCH-N facilitated the development of a common understanding of sustainability at higher education institutions as well as guidelines for preparing a declaration of compliance with the German Sustainability Code in relation to HEIs (HS-DNK) which is aimed at members and institutions at German higher education institutions. Based on the successful cooperation within the HOCH-N project, the German Society for Sustainability at Higher Education Institutions (DG HOCH-N) was founded in 2020. The society continues the work of the HOCH-N project by facilitating networking within the German higher education landscape as well as beyond via hubs. The society also continues to maintain the DG HOCH-N wiki knowledge platform, which was also created within the HOCH-N project. The platform allows members to exchange experiences regarding the implementation of sustainability projects in the context of higher education institutions and contains a wide range of guidelines for sustainable development in areas such as research, teaching, and knowledge exchange.

www.hochn.uni-hamburg.de/1-projekt/foerderer-projekttraeger

www.dg-hochn.de

The development of a sustainable mobility strategy requires a valid information base, a scientific approach, and practical expertise. It is for this reason that Universität Hamburg is participating **in the FlyingLess project** as a **satellite**. The project goal is to support higher education institutions in reducing their air travel. FlyingLess is led by the Institute für Energie- und Umweltforschung Heidelberg (IFEU) in close cooperation with TdLab Geography within the Institute of Geography at Heidelberg University. The aim is to gain insights into individual and national air travel behavior at higher education institutions. In addition to providing research-based information and findings from mobility surveys, the project also provides opportunities for networking and exchange.

flyingless.de

Participation in certification processes

For several years now, Universität Hamburg has also been increasingly involved in measures to encourage staff and students to use their bikes more often. There are currently more than 1,700 bicycle parking spaces on campus, for example, and another 300 are in the planning or construction stages. In addition, free cargo bikes and rental bikes are available to staff. Various campaigns and workshops are also offered to encourage people to cycle and to give staff the opportunity to participate in bicycle repair workshops. Thanks to these and other efforts, Universität Hamburg was awarded the silver **certificate as a bicycle-friendly employer** by the German Cycling Association (Allgemeiner Deutscher Fahrrad-Club, ADFC). The certificate was presented by

the ADFC at the second open plenum on sustainability in June 2023.

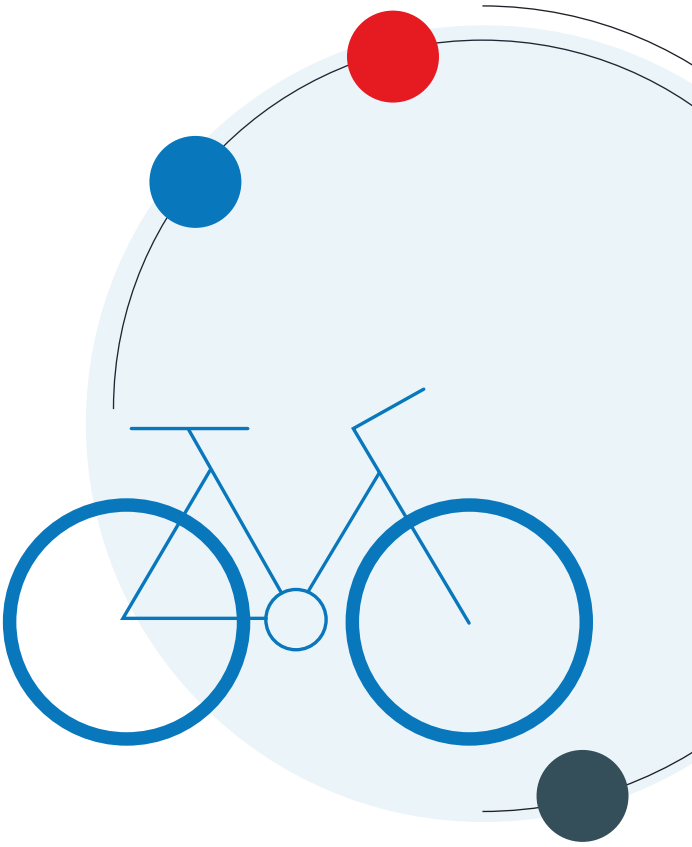
www.uni-hamburg.de/newsroom/campus/2023/0623-fahrradfreundlicher-arbeitgeber

www.fahrradfreundlicher-arbeitgeber.de

In addition to being recognized as a bicycle-friendly employer, Universität Hamburg is currently seeking certification as a **Fairtrade University**. Since 2014, the Fairtrade Germany campaign has been recognizing higher education institutions that raise awareness for fair trade on their campuses based on five criteria. These criteria include the organization of fair-trade events and the availability of fair-trade products on campus. Studierendenwerk Hamburg currently offers a variety of these products in the student dining halls and cafés at Universität Hamburg. In addition to coffee and coffee specialties, tea, some cold drinks, hot chocolate, and bananas are also available. In addition, the University's newly formed Fair Trade working group is currently preparing the application for certification as a Fairtrade University.

www.stwhh.de/gastronomie/nachhaltigkeit-und-gesundheit

www.fairtrade-universities.de/mitmachen/kriterien



02

Methodology for Greenhouse Gas Accounting

Approach to climate reporting

The implementation of climate reporting requires data collection and assessment based on scientific standards as well as the involvement of internal and external experts. The data and consumption required for the Climate Action Report was assessed in a structured process that included nonstandardized workflows as the analysis focused on the past. With the goal of gaining a comprehensive understanding of the initial situation at Universität Hamburg, all of the data required for the reporting period 2019 to 2022—which included data from financial accounting, procurement, and property management—was reviewed and analyzed. The data review, which took several months and involved student employees and staff, provides a comprehensive understanding of Universität Hamburg's GHG emissions.

Universität Hamburg received external support from **Hamburg Institut Consulting GmbH (HIC)**, a Hamburg-based consulting firm with a focus on climate neutrality and climate strategy. The institute's

clients range from ministries and municipalities to companies and nongovernmental organizations. References include consulting mandates for various cities on climate neutrality and, at the state level, the Integrated Energy and Climate Protection Plan (Integrierte Energie- und Klimaschutzkonzept, IEKK) established by the state of Baden-Württemberg. In addition to consulting services, HIC provided support by converting Universität Hamburg's GHG emissions calculated for the years 2019 to 2022 in accordance with the GHG Protocol.

The Climate Action report at Universität Hamburg was prepared by the Sustability Office led by the chief sustaiability officer and in collaboration with the officers responsible for impact measurement and reporting, for community management, and with the climate action manager. The assessment of Scope 3 emissions was made possible through the extensive work of student employees.

Greenhouse gas accounting standard

Climate reporting at Universität Hamburg is based on the **GHG Protocol Standard**. The GHG Protocol is a multistakeholder partnership of companies, NGOs, governments, and other organizations that was initiated by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Established in 1998, the initiative's mission is to develop and promote the adoption of internationally recognized standards for greenhouse gas[1] accounting and reporting (WRI/WBCSD, 2023). The outcome is the internationally recognized GHG Protocol, which can be used to account for the full range of greenhouse gas risks and opportunities associated with direct and indirect emissions. For effective greenhouse gas management, the GHG Protocol (WRI/WBCSD, 2004) divides GHG emissions into three areas (Scopes 1 to 3).

Scope 1—direct emissions: Direct GHG emissions result from sources owned or controlled by the higher education institution. Examples include emissions from combustion in boilers, furnaces, or vehicles as well as emissions from chemical production in processing plants owned or controlled by the higher education institution.

Scope 2—indirect emissions from purchased electricity and heat: Scope 2 covers GHG emissions from the generation of purchased electricity and heat. Scope 2 emissions are physically generated at the facilities where the electricity and heat are produced and are brought to the organizational areas of the higher education institutions.

[1] Greenhouse gases are those named as such in the Kyoto Protocol: carbon dioxide, methane, nitrous oxide, fluorocarbons, perfluorinated hydrocarbons, sulfur hexafluoride, nitrogen trifluoride.

Scope 3—other indirect emissions: Scope 3 includes all other indirect emissions generated from activities at the higher education institution. These are GHG emissions from sources that they do not own or control. This area primarily includes GHG emissions from the production and transport of purchased goods, from supply and disposal, and from the mobility behavior of University members.

Figure 7: Classification of scopes according to the GHG Protocol
The classification of scopes corresponds to the GHG Protocol. However, this includes emissions relevant to Universität Hamburg only.

Defining the system boundaries

The emissions included in Universität Hamburg's GHG accounting are determined by defining the organizational and operational system boundaries. With regard to the University's participation structure, the organizational system boundary deals with the question of which University units are to be included in the accounting. In contrast, the operational system boundary defines the University activities and processes that are to be reported.

Universität Hamburg uses the operational control approach in accordance with the GHG Protocol to define the **organizational system boundary**. This control approach includes all GHG emissions that are under Universität Hamburg's operational control. For identification purposes, a comparison was made between all organizational units of the University and the units that the business plan of the University is based on. As a result, the organizational system boundary includes all units that are part of Universität Hamburg's organizational structure and are financed by the University's business plan. The following units were therefore included in Universität Hamburg's GHG inventory:

» Executive University Board
» all departments (1–8) and all University Administration units
» the faculties (except the Faculty of Medicine and UKE)
» central institutions
» the staff councils and representatives

The University Medical Center Hamburg-Eppendorf (UKE) and the Faculty of Medicine (MED) were not included as they have their own business plan.

The **operational system boundary** determines which activities and processes are included in Universität Hamburg's GHG accounting. Direct emissions (Scope 1) and indirect emissions from purchased energy (Scope 2) are mandatory for the GHG Protocol Standard; upstream and downstream emissions (Scope 3) are optional. In line with Universität Hamburg's efforts to report the GHG emissions produced by the University as completely as possible, full accounting is provided for Scopes 1 to 3. Scope 3 includes GHG emissions from the following categories:

» upstream emissions
» supply and disposal
» procurement
» fixed assets and investments
» lease and rental of tangible assets
» mobility

Downstream activities are not significant for Universität Hamburg because of its role as a higher education institution and therefore have not been included in the current GHG accounting for Universität Hamburg. In addition, GHG emissions from purchased services are not yet accounted for.

Data collection process

To prepare the GHG accounting, Universität Hamburg's institutional consumption for the reporting period from 2019 to 2022 was collected. The main departments and units involved were Property Management, Finance and Accounting, International Affairs, Occupational Safety and Environmental Protection, and library statistics of the Universität Hamburg library system. Although each scope varied, the overall data collection period extended from June 2022 to June 2023. The reporting period from 2019 to 2022 is based on the last sustainability report published by Universität Hamburg in 2018, which made it possible to ensure continuous reporting. To explain the data collection process, the consumption figures included in the report are presented below in chronological order based on the scopes defined in the GHG Protocol.

Scope 1—direct emissions

Direct emissions from **combustion processes in stationary facilities** were collected through consumption data. The consumption of **natural gas** was recorded after invoices were received. As it was not possible to record annual consumption data for the reporting period, a discrepancy exists between the recorded and actual annual consumption figures. Some of the University's buildings and areas are also rented from external parties. The total consumption data for natural gas therefore also includes external consumption. This share was deducted for the rented area so that 95.65 percent of the natural gas consumption is attributed to the University. **Heating oil** was used at Universität Hamburg only to cover the peak load of a peak-load boiler during high heating demand in winter. The consumption was about 2,000 liters of heating oil per year. This value was assumed for all years included in the report. The boiler was decommissioned in 2023 and, as such, the resulting GHG emissions no longer exist for subsequent years.

Direct emissions from **combustion processes in mobile facilities** include use of the company's own **vehicle fleet**. For this purpose, data on vehicle mileage in kilometers, the corresponding combined CO_2 emissions per kilometer, and the total CO_2 emissions were determined.

The use of **refrigerants** in air conditioners results in **direct emissions** of **volatile gases**. The number and category of air conditioners was provided by Property Management. A 10 percent margin was added to account for any unlisted equipment.

Scope 2—indirect emissions from purchased electricity and district heating

The consumption of purchased **electricity** and **district heating** was recorded after invoices were received. This results in a discrepancy between the recorded and actual annual consumption. In addition, the total consumption data includes consumption from external building rentals. This share

was deducted for the rented area so that 95.65 percent of the consumption of electricity and district heating was attributed to Universität Hamburg.

Scope 3—other indirect emissions

As Scope 3 emissions consist of heterogeneous consumption, it is helpful to present the subareas separately. The following presentation follows a process-oriented sequence.

Upstream emissions (Scopes 1 and 2): Upstream emissions data for energy sources (natural gas, heating oil, gasoline, diesel, and refrigerants) are derived from the consumption data for Scopes 1 and 2.

Upstream emissions (Scope 3): Specific data on upstream transportation and distribution of purchased goods is not available from suppliers. Emission factors reflecting the average transport distances of the purchased goods were therefore used to calculate the emissions.

Supply and disposal: The consumption of **fresh water** and **wastewater** was included in the GHG accounting using cubic meter figures. The data was collected after the invoice was received; hence, a discrepancy exists between the reported and actual annual consumption. The total consumption data also includes consumption from external building rentals. This share was deducted for the rented area so that 95.65 percent of the consumption of fresh water and wastewater was attributed to Universität Hamburg.

The amount of **waste** generated was recorded in tons for the following categories: old files and data storage devices, waste paper, electronic waste, hazardous waste, mixed municipal waste, glass, lightweight packaging, and other waste (incl. bulky waste). For this purpose, the City of Hamburg and the respective framework agreement partners provided the waste quantities in cubic meters as well as additional conversion factors to indicate the waste quantities in tons.

Procurement: For the library, **printed books** and **journals** were included in the GHG inventory based on the number of new acquisitions in the library statistics provided by the Universität Hamburg library system. E-books and e-papers were not yet included for the reporting period. All of Universität Hamburg's departmental libraries, special libraries, research libraries, and special collections (excluding the UKE and the Faculty of Medicine) were included. **Paper consumption** is based on the kilograms of virgin and recycled paper provided by suppliers. The procurement accounts were used to assess the goods purchases. All accounts related to **goods purchases** were analyzed using a cross-account categorization system comprising over 200 categories. Accounts related to services only were not included. This allowed an accurate calculation of emissions, which are summarized in the following eight categories:

- buildings and green spaces (equipment, supplies, and materials)
- laboratory supplies (facilities, equipment, materials, and chemicals)
- furnishings (office furniture, other furnishings, and sanitation needs)
- IT needs (IT equipment, telephone services, and other office technology)
- office supplies (consumables and supplies)
- health and safety supplies (consumables and supplies)
- catering (food, beverages, and consumables)
- other supplies (printing, advertising, and sports)

Fixed assets and investments: The fixed assets and investments category includes the vehicles procured by the University. The calculation of GHG emissions is based on the vehicle types.

Rental and leasing of tangible assets: For Universität Hamburg, the category of rented or leased tangible assets only includes the use of **leased vehicles**. The responsible department provided data on vehicle mileage in kilometers, the corresponding combined CO_2 emissions per kilometer, and the total CO_2 emissions.

Mobility: Since Universität Hamburg did not have a digital **work-related travel management system** in place during the reporting period, data was assessed and archives were reviewed. It was not possible to assess the field trip and guest mobility accounts during the reporting period because of the labor intensive process. In order to calculate the GHG emissions from students' **semesters abroad** and **stays abroad**, the number of semesters abroad and internships abroad as well as the locations of the partner university were taken into account. This was based on the academic year. The GHG emissions produced by University members who **commute** to Universität Hamburg were calculated based on the results of a survey conducted at the University. The survey, which asked about commuting behavior in the years 2019 to 2022, was sent to all University members in May 2023.

Categorization of data quality

In contrast to financial reporting, which is based on a long history and extensive standardization, **sustainability reporting** (including climate reporting) has only become established in recent years. In this respect, reporting organizations face the challenge of collecting the data required for reporting and making it available in sufficient quality. This task is challenging to the extent that higher education institutions are already subject to extensive and diverse reporting requirements, but these do not relate to sustainability data, or only to a very limited extent. It should therefore be noted that many organizations are still developing their sustainability data collection and management processes, which means that manual data collection and evaluation processes are often still used for reporting. As a result, GHG accounting for the reporting period is not always based on exact consumption, but also on estimated and derived data.

Based on the existing data situation and the requirement for comprehensive **climate reporting**, Universität Hamburg has decided to collect and evaluate sustainability data in an extensive and personnel-intensive process, in which particularly Scope 3 emissions are included comprehensively. The following tables and supplementary explanations show the data quality of the consumption and purchases taken into account in the reporting. The order corresponds to the Scopes 1 to 3 emissions reported in the GHG Protocol.

Scope 1—direct emissions

Consumption	Data used	Accounting
Combustion processes in stationary facilities		
Natural gas	Invoices	Quantity-based
Heating oil	Estimated data	Quantity-based
Combustion processes in mobile facilities		
Vehicle fleet (diesel and gasoline)	Total mileage	Quantity-based
Air conditioners		
Refrigerants	Estimated data	Quantity-based

Table 1: Data quality—stationary and mobile facilities and air conditioners

Direct emissions from combustion processes in stationary facilities were recorded based on consumption data from Property Management. **Natural gas consumption** was recorded after receipt of the invoice. As a result, there is a discrepancy between the recorded and actual annual consumption. The total consumption data for natural gas also includes consumption by third parties. This share was deducted for the rented area so that 95.65 percent of the natural gas consumption is attributed to Universität Hamburg. Based on the overall low GHG emissions, Property Management estimated consumption of 2,000 liters of **heating oil** per year for the reporting period to cover the peak load.

Consumption data on direct emissions from combustion processes in mobile facilities—that is, **diesel** and **gasoline consumption** for the University's vehicle fleet—is available in very good data quality as the total annual mileage in kilometers per vehicle, and the CO_2 emissions for the individual vehicles could be recorded using the manufacturer's data.

The consumption data on **refrigerants** is incomplete. A margin of 10 percent has been applied. The overall data quality is therefore rated as average. In the coming years, the data quality should improve as all air conditioners in the buildings will be recorded and the refill quantities documented using information from the service provider.

Scope 2—indirect emissions from purchased electricity and district heating

Consumption	Data used	Accounting
Electricity	**Invoices**	**Quantity-based**
District heating	**Invoices**	**Quantity-based**

Table 2: Data quality—electricity and district heating

Given an insufficient meter structure during the reporting period, electricity and district heating consumption could not yet be measured for each building. Instead, data was collected using invoices. The total consumption data for **electricity** and **district heating** also includes third-party consumption. These shares were deducted for the rented area so that 95.65 percent of the consumption is attributed to Universität Hamburg.

Scope 3—other indirect emissions

Consumption	Data used	Accounting
Upstream emissions (Scopes 1 and 2)	Average data	Quantity-based

Table 3: Data quality—upstream emissions (Scopes 1 and 2)

The data for **upstream emissions** from fuel and energy-related emissions are derived from the energy consumption data for **Scopes 1 and 2**. The emission factors for the vehicle fleet were established based on the average vehicle types. And the emission factors for natural gas and heating oil come from the average for Germany. Data for upstream transportation and distribution (**Scope 3**) could not be determined. The category has been accounted for by using emission factors that include the average transport distances of the purchased goods.

Consumption	Data used	Accounting
Fresh water	Invoices	Quantity-based
Wastewater	Invoices	Quantity-based
Old files and data storage devices	Estimated data	Quantity-based
Waste paper	Estimated data	Quantity-based
Electronic waste	Consumption data	Quantity-based
Hazardous waste	Consumption data	Quantity-based
Mixed municipal waste	Estimated data	Quantity-based
Glass	Estimated data	Quantity-based
Lightweight packaging	Estimated data	Quantity-based
Other waste (including bulky waste)	Estimated data	Quantity-based

Table 4: Data quality—supply and disposal

The consumption figures for **fresh water** and **wastewater** are based on incoming invoices and are therefore not yet based on actual annual consumption. They also include the consumption of external users so that a reduced consumption of 95.65 percent is attributed to Universität Hamburg.

In the reporting period, estimates were available for the waste types of **old files** and **data storage devices**, **waste paper**, **mixed municipal waste**, **glass**, **lightweight packaging**, **other waste**, and **bulky waste**. In contrast, exact consumption figures were available for **electronic waste** and **hazardous waste**.

Consumption	Data used	Accounting
Virgin and recycled paper	Consumption data	Quantity-based
Books and journals	Estimated data	Quantity-based

Table 5: Data quality—paper and library

Precise information on **paper consumption data** (format, grammage) was provided by the relevant service providers, which means that the data quality is very good.

The number of **books** and **journals** purchased was included in the GHG inventory via the new acquisitions in the library statistics provided by the Universität Hamburg library system. All of Universität Hamburg's departmental libraries, special libraries, research libraries, and special collections were included. Estimates were used to determine the weight of the media.

Measuring Scope 3 emissions related to **procurement** is a major challenge for organizations due to the enormous human resources required to manually evaluate a large amount of individual data. As a result, consumption was calculated based on expenditure. Of the University's 141 procurement accounts, all 83 accounts related to materials and goods were evaluated, which led to the exclusion of 58 purely service accounts. In the next step, an iterative process was used to create 258 categories into which all University purchases were sorted. The category system is based on individual categories for specific procured goods, account-specific categories for large and small items, and material categories. In addition, the assessment includes deductions for the percentage of services in the case of mixed procurements as well as for the conversion of foreign currencies. In this way, over 300,000 procurement entries were reviewed manually and categorized. This categorization was automated by a computer program developed by the University in Python, applied to the transaction data, and validated by extensive subsequent manual review. The process results in valid data quality, albeit subject to the existing limitations.

Consumption	Data used	Accounting
Buildings and green spaces	Consumption and estimated data	Expenditure-based
Laboratory supplies	Consumption and estimated data	Expenditure-based
Furnishings	Consumption and estimated data	Expenditure-based
IT needs	Consumption and estimated data	Expenditure-based
Office supplies	Consumption and estimated data	Expenditure-based
Health and safety supplies	Consumption and estimated data	Expenditure-based
Catering	Consumption and estimated data	Expenditure-based
Other supplies	Consumption and estimated data	Expenditure-based

Table 6: Data quality—procurement

The **fixed assets** and **investments** category includes vehicles purchased by the University. As the calculation of GHG emissions is based on vehicle types, the data quality is very good.

The consumption data for **rented** and **leased tangible assets** refers to leased vehicles in Universität Hamburg's fleet. The total annual mileage in kilometers per vehicle and the CO_2 emissions were recorded according to the manufacturer's specifications.

Consumption	Data used	Accounting
Vehicles	Invoices	Quantity-based

Table 7: Data quality—fixed assets and investments

Consumption	Data used	Accounting
Rented and leased tangible assets	Total mileage	Quantity-based

Table 8: Data quality—rented and leased tangible assets

Consumption	Data used	Accounting
Work-related travel	Consumption and estimated data	Quantity- and expenditure-based
Semesters and stays abroad	Consumption and estimated data	Quantity-based
Commuting	Survey data	Quantity-based

Table 9: Data quality—mobility

Extensive data was analyzed manually and archives were reviewed to calculate emissions. More than 15,000 **work-related trips** were analyzed based on destination and in partnership with experts from the department responsible. In addition to assessing trips in this manner based on the mode of transportation that resulted in quantity-based accounting, trips for which the mileage could not be determined were also assessed based on expenditure. Data on the number of semesters abroad and internships as well as information on the location of the partner university were available for **student semesters abroad** and stays abroad. However, because of a lack of data, information on the mode of transportation had to be supplemented based on assumptions. A University-wide survey was conducted in May 2023 to calculate the GHG emissions produced by University members who **commute** to Universität Hamburg. With the help of student employees, more than 2,500 responses to the question about commuting behavior were evaluated. The data basis is good as respondents were asked about their commuting behavior in the summer and winter semesters, the use of one or more modes of transportation, and the distance traveled. In addition, emissions were calculated using year- and semester-specific extrapolations based on the exact number of students and staff at Universität Hamburg. Adjusted additions and deductions for staff and students were also taken into account based on the time the University was closed due to Covid-19.


03

Greenhouse Gas Inventory at Universität Hamburg

Overview of total greenhouse gas emissions

The following figures provide a general overview of the GHG emissions generated by Universität Hamburg.

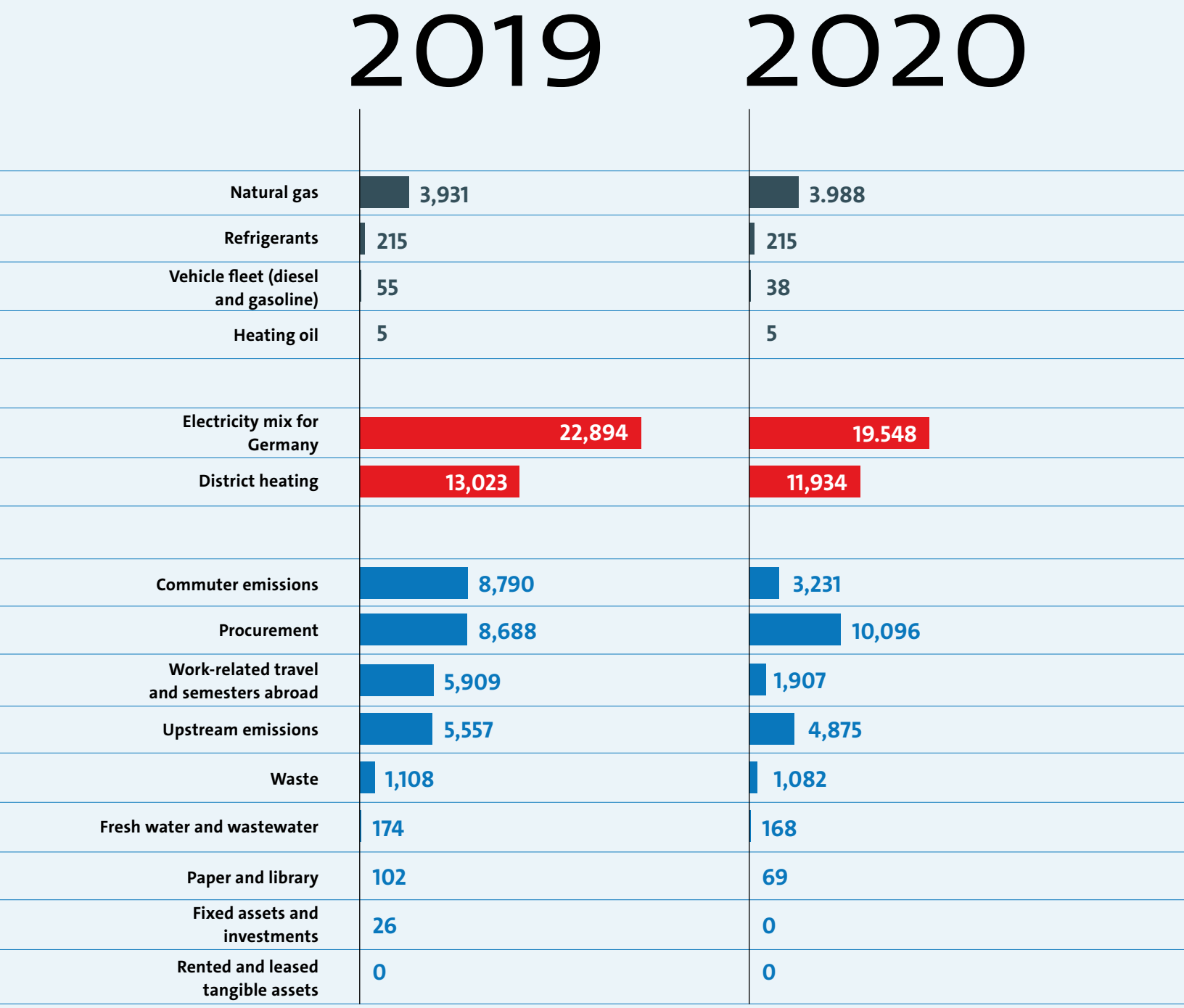


Figure 8/9: Overview of total GHG emissions in t CO_2e, 2019 and 2020

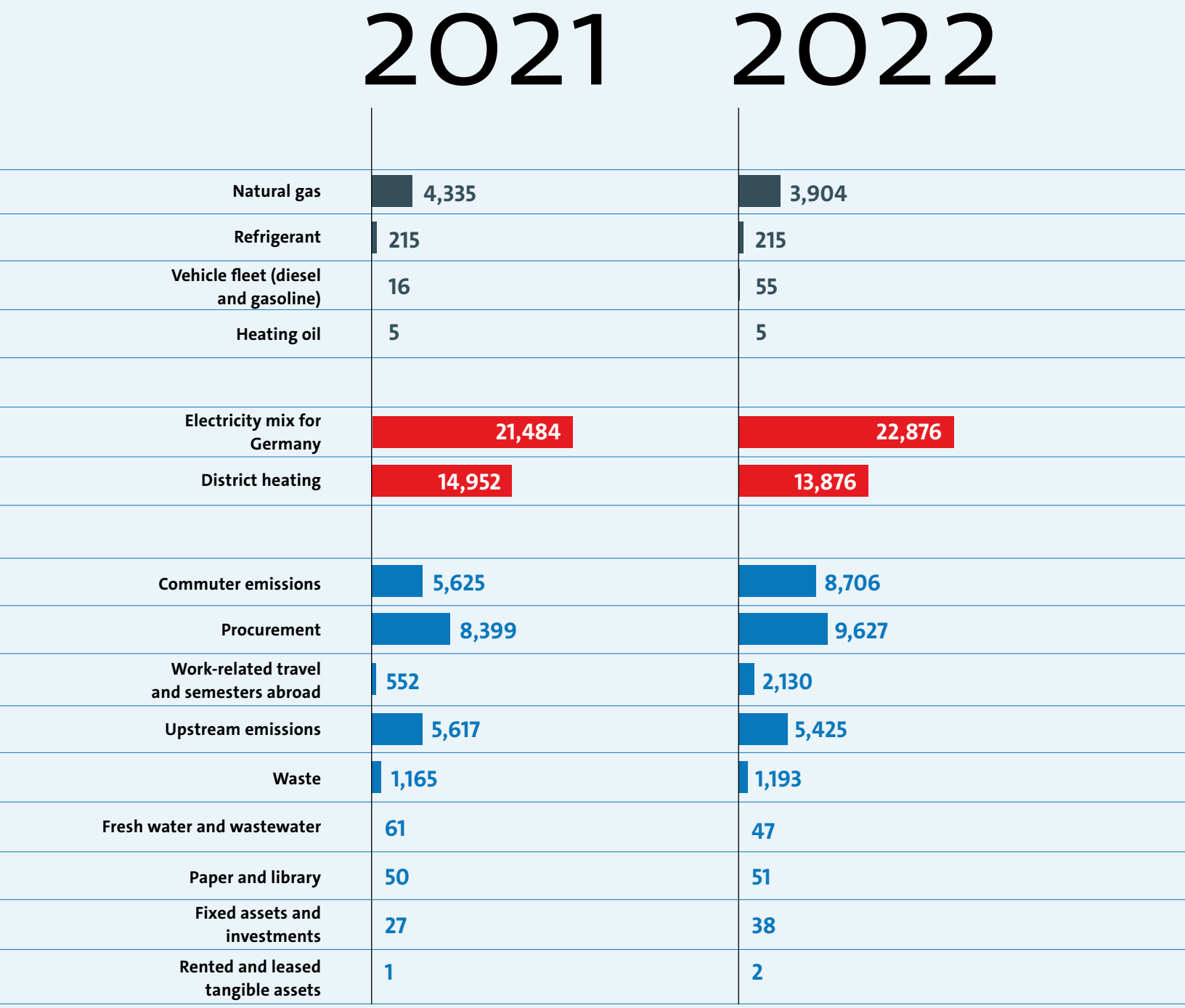


Figure 10/11: Overview of total GHG emissions in t CO_2e, 2021 and 2022

The overview of total emissions shows that the highest GHG emissions over all reporting years were generated by Scope 2, the second highest by Scope 3, and the lowest by Scope 1. Overall, it is clear that electricity consumption in particular contributes enormously to GHG emissions and appropriate reduction measures need to be determined. Looking back at the Covid years, we see that the pandemic reduced mobility and increased IT procurement in particular. This finding highlights the scope of possibilities to reduce Scope 3 emissions as it shows that short-term savings can be achieved through changes in behavior.

Individual assessment of greenhouse gas emissions

Based on the overall assessment, the following tables and figures offer detailed insights into the GHG emissions generated by Universität Hamburg. While the following **table** provides a **general overview**, the **figures** thereafter allow for an **individual assessment** of each scope. Scopes 1 and 2 are each presented in one figure, and Scope 3 is divided into three areas and presented in three figures. The figures for this scope cover the main areas of procurement, supply and disposal, and mobility. In addition, the Climate Action Report's **appendix** contains additional tables with detailed information on the calculation of GHG emissions. It should be noted that the emission factors used to convert consumption are not constant throughout the reporting period. This can lead to a change in GHG emissions that is independent of consumption (see tables in the appendix).

Overall assessment of GHG emissions

Scope 1: direct emissions	2019	2020	2021	2022	Emissions
Natural gas / heating oil	3,931 / 5	3,988 / 5	4,335 / 5	3,904 / 5	t CO_2e
Total	3,936	3,993	4,340	3,909	t CO_2e
Vehicle fleet (diesel and gasoline)	55	38	16	55	t CO_2e
Refrigerants	215	215	215	215	t CO_2e
Total Scope 1 emissions	**4,206**	**4,247**	**4,571**	**4,180**	**t CO_2e**

Scope 2: energy-related indirect emissions	2019	2020	2021	2022	Emissions
Electricity (electricity mix for Germany)	22,894	19,548	21,484	22,876	t CO_2e
District heating	13,023	11,934	14,952	13,876	t CO_2e
Total Scope 2 emissions	35,916	31,482	36,437	36,753	t CO_2e

Scope 3: upstream and downstream emissions	2019	2020	2021	2022	Emissions
Natural gas	876	791	905	815	t CO_2e
Heating oil	1	1	1	1	t CO_2e
Diesel	12	8	3	12	t CO_2e
Gasoline	3	3	1	3	t CO_2e
Refrigerants	2	2	2	2	t CO_2e
Electricity	2,682	2,477	2,581	2,621	t CO_2e
District heating	1,980	1,593	2,124	1,971	t CO_2e
Total	5,557	4,875	5,617	5,425	t CO_2e
Fresh water	60	62	22	18	t CO_2e
Wastewater	114	106	40	29	t CO_2e
Total	174	168	61	47	t CO_2e
Lightweight packaging	1	1	1	1	t CO_2e
Glass	1	1	1	1	t CO_2e
Electronic waste	1	1	1	1	t CO_2e
Old files and data storage devices	1	0.4	1	1	t CO_2e

Waste paper	7	7	8	7	t CO_2e
Other waste (incl. bulky waste)	130	69	209	253	t CO_2e
Hazardous waste	188	166	178	172	t CO_2e
Mixed municipal waste	779	837	767	758	t CO_2e
Total	1,108	1,082	1,165	1,193	t CO_2e
Paper	73	42	26	28	t CO_2e
Library	29	27	24	23	t CO_2e
Total	102	69	50	51	t CO_2e
Buildings and green spaces	1,596	1,850	1,739	2,435	t CO_2e
Laboratory supplies	2,345	1,901	2,250	2,489	t CO_2e
Furnishings	704	632	571	644	t CO_2e
IT needs	3,170	5,076	3,359	3,511	t CO_2e
Office supplies	157	157	92	110	t CO_2e
Health and safety supplies	238	206	172	181	t CO_2e
Catering	105	26	14	107	t CO_2e
Other supplies	372	249	202	150	t CO_2e
Total	8,688	10,096	8,399	9,627	t CO_2e
Vehicles	26	0	27	38	t CO_2e
Leased vehicles	0	0	1	2	t CO_2e
Work-related travel: flights	4,631	1,035	362	1,586	t CO_2e
Work-related travel: train travel	95	20	28	78	t CO_2e
Work-related travel: car travel	25	5	5	13	t CO_2e

Work-related travel: expenditure-based emissions	19	4	3	7	t CO_2e
Work-related travel: travel to/from airport	14	3	2	9	t CO_2e
Semesters abroad: flights	1.116	830	147	430	t CO_2e
Semesters abroad: train travel	1	2	1	2	t CO_2e
Semesters abroad: car travel	7	8	3	6	t CO_2e
Total	5,909	1,907	552	2,130	t CO_2e
Employees: cars	1.043	436	439	865	t CO_2e
Employees: public transport	874	522	558	777	t CO_2e
Employees: motorbikes	54	22	23	45	t CO_2e
Employees: e-scooters	14	6	6	11	t CO_2e
Students: cars	2,111	539	1,055	2,074	t CO_2e
Students: public transport	4,621	1,687	3,507	4,862	t CO_2e
Students: motorbikes	67	17	33	65	t CO_2e
Students: e-scooters	7	2	4	7	t CO_2e
Total	8,790	3,231	5,625	8,706	t CO_2e
Total Scope 3 emissions	**30,353**	**21,429**	**21,496**	**27,219**	**t CO_2e**
Total Scope 1–3 emissions	**70,476**	**57,157**	**62,504**	**68,152**	**t CO_2e**

Table 10: Overview of total GHG emissions Scopes 1 to 3

Assessment of GHG emissions in Scope 1

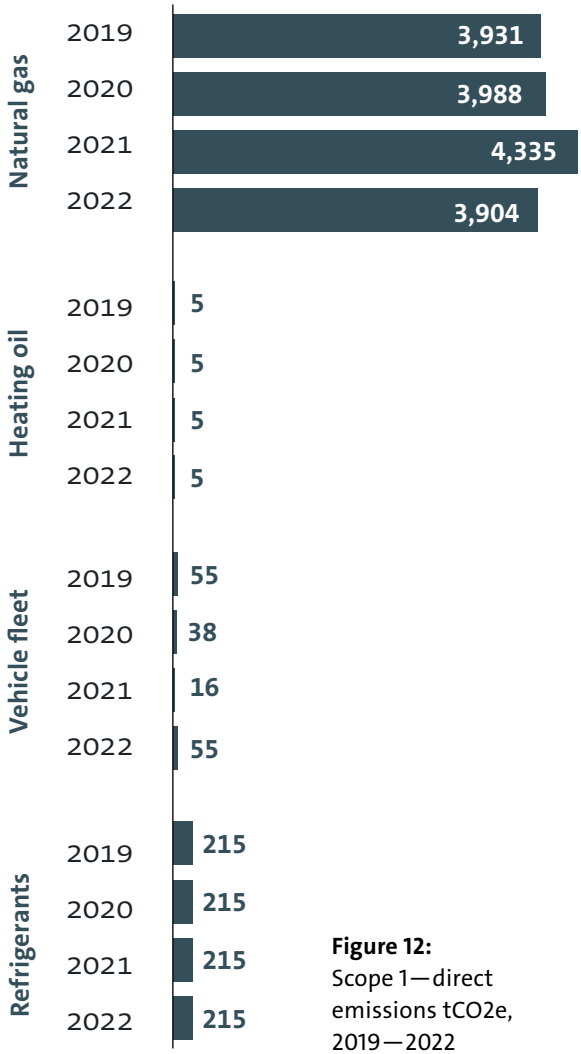


Figure 12:
Scope 1—direct emissions tCO2e, 2019—2022

The figure shows the progression of GHG emissions over the reporting period from 2019 to 2022 for **Scope 1**. Overall, there is no significant reduction here in GHG emissions over the past reporting period. In terms of Scope 1 consumption, natural gas is by far the largest contributor to GHG emissions as compared to heating oil, diesel, gasoline, and refrigerants. Measures to reduce natural gas emissions should therefore be prioritized in order to effectively reduce the University's GHG emissions. Since the peak-load boiler was decommissioned in 2023, GHG emissions from heating oil will be eliminated in 2024. In addition, GHG emissions from gasoline and diesel will be reduced as Universität Hamburg is transitioning to an all-electric vehicle fleet. It is necessary to first improve the quality of existing data on refrigerants in order to establish measures to reduce emissions here. To accomplish this, all of the air conditioners operated in University buildings need to be recorded and the refill quantities must be documented accurately based on information from the service provider.

Assessment of GHG emissions in Scope 2 (electricity and district heating)

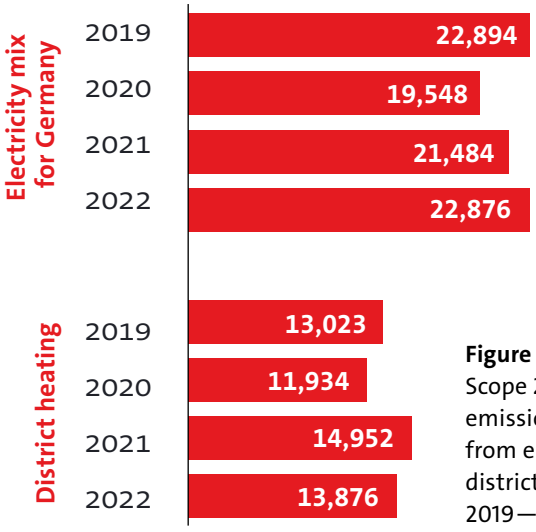


Figure 13:
Scope 2—indirect emissions in tCO2e from electricity and district heating, 2019—2022

The figure shows the progression of GHG emissions over the reporting period from 2019 to 2022 for **Scope 2**. The results show that GHG emissions from electricity and district heating are significant for Universität Hamburg's footprint and that

electricity consumption overall generates more GHG emissions than district heating. It should be noted that Universität Hamburg accounts for electricity according to Germany's electricity mix, although green electricity is purchased from Norwegian hydropower.[2] This approach is based on the fact that the electricity is generated from existing sources and not from new plants built for this purpose. Universität Hamburg is currently investigating the possibility of operating renewable energy plants independently. In addition to a possible switch to renewable energy, projects to promote resource-conserving consumer behavior among University members will also be implemented. The speed at which emissions generated by district heating are reduced depends on how quickly Hamburger Energiewerke (power supplier) achieves GHG neutrality in district heating. The amendment to Hamburg's climate act (Free and Hanseatic City of Hamburg, 2023) predicts that Hamburg's district heating will be at least 50 percent GHG neutral by 2030 and, in line with the climate goals of the City of Hamburg, GHG neutral by 2045.

The figure here shows the progression of GHG emissions over the 2019—2022 reporting period for supply and disposal in **Scope 3**. The results make clear that waste accounts for significantly higher total GHG emissions than fresh water and wastewater do. Measures are therefore needed to further develop the University's waste management in the context of a sustainable circular economy. For example, measures

[2] Purchasing green electricity does not result in any Scope 2 GHG emissions. However, upstream emissions generated during the production of energy sources (photovoltaic modules and wind turbines) must be accounted for in Scope 3.

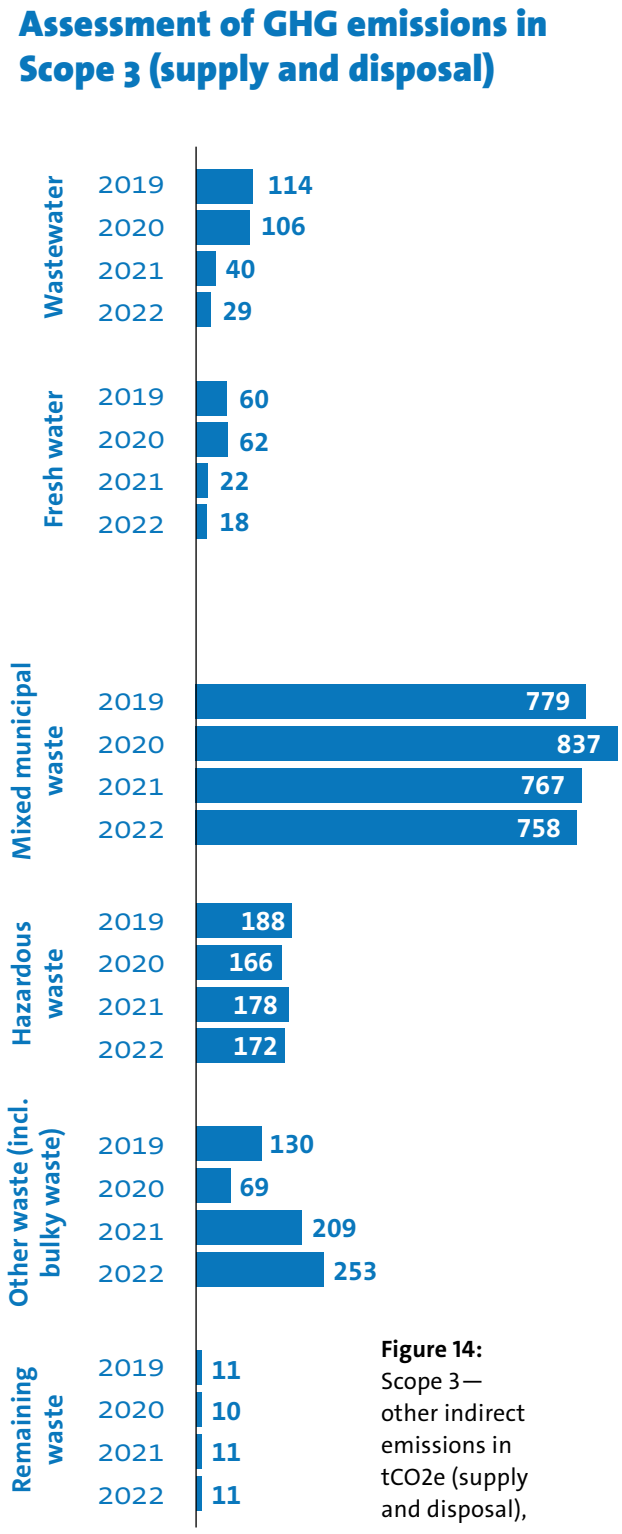


Figure 14: Scope 3—other indirect emissions in tCO2e (supply and disposal),

for waste prevention and proper waste separation must be implemented. With regard to the different types of waste and taking into account the GHG emissions generated for these, measures are needed, in particular, for mixed municipal waste, hazardous waste, and other waste (including bulky waste). In terms of fresh water and wastewater, measures for the conscious use of water and the installation of technical solutions to reduce consumption are under consideration.

The assessment of the procurement data for the observation period from 2019 to 2022 shows that high GHG emissions are generated in the areas of IT needs, laboratory supplies, and buildings and green spaces. Consequently, measures to reduce GHG emissions need to be established for these areas in particular. In addition, the area of furnishings can be made sustainable through the long-term use of furniture and the introduction of models for continued use of furniture within or outside Universität Hamburg. The GHG emissions generated for other procurements (office supplies, health and safety supplies, catering, and other supplies) were combined in the assessment as other supplies due to their lower overall GHG emissions. Measures should also be implemented for this category however. One example is to implement a paperless administration, which would also promote accessibility.

The figure shows the progression of GHG emissions over the reporting period 2019 to 2022 for mobility in Scope 3. Looking back at the Covid-19 years, we see that emissions from work-related travel and commuting decreased significantly in 2020 and 2021. However, the analysis also shows that emissions increased again considerably in 2022. To sustainably reduce emissions, it will be important to develop a sustainable mobility strategy for Universität Hamburg that raises awareness among University members. In particular, it is important to reduce mobility emissions from high-emission modes of transportation.

Assessment of GHG emissions in Scope 3 (procurement)

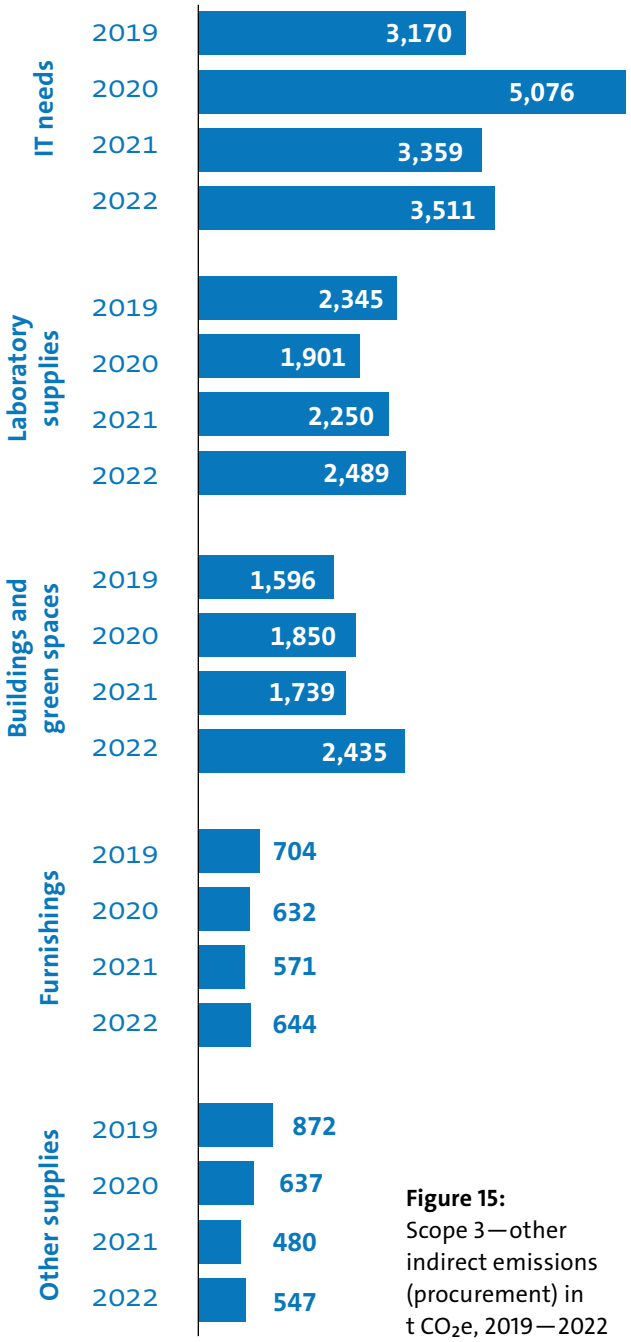


Figure 15:
Scope 3—other indirect emissions (procurement) in t CO_2e, 2019—2022

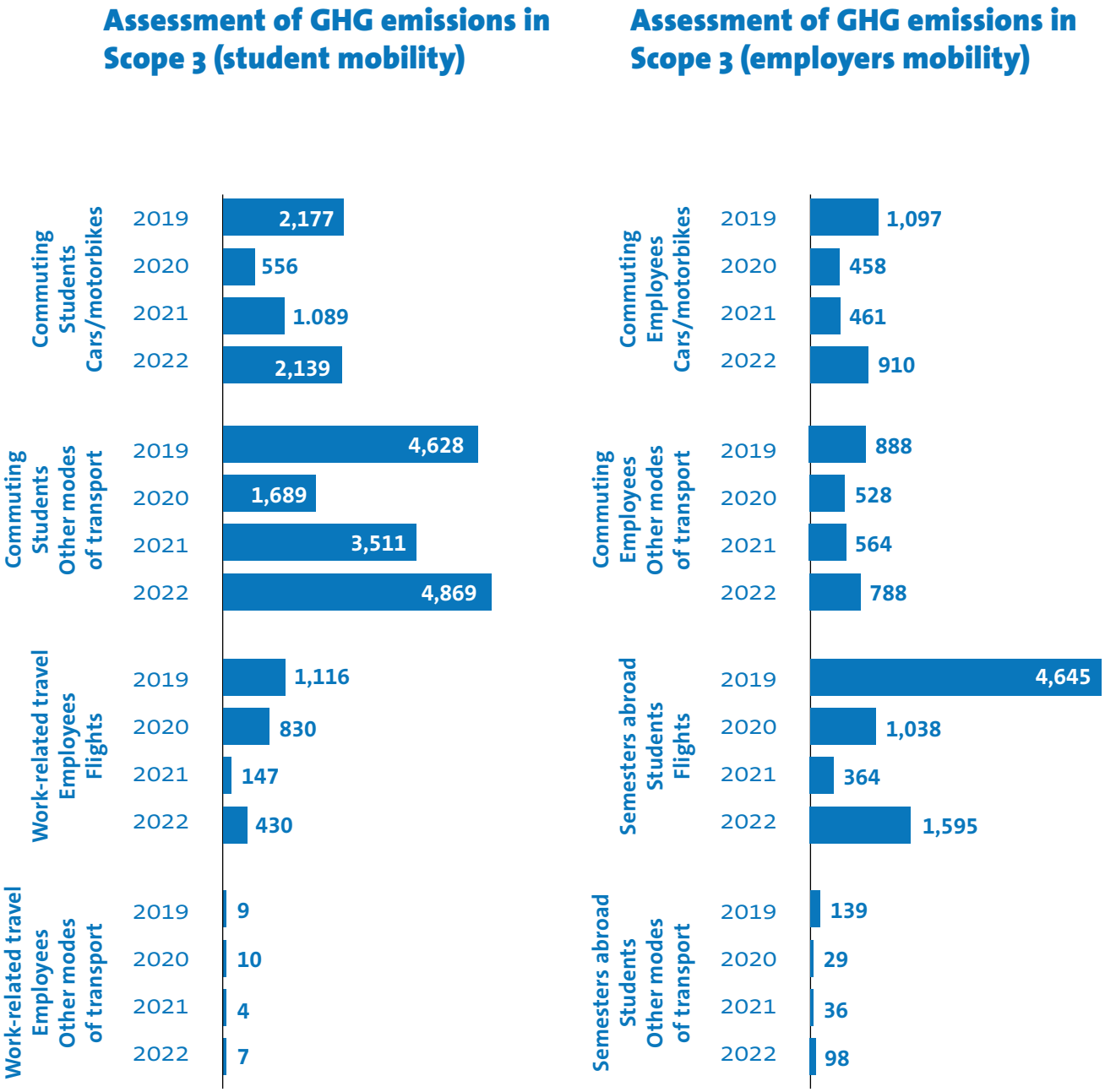


Figure 16:
Scope 3—other indirect emissions (mobility) in t CO_2e, 2019—2022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04

Climate Action Measures at Universität Hamburg

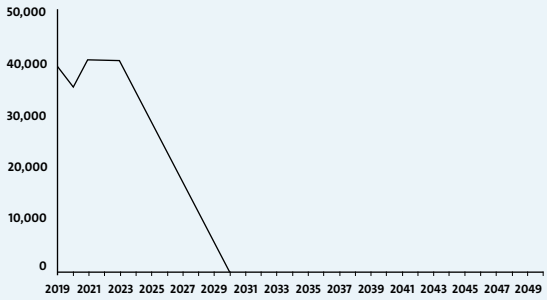
Emissions budget and analysis of potential

Establishing an emissions budget for Universität Hamburg

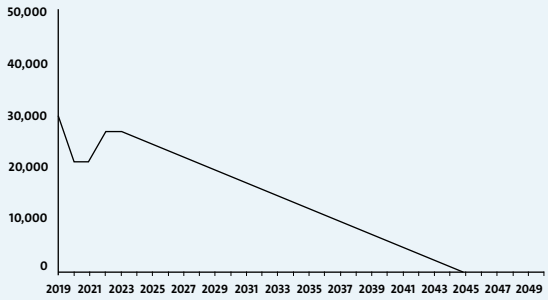
The emissions budget defines the amount of emissions that Universität Hamburg is allowed to produce per calendar year until the University reaches its goal of GHG neutrality. The calculation of the annual emissions budget is determined by the emissions consumption at the starting point and the time at which GHG neutrality is targeted. The upper graphs below show the **reduction paths** adopted for **Universität Hamburg**, which will be used as the basis for the following GHG reduction

Reduction paths—other goals for Universität Hamburg

GHG neutrality: Scopes 1 and 2 by 2030, Scope 3 by 2045



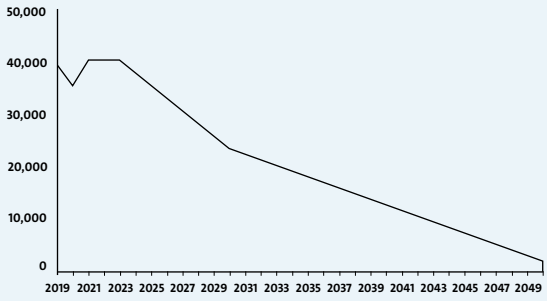
Reduction path—Scope 1 and 2 emissions



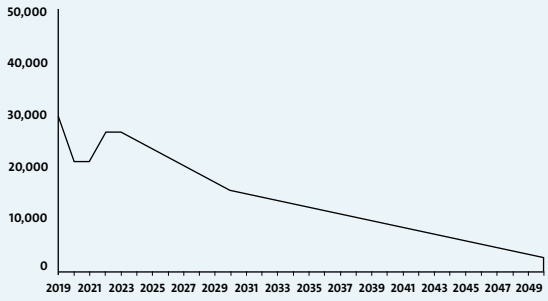
Reduction path—Scope 3 emissions

Reduction paths—other goals in line with the Science Based Targets initiative (SBTi)

In line with SBTi, either 4.2% annual reduction compared to the base year of 2020 or earlier or -42% by 2030 (near-term target) and -95% (Scopes 1 and 2) and -90% (Scope 3) by 2050 (long-term target) compared to the base year



Reduction path—Scope 1 and 2 emissions



Reduction path—Scope 3 emissions

Figure 17:
Comparison of the paths taken to reduce emissions by Universität Hamburg and the SBTi.

considerations. The two lower graphs compare this target with the **reduction paths** established by the **Science Based Targets initiative** (SBTi) and help to classify the University's neutrality targets in terms of their ambition.

SBTi is the best-known initiative for science-based corporate climate targets. The **Science Based Targets approach** developed by the initiative is based on the scientific findings related to limiting global warming to a maximum of 1.5°C and is designed to help organizations achieve the fastest possible, evidence-based reductions in GHG emissions. Launched in 2014, the initiative is made up of members of the Carbon Disclosure Project (CDP), UN Global Compact, World Resources Institute (WRI), and World Wide Fund for Nature (WWF) (SBTi, 2023) and aims to contribute to the climate goals set out in the Paris Agreement (SBTi, 2022; SBTi, 2023). The approach envisages a continuous and therefore long-term reduction in GHG emissions, with a baseline level of residual emissions remaining. While an immediate reduction of all GHG emissions is a desirable goal, this aspiration must be balanced with the realities of implementation and the availability of the necessary resources in order to define a realistic reduction path for Universität Hamburg. An immediate reduction of certain emission components—for example, in the area of heat supply—is not possible, even if the necessary financial resources are available. This is because in some cases, technical feasibility studies have to be conducted, expert opinions have to be obtained from engineering offices, and building permits have to be applied for.

The comparison of the two climate paths, that of Universität Hamburg and the SBTi approach, shows the ambitious path Universität Hamburg has set to achieve **GHG neutrality** early. Universität Hamburg has set itself the goal of becoming GHG neutral in Scopes 1 and 2 by 2030 in accordance with the GHG Protocol, provided external circumstances allow for this. In addition, process-related changes are to be implemented in Scope 3, which is more action oriented and less investment oriented, in order to reduce GHG emissions in the near future. However, specific targets have not yet been formulated. This will require more detailed coordination with the relevant departments and an assessment of the reduction potential for the various emission components. A more precise target for the reduction of Scope 3 emissions will therefore only be set as part of the further development of the climate strategy.

Analysis of potential to prioritize measures

The following table for the **analysis of potential** shows the GHG emissions generated by Universität Hamburg and serves as a starting point for the establishment of climate action at the University. By giving an overview of the proportionate GHG emissions per scope overall as well as the relevance of the specific types of consumption, a picture of the initial situation becomes clear.

The tabular overview is complemented with a **priority matrix** below. The matrix includes the most important criteria for reducing emissions (reduction costs, reduction options, and materiality of GHG emissions) and thus provides a starting point from which measures to reduce GHG emissions at Universität Hamburg can be assessed and prioritized based on the most important factors influencing

Consumption	Percentage of scope	Percentage of total amount	Relevance
Combustion processes in stationary facilities			
Natural gas	93.92%	6.26 %	Medium
Heating oil	0.12 %	0.01 %	Low
Combustion processes in mobile facilities			
Vehicle fleet (diesel and gasoline)	0.95 %	0.06 %	Low
Air conditioners			
Refrigerants	5.01 %	0.33 %	Low
Entire Scope 1	**100.00 %**	**6.70 %**	**Low**
Electricity and district heating			
Electricity	61.74 %	33.61 %	High
District heating	38.26 %	20.82 %	High
Entire Scope 2	**100.00 %**	**54.43 %**	**High**
Upstream emissions			
Upstream emissions (Scopes 1 and 2)	21.37 %	8.31 %	Medium
Supply and disposal			
Fresh water and wastewater	0.45 %	0.17 %	Low
Disposal	4.53 %	1.76 %	Low
Paper and library			
Paper	0.17 %	0.07 %	Low

Books and journals	0.10 %	0.04 %	Low
Procurement			
Buildings and green spaces	7.58 %	2.95 %	Medium
Laboratory supplies	8.94 %	3.48 %	Medium
Furnishings	2.54 %	0.99 %	Low
IT needs	15.04 %	5.85 %	Medium
Other supplies	2.52 %	0.98 %	Low
Fixed assets and investments			
Vehicles	0.09 %	0.04 %	Low
Rented and leased tangible assets			
Leased vehicles	0.00 %	0.00 %	Low
Mobility			
Work-related travel and semesters abroad	10.45 %	4.06 %	Medium
Commuting	26.22 %	10.20 %	Medium
Entire Scope 3	**100.00 %**	**38.91 %**	**High**

Table 11: Analysis of potential for reducing emissions

implementation. There is a separate figure for each scope, whereby Scope 3 has been expanded to include figures for the three main areas of procurement, supply and disposal, and mobility. The sizes of the bubbles used in the figures convey the materiality of consumption. The costs (low, medium, and high) associated with a measure are shown in three fields, which have in some cases also been supplemented (where this makes sense for the respective scope) with the boxes "Cost neutral" (Kostenneutral) and "Cost savings" (Kostenersparnis). The GHG reduction measures are additionally indicated below the consumption type.

The figure shows that measures to reduce Scope 1 emissions are costly and time-consuming. This is especially the case for natural gas, which is by far the largest source of emissions. However, in

addition to the long-term switch to renewable energy alternatives, savings can also be achieved in the short term if members of the University change their consumption behavior. This includes the sustainable use of IT equipment in administrative and academic operations as well as the sustainable use of energy-intensive laboratory equipment. Furthermore, even if it does not generate high GHG emissions, converting the vehicle fleet to electric vehicles or switching to sharing models within the University has reduction potential. Measures in this regard are primarily aimed at service vehicles as converting or replacing special vehicles, such as those used for research field trips, is difficult to implement because these are customized vehicles that are needed to handle the conditions in the field trip destinations. One measure that has already successfully been implemented is decommissioning of the peak-load boiler, which will eliminate GHG emissions from the combustion of heating oil.

The University's GHG emissions from electricity and district heating are very high. Universität Hamburg's primary goal in this context must therefore be to implement comprehensive

Analysis of potential to determine measures to be taken—Scope 1

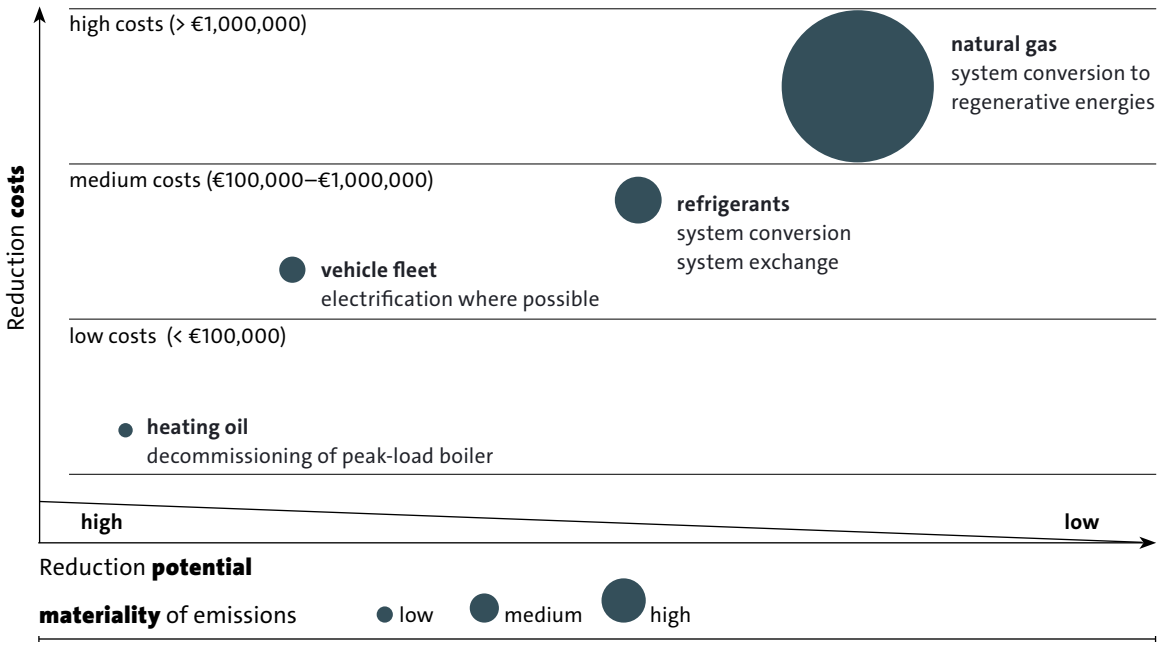


Figure 18: Scope 1—priority matrix for analysis of potential

measures as soon as possible in order to reduce the GHG emissions. However, this goal is accompanied by considerable challenges in terms of the clarity of the legal situation, involvement of and coordination with the authorities responsible, and financial and personnel resources. While reducing emissions from electricity involves high and long-term investments and a legal situation that is still unclear, when it comes to reducing emissions from district heating, Universität Hamburg is dependent on Hamburger Energiewerke (power supplier), even though the goal of reducing emissions applies to both parties. Although the use of district heating as a substitute for gas makes sense from a climate point of view, significant connection costs must be expected for University locations that are not currently connected to the district heating network. The development and implementation of a University-wide plan for the efficient use of waste heat also offers potential for the future. Although the necessary installations are associated with high costs, taking this step may lead to a more climate-friendly use of energy.

High potential exists for the University to reduce its GHG emissions in the areas of supply and disposal

Analysis of potential to determine measures to be taken—Scope 2

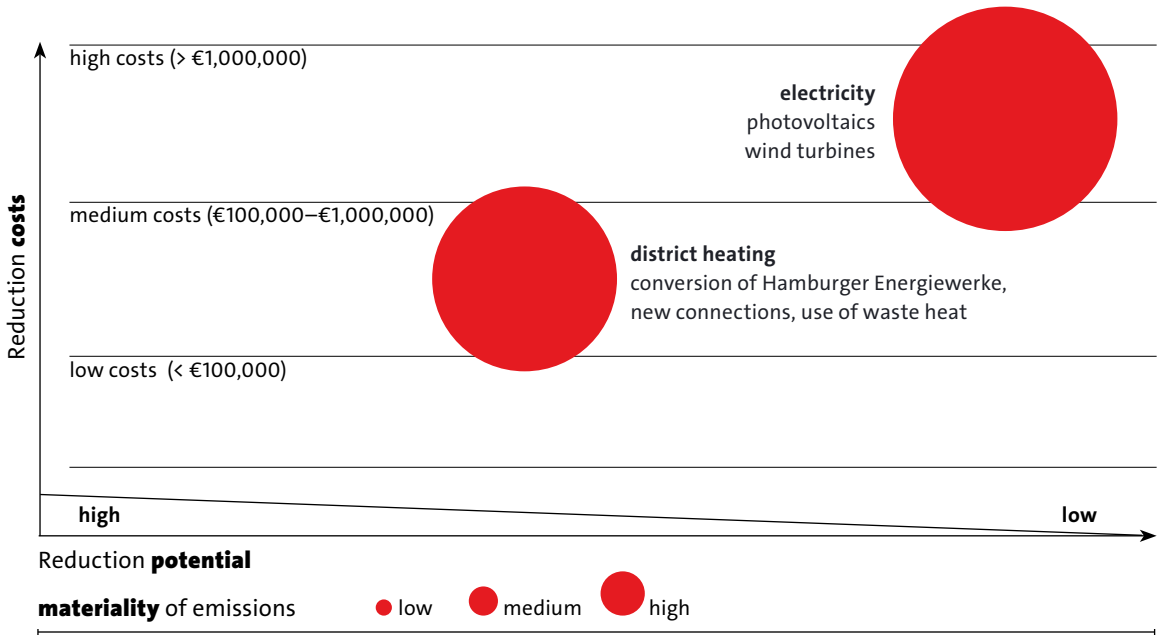


Figure 19: Scope 2—priority matrix for analysis of potential

in the near future. One key measure to reduce waste-related emissions is the establishment of a waste management system covering all University buildings and the campus. Measures to reduce freshwater consumption and wastewater are complex in that they are both costly and labor-intensive due to the extensive building structure at Universität Hamburg. Similarly, the disposal of hazardous waste must comply with legal requirements and occupational health and safety obligations.

In terms of reducing emissions from procurement, the encouraging view is that potential exists to reduce the GHG emissions in the near future in areas other than that of buildings. Existing processes will need to be modified and aligned with sustainable criteria. Taking into account the emissions generated by IT, laboratories, furnishings, and office supplies, there is still untapped potential that can be harnessed with manageable costs or even cost savings. Measures in this area are aimed at making institutional processes more sustainable, for example, through sharing models within

Analysis of potential to determine measures to be taken— Scope 3 supply and disposal

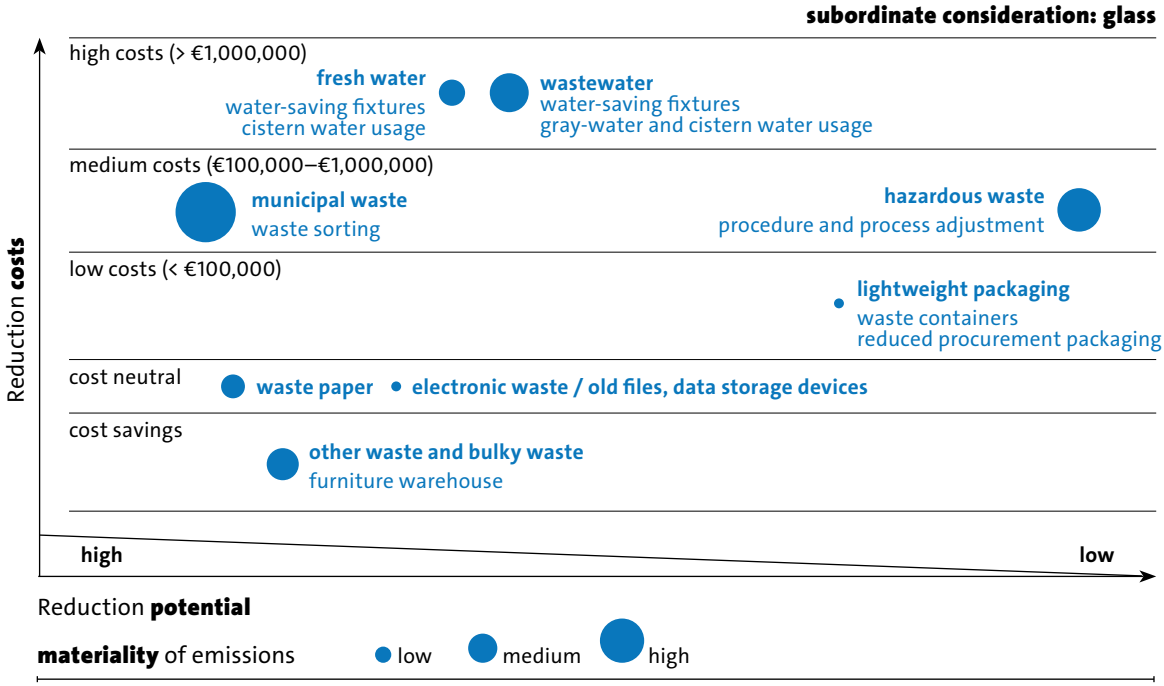


Figure 20: Scope 3—priority matrix for analysis of potential (supply and disposal)

the University, the internal or external reuse of IT equipment and furniture, and the development of a sustainability strategy for the University for sustainable events, catering, and mobility plans. In addition, switching to digital and paperless work can save GHG emissions and resources and encourage the removal of barriers to an inclusive university environment.

Measures to reduce GHG emissions from buildings are complex as Universität Hamburg is constrained by the tenant-landlord model, which often prevents the University from acting independently. Since energetic refurbishment plans are necessary to directly reduce Scope 1 and 2 emissions, Universität Hamburg is making every effort to implement such emission-reducing measures.

Universität Hamburg does not currently see a primary need for action in the areas of health and safety supplies or other supplies, which are not included in the figure. The main reason for this is that action in the area of health and safety must meet the legal requirements. Determining

Analysis of potential to determine measures to be taken— Scope 3 procurement

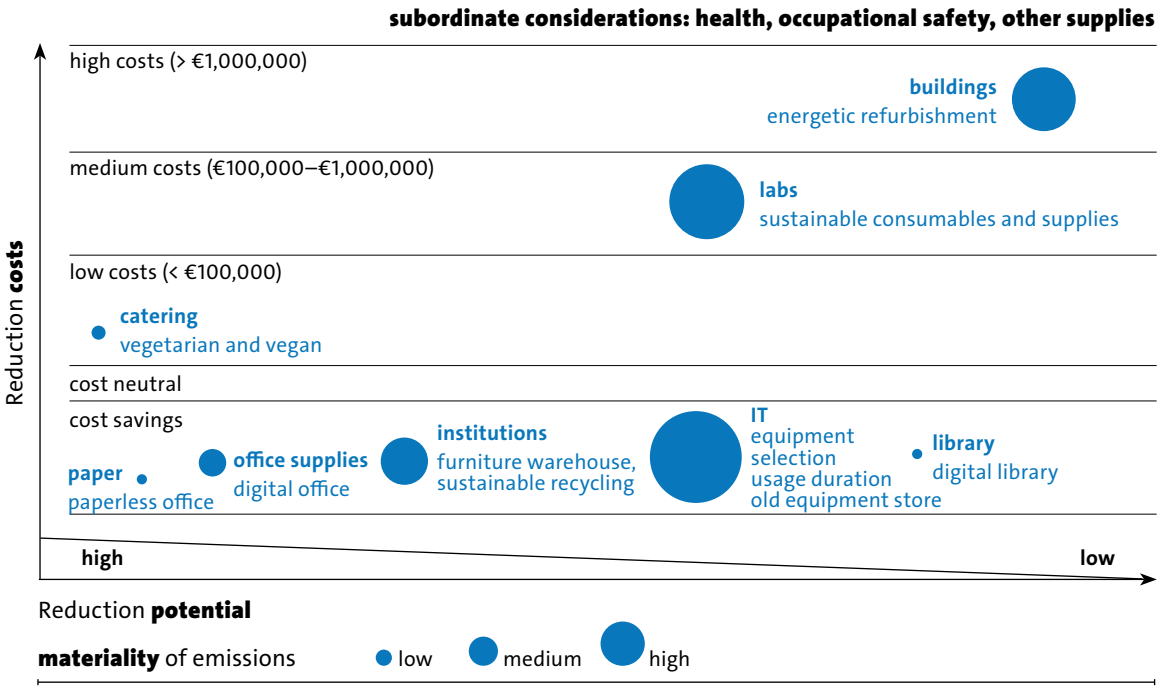


Figure 21: Scope 3—priority matrix for analysis of potential (procurement)

measures for other supplies is extremely complex due to the wide variety of procurements covered by the pool items. Specific individual measures must be established, which will be considered at a later stage as they are only of minor significance to GHG accounting.

With regard to reducing GHG emissions relating to the mobility of University students and staff, the costs are manageable and linked to the possibility of saving emissions in the higher range. In order to successfully implement a University-wide climate strategy, Universität Hamburg wishes to develop and implement measures that use incentives to help University members to adopt sustainable commuting and mobility behavior. In particular, environmentally damaging modes of transportation should be replaced by environmentally friendly modes, and student and business trips should be evaluated in terms of their materiality and necessity.

Analysis of potential to determine measures to be taken— Scope 3 mobility

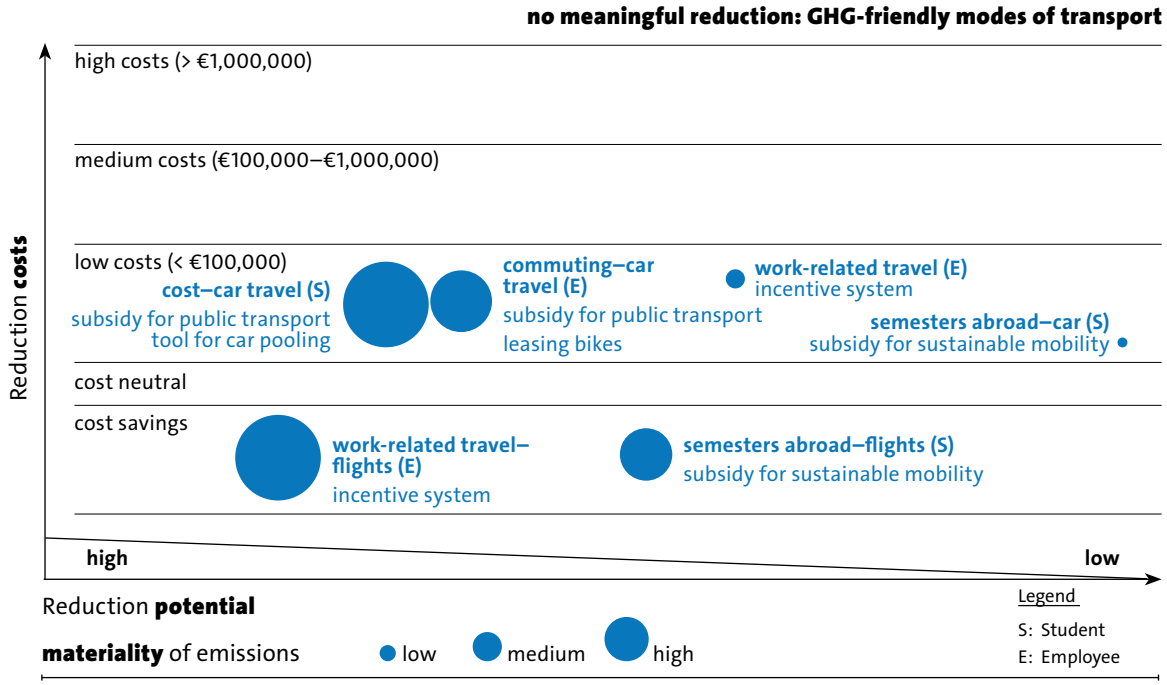


Figure 22: Scope 3—priority matrix for analysis of potential (mobility)


WOLTMAN
MAERSK

Overview of measures

Since the collection, assessment, and reporting of GHG emissions at Universität Hamburg is still in the beginning stages, it is not possible to establish measures based on actual consumption at this time (during the preparation of the Climate Action Report). At this stage, Universität Hamburg wishes to develop a holistic **climate action strategy** and to implement increasingly evidence-based management. The **measures** outlined below should therefore be seen as the start of an evolving climate strategy that will be expanded and developed continuously. The following explanations begin with a holistic view of the current state of implementation at Universität Hamburg. This is followed by an assessment of the measures that can currently be implemented and is supplemented with specific project profiles describing planned and possible strategies.

Buildings

General refurbishment of buildings: The City of Hamburg has decided that public buildings should gradually be transitioned to operation under the tenant-landlord model. Under this model, a building is handed over to the landlord for general refurbishment and then made available to the tenants again following refurbishment. Based on this model, Universität Hamburg is therefore involved in the planning as a user, but has no influence on the strategic planning process. Universität Hamburg currently operates three buildings under the tenant-landlord model, with another 135 buildings to be handed over. One of these buildings is planned to be commissioned as a new building in 2024. In addition, an expert inspection was carried out from the landlord side by Gebäudemanagement Hamburg (GMH) and Sprinkenhof. The Hamburg Ministry of Science, Research, Equalities and Districts (BWFGB) plans to develop a refurbishment plan based on their report. The University regularly follows up on the issue in management level meetings with the BWFGB. Universität Hamburg has not yet been given a schedule, specific refurbishment plans, or a climate assessment.

Maintenance and energetic refurbishment measures: Given the heterogeneous building structure and age, a considerable need exists for fundamental work. However, measures to maintain building operations are mainly carried out, such as fire protection and structural safety measures. At the end of each year, a plan is drawn up for the following year's construction needs and prioritized according to urgency. In future, this will also include creating an energetic refurbishment plan.

Adherence to sustainable construction regulations: For construction in existing buildings, Universität Hamburg adheres to the sustainable construction regulations developed by the Federal Ministry of the Interior and Community (BMI). By compiling an annual list of measures to be taken in planning and construction, the reduction and compensation of GHG emissions is to be actively implemented and taken into account in construction projects from the outset.

Use of fossil fuels: The Von-Melle-Park location used an oil-fired peak-load boiler for heating, which was decommissioned in 2023. This will reduce heating-oil consumption to zero. The highest consumption of natural gas occurs at two locations.

A building on Vogt-Kölln-Straße is heated with natural gas but will be leased out by 2025. The Klein-Flottbek location uses a combined heat and power plant, which will be replaced by a connection to the district heating system in the future.

Use of renewable energies: The University is reviewing the extent to which the use of renewable energies is possible in relation to its various properties. The review will include energy and resource issues.

Use of waste heat: Waste heat is currently used at several University locations. At the Bundesstraße location, waste heat from the mainframe computer of the German Climate Computing Center (DKRZ) is used to preheat the ventilation system in the pharmacy and technical and molecular chemistry buildings. At the Klein-Flottbek location, waste heat from the combined heat and power plant (CHP) is used to operate an absorption refrigerator. In addition, preparations are underway to commission a geothermal plant at the Science City Hamburg-Bahrenfeld location.

Temperature reduction in buildings: During the energy crisis, temperatures were reduced to 19 – 20°C in offices. Corridors and foyers were not heated where technically possible. Exceptions were made for foyers used by students as study and meeting spaces. All heating systems were also turned down at night. With a view to sustainable building use, projects to regulate room temperature are underway at various University locations. Some departments and facilities have a high potential for reducing electricity consumption as they operate electricity-intensive systems. By limiting the hours of use in the evening, at night, and in the morning, consumption can be reduced significantly.

Lighting: A sustainable lighting plan includes only having the lights on during normal operating times. In addition, demand-responsive lighting (automatic switch-off and LED lights in corridors, stairwells, and staff areas) will be implemented for indoor and outdoor areas.

Recording natural-gas and heating-oil consumption: To ensure efficient and accurate data collection in the future, meter readings will be taken at the beginning and end of the year, and additional machine readings will be documented. In addition, the meter structure will be continuously expanded so that approximately 90 percent of the buildings and their consumption will be recorded on a building-specific basis by 2024. This will allow Universität Hamburg to systematically record and manage the GHG emissions of the properties it uses.

Recording electricity and district heating consumption: Currently, not all Universität Hamburg buildings are equipped with their own meters. At large campus locations, such as Von-Melle-Park and Bundesstraße, buildings are often grouped together in a ring circuit. As a result, electricity is only measured in the ring circuit, which means that consumption of the individual buildings cannot be determined. In 2023, the Property Management team took monthly readings of the existing meters in order to determine seasonal effects. In subsequent years, meter readings will be taken at the beginning and end of the year, and additional machine readings will be documented to capture actual consumption. In addition, the meter structure will be expanded so that approximately 90 percent of the buildings can be recorded on a building-specific basis by 2024.

Computer-aided facility management (CAFM): As a next step, it will be necessary to further develop

the metering system so that energy consumption can be attributed and managed. A more advanced metering infrastructure like this is the basis for measuring consumption. Together with the relevant departments, workshops have been held to determine the requirements for CAFM. An external company will install a CAFM system. As soon as the exact requirements are available, the tendering process will be initiated.

Photovoltaics: Two buildings at Universität Hamburg are currently equipped with a photovoltaic system. A further 11 locations could potentially be suitable—subject to pending inspections of the roof structure and covering—whereby two locations do not have sufficient load reserves so that the cost of upgrading the supporting structure for these will be calculated. For the buildings that the City of Hamburg makes available to the University, there is currently no operator model that meets the administrative, legal, and economic requirements.

Cooling systems: The University plans to group the cooling systems based on need and performance in order to ensure their climate-friendly usage.

Recording of refrigerant consumption: In the future, the quality of data on refrigerant consumption will be improved to the extent that all air conditioners in the University buildings and, if possible, the refill quantities (based on an inquiry to the service providers) will be recorded.

Water dispensers: Providing fresh water helps to improve the experience at the University. Maintenance-free water dispensers are currently installed in 7 of the 17 representative locations assessed. Wall-mounted dispensers were chosen to prevent damage from vandalism and to ensure that floors can still be cleaned unhindered.

Exterior areas

Campus design: Particularly on the centrally located campuses, the building density is high and land surface sealing extensive. In addition, the few spaces with potential for improvement are subject to various usage conflicts. Further challenges arise from issues such as the protection of building ensembles and monuments as well as from interfaces with the tenant-landlord model. Overall, securing funding for outdoor study and meeting spaces catering to the existing needs is proving complex. In the short term, interventions to improve the quality of outdoor spaces with study and meeting spaces and urban gardening projects are planned to achieve tangible and quick, concrete wins in addition to long-term developments. Projects that have already been implemented include an urban gardening project at the Sportpark campus as well as the Wurzelwerk project at the Von-Melle-Park campus, which was carried out by students and Property Management.

Biodiversity: The project on model biotopes in the astronomy park at the Hamburg Observatory in Bergedorf funded by the Deutsche Wildtier Stiftung has already implemented a plan to promote biodiversity there. In the Science City Hamburg-Bahrenfeld, the planning process for the districts next to the Volkspark includes planning parameters to optimize the living conditions for animals and plants in urban areas (animal-aided design). Small-scale measures, such as wildflower strips at Von-Melle-Park, are intended to improve biodiversity in the short term. In 2020, four beehives were installed on the Sportpark campus.

Supply and disposal

Fresh water: In the coming years, meter readings will be taken at the beginning and end of the year and additional machine readings will be documented to determine actual consumption.

Waste separation: Waste is currently separated into at least two categories in University buildings. In some buildings, waste is separated into three categories. In addition to separating waste inside the buildings, Universität Hamburg also aims to provide opportunities for separate waste disposal outside the buildings.

Procurement

The knowledge gained from this assessment should be used to further develop sustainable procurement by tapping into the knowledge of existing restrictions as a starting point for restructuring. This will require a change in the procurement process to allow for the quantity-based accounting of GHG emissions. In addition to restructuring the process, the applicable procurement regulations should be reviewed and developed further, taking social and environmental procurement guidelines into account. The following measures are to be implemented in the individual procurement areas.

Digitalization of administrative processes: In order to create an environment that is accessible to all individuals, including those with disabilities, and increase the efficiency of processes, Universität Hamburg is pursuing the goal of full digitalization of its administrative processes. Providing a modern work environment should accelerate work processes and limit resource consumption in terms of the equipment required.

Furnishings: For the long-term use of office furniture, Universität Hamburg is reviewing both the options to establish furniture warehouses and cooperate with second-hand furniture stores.

IT needs: As part of the procurement process for IT components, a procedure will be developed that takes into account energy and resource efficiency based on the award criteria for the Blue Angel environmental label. In addition, guidelines will be developed on how to reduce the energy consumption of workstation systems in terms of resource use (energy use, raw material use, and pollutant emissions), taking into account future requirements and expected increases in the performance of these IT components.

Catering: Universität Hamburg is pursuing a number of measures to ensure that the events it hosts are sustainable. The technical possibilities for holding videoconferences are to be further improved and communicated. In addition, guidelines for planning and hosting sustainable events at Universität Hamburg are currently being developed.

Mobility

Commuter mobility: In order to promote sustainable commuting behavior, Universität Hamburg is committed to providing secure and, if possible, covered bicycle parking spaces as part of renovations. Sustainable mobility options will be reviewed for all campus locations and the bicycle infrastructure continuously optimized. This includes the construction of additional bicycle parking spaces and the replacement of inconvenient parking spaces with ADFC compliant bicycle racks. By cooperating with the local authorities, the University's interests will be taken into account when the city's cycling network is expanded.

Universität Hamburg is the first higher education institution in Hamburg to become a bicycle friendly university. At the Von-Melle-Park campus, the ADFC carried out an audit and a campus inspection at the beginning of June 2023. Universität Hamburg was then awarded the bicycle friendly employer status (silver). By implementing further measures to improve bicycle mobility, the goal is to achieve gold status for the Von-Melle-Park campus and further certifications for the Bundesstraße campus and Science City Hamburg-Bahrenfeld.

As part of the Quartiere am Volkspark and Rahmenplan Campus West planning processes, differentiated bicycle and mobility plans and additional services are being developed for Science City Hamburg-Bahrenfeld. This is an important building block for better connecting the campuses. As part of the central teaching and learning infrastructure, mobility hubs in the form of bicycle garages are to be constructed in the learning and lecture hall center and supplemented with decentralized bicycle parking near the entrances. On the way to Science City Hamburg-Bahrenfeld, it is also important to implement visible measures that improve the bicycle infrastructure in the spirit of quick wins.

Conversion of the vehicle fleet: In general, new purchases will be electric vehicles. In justified exceptional cases, such as special vehicles for research, the purchase of vehicles with internal combustion engines is permitted. A review has been conducted of potential service providers for the installation of charging stations. Once the procurement has been decided, and subject to a legal and economic assessment, the charging stations will be installed at the centrally located campus. The Campus Development section has already identified potential locations.

Overview of the measures currently determined

See table 12 on the following page.

Measure	Responsibility	Objective	Status
Entire Scope 1			
Reduction of the vehicle fleet (sharing strategies, cargo bikes)	Executive University Board	Short term	Outstanding
Conversion of the vehicle fleet by switching to e-vehicles	Executive University Board	Medium term	Outstanding
Review of the more efficient use of refrigerants	Property Management	Short term	Outstanding
Entire Scope 2			
Review of alternative electricity supply from renewable energies	Property Management	Medium term	Ongoing
Review of possibilities to acquire green electricity by operating renewable energy plants independently	Property Management	Short term	Ongoing
Energy-saving lighting	Property Management	Short term	Ongoing
Campaign for sustainable laboratories	Faculties	Short term	Outstanding
Campaign for sustainable administration	Faculties / University Strategy	Short term	Outstanding
Campaign for changes in consumer behavior	Communication	Short term	Outstanding
Entire Scope 3			
Water-saving sanitary facilities	Property Management	Medium term	Ongoing
Waste avoidance and waste separation	Property Management / Occupational Safety and Environmental Protection Unit	Short term	Outstanding
Climate-neutral Regional Computing Center	Regional Computing Center	Medium term	Outstanding
IT use and recycling	Regional Computing Center	Short term	Outstanding
Paperless office	Regional Computing Center / Digital Office	Medium term	Outstanding
Sustainable procurement guidelines	Procurement	Medium term	Outstanding
Use and reuse of furniture	Working group	Short term	Ongoing
Biodiversity and greening	Biodiversity Lab /working group	Short term	Ongoing
Sustainable and fair catering	Working group	Short term	Ongoing
Sustainable mobility	Mobility Lab	Short term	Ongoing
Bicycle-friendly university	Working group	Short term	Ongoing

Table 12: Overview of measures to implement

The following project outlines present short-, medium-, and long-term measures and strategies to reduce GHG emissions and create a more sustainable and livable campus.

Short-term measures and long-term strategies

Plan: Wildflower strips on campus

Location: University-wide
Goal: Increase biodiversity and beautify the campus
Requirements: Clarify monument protection status and funding

Measure: Greening of Von-Melle-Park 5

Location: Von-Melle-Park campus
Goal: Improve the quality of time spent at the University and provide greenery and seating in the inner courtyard and flower beds
Requirements: Review possible spaces

Plan: Design for the area outside Martha Muchow Library

Location: Von-Melle-Park campus, Bi40
Goal: Increase biodiversity, improve the quality of the outside space, develop the outside areas
Requirements: Check the planning for the new synagogue and refurbishment of VMP8, clarify monument protection status and funding, develop the outside areas

Plan: Bicycle parking spaces on the Bahrenfeld Campus

Location: Bahrenfeld Campus
Goal: Provide additional bicycle parking spaces, improve the quality of bicycle parking spaces (ADFC-compliant bike racks, covered bicycle parking, ADFC-certified double-decker parking systems).
Requirements: Funding and integration into new building plans

Measure: Install additional StadtRAD station at the DKRZ

Location: MLKP and MLKP3 campus
Goal: Additional StadtRAD bike-sharing station on campus, increase bicycle traffic, improve mobility services
Requirements: Contract between Universität Hamburg and Deutsche Bahn Connect GmbH (planning organized by DB Connect)

Plan: Eatable@ Science City

Location: Bahrenfeld Campus
Goal: Create space for meetings, increase biodiversity, install raised flower beds and pallet furniture
Requirements: Develop together with academic staff and students on-site and find funding

Medium-term measures and strategies

Measure: Campus furniture

Location: University-wide
Goal: Improve the quality of time spent at the University, expand spaces to work and spend time outside, acquire campus furniture from the joint project, and set it up across the University
Requirements: Build campus furniture together with the BEAT! project (student health management) and students from the Hamburg University of Fine Arts (HFBK) and TU Braunschweig, and find funding to mass-produce the furniture

Plan: Redesign Philosphenturm parking lot

Location: Von-Melle-Park campus
Goal: Develop a mobility hub (e.g., bicycle parking spaces, accessible car parking spaces, e-charging spaces, and service zone with a parcel collection station and storage lockers), redesign the existing parking lot and the outdoor area around the Philosophenturm
Requirements: Restore and redesign the parking lot at the Philosophenturm,
redesign Schlüterstraße, clarify legal aspects of charging spaces, find funding

Plan: Bicycle service stations

Location: University-wide
Goal: Provide bicycle service stations across campus, increase user-friendliness, and facilitate the transition to cycling
Requirements: Funding

Long-term measures and strategies

Measure: Underground station (U5)

Location: Von-Melle-Park campus
Goal: Provide access to the stop from Von-Melle-Park campus, decide on design together, develop the Mobility Hub entrance in the arrival area of Universität underground station (U5), improve mobility options on and near the Von-Melle-Park campus.
Requirements: Cooperate with Hamburger Hochbahn AG rapid-transit operator during construction

Plan: SCHB mobility hubs (HZ, LC)

Location: Bahrenfeld campus
Goal: Link the modes of mobility on campus, increase the user-friendliness
Requirements: Tenant-landlord model and Science City society

Plan: StadtRad stations for Bahrenfeld campus

Location: Bahrenfeld campus
Goal: Add more StadtRAD bike-sharing stations, increase bike traffic and mobility options on campus
Requirements: Science City development together with the Science City society and the Hamburg Ministry

Funding options

Implementing a sustainability transformation is an immense challenge for higher education institutions. While Scope 3 emissions can be greatly reduced by implementing sustainable practices and processes and by University members making changes, the reduction of Scope 1 and 2 emissions requires regular and extensive structural measures for which considerable personnel and financial resources must be available. In this context and in partnership with its University members, Universität Hamburg is reviewing the options available to achieve **GHG neutrality**, taking environmental, social, and financial aspects into account. Overall, the University follows the guiding principle that an avoidance of emissions should come before reduction and a reduction of emissions before offsetting. Various approaches can be taken to achieve the climate goals presented. With regard to specific **funding options**, the **intracting** model already established at Universität Hamburg and an **internal offsetting** model are presented here as options.

Intracting

Intracting is a funding model that allows energy-saving measures to be implemented in the long term and without affecting the budget. Savings from investments or refurbishments are moved into an intracting fund and can then be used to fund future measures. For the model to work, initial financing and a revolving fund are required.

Overview of measures already implemented:

- replacement of an additional batch of heating pumps (University-wide, 2018)
- optimization of ventilation in lecture halls (Bundesstraße location, 2018)
- replacement of helium compressor (Jungiusstraße location, 2018)
- heating valves with individual room control (Von-Melle-Park location, 2018)
- smoke and heat extraction flaps in the elevator shafts in accordance with the German energy saving ordinance (Energiesparverordnung, EnEV) (Von-Melle-Park location)
- use of waste heat from the German Climate Computing Center (DKRZ) to preheat the ventilation system in the chemistry institutes (Bundesstraße location, 2019)
- use of waste heat from the combined heat and power plant (CHP) to improve the energy efficiency of operating an absorption refrigerator (Hesten and Ohnhorststraße locations, 2019)
- energetic optimization of the heat exchange ventilation (Grindelallee location, 2019).

Universität Hamburg participates in intracting; however, the model in its current form is only suitable for smaller investments of up to €50,000. Projects have been planned, funded, and implemented based on this since 2017—for example, the helium compressor was replaced, ventilation in lecture halls was optimized, and an additional batch of heating pumps was also replaced.

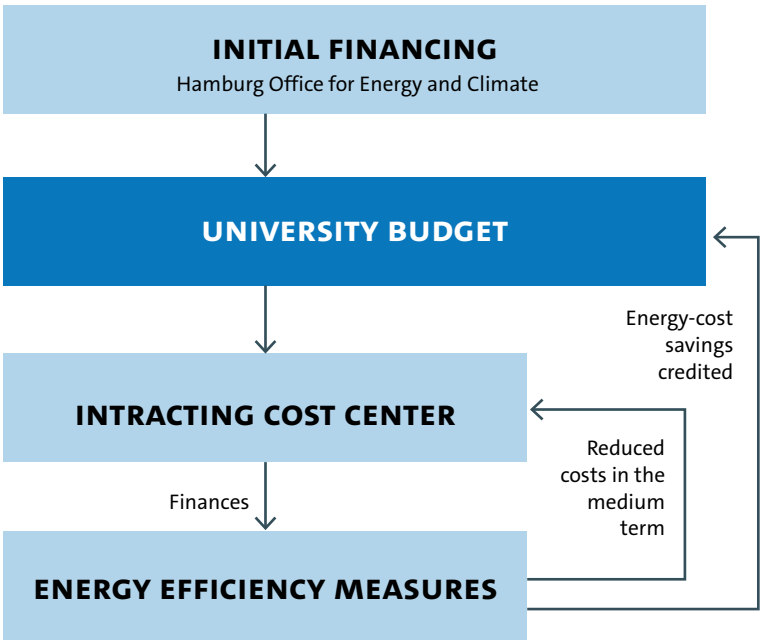
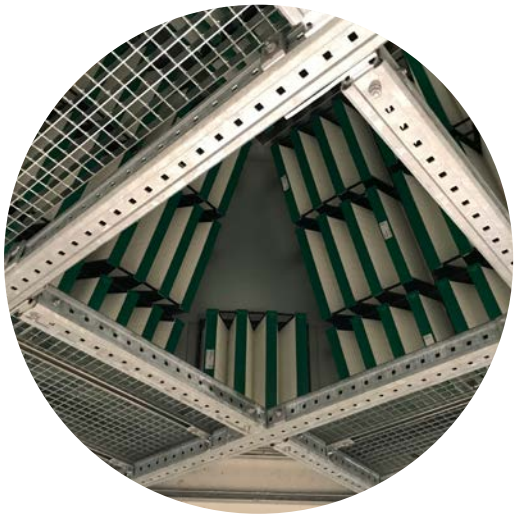


Figure 23: Intracting



Internal compensation

Since the establishment of an internal compensation fund for Universität Hamburg involves diverse and complex issues—such as the origin and distribution of funds, the determination of an emission price, the appointment of the decision-making committee, and its decision-making process—a University-wide process is required. To ensure broad acceptance and budgetary feasibility, Universität Hamburg is currently engaged in a participatory process to

examine the opportunities and challenges of an internal climate action fund. The topic of a climate action fund was discussed with student representatives from the working group on climate (Resonanz-Arbeitsgruppe Klima), which was involved in preparation of the Climate Action Report in an advisory capacity. It was also a topic of discussion within the working group on the climate-neutral use of resources (Arbeitsgruppe Klimaneutrale Ressourcennutzung). This group includes members from a wide range of status groups and areas of responsibility such as students, members of the Executive University Board, department heads, and sustainability experts from administration and science. As the discussions are still ongoing, no decision for or against a climate protection fund or its possible structure can be presented in the current Climate Action Report.

Summary and conclusion

Universität Hamburg's goal is to implement sustainability throughout the entire University—in the administration, faculties, and institutions. Sustainability is to be understood and practiced holistically and to include all sustainability dimensions, areas of activity, and members of the University. This Climate Action Report marks the beginning of a sustainability strategy that is to be implemented across the whole University. Based on this first Climate Action Report, Universität Hamburg intends to develop a climate strategy. In particular, the following measures are necessary.

Creating a common understanding of sustainability as a mobilization factor

The process of preparing this first Climate Action Report has already initiated a comprehensive process of sustainability transformation at Universität Hamburg. The process required to prepare the Climate Action Report was based on the implementation of many small steps. These have gradually led to the establishment of climate reporting alongside financial reporting. Although the process involved a great deal of groundwork, the resulting GHG accounting shows the relevance of these efforts. Calculating the University's GHG emissions based on scientific methods and our own consumption data has made the previously abstract idea of our own footprint tangible so that we can now take concrete action in line with the motto of "You cannot manage what you do not measure!"

Optimizing processes and data

The process of preparing this Climate Action Report has shown that our organizational processes need to be adjusted for the optimal provision of data. As is common in sustainability reporting, this requires the extensive development of digital processes in order to be able to collect, assess, and report data in a quality-assured manner. The experience gained from our first climate report should now be used to modify our existing processes. To this end, all relevant departments should be involved in order to work together on a forward-looking strategy.

Determining the need for action and appropriate measures

The GHG inventory shows the emissions generated by Universität Hamburg. It also reveals the most important areas of activity by indicating which components of the footprint are caused by which actions. This knowledge will help us to integrate sustainability into the University's processes and to ask and answer relevant key questions, such as those on the use of renewable energies, climate-friendly drive technologies, the climate-oriented use of resources, and the establishment of sustainable processes at the University. This will ensure that measures are prioritized, monitored, and adjusted accordingly.

Resource requirements

The measures outlined in the Climate Action Report are not part of the University's original activities. Additional personnel and financial resources are therefore required to implement the sustainability transformation. It is also important that higher education institutions work together with the federal states and federal government on forward-looking strategies, whereby an intensive exchange of ideas and experiences and the reduction of bureaucracy are essential for effective action.

Joint action

Ultimately, any transformation will only be successful if the organization succeeds in inspiring its members to follow the new path forward. With this in mind, Universität Hamburg wishes to create an environment in which each individual can become part of the University's sustainability transformation. We invite all members of the University to join us on this journey and would like to thank all those who have made this report possible.

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Appendix

GHG accounting for Universität Hamburg, 2019—Scope 1: Direct emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO_2e**
Direct emissions from combustion processes in stationary facilities	Natural gas	19,507,962.89	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.202	kg CO2/kWh	UBA emissions accounting—renewable energies, p. 83, www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2019-11-07_cc-37-2019_emissionsbilanz-erneuerbarer-energien_2018.pdf	**3,931.17**
	Heating oil	2,000.00	l	Estimate by Dept. 8 (2,000 liters per year to cover peak load)	2.660	kg CO2/l	Emissions factors for calculating the reduction in CO_2 emissions within the Hamburg Climate Plan (2020), extra-light heating oil (in l)	**5.32**
Direct emissions from combustion processes in mobile facilities	Diesel for the vehicle fleet	248,862.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**45.27**
	Gasoline for the vehicle fleet	50,304.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**9.33**
Direct emissions of volatile gases	Refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	2088	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**26.05**
	Refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	1430	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**189.26**
	Total							**4,206.40**

GHG accounting for Universität Hamburg, 2020—Scope 1: direct emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Direct emissions from combustion processes in stationary facilities	Natural gas	19,839,618.74	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.201	kg CO2/kWh	UBA emissions accounting—renewable energies, p. 90, www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2021-12-13_climate-change_71-2021_emissionsbilanz_erneuerbarer_energien_2020_bf_korr-01-2022.pdf	**3,987.76**
	Heating oil	2,000.00	l	Estimate by Dept. 8 (2,000 liters per year to cover peak load)	2.660	kg CO2/l	Emissions factors for calculating the reduction in CO_2 emissions within the Hamburg Climate Plan (2020), extra-light heating oil (in l) & www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_infoblatt_co2_faktoren_2021.pdf?__blob=publicationFile&v=5	**5.32**
Direct emissions from combustion processes in mobile facilities	Diesel for the vehicle fleet	167,578.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**30.82**
	Gasoline for the vehicle fleet	42,101.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**7.63**

Direct emissions of volatile gases	Refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	2088	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**26.05**
	Refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	1430	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**189.26**
	Total							**4,246.84**

GHG accounting for Universität Hamburg, 2021—Scope 1: direct emissions

Scope	Emission source	Amount	Unit	Source	Factor	Unit	Source	t CO2e
Direct emissions from combustion processes in stationary facilities	Natural gas	21,459,836.96	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.202	kg CO2/kWh	UBA emissions accounting—renewable energies, p. 92, www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2022-12-09_climate-change_50-2022_emissionsbilanz_erneuerbarer_energien_2021_bf.pdf	**4,334.89**
	Heating oil	2,000.00	l	Estimate by Dept. 8 (2,000 liters per year to cover peak load)	2.660	kg CO2/l	Emissions factors for calculating the reduction in CO_2 emissions within the Hamburg Climate Plan (2020), extra-light heating oil (in l) & www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_infoblatt_co2_faktoren_2021.pdf?__blob=publicationFile&v=5	**5.32**
Direct emissions from combustion processes in mobile facilities	Diesel for the vehicle fleet	67,318.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**12.24**
	Gasoline for the vehicle fleet	19,245.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**3.32**
Direct emissions of volatile gases	Refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	2088	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**26.05**
	Refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	1430	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**189.26**
	Total							**4,571.08**

GHG accounting for Universität Hamburg, 2022—Scope 1: direct emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Direct emissions from combustion processes in stationary facilities	Natural gas	19,327,456.99	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.202	kg CO2/kWh	UBA emissions accounting—renewable energies, p. 92, www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2022-12-09_climate-change_50-2022_emissionsbilanz_erneuerbarer_energien_2021_bf.pdf	**3,904.15**
	Heating oil	2,000.00	l	Estimate by Dept. 8 (2,000 liters per year to cover peak load)	2.660	kg CO2/l	Emissions factors for calculating the reduction in CO_2 emissions within the Hamburg Climate Plan (2020), extra-light heating oil (in l) & www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_infoblatt_co2_faktoren_2021.pdf?__blob=publicationFile&v=5	**5.32**
Direct emissions from combustion processes in mobile facilities	Diesel for the vehicle fleet	240,458.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**45.70**
	Gasoline for the vehicle fleet	55,406.00	km	Data collected by Universität Hamburg	/	kg CO2e/km	Manufacturer information	**9.57**
Direct emissions of volatile gases	Refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	2088	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**26.05**
	Refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	1430	kg CO2/kg	www.infraserv.com/de/leistungen/facility-management/expertenwissen/f-gase/gwp-rechner	**189.26**
	Total							**4,180.05**

GHG accounting for Universität Hamburg, 2019—Scope 2: indirect emissions from energy supply								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Indirect emissions from purchased electricity	Electricity (electricity mix for Germany)	48,298,649.24	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.474	kg CO2e/kWh	Electricity: Emissions factors for the energy mix for Germany in 2019, UBA (p. 12)	**22,893.56**
Indirect emissions from heating/cooling	District heating	44,905,702.70	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.29	kg CO2e/kWh	Statistical Office for Hamburg and Schleswig Holstein, energy accounting and CO_2 accounting for Hamburg in 2019: www.statistik-nord.de/zahlen-fakten/umwelt-energie/energie/dokumentenansicht/product/3381/energie-und-co2-bilanzen-fuer-hamburg-361?cHash=4201529a752424c94a05eb3c4ae751ea	**13,022.65**
	Total							**35,916.21**

GHG accounting for Universität Hamburg, 2020—Scope 2: indirect emissions from energy supply

Scope	Emission source	Amount	Unit	Source	Factor	Unit	Source	t CO2e
Indirect emissions from purchased electricity	Electricity (electricity mix for Germany)	45,249,009.68	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.432	kg CO2e/kWh	Electricity: Emissions factors for the energy mix for Germany in 2020, UBA (p. 12)	**19,547.57**
Indirect emissions from heating/cooling	District heating	39,000,175.09	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.306	kg CO2e/kWh	Statistical Office for Hamburg and Schleswig Holstein, energy accounting and CO_2 accounting for Hamburg in 2020: www.statistik-nord.de/zahlen-fakten/umwelt-energie/energie/dokumentenansicht/product/3381/energie-und-co2-bilanzen-fuer-hamburg-361?cHash=4201529a752424c94a05eb3c4ae751ea	**11,934.05**
	Total							**31,481.63**

GHG accounting for Universität Hamburg, 2021—Scope 2: indirect emissions from energy supply

Scope	Emission source	Amount	Unit	Source	Factor	Unit	Source	t CO2e
Indirect emissions from purchased electricity	Electricity (electricity mix for Germany)	45,230,456.45	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.475	kg CO2e/kWh	Electricity: Emissions factors for the energy mix for Germany in 2021, UBA (p. 12)	**21,484.47**
Indirect emissions from heating/cooling	District heating	49,841,035.14	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.3	kg CO2e/kWh	Statistical Office for Hamburg and Schleswig Holstein, energy accounting and CO_2 accounting for Hamburg in 2021: www.statistik-nord.de/zahlen-fakten/umwelt-energie/energie/dokumentenansicht/product/3381/energie-und-co2-bilanzen-fuer-hamburg-361?cHash=4201529a752424c94a05eb3c4ae751ea	**14,952.31**
	Total							**36,436.78**

GHG accounting for Universität Hamburg, 2022—Scope 2: indirect emissions from energy supply

Scope	Emission source	Amount	Unit	Source	Factor	Unit	Source	t CO2e
Indirect emissions from purchased electricity	Electricity (electricity mix for Germany)	45,936,298.93	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.498	kg CO2e/kWh	Electricity: Emissions factors for the energy mix for Germany in 2022, UBA (p. 17)	**22,876.28**
Indirect emissions from heating/cooling	District heating	46,254,668.04	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.3	kg CO2e/kWh	Statistical Office for Hamburg and Schleswig Holstein, energy accounting and CO_2 accounting for Hamburg in 2021: www.statistik-nord.de/zahlen-fakten/umwelt-energie/energie/dokumentenansicht/product/3381/energie-und-co2-bilanzen-fuer-hamburg-361?cHash=4201529a752424c94a05eb3c4ae751ea	**13,876.40**
	Total							**36,752.68**

GHG accounting for Universität Hamburg, 2019—Scope 3: upstream emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fuel and energy-related emissions	**Heating**							**877.15**
	Upstream natural gas	19,507,962.89	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.045	kg CO2e/kWh	UBA (2019): Emissions accounting—renewable energy sources, p. 83, natural gas, upstream	**876.24**
	Upstream heating oil	19,880.00	kWh	Estimate by Universität Hamburg	0.046	kg CO2e/kWh	UBA (2021): Emissions accounting—renewable energy sources, p. 90, upstream	**0.91**
	Fuels							**15.35**
	Upstream diesel for the vehicle fleet	22,631.00	km	Data collected by Universität Hamburg	0.043	kg CO2e/km	Defra 2019, WTT-pass vehs & travel- land, diesel MPV	**0.98**
		226,231.00	km	Data collected by Universität Hamburg	0.050	kg CO2e/km	Defra 2019, WTT-pass vehs & travel- land, diesel large car	**11.33**
	Upstream gasoline for the vehicle fleet	36,020.00	km	Data collected by Universität Hamburg	0.054	kg CO2e/km	Defra 2019, WTT-pass vehs & travel- land, gasoline, MPV	**1.95**
		14,284.00	km	Data collected by Universität Hamburg	0.077	kg CO2e/km	Defra 2019, WTT-pass vehs & travel- land, gasoline, large car	**1.10**
	Refrigerants							**2.21**
	Upstream refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**0.19**
	Upstream refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**2.02**
	Electricity and district heating							**4,662.20**
	Upstream electricity (electricity mix)	48,298,649.24	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.056	kg CO2e/kWh	UBA (2019): Emissions accounting—renewable energy sources, p. 83, electricity, upstream incl. network losses	**2,682.27**
	Upstream District heating	44,905,702.70	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.044	kg CO2e/kg	UBA (2019): Emissions accounting—renewable energy sources, p. 83, district heating, upstream	**1,979.94**
	Total							**5,556.91**

GHG accounting for Universität Hamburg, 2020—Scope 3: upstream emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fuel and energy-related emissions	**Heating**							**791.61**
	Upstream natural gas	19,839,618.74	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.040	kg CO2e/kWh	UBA (2021): Emissions accounting—renewable energy sources, p. 90, natural gas, upstream	**790.71**
	Upstream heating oil	19,880.00	kWh	Estimate by Universität Hamburg	0.046	kg CO2e/kWh	UBA (2021): Emissions accounting—renewable energy sources, p. 90, upstream	**0.91**
	Fuels							**10.65**
	Upstream diesel for the vehicle fleet	21,847.00	km	Data collected by Universität Hamburg	0.042	kg CO2e/km	Defra 2020, WTT-pass vehs & travel- land, diesel MPV	**0.93**
		145,731.00	km	Data collected by Universität Hamburg	0.049	kg CO2e/km	Defra 2020, WTT-pass vehs & travel- land, diesel large car	**7.17**
	Upstream gasoline for the vehicle fleet	28,470.00	km	Data collected by Universität Hamburg	0.053	kg CO2e/km	Defra 2020, WTT-pass vehs & travel- land, gasoline, MPV	**1.51**
		13,631.00	km	Data collected by Universität Hamburg	0.076	kg CO2e/km	Defra 2020, WTT-pass vehs & travel- land, gasoline, large car	**1.04**
	Refrigerants							**2.21**
	Upstream refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**0.19**
	Upstream refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**2.02**
	Electricity and district heating							**4,070.86**
	Upstream electricity (electricity mix)	45,249,009.68	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.055	kg CO2e/kWh	UBA (2021): Emissions accounting—renewable energy sources, p. 91, electricity, upstream incl. network losses	**2,477.47**
	Upstream District heating	39,000,175.09	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.041	kg CO2e/kg	UBA (2021): Emissions accounting—renewable energy sources, p. 90, district heating, upstream	**1,593.39**
	Total							**4,875.33**

GHG accounting for Universität Hamburg, 2021—Scope 3: upstream emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fuel and energy-related emissions	**Heating**							**905.59**
	Upstream natural gas	21,459,836.96	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.042	kg CO2e/kWh	UBA (2022): Emissions accounting—renewable energy sources, p. 92, natural gas, upstream	**904.68**
	Upstream heating oil	19,880.00	kWh	Estimate by Universität Hamburg	0.046	kg CO2e/kWh	UBA (2022): Emissions accounting—renewable energy sources, p. 92, upstream	**0.91**
	Fuels							**4.49**
	Upstream diesel for the vehicle fleet	10,201.00	km	Data collected by Universität Hamburg	0.043	kg CO2e/km	Defra 2021, WTT-pass vehs & travel- land, diesel MPV	**0.44**
		57,117.00	km	Data collected by Universität Hamburg	0.051	kg CO2e/km	Defra 2021, WTT-pass vehs & travel- land, diesel large car	**2.89**
	Upstream gasoline for the vehicle fleet	14,504.00	km	Data collected by Universität Hamburg	0.055	kg CO2e/km	Defra 2021, WTT-pass vehs & travel- land, gasoline, MPV	**0.79**
		4,741.00	km	Data collected by Universität Hamburg	0.078	kg CO2e/km	Defra 2021, WTT-pass vehs & travel- land, gasoline, large car	**0.37**
	Refrigerants							**2.21**
	Upstream refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**0.19**
	Upstream refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**2.02**
	Electricity and district heating							**4,704.58**
	Upstream electricity (electricity mix)	45,230,456.45	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.057	kg CO2e/kWh	UBA (2022): Emissions accounting—renewable energy sources, p. 93, electricity, upstream incl. network losses	**2,580.85**
	Upstream District heating	49,841,035.14	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.043	kg CO2e/kg	UBA (2022): Emissions accounting—renewable energy sources, p. 93, district heating, upstream	**2,123.73**
	Total							**5,616.86**

GHG accounting for Universität Hamburg, 2022—Scope 3: upstream emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fuel and energy-related emissions	**Heating**							**815.70**
	Upstream natural gas	19,327,456.99	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.042	kg CO2e/kWh	UBA (2022): Emissions accounting—renewable energy sources, p. 92, natural gas, upstream	**814.79**
	Upstream heating oil	19,880.00	kWh	Estimate by Universität Hamburg	0.046	kg CO2e/kWh	UBA (2022): Emissions accounting—renewable energy sources, p. 92, upstream	**0.91**
	Fuels							**15.42**
	Upstream diesel for the vehicle fleet	20,941.00	km	Data collected by Universität Hamburg	0.043	kg CO2e/km	Defra 2022, WTT-pass vehs & travel- land, diesel MPV	**0.89**
		219,517.00	km	Data collected by Universität Hamburg	0.051	kg CO2e/km	Defra 2022, WTT-pass vehs & travel- land, diesel large car	**11.11**
	Upstream gasoline for the vehicle fleet	38,806.00	km	Data collected by Universität Hamburg	0.055	kg CO2e/km	Defra 2022, WTT-pass vehs & travel- land, gasoline, MPV	**2.12**
		16,600.00	km	Data collected by Universität Hamburg	0.078	kg CO2e/km	Defra 2022, WTT-pass vehs & travel- land, gasoline, large car	**1.30**
	Refrigerants							**2.21**
	Upstream refrigerant R 410a	11.34	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**0.19**
	Upstream refrigerant R 134 a	120.32	kg	Information from Universität Hamburg and assumptions based on research and average values	16.765	kg CO2e/kWh	Ecoinvent 3.9.1, market for 134A	**2.02**
	Electricity and district heating							**4,592.04**
	Upstream electricity (electricity mix)	45,936,298.93	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.057	kg CO2e/kWh	UBA (2022): Emissions accounting—renewable energy sources, p. 93, electricity, upstream incl. network losses	**2,621.13**
	Upstream District heating	46,254,668.04	kWh	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.043	kg CO2e/kg	UBA (2022): Emissions accounting—renewable energy sources, p. 93, district heating, upstream	**1,970.91**
	Total							**5,425.36**

GHG accounting for Universität Hamburg, 2019—Scope 3: supply and disposal								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Supply and disposal	**Fresh water and wastewater**							**173.99**
	Fresh water	174,774.55	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.344	kg CO2e/m^3	Defra 2019, water supply	**60.12**
	Wastewater	160,832.61	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.708	kg CO2e/m^3	Defra 2019, water treatment	**113.87**
	Waste							**1,107.89**
	Lightweight packaging	41.40	t	Data collected by Universität Hamburg, city (estimated values)	21.354	kg CO2e/t	Defra 2019, waste disposal, plastic, plastics: average plastics, closed-loop	**0.88**
	Glass	41.50	t	Data collected by Universität Hamburg, haulage on behalf of the city cleaning services (estimated values)	21.354	kg CO2e/t	Defra 2019, waste disposal, other, glass, closed-loop	**0.89**
	Electronic waste	48.80	t	Data collected by Universität Hamburg (very precise data available)	21.354	kg CO2e/t	Defra 2019, waste disposal, electrical items, WEEE-mixed, open-loop	**1.04**
	Old files / data storage devices	57.50	t	Data collected by Universität Hamburg, framework contract with Reisswolf	21.354	kg CO2e/t	Defra 2019, waste disposal, electrical items, WEEE-mixed, open-loop	**1.23**
	Waste paper	308.10	t	Data collected by Universität Hamburg, city (estimated values)	21.354	kg CO2e/t	Defra 2019, waste disposal, paper, paper and board: paper, closed-loop	**6.58**
	Other waste (incl. bulky waste)	284.35	t	Data collected by Universität Hamburg, city cleaning services, HIG	458.176	kg CO2e/t	Defra 2020, waste disposal, refuse, commercial and industrial waste, landfill	**130.28**
	Hazardous waste (for recycling and disposal)	77.80	t	Data collected by Universität Hamburg, nearest hazardous waste incineration (very precise data available)	2,411.500	kg CO2e/t	Ecoinvent 3.8; treatment of hazardous waste, incineration, Europe without Switzerland	**187.61**
	Mixed municipal waste	767.10	t	Data collected by Universität Hamburg, city (estimated values)	1,016.000	kg CO2/t	www.emas.de/fileadmin/user_upload/ue/reg/DE-131-00027_MVR-Muellverwertung-Rugenberger-Damm.pdf	**779.37**
	Total							**1,281.88**

GHG accounting for Universität Hamburg, 2020—Scope 3: supply and disposal								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Supply and disposal	**Fresh water and wastewater**							**168.19**
	Fresh water	181,054.93	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.344	kg CO2e/m^3	Defra 2020, water supply	**62.28**
	Wastewater	149,580	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.708	kg CO2e/m^3	Defra 2020, water treatment	**105.90**
	Waste							**1,081.84**
	Lightweight packaging	46.80	t	Data collected by Universität Hamburg, city (estimated values)	21.317	kg CO2e/t	Defra 2020, waste disposal, plastic, plastics: average plastics, closed-loop	**1.00**
	Glass	41.50	t	Data collected by Universität Hamburg, haulage on behalf of the city cleaning services (estimated values)	21.317	kg CO2e/t	Defra 2020, waste disposal, other, glass, closed-loop	**0.88**
	Electronic waste	35.80	t	Data collected by Universität Hamburg (very precise data available)	21.317	kg CO2e/t	Defra 2020, waste disposal, electrical items, WEEE-mixed, open-loop	**0.76**
	Old files / data storage devices	18.10	t	Data collected by Universität Hamburg, framework contract with Reisswolf	21.317	kg CO2e/t	Defra 2020, waste disposal, electrical items, WEEE-mixed, open-loop	**0.39**
	Waste paper	333.70	t	Data collected by Universität Hamburg, city (estimated values)	21.317	kg CO2e/t	Defra 2020, waste disposal, paper, paper and board: paper, closed-loop	**7.11**
	Other waste (incl. bulky waste)	149.90	t	Data collected by Universität Hamburg, city cleaning services, HIG	458.176	kg CO2e/t	Defra 2020, waste disposal, refuse, commercial and industrial waste, landfill	**68.68**
	Hazardous waste (for recycling and disposal)	67.10	t	Data collected by Universität Hamburg , nearest hazardous waste incineration (very precise data available)	2,473.500	kg CO2e/t	Ecoinvent 3.9.1; treatment of hazardous waste, incineration, Europe without Switzerland	**165.97**
	Mixed municipal waste	810.30	t	Data collected by Universität Hamburg, city (estimated values)	1,033.000	kg CO2/t	MVR-22-2_Umwelterklärung_Innen.qxp (mvr-hh.de) (p. 23)	**837.04**
	Total							**1,250.02**

GHG accounting for Universität Hamburg, 2021—Scope 3: supply and disposal								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Supply and disposal	**Fresh water and wastewater**							**61.13**
	Fresh water	144,600.80	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.149	kg CO2e/m^3	Defra 2021, water supply	**21.55**
	Wastewater	145,516	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.272	kg CO2e/m^3	Defra 2021, water treatment	**39.58**
	Waste							**1,165.06**
	Lightweight packaging	46.30	t	Data collected by Universität Hamburg, city (estimated values)	21.294	kg CO2e/t	Defra 2021, waste disposal, plastic, plastics: average plastics, closed-loop	**0.99**
	Glass	41.50	t	Data collected by Universität Hamburg, haulage on behalf of the city cleaning services (estimated values)	21.294	kg CO2e/t	Defra 2021, waste disposal, other, glass, closed-loop	**0.88**
	Electronic waste	35.00	t	Data collected by Universität Hamburg (very precise data available)	21.294	kg CO2e/t	Defra 2021, waste disposal, electrical items, WEEE-mixed, open-loop	**0.75**
	Old files / data storage devices	33.90	t	Data collected by Universität Hamburg, framework contract with Reisswolf	21.294	kg CO2e/t	Defra 2021, waste disposal, electrical items, WEEE-mixed, open-loop	**0.72**
	Waste paper	353.60	t	Data collected by Universität Hamburg, city (estimated values)	21.294	kg CO2e/t	Defra 2021, waste disposal, paper, paper and board: paper, closed-loop	**7.53**
	Other waste (incl. bulky waste)	448.05	t	Data collected by Universität Hamburg, city cleaning services, HIG	467.046	kg CO2e/t	Defra 2021, waste disposal, refuse, commercial and industrial waste, landfill	**209.26**
	Hazardous waste (for recycling and disposal)	72.10	t	Data collected by Universität Hamburg , nearest hazardous waste incineration (very precise data available)	2,473.500	kg CO2e/t	Ecoinvent 3.9.1; treatment of hazardous waste, incineration, Europe without Switzerland	**178.34**
	Mixed municipal waste	759.00	t	Data collected by Universität Hamburg, city (estimated values)	1,010.000	kg CO2/t	MVR-22-2_Umwelterklärung_Innen.qxp (mvr-hh.de) (p. 23)	**766.59**
	Total							**1,226.18**

GHG accounting for Universität Hamburg, 2022—Scope 3: supply and disposal								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Supply and disposal	**Fresh water and wastewater**							**47.15**
	Fresh water	122,185.22	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.149	kg CO2e/m^3	Defra 2022, water supply	**18.21**
	Wastewater	106,417.32	m^3	Data collected by Universität Hamburg, minus the third-party consumption according to the area rented	0.272	kg CO2e/m^3	Defra 2022, water treatment	**28.95**
	Waste							**1,193.14**
	Lightweight packaging	50.10	t	Data collected by Universität Hamburg, city (estimated values)	21.280	kg CO2e/t	Defra 2022, waste disposal, plastic, plastics: average plastics, closed-loop	**1.07**
	Glass	41.60	t	Data collected by Universität Hamburg, haulage on behalf of the city cleaning services (estimated values)	21.280	kg CO2e/t	Defra 2022, waste disposal, other, glass, closed-loop	**0.89**
	Electronic waste	35.90	t	Data collected by Universität Hamburg (very precise data available)	21.280	kg CO2e/t	Defra 2022, waste disposal, electrical items, WEEE-mixed, open-loop	**0.76**
	Old files / data storage devices	43.10	t	Data collected by Universität Hamburg, framework contract with Reisswolf	21.280	kg CO2e/t	Defra 2022, waste disposal, electrical items, WEEE-mixed, open-loop	**0.92**
	Waste paper	327.60	t	Data collected by Universität Hamburg, city (estimated values)	21.280	kg CO2e/t	Defra 2022, waste disposal, paper, paper and board: paper, closed-loop	**6.97**
	Other waste (incl. bulky waste)	541.85	t	Data collected by Universität Hamburg, city cleaning services, HIG	467.008	kg CO2e/t	Defra 2022, waste disposal, refuse, commercial and industrial waste, landfill	**253.05**
	Hazardous waste (for recycling and disposal)	69.50	t	Data collected by Universität Hamburg , nearest hazardous waste incineration (very precise data available)	2,473.500	kg CO2e/t	Ecoinvent 3.9.1; treatment of hazardous waste, incineration, Europe without Switzerland	**171.91**
	Mixed municipal waste	777.80	t	Data collected by Universität Hamburg, city (estimated values)	974.000	kg CO2/t	MVR-22-2_Umwelterklärung_Innen.qxp (mvr-hh.de) (p. 23)	**757.58**
	Total							**1,240.29**

GHG accounting for Universität Hamburg, 2019—Scope 3: procurement								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Purchased goods	**Paper**							**72.91**
	Virgin paper	24.25	t	Data collected by Universität Hamburg	952.680	kg CO2e/t	Defra 2019, material use, paper, paper and board: paper, primary material production	**23.10**
	Recycled paper	62.71	t	Data collected by Universität Hamburg	794.240	kg CO2e/t	Defra 2019, material use, paper, paper and board: paper, closed-loop source	**49.81**
	Library							**28.78**
	Books	26,286	kg	Data collected by Universität Hamburg	0.953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**25.04**
	Journals	3,927	kg	Data collected by Universität Hamburg	0.953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**3.74**
	Procurement							**8,687.65**
	Buildings and green spaces	3,502,865.58	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**1,596.33**
	Laboratory supplies	15,771,530.81	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**2,345.18**
	Furnishings	2,559,859.79	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**703.90**
	IT needs	8,089,121.37	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**3,169.93**
	Office supplies	487,193.86	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**156.65**
	Health and safety supplies	676,762.02	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**237.73**
	Catering	239,899.40	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**105.44**
	Other supplies	466,451.07	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**372.49**
	Total							**8,789.35**

GHG accounting for Universität Hamburg, 2020—Scope 3: procurement								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Purchased goods	**Paper**							**42.09**
	Virgin paper	14.01	t	Data collected by Universität Hamburg	919,400	kg CO2e/t	Defra 2020, material use, paper, paper and board: paper, primary material production	**12.88**
	Recycled paper	39.50	t	Data collected by Universität Hamburg	739,400	kg CO2e/t	Defra 2020, material use, paper, paper and board: paper, closed-loop source	**29.21**
	Library							**27.11**
	Books	24,656	kg	Data collected by Universität Hamburg	0,953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**23.49**
	Journals	3.802	kg	Data collected by Universität Hamburg	0,953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**3.62**
	Procurement							**10,096.35**
	Buildings and green spaces	3,496,631.43	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**1,850.25**
	Laboratory supplies	11,273,366.10	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**1,900.89**
	Furnishings	2,259,334.13	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**632.22**
	IT needs	15,982,812.69	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**5,075.86**
	Office supplies	510,731.45	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**156.92**
	Health and safety supplies	684,504.81	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**205.61**
	Catering	64,492.44	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**26.07**
	Other supplies	330,726.40	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**248.53**
	Total							**10,165.55**

GHG accounting for Universität Hamburg, 2021—Scope 3: procurement								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Purchased goods	**Paper**							**25.52**
	Virgin paper	10.66	t	Data collected by Universität Hamburg	919,400	kg CO2e/t	Defra 2021, material use, paper, paper and board: paper, primary material production	**9.80**
	Recycled paper	21.26	t	Data collected by Universität Hamburg	739,400	kg CO2e/t	Defra 2021, material use, paper, paper and board: paper, closed-loop source	**15.72**
	Library							**24.22**
	Books	21,522	kg	Data collected by Universität Hamburg	0,953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**20.50**
	Journals	3,905	kg	Data collected by Universität Hamburg	0,953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**3.72**
	Procurement							**8,398.77**
	Buildings and green spaces	3,333,616.74	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**1,738.79**
	Laboratory supplies	16,311,447.35	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**~~2.249,51~~**
	Furnishings	2,093,465.78	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**570.97**
	IT needs	8,850,031.24	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**3,359.18**
	Office supplies	302,489.66	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**92.28**
	Health and safety supplies	744,783.79	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**171.62**
	Catering	43,865.10	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**14.44**
	Other supplies	301,463.86	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**201.98**
	Total							**8,448.52**

GHG accounting for Universität Hamburg, 2022—Scope 3: procurement								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Purchased goods	**Paper**							**28.00**
	Virgin paper	10.28	t	Data collected by Universität Hamburg	919.400	kg CO2e/t	Defra 2022, material use, paper, paper and board: paper, primary material production	**9.45**
	Recycled paper	25.08	t	Data collected by Universität Hamburg	739.400	kg CO2e/t	Defra 2022, material use, paper, paper and board: paper, closed-loop source	**18.54**
	Library							**22.71**
	Books	20,242	kg	Data collected by Universität Hamburg	0.953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**19.28**
	Journals	3,597	kg	Data collected by Universität Hamburg	0.953	kg CO2e/kg	Defra 2019, material use, other, books, primary material production	**3.43**
	Procurement							**9,626.57**
	Buildings and green spaces	5,192,125.49	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**2,435.34**
	Laboratory supplies	17,433,174.86	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**2,488.69**
	Furnishings	2,365,571.33	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**644.11**
	IT needs	8,805,509.89	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**3,511.43**
	Office supplies	355,599.97	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**109.52**
	Health and safety supplies	616,561.32	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**180.77**
	Catering	255,315.55	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**107.05**
	Other supplies	176,333.54	EUR	Data collected by Universität Hamburg, calculation in a separate table			USEPA, Defra and Ecoinvent	**149.66**
	Total							**9,677.28**

GHG accounting for Universität Hamburg, 2019—Scope 3: fixed assets and investments											
Scope	**Subcategory**	**Emission source**	**Amount**	**Unit**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fixed assets and investments	Vehicles	Dacia Duster (gasoline)	1	Unit	1,518.00	kg	Data collected by Universität Hamburg, weight conversion on dacia.de	7.02	kg CO2e/kg	Ecoinvent 3.9.1, passenger car production, petrol, natural gas, GLO	**10.66**
		VW Bus (gasoline)	1	Unit	2,194.00	kg	Data collected by Universität Hamburg, weight conversion on vw.de	7.02	kg CO2e/kg	Ecoinvent 3.9.1, passenger car production, petrol, natural gas, GLO	**15.40**
	Total										**26.06**

GHG accounting for Universität Hamburg, 2020—Scope 3: fixed assets and investments											
Scope	**Subcategory**	**Emission source**	**Amount**	**Unit**			**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fixed assets and investments											
	Total										**0.00**

GHG accounting for Universität Hamburg, 2021—Scope 3: fixed assets and investments											
Scope	**Subcategory**	**Emission source**	**Amount**	**Unit**			**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fixed assets and investments	Vehicles	VW Caddy (gasoline)	1	Unit	1,833.00	kg	Data collected by Universität Hamburg, weight conversion on vw.de	7.02	kg CO2e/kg	Ecoinvent 3.9.1, passenger car production, petrol, natural gas, GLO	**12.87**
		Mercedes Sprinter (diesel)	1	Unit	1,995.00	kg	Data collected by Universität Hamburg, weight conversion on mercedes-benz.lu	7.11	kg CO2e/kg	Ecoinvent 3.9.1, passenger car production, diesel, GLO	**14.18**
	Total										**27.05**

GHG accounting for Universität Hamburg, 2022—Scope 3: fixed assets and investments											
Scope	**Subcategory**	**Emission source**	**Amount**	**Unit**			**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Fixed assets and investments	Vehicles	Mercedes Vito (diesel)	1	Unit	1,992.00	kg	Data collected by Universität Hamburg, weight conversion on mercedes-benz.lu	7.11	kg CO2e/kg	Ecoinvent 3.9.1, passenger car production, diesel, GLO	**14.16**
		Tractor LS MT3.40 HAST (diesel)	1	Unit	3,000.00	kg	Data collected by Universität Hamburg, conversion based on information from Ecoinvent	8.04	kg CO2e/kg	Ecoinvent 3.9.1, market for tractor, 4-wheel, agricultural, RoW	**24.11**
	Total										**38.27**

GHG accounting for Universität Hamburg, 2019—Scope 3: rented and leased tangible assets								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Rented and leased tangible assets								
	Total							**0.00**

GHG accounting for Universität Hamburg, 2020—Scope 3: rented and leased tangible assets								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Rented and leased tangible assets								
	Total							**0.00**

GHG accounting for Universität Hamburg, 2021—Scope 3: rented and leased tangible assets								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Rented and leased tangible assets	Leased vehicles	5,424	km	Information from Universität Hamburg	/	/	CO2 emissions combined in (g/km) by vehicle model—see overview in the respective supplementary table	**0.69**
	Total							**0.69**

GHG accounting for Universität Hamburg, 2022—Scope 3: rented and leased tangible assets								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Rented and leased tangible assets	Leased vehicles	12,406	km	Information from Universität Hamburg	/	/	CO2 emissions combined in (g/km) by vehicle model—see overview in the respective supplementary table	**1.55**
	Total							**1.55**

GHG accounting for Universität Hamburg, 2019—Scope 3: work-related travel and semesters abroad								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Work-related travel and semesters abroad	**Flights**							**4,631.21**
	Work-related travel—long-haul flights, business class	3,144,932.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.434	kg CO2e/pkm	Defra 2019, business travel-air, flight, long-haul, to/from UK, business class, with radiative forcing	**1,434.66**
	Work-related travel—long-haul flights, economy class	12,579,727.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.150	kg CO2e/pkm	Defra 2019, business travel-air, flight, long-haul, to/from UK, economy class, with radiative forcing	**1,978.80**
	Work-related travel—short-haul flights, business class	156,058.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.234	kg CO2e/pkm	Defra 2019, business travel-air, flight, short-haul, to/from UK, business class, with radiative forcing	**730.66**
	Work-related travel—short-haul flights, economy class	3,127,808.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.156	kg CO2e/pkm	Defra 2019, business travel-air, flight, short-haul, to/from UK, economy class, with radiative forcing	**487.09**
	Other modes of transport							**120.04**
	Work-related travel—train travel	3,275,341.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.029	kg CO2e/pkm	TREMOD 6.21; UBA 2019, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**94.98**
	Work-related travel—car travel	162,697.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	TREMOD 6.21; UBA, 2019, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**25.06**
	Travel to/from airport							**13.68**
	Travel to/from airport—taxi	66,740.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	TREMOD 6.21; UBA, 2019, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**10.28**
	Travel to/from airport—public transport	66,740.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.051	kg CO2e/EUR	TREMOD 6.21; UBA 2019, modes of transport, railway, short-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**3.40**
	Expenditure-based emissions							**19.39**
	Work-related travel—taxi	4,600.29	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**2.82**

Work-related travel and semesters abroad	Work-related travel—public transport	7,531.00	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.384	kg CO2e/EUR	DEFRA Table-13, 2019, rail transport services, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**2.89**
	Work-related travel—gasoline	22,306.41	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**13.67**
	Flights							**1,116.17**
	Semesters abroad—long-haul flights	4,702,310.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.196	kg CO2e/pkm	Defra 2019, business travel-air, flight, long-haul, to/from UK, average passenger, with radiative forcing	**919.87**
	Semesters abroad—short-haul flights	1,239,951.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.158	kg CO2e/pkm	Defra 2019, business travel-air, flight, short-haul, to/from UK, average passenger, with radiative forcing	**196.31**
	Other modes of transport							**8.82**
	Semesters abroad—train travel	48,214.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.029	kg CO2e/pkm	TREMOD 6.21; UBA 2019, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**1.40**
	Semesters abroad—car travel	48,214.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	TREMOD 6.21; UBA, 2019, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**7.42**
	Total							**5,909.32**

GHG accounting for Universität Hamburg, 2020—Scope 3: work-related travel and semesters abroad								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Work-related travel and semesters abroad	**Flights**							**1,034.63**
	Work-related travel—long-haul flights, business class	879,906.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.424	kg CO2e/pkm	Defra 2020, business travel-air, flight, long-haul, to/from UK, business class, with radiative forcing	**391.60**
	Work-related travel—long-haul flights, economy class	3,519,625.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.146	kg CO2e/pkm	Defra 2020, business travel-air, flight, long-haul, to/from UK, economy class, with radiative forcing	**540.11**
	Work-related travel—short-haul flights, business class	31,165.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.229	kg CO2e/pkm	Defra 2020, business travel-air, flight, short-haul, to/from UK, business class, with radiative forcing	**7.15**
	Work-related travel—short-haul flights, economy class	626,024.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.153	kg CO2e/pkm	Defra 2020, business travel-air, flight, short-haul, to/from UK, economy class, with radiative forcing	**95.77**
	Other modes of transport							**24.91**
	Work-related travel—train travel	679,101.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.029	kg CO2e/pkm	TREMOD 6.21; UBA 2019, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**19.69**
	Work-related travel—car travel	33,880.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	TREMOD 6.21; UBA, 2019, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**5.22**
	Travel to/from airport							**2.98**
	Travel to/from airport—taxi	14,540.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	TREMOD 6.21; UBA, 2019, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**2.24**
	Travel to/from airport—public transport	14,540.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.051	kg CO2e/EUR	TREMOD 6.21; UBA 2019, modes of transport, railway, short-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**0.74**
	Expenditure-based emissions							**4.14**

Work-related travel and semesters abroad	Work-related travel—taxi	2,530.19	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**1.55**
	Work-related travel—public transport	609.73	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.384	kg CO2e/EUR	DEFRA Table-13, 2019, rail transport services, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**0.23**
	Work-related travel—gasoline	3,834.44	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**2.35**
	Flights							**830.41**
	Semesters abroad—long-haul flights	3,375,262.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.191	kg CO2e/pkm	Defra 2020, business travel-air, flight, long-haul, to/from UK, average passenger, with radiative forcing	**644.17**
	Semesters abroad—short-haul flights	1,197,433.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.156	kg CO2e/pkm	Defra 2020, business travel-air, flight, short-haul, to/from UK, average passenger, with radiative forcing	**186.24**
	Other modes of transport							**9.71**
	Semesters abroad—train travel	53,066.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.029	kg CO2e/pkm	TREMOD 6.21; UBA 2019, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**1.54**
	Semesters abroad—car travel	53,066.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	TREMOD 6.21; UBA, 2019, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**8.17**
	Total							**1,906.77**

GHG accounting for Universität Hamburg, 2021—Scope 3: work-related travel and semesters abroad								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
	Flights							**361.65**
Work-related travel and semesters abroad	Work-related travel—long-haul flights, business class	263,096.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.429	kg CO2e/pkm	Defra 2021, business travel-air, flight, long-haul, to/from UK, business class, with radiative forcing	**118.46**
	Work-related travel—long-haul flights, economy class	1,052,384.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.148	kg CO2e/pkm	Defra 2021, business travel-air, flight, long-haul, to/from UK, economy class, with radiative forcing	**163.40**
	Work-related travel—short-haul flights, business class	24,284.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.227	kg CO2e/pkm	Defra 2021, business travel-air, flight, short-haul, to/from UK, business class, with radiative forcing	**5.50**
	Work-related travel—short-haul flights, economy class	491,939.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.151	kg CO2e/pkm	Defra 2021, business travel-air, flight, short-haul, to/from UK, economy class, with radiative forcing	**74.29**
	Other modes of transport							**32.73**
	Work-related travel—train travel	603,879.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.046	kg CO2e/pkm	TREMOD 6.21; UBA 2021, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**27.78**
	Work-related travel—car travel	30,551.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.162	kg CO2e/pkm	TREMOD 6.21; UBA, 2021, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**4.95**
	Travel to/from airport							**2.43**
	Travel to/from airport—taxi	9,540.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.162	kg CO2e/pkm	TREMOD 6.21; UBA, 2021, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**1.55**
	Travel to/from airport—public transport	9,540.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.093	kg CO2e/EUR	TREMOD 6.21; UBA 2021, modes of transport, railway, short-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**0.89**
	Expenditure-based emissions							**3.45**

Work-related travel and semesters abroad	Work-related travel—taxi	1,085.10	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**0.67**
	Work-related travel—public transport	965.86	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.384	kg CO2e/EUR	DEFRA Table-13, 2019, rail transport services, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**0.37**
	Work-related travel—gasoline	3,936.88	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**2.41**
	Flights							**147.13**
	Semesters abroad—long-haul flights	473,833.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.193	kg CO2e/pkm	Defra 2021, business travel-air, flight, long-haul, to/from UK, average passenger, with radiative forcing	**91.49**
	Semesters abroad—short-haul flights	362,393.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	Defra 2021, business travel-air, flight, short-haul, to/from UK, average passenger, with radiative forcing	**55.64**
	Other modes of transport							**4.39**
	Semesters abroad—train travel	21,102.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.046	kg CO2e/pkm	TREMOD 6.21; UBA 2021, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**0.97**
	Semesters abroad—car travel	21,102.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.162	kg CO2e/pkm	TREMOD 6.21; UBA, 2021, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**3.42**
	Total							**551.78**

GHG accounting for Universität Hamburg, 2022—Scope 3: Work-related travel and semesters abroad								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
	Flights							**1,585.69**
Work-related travel and semesters abroad	Work-related travel—long-haul flights, business class	1,151,274.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.429	kg CO2e/pkm	Defra 2022, business travel-air, flight, long-haul, to/from UK, business class, with radiative forcing	**518.37**
	Work-related travel—long-haul flights, economy class	4,605,094.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.148	kg CO2e/pkm	Defra 2022, business travel-air, flight, long-haul, to/from UK, economy class, with radiative forcing	**715.00**
	Work-related travel—short-haul flights, business class	109,855.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.227	kg CO2e/pkm	Defra 2022, business travel-air, flight, short-haul, to/from UK, business class, with radiative forcing	**24.88**
	Work-related travel—short-haul flights, economy class	2,168,099.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.151	kg CO2e/pkm	Defra 2022, business travel-air, flight, short-haul, to/from UK, economy class, with radiative forcing	**327.43**
	Other modes of transport							**91.27**
	Work-related travel—train travel	1,699,380.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.046	kg CO2e/pkm	TREMOD 6.21; UBA 2021, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**78.17**
	Work-related travel—car travel	80,848.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.162	kg CO2e/pkm	TREMOD 6.21; UBA, 2021, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**13.10**
	Travel to/from airport							**8.90**
	Travel to/from airport—taxi	34,920.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.162	kg CO2e/pkm	TREMOD 6.21; UBA, 2021, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**5.66**
	Travel to/from airport—public transport	34,920.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.093	kg CO2e/EUR	TREMOD 6.21; UBA 2021, modes of transport, railway, short-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**3.25**
	Expenditure-based emissions							**6.86**

Work-related travel and semesters abroad	Work-related travel—taxi	2,610.28	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**1.60**
	Work-related travel—public transport	1,419.83	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.384	kg CO2e/EUR	DEFRA Table-13, 2019, rail transport services, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**0.55**
	Work-related travel—gasoline	7,694.32	EUR	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.613	kg CO2e/EUR	DEFRA Table-13, 2019, land transport services and transport services via pipelines, excluding rail transport, converted to EUR (www.exchange-rates.org/de/wechselkursverlauf/gbp-eur-2019-12-31)	**4.72**
	Flights							**430.25**
	Semesters abroad—long-haul flights	1,282,696.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.193	kg CO2e/pkm	Defra 2022, business travel-air, flight, long-haul, to/from UK, average passenger, with radiative forcing	**247.68**
	Semesters abroad—short-haul flights	1,189,172.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.154	kg CO2e/pkm	Defra 2022, business travel-air, flight, short-haul, to/from UK, average passenger, with radiative forcing	**182.57**
	Other modes of transport							**7.24**
	Semesters abroad—train travel	34,827.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.046	kg CO2e/pkm	TREMOD 6.21; UBA 2021, modes of transport, railway, long-distance transport (taking the energy mix for Germany into account); www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_grafik	**1.60**
	Semesters abroad—car travel	34,827.00	pkm	Information from Universität Hamburg, incl. information from HIC (see supplementary table)	0.162	kg CO2e/pkm	TREMOD 6.21; UBA, 2021, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**5.64**
	Total							**2,130.22**

GHG accounting for Universität Hamburg, 2019—Scope 3: commuter emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Commuting	**Employees**							**1,984.32**
	Employees— car travel	6,437,220	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**1,042.83**
	Employees— public transport	26,015,073	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.034	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=0.101 kg CO_2e/pkm; source: Hochbahn Hamburg), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/28776/e83a1802f-3b3f01008faf4f8f8116d9f/download-finanzteil-2021-data.pdf) and S-Bahn (EF=0; source: DB)	**874.11**
	Employees— motorbike	373,214	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**53.74**
	Employees— e-scooter	108,239	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**13.64**
	Students							**6,805.55**
	Students— car travel	13,028,392	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**2,110.60**
	Students— public transport	137,534,606	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.034	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=0.101 kg CO_2e/pkm; source: Hochbahn Hamburg), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/28776/e83a1802f-3b3f01008faf4f8f8116d9f/download-finanzteil-2021-data.pdf) and S-Bahn (EF=0; source: DB)	**4,621.16**
	Students— motorbike	462,655	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**66.62**
	Students— e-scooter	56,889	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**7.17**
	Total							**8,789.87**

GHG accounting for Universität Hamburg, 2020—Scope 3: Commuter emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO2e**
Commuting	**Employees**							**985.80**
	Employees— car travel	2,690,122	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**435.80**
	Employees— public transport	10,871,734	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.048	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=0.143 kg CO_2e/pkm; source: Hochbahn Hamburg 2020), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/53348/950abf7799f29d8e31ad5cc11af007ed/ub2022-finanzteil-d-data.pdf) and S-Bahn (EF=0; source: DB)	**521.84**
	Employees— motorbike	155,967	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**22.46**
	Employees— e-scooter	45,233	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**5.70**
	Students							**2,245.09**
	Students— car travel	3,329,132	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**539.32**
	Students— public transport	35,144,074	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.048	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=0.143 kg CO_2e/pkm; source: Hochbahn Hamburg 2020), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/53348/950abf7799f29d8e31ad5cc11af007ed/ub2022-finanzteil-d-data.pdf) and S-Bahn (EF=0; source: DB)	**1,686.92**
	Students— motorbike	118,222	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**17.02**
	Students— e-scooter	14,537	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**1.83**
	Total							**3,230.89**

GHG accounting for Universität Hamburg, 2021—Scope 3: commuter emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO_2e**
Commuting	**Employees**							**1,024.91**
	Employees—car travel	2,707,285	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**438.58**
	Employees—public transport	10,941,094	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.051	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=0.154 kg CO_2e/pkm; source: Hochbahn Hamburg), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/53348/950abf7799f29d8e31ad5cc11af007ed/ub2022-finanzteil-d-data.pdf) and S-Bahn (EF=0; source: DB)	**558.00**
	Employees—motorbike	156,962	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**22.60**
	Employees—e-scooter	45,522	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**5.74**
	Students							**4,599.76**
	Students—car travel	6,514,808	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**1,055.40**
	Students—public transport	68,773,759	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.051	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=0.154 kg CO_2e/pkm; source: Hochbahn Hamburg), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/53348/950abf7799f29d8e31ad5cc11af007ed/ub2022-finanzteil-d-data.pdf) and S-Bahn (EF=0; source: DB)	**3,507.46**
	Students—motorbike	231,349	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**33.31**
	Students—e-scooter	28,447	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**3.58**
	Total							**5,624.67**

GHG accounting for Universität Hamburg, 2022—Scope 3: commuter emissions								
Scope	**Emission source**	**Amount**	**Unit**	**Source**	**Factor**	**Unit**	**Source**	**t CO_2e**
Commuting	**Employees**							**1,698.21**
	Employees—car travel	5,341,016	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**865.24**
	Employees—public transport	21,584,930	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.036	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=108 kg CO_2e/pkm; source: Hochbahn Hamburg), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/53348/950abf7799f29d8e31ad5cc11af007ed/ub2022-finanzteil-d-data.pdf) and S-Bahn (EF=0; source: DB)	**777.06**
	Employees—motorbike	309,659	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**44.59**
	Employees—e-scooter	89,807	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**11.32**
	Students							**7,008.28**
	Students—car travel	12,802,203	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.162	kg CO2e/Pkm	UBA, 2022, www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#verkehrsmittelvergleich_personenverkehr_tabelle	**2,073.96**
	Students—public transport	135,051,819	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.036	kg CO2e/Pkm	Provided by EF; mean value from bus (EF=108 kg CO_2e/pkm; source: Hochbahn Hamburg), U-Bahn (EF=0; source: Hochbahn Hamburg: www.hochbahn.de/resource/blob/53348/950abf7799f29d8e31ad5cc11af007ed/ub2022-finanzteil-d-data.pdf) and S-Bahn (EF=0; source: DB)	**4,861.87**
	Students—motorbike	454,303	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.144	kg CO2e/Pkm	Motorrad & Reisen 2021: www.motorradundreisen.de/szene/sauberer-auto-motorradfahren-senkt-co2-emissionen/6246	**65.42**
	Students—e-scooter	55,862	Pkm	Mobility survey incl. extrapolation by Universität Hamburg	0.126	kg CO2e/Pkm	Hollingsworth et al. 2019 via Statista: https://de.statista.com/statistik/daten/studie/1061219/umfrage/umweltbilanz-von-e-scootern-im-vergleich-mit-anderen-verkehrsteilnehmern	**7.04**
	Total							**8,706.49**