



FIZ Karlsruhe

Leibniz Institute for Information Infrastructure

ADVANCING SCIENCE



**SUSTAINABILITY
REPORT
FIZ KARLSRUHE
2023**

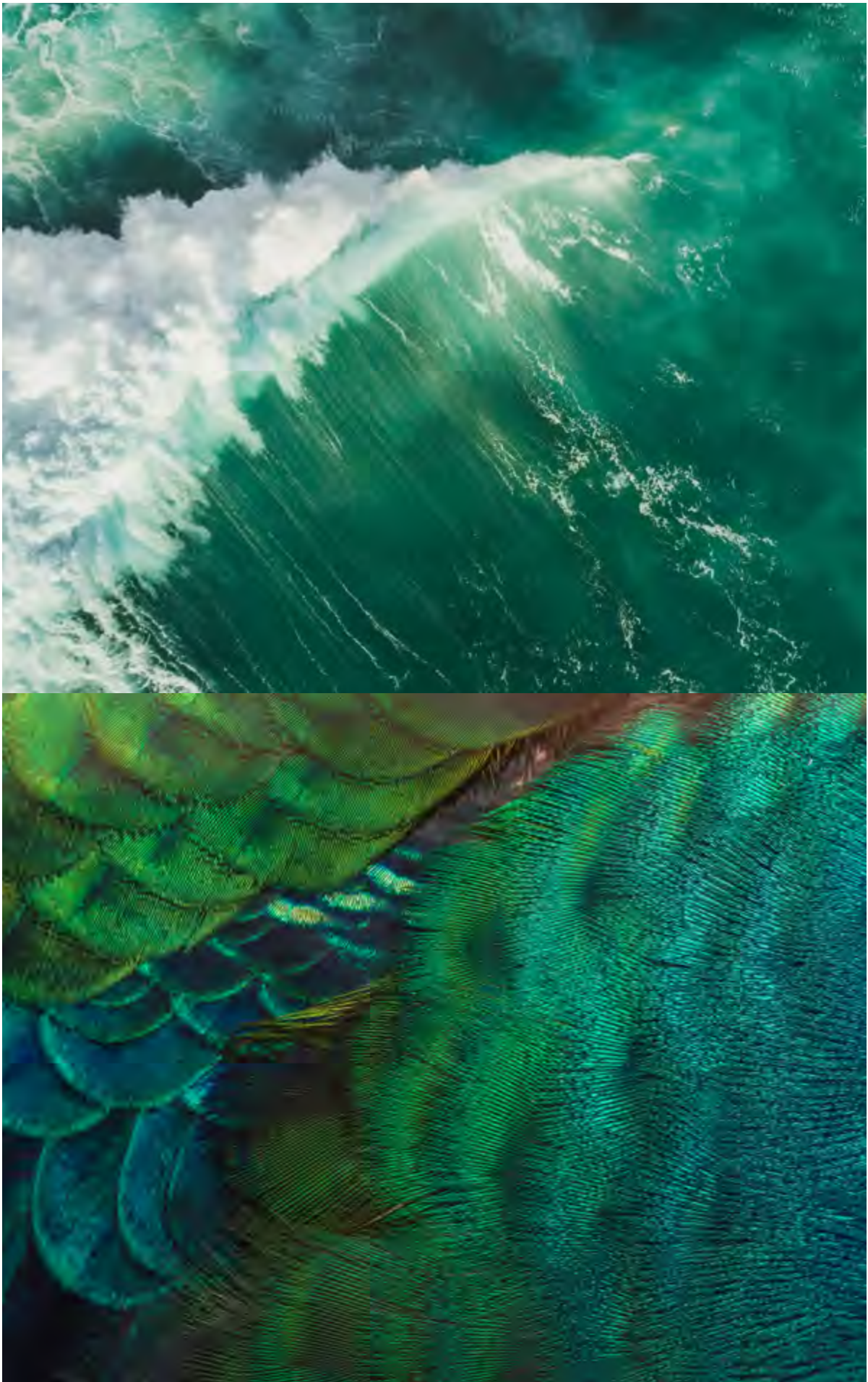


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»We see it as our obligation to align ourselves with the future.«

Micaela Münter, Sustainability Officer

Dear readers,

This is our first sustainability report. We have thus reached a first important milestone on the long road to becoming a sustainable institute.

We started working on the report last year. The first step was to clarify some fundamental questions: “How sustainable is FIZ Karlsruhe at present? What sustainability activities do already exist?” And above all: “What do we mean by sustainability?”

It quickly became clear that we needed a comprehensive status quo analysis in order to fully record all existing activities in the areas of social commitment, occupational health and safety, environmental protection (including energy and paper consumption, business trips and CO₂ emissions) as well as compliance with regulations such as data protection and other provisions. As part of this process, we spent a great deal of time researching, compiling and documenting data. In the process, we discovered that some important information, such as the exact number of business trips with the means of transport used and the distance traveled, the key figures for our buildings such as heat requirements, insulation thickness of the building envelope or ecological and social information on procurements, was not available at all or was only available after extensive research.

In summary, the analysis gave us many interesting and new insights into our institute. However, it also presented us with one or two difficult tasks. We have used tables and infographics in the individual chapters to present much of the data ob-

tained in a clear way, but sometimes this was not possible. The particular challenges include data quality and availability as well as the continuous updating and maintenance of this data.

We are just at the very beginning. A lot of data is still missing or may be inaccurate and incorrect. We are currently working intensively on obtaining missing information and eliminating potential sources of error. Our aim is to create structures that enable reliable documentation and evaluation of all relevant information so that we have increasingly reliable data available for future sustainability reports.

In future, we will report annually on our sustainability activities, the targets we have set and the milestones we have achieved. We are doing this in order to provide an honest and transparent picture of our commitment to social, ecological and economic sustainability.

Why are we so committed? We take the threat posed by the climate and environmental crisis very seriously and see it as our duty to focus on the future. We attach great importance not only to climate and environmental protection, but also to social responsibility. We are aware that there are many challenges to overcome, but we are confident that we will develop into a climate-neutral and sustainable institution in the long term.

We wish you an inspiring read

Micaela Münter, Sustainability Officer



Our understanding of sustainability

The fundamental idea of sustainable management is to use resources carefully and economically. In addition to energy, climate and other environmental issues, social issues such as equal opportunities, human rights and economic issues like good governance, anti-corruption and good scientific practice are also addressed. This makes it clear that sustainability is an important cross-cutting issue that runs through all areas of our institute. At the same time, it is clear that our understanding of sustainability is very comprehensive and holistic.

The term “sustainability” goes back to the Freiberg chief mining administrator Hans Carl von Carlowitz (1645-1714). He was the first to coin the term “sustainability” in relation to forestry: only as many trees should be removed from a forest, i.e., felled, as will grow back within a certain period of time. More than 250 years later, a UN commission convened in New York in 1987 to deal exclusively with the issue of sustainable development for the first time. The principle formulated at that time is still regarded as the guiding principle of sustainability today: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since 2016, Germany has been guided by the UN’s 17 Sustainable Development Goals¹ (SDG).

This sustainability report is a first for FIZ Karlsruhe. It documents the institute’s activities relating to sustainability and covers the period from January 01, 2023 to December 31, 2023. We report on the key aspects of our sustainable activities based on the Sustainability Management Guidelines for Non-University Research Institutions² (LeNa). These guidelines were developed as part of a joint project funded by the German Federal Ministry of Education and Research (BMBF). Various institutes of the Fraunhofer-Gesellschaft, the Helmholtz Association and the Leibniz Association were involved.

With the orientation towards LeNa, we have also adopted the structure and topics of the guidelines and divided our sustainability report into the action areas of sustainability management, sustainable organizational management, research, personnel, buildings and infrastructure and supporting processes.

We see this report as an initial stocktaking of our institute with regard to sustainability. We show the central fields of action, goals and measures that we have identified on the basis of the analysis results. This provides us with a starting point from which we can demonstrate FIZ Karlsruhe’s progress towards becoming a sustainable and climate-neutral institute in the long term.

1 <https://17ziele.de/info/was-sind-die-17-ziele.html>, accessed on September 03, 2024.

2 LeNa Guide to sustainability management in non-university research institutions; https://www.leibniz-gemeinschaft.de/fileadmin/user_upload/Bilder_und_Downloads/%C3%9Cber_uns/Nachhaltigkeit/LeNa.pdf, accessed on September 03, 2024.



1. ABOUT US

FIZ Karlsruhe - Leibniz Institute for Information Infrastructure is one of the major non-academic infrastructure institutions for scientific information. Our overall strategy aims to support the entire scientific value creation cycle. We research, develop and operate methods, processes and services for a sustainable information infrastructure and offer data, information and knowledge, software and services via open and legally compliant platforms.

FIZ Karlsruhe – Leibniz Institute for Information Infrastructure, hereinafter referred to as FIZ Karlsruhe, is a non-profit limited liability company and a large corporation. Our public mission is “to provide science and research with scientific information, to develop corresponding products and services in the field of scientific information infrastructure and to make them publicly accessible.”³

Our overall strategy aims to support the entire scientific value creation cycle - from the idea to data and analysis to the dissemination and enrichment of scientific information. It is supplemented by six sub-strategies that provide guidelines for the strategy process and also address sustainability to a significant extent:

- Portfolio strategy
- Agility strategy

- Opening and networking strategy
- Research strategy
- Cooperation strategy
- Sustainability strategy

In our mission statement⁴, we have defined values that guide our actions. We are committed to treating the environment and its resources with care (“Responsibility” value) and to applying the Public Corporate Governance Code of the Federal Government and the State of Baden-Württemberg (“Integrity” value). As a Leibniz Institute, we are guided by the sustainability mission statement of the Leibniz Association⁵ and the handout “Sustainability management in non-university research institutions” (LeNa). Careful treatment of the environment and its resources is important to us. Accordingly, we have anchored sustainability in our overall strategy (see section 2.1).

³ Excerpt from articles of association, § 2 (1), as at 28.07.2017). We are a company with recognized non-profit status.

⁴ Our mission statement, <https://www.fiz-karlsruhe.de/de/ueber-uns/unser-leitbild>, accessed on September 03, 2024.

⁵ “Sustainability” mission statement of the Leibniz Association; https://www.leibniz-gemeinschaft.de/fileadmin/user_upload/Bilder_und_Downloads/%C3%9Cber_uns/Nachhaltigkeit/Leitbild_Nachhaltigkeit.pdf, accessed on September 03, 2024.

For us, corporate responsibility means taking sustainability into account in all business processes,

from program planning and personnel management to operational processes and research activities.

1.1. FIZ KARLSRUHE IN FIGURES

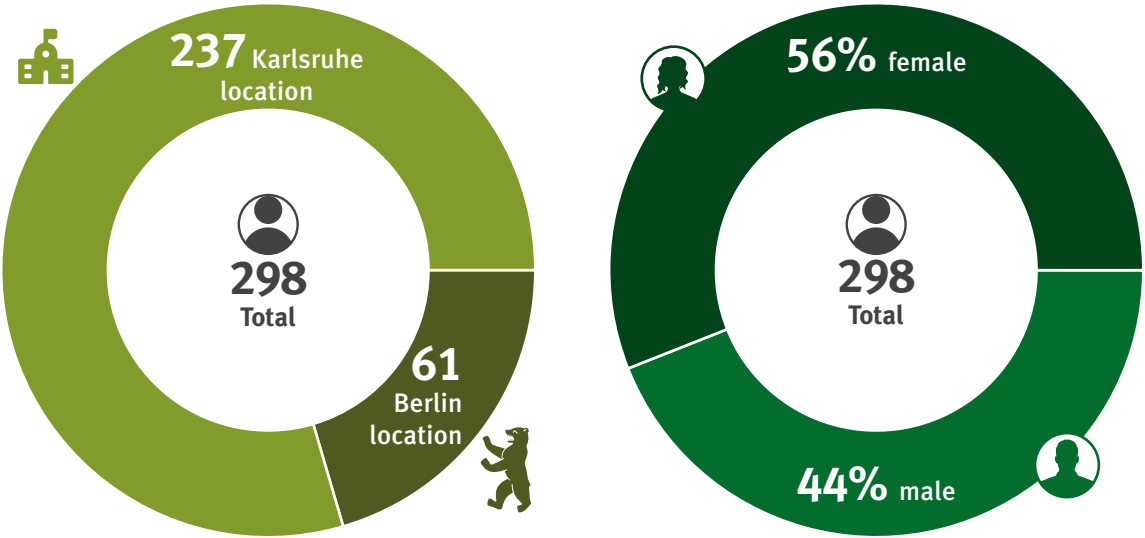


Figure 1: Number of employees in 2023, total, and percentage of male and female persons

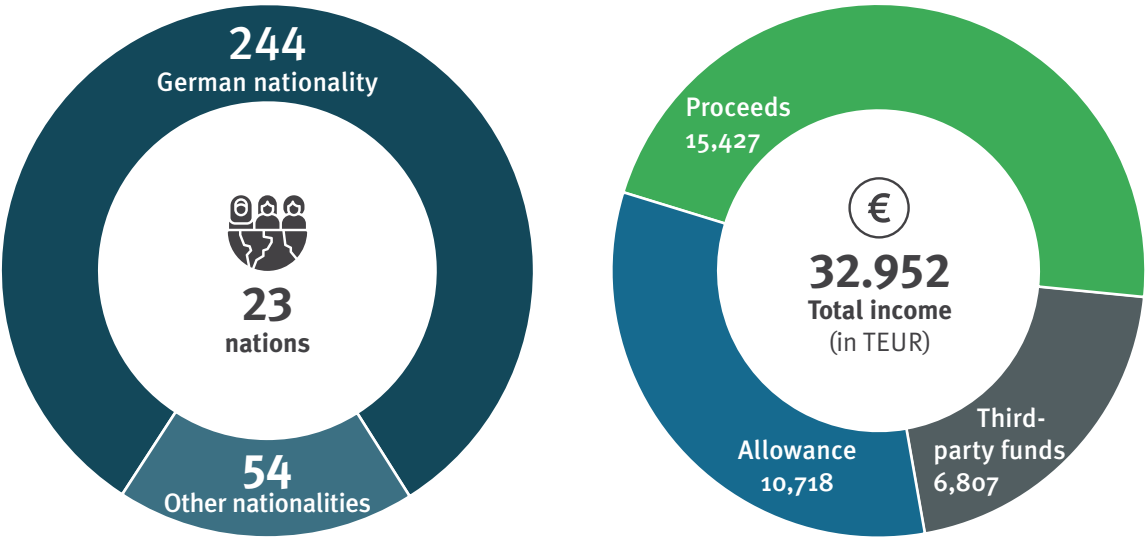


Figure 2: We are becoming increasingly international. On December 31, 2023, our team consisted of persons from 23 different nationalities, including our German colleagues.

Figure 3: Total income, broken down by grants, revenue and third-party funds (in EUR thousand)

Electricity and heat consumption

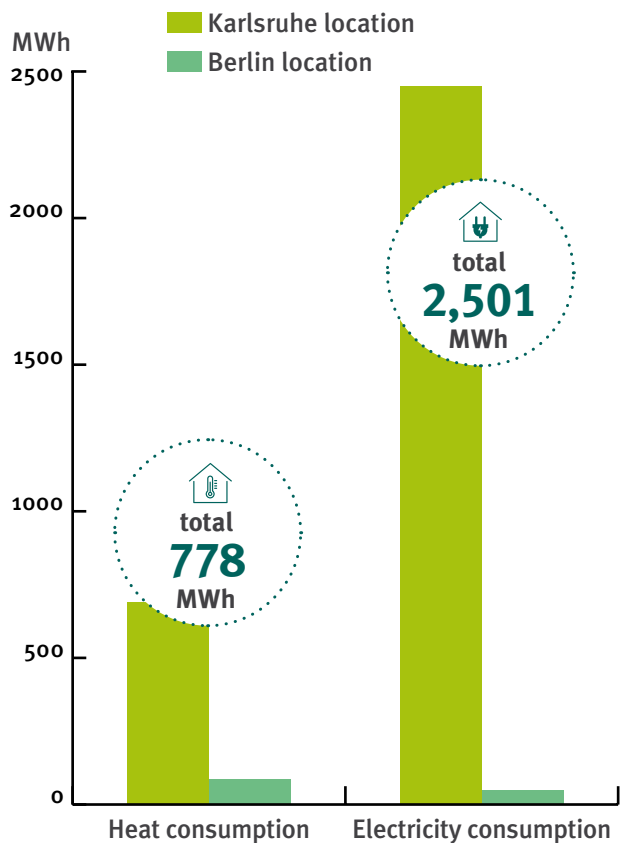


Figure 4: Electricity and heat consumption at FIZ Karlsruhe in 2023

Carbon dioxide emissions: Heating - electricity - business trips

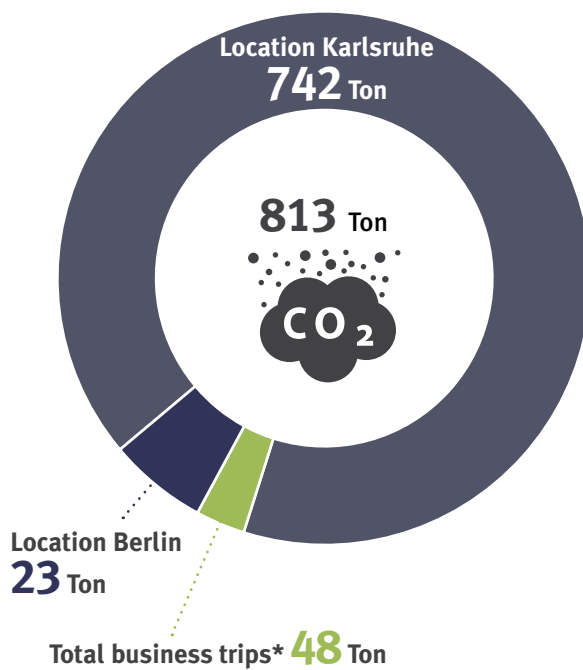


Figure 5: CO2 emissions of FIZ Karlsruhe based solely on our heating and electricity consumption (data source: Energy Audit 2024) and our business travel* (air, rail, car) calculated using the BWIHK-ECOCOCKPIT tool⁶



Figure 6: FIZ Karlsruhe – Leibniz Institute for Information Infrastructure, one of our office buildings on the North Campus of the Karlsruhe Institute of Technology (KIT)
Source: Daniel Wieser. Architectural photography, Karlsruhe, www.dv-a.de

⁶ Climate assessment tool “BWIHK-ECOCOCKPIT”; <https://ecockpit-bw.de>, accessed on September 03, 2024.



»Sustainability must be lived. That is why it is important to reach everyone in the organization and to implement efficient measures.«

Prof. Dr. Wolfram Horstmann, President & CEO of FIZ Karlsruhe

2. SUSTAINABILITY MANAGEMENT

Successful sustainability management requires the consistent implementation of effective measures throughout the entire organization. This also includes a clear commitment to sustainable action from all employees at all levels. The prerequisite for effective measures is a comprehensive analysis of the current status. Only when you know where you stand can you decide how to proceed. Accordingly, in this chapter we present the most important findings of our initial analysis and the need for action derived from it.

2.1. STRATEGIC ANALYSIS AND MANAGEMENT PROCESSES

In November 2023, FIZ Karlsruhe adopted a sustainability sub-strategy to point out the importance of sustainable corporate development to persons both within and outside our organization. It reads: “FIZ Karlsruhe is committed to the basic principles of sustainability. We use material and non-material resources responsibly. We take sustainability into account in our decision-making processes. We are developing into a climate-neutral institute.”

Our strategic guidelines with regard to sustainability are:

- **Sustainability in organizational development:** We establish sustainable, i.e., long-term effective developments in structures, procedures and management processes.
- **Sustainability in research and development processes:** We research, develop and operate methods, processes and services for a sustainable information infrastructure.

- **Sustainability in HR management:** We promote equal opportunities, appreciation of diversity and the compatibility of work and caring responsibilities as well as volunteering by our employees.
- **Sustainability in operating buildings and infrastructure as well as in procurement and mobility:** We optimize energy consumption in buildings and infrastructure and pursue a sustainable procurement policy. We try to replace business trips with virtual meetings wherever possible, otherwise we ensure that our mobility is as climate-friendly as possible with a low CO₂ footprint.

With the aim of anchoring the topic of sustainability conceptually and communicatively in the structure of FIZ Karlsruhe, we appointed Micaela Münter as a full-time sustainability officer on January 1, 2023. She is part of the management team and reports directly to the Management Board. Among other things, she develops a sustainability concept tailored to FIZ Karlsruhe, proposes suitable measures and continuously supports their implementation

in day-to-day work. Internally, she acts as the central point of contact for sustainability issues and is responsible for sustainability reporting at institute level.

In November 2023, we established the Sustainability Committee (see section 3.1) to strengthen the relevance of this topic both internally and externally. The committee began its work in January 2024. The members represent all areas of the institute and thus anchor sustainability as a cross-cutting issue across all organizational units.



2.2 KEY AREAS OF ACTION AND OBJECTIVES

In order to transform FIZ Karlsruhe into a sustainable institute, the status quo must first be determined in order to derive the key fields of action. We also addressed the following questions: What positive contribution can FIZ Karlsruhe make to a sustainable development? What are our ambitions? What are the biggest levers and how can we exert the greatest influence? The answers help us to define fields of action and measures that are tailored to FIZ Karlsruhe.

2.2.1. Status quo analysis FIZ Karlsruhe

In 2023, we carried out an initial comprehensive status quo analysis of the entire institute based on the LeNa guidelines. The reference year for this was 2022. The results gave us an overview of previous sustainability activities and deficits, energy consumption, investments and supporting processes such as procurement and mobility. At the same time, we identified the key fields of action/topics for sustainability management. The analysis forms the basis for our further activities. It is updated annually to determine the current status and to highlight progress and areas where action is required. The key performance indicators, which document the development within the respective topics, are derived from the key areas of action and objectives.

The most important result of the status quo analysis is that we have already taken extensive measures with regard to social issues and corporate governance to ensure that the institute acts sustainably (see Chapter 5). For example, FIZ Karlsruhe takes measures for a good work-life balance and to fulfill its duty of care (see chapter 5.4). On the other hand, we need to significantly expand our measures on ecological issues such as climate and environmental protection in the future.

Our key areas of action identified in 2023 are:

1. Efficient and resource-conserving use of energy
2. Buildings and infrastructure
3. IT and data center
4. Procurement and disposal
5. Mobility - business trips

In these areas, we see particularly great potential for contributions to the sustainable corporate development of FIZ Karlsruhe. In 2024, we will begin to specifically develop a sustainability plan tailored to FIZ Karlsruhe and define short, medium and long-term goals and measures. For example, the use of renewable energies is important to us in order to reduce our CO₂ emissions. Therefore, we already set ourselves the short-term goal of installing a photovoltaic system on suitable buildings in 2023.

We review the areas of action every two years for their significance and adapt them as necessary or add new topics. We base this on the annually repeated status quo analysis based on LeNa or other relevant guidelines. We will also carry out an annual greenhouse gas (GHG) analysis using the “BWIHK-ECOCOCPIT” climate assessment tool⁷ in order to review our progress.

2.3. COMMUNICATION AND STAKEHOLDER PARTICIPATION

The most important internal stakeholders for sustainable action include employees, while external stakeholders include suppliers, contractors, customers, donors and committees (Supervisory Board, Shareholders’ Meeting and Scientific Advisory Board).

On the intranet, we inform our employees about FIZ Karlsruhe’s activities via the “Sustainability”

topic page. Colleagues can also find in-depth information and tips on the topic of sustainability, for example from the Leibniz Association and the state of Baden-Württemberg, the German Sustainability Code, as well as certificates and laws. In future, we will regularly create blog posts on individual topics, for example on saving energy in the workplace, in order to raise awareness of the issue. The internal employee magazine *fiz.forum* also publishes an article on the topic of sustainability in every issue.

FIZ Karlsruhe regularly submits planning and reporting documents to its committees, i.e., the Supervisory Board, the Shareholders’ Meeting and the Scientific Advisory Board. In recent years, the topic of sustainability has been prominently anchored in all key committee documents such as the annual report, the management report, which includes a risk assessment, the planning document “Program Budget”⁸ (see chapter 3.1) and its accounting.

⁷ <https://ecocockpit-bw.de>, accessed on September 03, 2024.

⁸ See chapter 3.1.



»With our new organizational structure, we are strengthening our participative management culture.«

Andreas Schwartz, Head of Administration

3. SUSTAINABILITY WITHIN THE ORGANIZATION

For us, sustainable corporate governance means that we manage, control and monitor FIZ Karlsruhe holistically and integratively. It serves people, respects the environment and at the same time maintains our institute as a productive and long-term effective institution. Important aspects include the organizational form, business ethics and corporate culture - both internally and externally.

3.1. PARTICIPATORY ORGANIZATIONAL DEVELOPMENT

FIZ Karlsruhe is a limited liability company (GmbH) recognized as a non-profit organization and a large corporation. Its bodies are the shareholders' meeting and the Supervisory Board. Its shareholders are the federal government, the state of Baden-Württemberg, and major scientific societies and associations. In addition, the Scientific Advisory Board advises the management and the Supervisory Board on all technical, scientific and political issues. FIZ Karlsruhe has no influence on the composition of the shareholders' meeting and the Supervisory Board. The Scientific Advisory Board currently consists of four female and six male members. We aim to achieve gender parity in the future.

FIZ Karlsruhe is organized into six divisions: four program divisions and two service divi-

sions (see organizational chart). The management structure of FIZ Karlsruhe is made up of the President & CEO and the Executive Management Team, which, in addition to the Management Board, includes all division heads, the Head of Human Resources/Infrastructure and, as a permanent guest, the General Counsel. The President & CEO determines the guidelines for corporate policy and defines the corporate objectives in consultation with the members of the Executive Management Team. Responsibility for operational implementation lies with the Executive Management Team. We still see a need for action with regard to gender parity and greater diversity (see section 5).

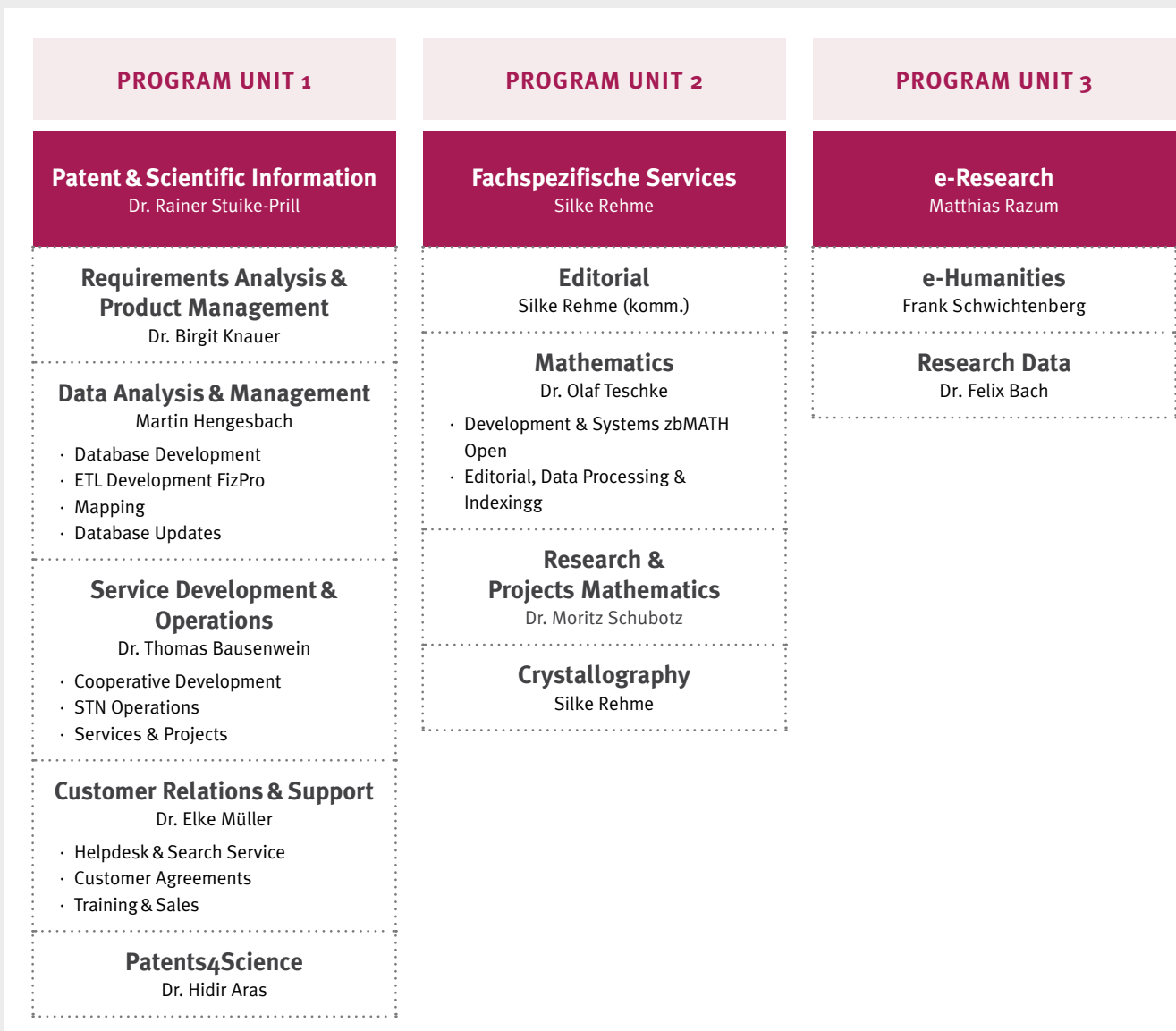
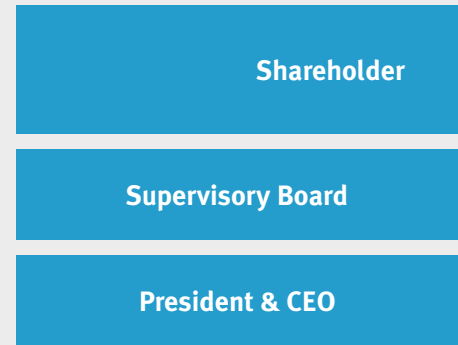
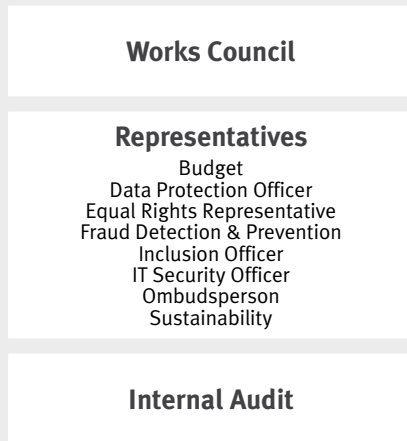
In order to strengthen the participatory management culture, we have set up a total of four committees⁹ since 2022, which support the management level in cross-divisional strategy, planning and decision-making processes. The committees make these processes transparent,

⁹ In addition to the Sustainability Committee, committees have been established for the areas of strategy, research and projects and technology.

ORGANIZATIONAL CHART

with organizational units and fields of work/research

October 1, 2024



Representatives Board

MinR'in
Marion Steinberger (BMBF)

Prof. Dr.
Wolfram Horstmann

Division

Department

Team or
Research Group

Management Team



Strategic Committee

Matthias Razum



Technical Committee

Hans-Jürgen Rudolph



Research and Projects

Prof. Dr. Harald Sack



Sustainability Committee

Micaela Münter

PROGRAM UNIT 4 RESEARCH & TEACHING

Information Service Engineering

Prof. Dr. Harald Sack

Knowledge Graphs

Dr. Jörg Waitelonis

Machine Learning

Dr. Genet Asefa Gesese

Intellectual Property Rights

Prof. Dr. Franziska Boehm

- Data Protection

Intellectual Property

Dr. Dr. Grischka Petri

SERVICE UNIT

IT Systems & Data Networks

Hans-Jürgen Rudolph

- Server & Storage
- Data Networks & IT Security
- Internal Services
- Desktop Services
- SAP

Administration

Andreas Schwartz

Finance

Viola Fina

- Customer Management
- Financial Accounting

Controlling

Michael Balzer

Human Resources/ Facility Management

Nadine Lambert

Legal Counsel

Michael-Olivier Müller

enable corrections to be made to the respective tasks if necessary and support agile management. The committees have equal gender representation; all areas and hierarchy levels are also represented.

We set up internal working groups as required for overarching topics, particularly those requiring co-determination. Examples include employee surveys, mission statement development, future work and working time recording. In 2023, a survey was conducted on the topic of “Mental stress in the workplace”.

The objectives are planned and the measures required to achieve them are defined as part of the annual program budget. It is ultimately addressed to the funding bodies (for FIZ Karlsruhe: the federal government and the state of Baden-Württemberg) and, according to the WGL¹⁰ resolution, has the character of a target agreement. The program budget statement serves to review the target agreement. With the 2024 program budget (created in 2022), we have included a section on our sustainability measures as an integral part of the planning document.

3.2. COMPLIANCE

FIZ Karlsruhe has to comply with a wide range of legal regulations and organization-specific standards of conduct. Accordingly, our work is governed by a comprehensive compliance catalog focusing on data protection, corruption prevention, IT security, occupational health and safety/safety and risk management. They significantly contribute to a sustainable corporate governance.

3.2.1. Corporate Governance Code

In the interests of responsible corporate governance, FIZ Karlsruhe is committed to the Public Corporate Governance Code (PCGK) of the Federal Government¹¹. The Code contains key provisions for the management and supervision of affiliated companies of the federal government as well as internationally and nationally recognized standards of good and responsible corporate governance. It aims to make corporate management and monitoring more transparent and comprehensible and to clarify the role of shareholders. Since 2010, we have published an annual corporate governance report on our website,¹² which also includes a section on sustainable corporate governance.

3.2.2. Corruption prevention

Corruption can cause considerable financial and immaterial damage in companies and public institutions alike. Immaterial damage is difficult to measure, but has far-reaching consequences. Preventing and combating corruption is therefore a high priority. Accordingly, the UN’s Sustainable Development Goals call for¹³ to “substantially reduce corruption and bribery in all their forms” (Goal 16.5).¹⁴ The Federal Government’s Public Corporate Governance Code (PCGK) emphasizes the prevention of corruption as a central task of management.

FIZ Karlsruhe has had its own guideline on corruption prevention since June 2013 (last updated in May 2023). It forms the basis for the protection and sensitization of all employees and at the same time provides guidance and assistance in combating corruption. We appointed an anti-corruption officer as a central contact in April 2012. He supports the management in implementing anti-corruption measures and regularly informs

10 WGL: Leibniz Association; https://www.leibniz-gemeinschaft.de/fileadmin/user_upload/Bilder_und_Downloads/%C3%9Cber_uns/Organisation/Dokumente/Handreichung_Programmbudgets_Aktualisierung_2020.pdf, accessed on September 03, 2024.

11 https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Bundesvermoegen/Privatisierungs_und_Beteiligungspolitik/Beteiligungspolitik/grundsaeetze-guter-unternehmens-und-aktiver-beteiligungsfuehrung.html, accessed on September 03, 2024.

12 <https://www.fiz-karlsruhe.de/de/ueber-uns/corporate-governance-bericht-2023#>, accessed on September 03, 2024.

13 <https://unric.org/de/17ziele>, accessed on September 03, 2024.

14 <https://www.17ziele.de/ziele/16.html>, accessed on September 03, 2024.

them about ongoing activities and any cases of suspected corruption.¹⁵ In addition, in consultation with the President & CEO and the Head of Administration, he or she reviews a functional area or organizational unit on an annual basis and carries out a risk analysis to identify potential risks and possible abuse.

3.2.3. Responsible handling of risks

Every organization is exposed to risks that can cause material and immaterial damage to the company and its employees. In extreme cases, risks that occur can jeopardize the continued existence of the organization. Appropriate handling of risks is therefore a core task of the management, and appropriate risk management and control is an important part of sustainable corporate governance.

We systematically analyze potential risks and regularly communicate our assessment to the Supervisory Board and also include it in the management report as part of the annual financial statements.



Foto: Daniel Vieser. Architekturfotografie, Karlsruhe, www.dv-a.de

3.2.4. Cybersecurity and data protection

Almost all business processes at FIZ Karlsruhe are digital and therefore rely heavily on IT services. They significantly determine the perception of FIZ Karlsruhe by our stakeholders, the quality of the results and our reputation. Information technology is therefore a constitutive factor for FIZ Karlsruhe and the provision of the IT resources required for our employees, services and projects is crucial to our success. At the same time, the threat of cyberattacks is constantly increasing and therefore represents a significant risk. Not only the IT systems and data networks area, but the entire company must therefore increasingly operate in an area of tension between cybersecurity and openness. In recent years, we have therefore made considerable investments in hardware and employee training in order to defend us against cyberattacks and will continue to do so in the future.

An important goal of cybersecurity is the protection and security of data. This applies to personal data as well as to confidential data that partners entrust to us as part of cooperation projects or that we generate ourselves. However, sustainable access to publicly available data also plays a role here, both in terms of the availability and integrity of the data (see chapter 4). With the European General Data Protection Regulation (GDPR) entered into force in May 2018, data protection has gained considerable attention. Responsibility for data protection lies with both the employees and the President & CEO. We have had a data protection officer since 1995, who advises the President & CEO and the employees on data protection issues and monitors compliance with data protection regulations. To raise our employees' awareness of data protection issues, we organize mandatory annual online training courses. In these, we convey the relevant legal regulations and recommended courses of action.

3.2.5. Whistleblower Protection Act

Whistleblowers make an important contribution to uncovering wrongdoing in companies. The

15 <https://www.fiz-karlsruhe.de/de/ueber-uns/ueber-uns#korrupsionspr%C3%A4vention>, accessed on September 03, 2024.

Whistleblower Protection Act (HinSchG)¹⁶, which came into force in mid-2023, aims to prevent disadvantages for whistleblowers and to give them legal certainty.

It is important to us that we are informed promptly of potential legal violations that may occur within our company and that we are able to respond to them. It is also part of our self-image that a person who draws our attention to such a violation will not suffer any reprisals, regardless of the nature of the legal violation to which they draw our attention. With the Whistleblower Protection Act (HinSchG), which transposes the EU Whistleblower Directive into German law, such protection is now also enshrined in law. FIZ Karlsruhe has implemented the Whistleblower Protection Act through an external service provider. Employees can submit anonymous reports of possible violations on an independent and neutral¹⁷ platform. It is located outside our own IT infrastructure.

3.3. RELATIONSHIP WITH SUPPLIERS

In our values, we promise to treat our partners fairly and respectfully. This also applies to our suppliers. We have transparent purchasing conditions with fair payment terms.

3.4. POLITICAL CONSULTING AND LOBBYING

We see political consulting as an important task of our institute. In our field of research in particular, we have proven expertise that is readily called upon at state, federal and EU level. We also participate in studies and statements that are ultimately aimed at the political level. We see it as part of sustainable corporate management to make our activities transparent in terms of policy advice and transfer to the public, for example in our annual report.¹⁸ We regularly evaluate our activities against the background of the Lobby Register Act (LobbyRG).¹⁹ To date, due to the nature of our consulting activities, we see no need for FIZ Karlsruhe to be entered in the lobby register.

¹⁶ <https://www.gesetze-im-internet.de/hinschg/BJNR08CoBoo23.html>, accessed on September 03, 2024.

¹⁷ <https://fizkarlsruhehinweisgeberschutz.roedl-whistleclue.de>, accessed on September 03, 2024.

¹⁸ <https://www.fiz-karlsruhe.de/sites/default/files/FIZ/Dokumente/Jahresberichte/Jahresbericht-2023.pdf>, accessed on September 03, 2024.

¹⁹ <https://www.gesetze-im-internet.de/lobbyrg/index.html#BJNR081800021BJNE000802311>, accessed on September 03, 2024.





»Sustainable research requires responsible and transparent handling of data, processes and transfer.«

Prof. Dr. Harald Sack, Head of Information Service Engineering

4. SUSTAINABILITY IN THE RESEARCH PROCESS

What does it mean to combine sustainability with research processes?

As a non-academic research institution, we examine and reflect on the entire research process to ensure that we maintain a sustainable approach to research data, results and processes. Awareness of the social responsibility that goes hand in hand with our research also plays a major role here. We also always ensure that the sustainable transfer of knowledge from our research is guaranteed and what impact our research results have on the environment and society.

4.1. GOOD SCIENTIFIC PRACTICE

Sustainability in processes and research data management and in dealing with the possible consequences of research results are important elements of scientific integrity. FIZ Karlsruhe has anchored scientific integrity as a value in its mission statement. As a scientific institution, we regard scientific integrity and good scientific practice a responsibility of both our institute and all our employees - and we are committed to complying with the appropriate standards. Our guideline “Good Scientific Practice”²⁰ is an institute-specific specification of the “Leibniz Code of Good Scientific Practice”²¹.

4.1.1. Ombudsperson

In accordance with the above-mentioned guideline, FIZ Karlsruhe provides an independent ombudsperson, to whom all employees and, if necessary, third parties can turn to in questions of good scientific practice and in questions of suspected scientific misconduct. In the event of concerns of bias or if the ombudsperson is unable to act, FIZ Karlsruhe provides a deputy who comes from a different organizational unit than the ombudsperson. To ensure that employees know the ombudsperson and their deputy, we provide regular information on our intranet and through corresponding blog entries.

²⁰ <https://www.fiz-karlsruhe.de/sites/default/files/FIZ/Dokumente/richtlinie-wiss-praxis-de.pdf>, accessed on September 03, 2024.

²¹ https://www.leibniz-gemeinschaft.de/fileadmin/user_upload/Bilder_und_Downloads/%C3%9Cber_uns/Gute_wissenschaftliche_Praxis/Leibniz-Kodex_gute_wissenschaftliche_Praxis.pdf, accessed on September 03, 2024.

4.2. RESEARCH DATA POLICY²²

We consider research data to be data that is generated in the course of scientific projects, for example through observations, experiments, simulations, surveys, interviews, source research, recordings, digitization or evaluations. We also include algorithms and (research) software. Research data management begins with the planning of a project and only ends when the data has been deleted after an appropriate retention period.

Where legally and ethically possible, research data should be published in suitable repositories and offered for reuse for reasons of transparency, traceability and connectivity of research. FIZ Karlsruhe supports the principles of FAIR²³ - and CARE²⁴ . FIZ Karlsruhe also offers the RADAR repository²⁵ , which institutions can use to archive and publish digital research data. It thus contributes to the sustainable availability and reusability of research data.

4.3. OPEN ACCESS

Open Access stands for unrestricted and free digital access to quality-checked scientific information. By removing technical, financial and legal barriers, open access helps accelerate scientific innovation processes, improve the visibility of research results and thus promote the sustainable use of these results.²⁶

In 2021, FIZ Karlsruhe adopted an open access policy²⁷ and thus clearly commits itself to open standards in science. We have also appointed an

Open Access Officer to advise and support FIZ employees who are researching and publishing. Employees can find extensive information about Open Access and the Officer's contact details on the intranet. A budget is also available to employees for Open Access publications.

4.4. RESEARCH WITH SOCIAL RESPONSIBILITY

We define clear selection criteria for deciding on planned research activities with regard to topics, cooperation partners, funding opportunities and required research equipment. In doing so, we always take sustainability aspects into account by actively following the rules of good scientific practice and also considering the field of action "research with social responsibility". Sustainability based on ecology, economy and social responsibility is a fundamental principle for FIZ Karlsruhe that is taken into account at all stages of the research process, from the identification of topics to implementation and documentation to the subsequent transfer, in order to achieve long-term positive effects.

4.5. FUNDING BODY

When selecting funding providers, we strive to achieve the best possible diversification between national, regional and international as well as public and private funding institutions in order to be as broadly positioned as possible. In the case of contract research, we always pay attention to the scientific usability of the research results.

²² <https://www.fiz-karlsruhe.de/de/forschung/forschung#forschungsdaten-policy>, retrieved on September 03, 2024

²³ FAIR stands for "Findable, Accessible, Interoperable, Re-Usable". <https://www.go-fair.org/fair-principles>, accessed on September 03, 2024.

²⁴ CARE stands for "Collective Benefit, Authority to Control, Responsibility, Ethics". <https://www.gida-global.org/care>, accessed on September 03, 2024.

²⁵ <https://www.fiz-karlsruhe.de/de/produkte-und-dienstleistungen/radar>, accessed on September 03, 2024.

²⁶ For example, zbMATH Open for Mathematics, <https://zbmath.org>, accessed on September 03, 2024.

²⁷ <https://www.fiz-karlsruhe.de/de/forschung/forschung#open-access-policy>, accessed on September 03, 2024.

4.6. KNOWLEDGE TRANSFER

Strengthening knowledge transfer between science, civil society, politics, business and social stakeholders is an important concern for us. Stakeholders in the science and innovation system should have reliable access to all relevant digital information and tools anytime and anywhere. To this end, we offer data, information and knowledge, software and services via open and legally compliant [FB1] platforms. We develop our products into open, networked platforms and strengthen our open policy (open access/open source/open science) (see section 4.3).

FIZ Karlsruhe is involved in workgroups and committees on issues relating to scientific information

infrastructures at a national and an international level, for example in the Council for Information Infrastructures. Other key areas of policy advice are data (protection) law and copyright.

Through the two professorships of Information Service Engineering (Prof. Dr. Harald Sack) and Intellectual Property Rights (Prof. Dr. Franziska Boehm) as well as several deputy professorships held by our employees, we are actively involved in teaching and promoting young academics.

Our Science Communications unit reports on FIZ Karlsruhe's tasks, services and work results. We also make relevant information available to the general public via various internal and external communication formats, e.g., our website, press releases and social media.



»For us, sustainable HR management means one thing above all: retaining and promoting our employees through appreciation.«

Nadine Lambert, Head of Human Resources and Infrastructure Department

5.5. SUSTAINABLE HR MANAGEMENT

Our employees are our most important resource. Accordingly, FIZ Karlsruhe as an employer is always aware of its responsibility and duty of care towards all employees. Sustainability in personnel management concerns occupational health and safety, company health management, equal opportunities, the promotion of diversity and a good work-life balance. For us, sustainably promoting our employees means: providing opportunities for further training, supporting individual career development and a fundamentally respectful approach as part of our overall corporate culture.

5.1. PERSONNEL DEVELOPMENT

On December 31, 2023, 298 persons were employed by FIZ Karlsruhe, 237 of whom were working at the Karlsruhe site and 61 at the Berlin site. We hired a total of 38 employees in 2023, 20 of whom were in the scientific field. 39 employees left the company. Our employees come from 23 different countries. Recruitment, particularly of specialists from abroad, is successfully supported by the Future Work concept (see 5.4.1). Personnel development, adequate training paths and in-house further training are important measures for obtaining and retaining the ever changing, necessary know-how. In accordance with FIZ Karlsruhe's strategic orientation and the qualifications required for this, adequate training courses are offered²⁸.

5.2. INTEGRATION OF NEW EMPLOYEES

We involve team members in our selection processes for vacancies. When new employees start working for us, we focus on holistic onboarding that welcomes new employees, quickly familiarizes them with their working environment and promotes their integration. This includes, for example, offering language courses for foreign employees or providing support in dealing with the authorities. There are also plans for a buddy system, i.e., the establishment of an accompanying person to provide efficient and personal guidance on important processes and topics relating to internal collaboration during the first few days at the institute. We are currently developing these processes further with a view to a hybrid working environment.

²⁸ In cooperation with the Baden-Württemberg Cooperative State University (DHBW), Karlsruhe - apprenticeships for (1) the "Computer Science" degree program and (2) the "Business Administration - Digital Business Management" degree program. In cooperation with the Department of Media at Darmstadt University of Applied Sciences, training places are offered for postgraduate trainees to become scientific documentarians or information specialists (two-year further training course).

33 | 54%
Female at the Berlin location

133 | 56%
Female at the Karlsruhe location

95 | 77%
Full-time, female

71 | 77%
Part-time, female

18 | 43%
Female scientists

11 | 44%
Female managers

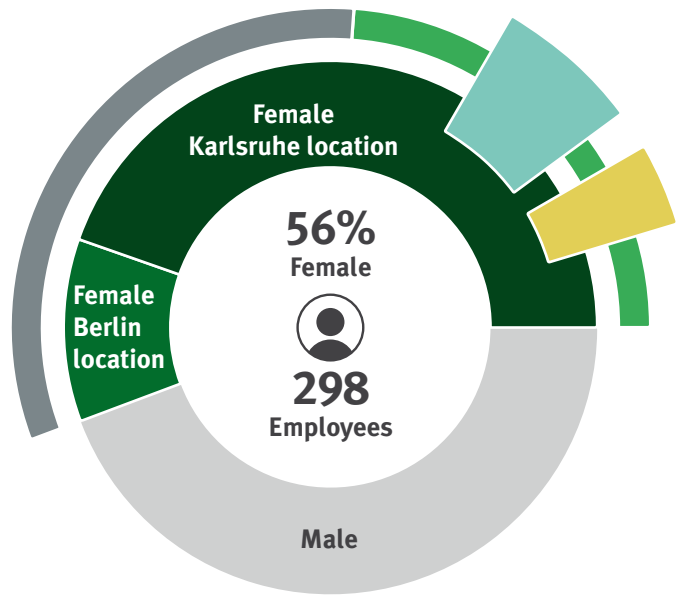


Figure 8: Number of female employees and their share of academic staff and their share of all managers in 2023.

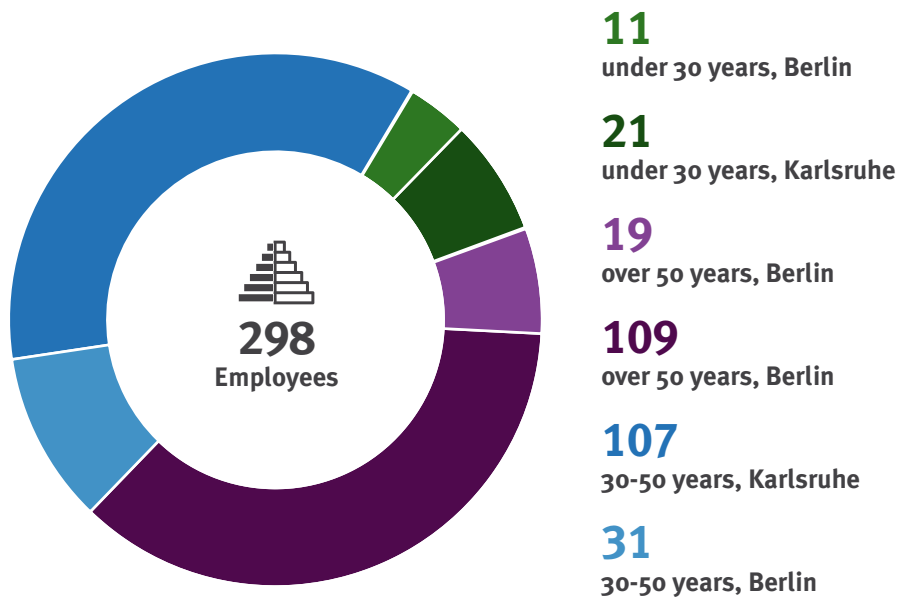


Figure 9: Age distribution of FIZ Karlsruhe's employees in 2023. 43 % of our employees are aged 50 and over.

5.3. CONTRACTUAL SITUATION

The overall psychosocial situation of employees and their sense of belonging to their employer is influenced by many other factors, including the contractual situation and pay. FIZ Karlsruhe is a member of the Municipal Employers' Association (KAV) for Baden-Württemberg. This means that employment contracts are concluded with employees in accordance with the collective bargaining law for the public sector. Academic staff are initially employed on a temporary basis. The same applies to the employment of persons whose work is temporary and financed (for example, for training and projects). Temporary employment contracts can be transformed into permanent employment contracts if funding is available for this. For a research institute, we have a very low rate of fixed-term employment contracts at 19.8 percent. Non-scientific staff, particularly in the two service areas of administration and IT, are generally employed on permanent contracts.

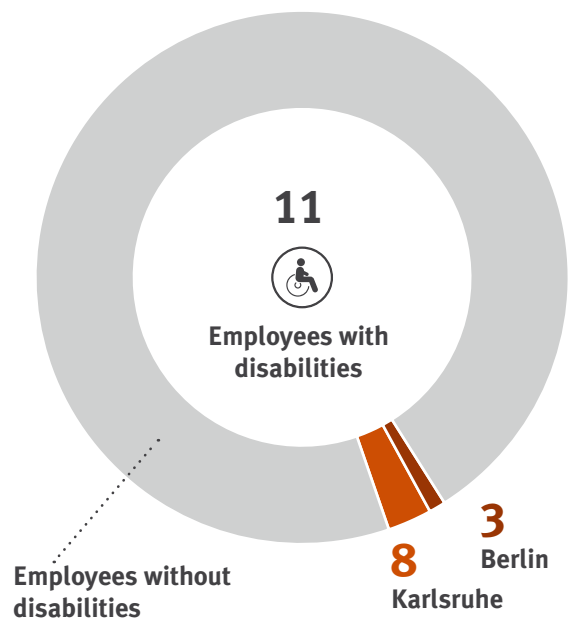


Figure 10: The number of employees with disabilities was just below the legally required quota of five percent.

5.4. FAMILY-FRIENDLY WORKING CONDITIONS

5.4.1. Future Work

An important step towards sustainable corporate development was taken with the General Works Agreement (GBV) "Mobile Working (Future Work)". Employees have the opportunity to work up to 80 percent of their working hours from home or other places within Germany. In individual cases, FIZ Karlsruhe also allows mobile working abroad. In this way, we promote and support the compatibility of work, family and caring obligations and at the same time help to reduce environmentally harmful emissions caused by commuting.

Together with the General Works Council, an internal FIZ working group evaluated the GBV "Mobile Working (Future Work)" using a mix of methods consisting of personal interviews and a standardized questionnaire for all employees. The result

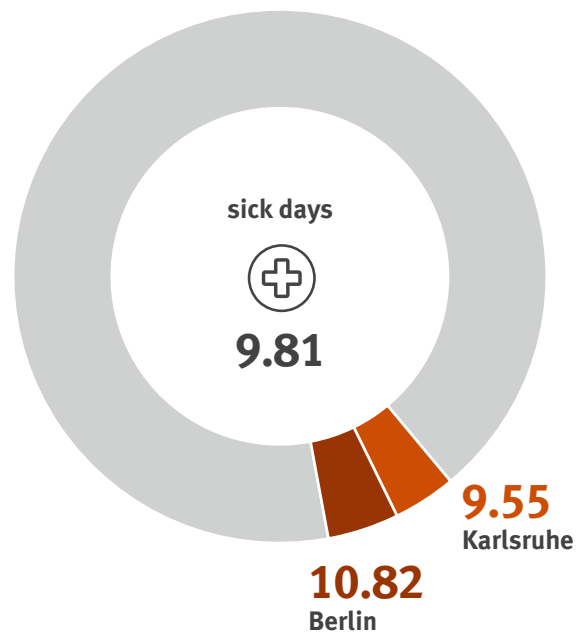


Figure 11: With an average number of 9.81 sick days per employee in 2023, FIZ Karlsruhe is well below the national average of 15.1 days. Source: Federal Statistical Office (<https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Qualitaet-Arbeit/Dimension-2/krankenstand.html>)

was a recommendation to continue the agreement. The employee survey was carried out as part of the risk assessment on mental stress in the workplace, supplemented by questions on mobile working. Both the interviews with employees and managers and the online survey came to a clearly positive conclusion: on the one hand, employees would like to adhere to the GBV regulations, and on the other hand, the personal and techni-

uncomplicated joint work, the World Work Café has become a central place for employees to socialize and meet when they are on site. On the one hand, the newly equipped meeting rooms and co-working spaces promote hybrid working models. On the other hand, open space models and the new spaces for communication and exchange increase the appeal for our employees to choose a flexible, balanced mix of on-site work and work-



Figure 12: The newly designed World Work Café, Photos: feco-feederle GmbH, Karlsruhe

cal framework conditions are in place to continue them. A further evaluation will be carried out in 2025 to help decide whether the GBV should become valid for an unlimited time.

In order to motivate our employees to work on site more often despite the high proportion of mobile work, and thus to strengthen collaboration and cooperation, we have modernized the FIZ premises in Karlsruhe as an additional measure within the scope of the Future Work GBV and created the World Work Café and a newly furnished meeting room. In addition to more co-working spaces for

ing from home. When planning the renovation and selecting the materials, we naturally focused on sustainability aspects.

5.4.2. Work-life balance and family audit

The individual needs of employees for a good work-life balance are taken into account wherever possible; this applies not only to raising children, but also to caring for relatives in old age or in the event of illness. Flexible working time arrangements and the option of mobile working are important building blocks in this respect. Reduc-

tions in working hours do not lead to a reduction in career opportunities. For example, part-time employees at FIZ Karlsruhe are also entrusted with management responsibilities. In 2022, the company was re-certified as a partner of the “audit berufundfamilie”²⁹. This is accompanied by the planning of further measures, for example:

- examination of further flexibilization of working hours
- further development of pre- and onboarding processes with regard to the hybrid working environment
- establishment of a mentoring program

Further measures are planned for the coming years, for example, the introduction of emergency support in the event of care bottlenecks, or a series of events dedicated to the topics of care, health care proxies and living wills.

mental stress in the workplace at FIZ Karlsruhe’s premises and during mobile working. It was completed with a high response rate from employees and did not reveal any critical points following the evaluation of the results.

In addition to these statutory requirements, FIZ Karlsruhe offers a range of voluntary services, such as flexible working hours, the “Mobile Working (Future Work)” GBV and health-promoting workplace equipment. We are gradually equipping workstations with height-adjustable desks with electric drives that support working while standing. A health day was held at the Karlsruhe site in spring 2024. In addition to presentations on first aid and mental health, we organized a vaccination check and a bike fitting course for our employees to check the ergonomic settings of their bicycles.

5.5. COMPANY HEALTH MANAGEMENT

In 2023, FIZ Karlsruhe created the position of an occupational health and safety and health management officer as part of its occupational health management (OHM) program. OHM encompasses all measures that help improve the health of our employees and their quality of life in the workplace. There are legal requirements in this regard, such as occupational health and safety, which is intended to prevent accidents in the workplace and protect the health of employees, or occupational integration management (BEM), which helps employees to get back to work after a long period of illness. The existing GBV will be revised and updated in the coming year in consultation with the BEM team.

In June and July 2023, a survey of employees was conducted on the risk assessment of mental stress in the workplace, which focused on two areas:

5.6. EQUAL OPPORTUNITIES & DIVERSITY

5.6.1. Equal opportunities

Equal opportunities are anchored as a value in FIZ Karlsruhe’s mission statement³⁰, and the implementation of the Equal Opportunities Implementation Agreement (AV-Glei) is a continuous structural goal of our institute. As a member of the Leibniz Association, we have been very successfully implementing the DFG’s “Research-oriented equality standards”³¹ for years. Cooperative behavior is anchored in our values. The Equal Opportunities Officer is involved in all relevant measures and is in constant communication with employees.

The European Union has established a “Gender Equality Plan” (GEP) as an eligibility criterion for Horizon Europe funding. Since March 2022, we have defined the key points of “Equality at FIZ

²⁹ Audit berufundfamilie certificate, <https://www.fiz-karlsruhe.de/sites/default/files/FIZ/Dokumente/berufundfamilie-zertifikat-und-kurzportrait.pdf>, accessed on September 03, 2024.

³⁰ <https://www.fiz-karlsruhe.de/de/ueber-uns/unser-leitbild>, accessed on September 03, 2024.

³¹ <https://www.dfg.de/de/aktuelles/zahlen-fakten/evaluation-studien-monitoring/studien/studie-gleichstellungsstandards>, accessed on September 03, 2024.

Karlsruhe³² within a Gender Equality Plan (GEP) and published them on our homepage. The plan will be updated in 2024.

As of December 31, 2023, the proportion of female employees was 56%; the proportion of women in management positions³³ was 44% (division, department and team heads). As part of the update of the Pact for Research and Innovation in 2020, FIZ Karlsruhe set target quotas for the year 2025. The actual status as at December 31, 2023 compared to the target quota for 2025³⁴ is shown in the table below:

Target quotas by management level	ACTUAL 12/31/2023	Target quota
Management	100 %	50 % ³⁵
Division management	33 %	50 %
Department management	40 %	41 %

Table 1: Proportion of female employees in management positions and target quotas

FIZ Karlsruhe is actively committed to ensuring that people with disabilities are not disadvantaged. The representative body for severely disabled employees, which is elected in accordance with the German Social Security Code, is involved in all measures affecting severely disabled employees and is informed and consulted accordingly. The workplace equipment and the building infrastructure are accessible and barrier-free. If required, FIZ Karlsruhe provides a workplace in the employee's home for severely disabled employees. FIZ Karlsruhe has had an inclusion officer since December 01, 2023.

The implementation of the Federal and State of Baden-Württemberg Disability Equality Acts (BGG and L-BGG) is a continuously pursued and achieved goal. When redesigning FIZ Karlsruhe's website, the requirements of BITV 2.0³⁶ were implemented (in accordance with L-BGG, § 10). When designing user interfaces for our own electronic products and services and the FIZ homepage, accessibility measures are implemented as far as possible. For user interfaces created in cooperative projects, we work towards the implementation of accessibility.

5.6.2. Diversity

We understand diversity in a professional context as more than just the presence of different people: it is about creating an inclusive and equitable working environment for these people in which everyone feels they belong - regardless of ethnic origin and nationality, gender and gender identity, physical and mental abilities, religion and worldview, sexual orientation, social background and age. These topics form the so-called diversity core dimensions. Our quota of severely disabled employees is 4%. We would like to increase this rate, for example by pointing out in job advertisements that we give preference to applicants with severe disabilities if they are equally qualified.

FIZ Karlsruhe signed the Diversity Charter³⁷ in 2024 in order to send a clear signal for diversity and tolerance and an appreciative and unprejudiced working environment. We ensure that the provisions of the General Equal Treatment Act (AGG) are complied with and are planning online training for 2024 to sensitize our employees to this topic.

32 <https://www.fiz-karlsruhe.de/sites/default/files/FIZ/Dokumente/Gleichstellung.pdf>, accessed on September 03, 2024.

33 Including non-scientific employees.

34 Explanation for these values: According to the Leibniz Association's guidelines, in 2020, when the target quotas for 2025 were set, a target quota of 50% was assumed as soon as gender parity was achieved at a career level. was set. The target quotas set for the year 2025 should not be adjusted annually to the quotas actually achieved, but should be defined as Target for 2025 to be maintained. https://www.leibniz-gemeinschaft.de/fileadmin/user_upload/Bilder_und_Downloads/Über_uns/Chancengleichheit/Handreichung_Zielquoten_2025.pdf, accessed on September 03, 2024.

35 not applicable in the case of sole management.

36 https://www.gesetze-im-internet.de/bitv_2_0/BITV_2.0.pdf, accessed on September 03, 2024.

37 Diversity Charter: <https://www.charta-der-vielfalt.de>, accessed on September 03, 2024.

Diversity is anchored as a value in FIZ Karlsruhe's mission statement. Our employees come from 23 different nations. The active integration of foreign employees, for example by means of individual, in-house language training, assistance with visits to the authorities and support with official correspondence, is an integral part of diversity management. In a pilot project, we are currently employing two staff members who live permanently in Spain and are investigating the extent to which our offer to work permanently for FIZ Karlsruhe from their country of origin can also be implemented for other EU countries.

personal and social skills of our employees, for example on the following topics: Establishing a sustainability management system based on ISO 26000, working from home and legally compliant mobile working, working relationships with severely disabled employees and third-party funding. The events were mainly attended online. We also offer all employees online training on occupational health and safety and two training courses on data protection and data protection in human resources. Since 2023, external language courses have also been offered in addition to in-house courses.

5.7. QUALIFICATION, TRAINING AND FURTHER EDUCATION

Sustainable personnel development means strengthening employer attractiveness in such a way that staff turnover is kept to a minimum. The personnel development measures at FIZ Karlsruhe include regular feedback meetings between employees and their superiors, as well as further and advanced training. In 2023, we financed 67 events with a total of 91 participants to develop and promote the professional,

5.8. GOOD LEADERSHIP

Good leadership and a trusting relationship between employees and their line managers are also relevant for a sustainable HR strategy. Confidential annual feedback meetings between employees and their direct superiors offer the opportunity to discuss the employee's work tasks, cooperation and prospects for change and development and, if necessary, to reach agreements on this. A "performance review" guide serves as orientation for both employees and managers.



»Our office buildings are between forty and well over a hundred years old, making them a challenge for sustainability management.«

Uwe Lumpp, Facility Manager

6. SUSTAINABILITY MANAGEMENT OF BUILDINGS AND INFRASTRUCTURES

The sustainability management of buildings has a significant impact on energy consumption and the resulting CO₂ emissions. The energy quality of buildings, the building technology used, the energy sources used and the materials used in refurbishment projects play a key role here. FIZ Karlsruhe is pursuing the goal of significantly reducing energy consumption and CO₂ emissions over the next ten years and using renewable energies, in particular photovoltaics.

FIZ Karlsruhe has two locations in Germany: Eggenstein-Leopoldshafen (near Karlsruhe) and Berlin. The head office is located on the North Campus of the Karlsruhe Institute of Technology (KIT). At the Berlin location, we use rented office space in the immediate vicinity of the Technical University.

As part of the status quo analysis, we also recorded the condition of the buildings we use, the building technology and our energy consumption. This information forms the basis for deriving specific measures such as energy-efficient refurbishments and suitable material selection for structural changes. The analysis has shown that there are gaps in much of the data on both buildings and building technology. We are therefore planning an energy audit and an energy consultation for 2024. In addition, we want to determine building parameters and current energy requirements and identify sensible energy-efficient refurbishment measures in order to use the available financial resources for refurbishment and modernization as effectively as possible.

6.6.1. INITIAL SITUATION OF THE OFFICE BUILDINGS IN KARLSRUHE AND BERLIN

6.1.1. Karlsruhe location

At our main location, we have four buildings for traditional office operations (Buildings 238, 240, 241, 444). They were built in the 1960s, 1970s and 1980s and have a total of 11,120 m² net floor area (GFA, DIN 277). We have not used building 444 with 938 m² net floor space since 2023. We plan to hand over the building to KIT in 2024. No energy performance certificates are currently available; meaningful parameters on the energy status of the buildings are therefore not available. Ventilation is provided via the windows, some of which have external and/or internal shading/glare protection.

KIT acts as the energy supplier on the North Campus site. Accordingly, we are supplied with electricity, heating and drinking water via the KIT supply network. We use district heating to heat the build-

Gebäude 240/241
 Geschäftsführung
 Patent & Scientific Information
 Fachspezifische Services
 e-Research
 Information Service Engineering
 Immaterialgüterrechte
 IT-Systeme und Datennetze
 Verwaltung (Leitung, Personal/Infrastruktur, Justizariat)

Gebäude 238
 Patent & Scientific Information
 Verwaltung (Finanzen und Controlling)



Figure 13: FIZ Karlsruhe site plan at the Campus North location

ings and provide hot water. Heat is transferred from the KIT district heating network via a heat transfer station. FIZ Karlsruhe draws its electrical energy from the KIT's 20 kV (kilovolt) grid via a KIT-owned transformer station. KIT is considering obtaining electricity from 100 percent renewable sources in the future. Until then, FIZ Karlsruhe depends on KIT's current energy mix.

6.1.2. Data center at the Karlsruhe site

FIZ Karlsruhe's data center (RZ) is located on the first floor and basement of the main building 240, where we currently operate over 361 physical servers, 46 of which we use for virtualization. They are currently running 522 virtual machines. There is also a mainframe system (mainframe computer). A total of 617 terabytes of hard disk and flash memory and 46 drives for tape backups are available. Air conditioning is provided by a ventilation system in conjunction with a cooling system consisting of three chillers. In 2007, we integrated a free cooling system into the system, which uses cool (and free) outside air to transfer heat between the ambient air and the cold water used for cooling. If the outside temperature falls just a few degrees Celsius below the required flow temperature of the cooling systems, we can use free cooling instead of the much less energy-efficient compressors of the chillers. Free cooling re-

duces the need for electrical power and therefore increases energy efficiency.

6.1.3. Berlin location

The rented office space is located in a mixed-use building (office, warehouse, production) built between 1865 and 1910. The net floor area of the rooms we use is 842 m². Heating is provided by district heating and hot water is heated electrically. A server room for the locally operated IT infrastructure is cooled with an air conditioning split unit.

6.2. REFURBISHMENT AND MODERNIZATION

In recent years, we have already implemented initial measures to improve the energy quality of the building fabric:

- Between 2008 and 2013, renovation work was carried out on the heating, air conditioning and ventilation technology. For example, some of the district heating transfer stations and heating distribution systems were replaced and optimized.

- We renewed the windows of the meeting rooms on the west side of building 241.
- In summer, room temperatures regularly exceed the maximum temperatures recommended for offices. We have therefore decided to install modern and energy-efficient air conditioning systems (air conditioning split units). The offices in the main building 240 have had air conditioning units since 2023. Buildings 238 and 241 followed in 2024, meaning that the entire office space at the Karlsruhe site will be air-conditioned from 2025. We regularly inform employees about energy-saving use.
- We commissioned the energy-efficient refurbishment of the roof of building 241 (the work was carried out in 2024).
- In 2023, we began installing energy-efficient LED lighting in building 241. This will be followed by successive replacements in the other buildings. We are replacing defective light sources directly with LED lights.
- In 2023, we converted our cafeteria into a World Work Café (see section 5.4) and furnished several public spaces (foyer, passageway to building 242, cafeteria) with natural plant and moss walls known as “Living Walls”.

Due to the high-capacity utilization of our buildings, we have to carry out all modernization and renovation work during ongoing operations. We take care to provide our employees with a pleasant working environment that meets health and safety requirements during this work. We inform employees in advance of any particularly noisy or dust-intensive work and encourage them to use our internal co-working spaces or mobile working outside FIZ Karlsruhe’s buildings.

6.3. ENERGY CONSUMPTION

From a climate protection perspective, it is essential to significantly reduce the consumption of non-renewable resources - such as fossil fuels - in order to both protect the environment and save costs. We have therefore started analyzing our electricity consumption in recent years using the



Figure 14: Living Walls with natural plants in the entrance and corridor area of our main building at the Karlsruhe site, source: FIZ Karlsruhe, Petra Schwartz



Figure 15: Exterior view of the office building in Berlin, source: FIZ Karlsruhe, Franziska Fodstad



Figure 16: Interior view of the office in Berlin, source: FIZ Karlsruhe, Franziska Fodstad

KARLSRUHE LOCATION

Description of existing buildings in Karlsruhe, as at Dec 31, 2023

Building 238

Year of construction: 1985
Construction method: Solid construction
Net floor area according to DIN 277:
1,330 m²

Building 240

Year of construction: 1976-1978
Construction method: Solid construction
Net floor area according to DIN 277:
6,509 m²

All Buildings

Low barrier: Yes
Energy consumption certificate: no
Energy supply via the KIT
Electricity: enercity AG
Share of renewable energies: 49.2 %
CO₂ emission factor: 269 g/kWh
Heat supply (heating/hot water): District heating
Energy source: Gas
CO₂ emission factor: 119 g/kWh

Data center in Building 240

Emergency power supply: Batteries for RZ 245 kW, Emergency diesel power 820 kVA
Cooling supply RZ: 3 coolers
Total cooling capacity: 810 kW
Electrical power: 270 kW

Building 241

Year of construction: before 1960
Construction method:
Lightweight construction
Net floor area according to DIN 277:
2,343 m²



RENTED OFFICE SPACE BERLIN

Description of rented office space in Berlin, as at Dec 31, 2023

Year of construction: 1865-1910

Construction method: Solid construction

Net floor area (NGF) according to DIN 277: 842 m²

Low barrier: Yes

Energy consumption certificate: Yes

Air conditioning server room, Electrical power 7 kW

Energy supply:

Electricity: Vattenfall

Share of renewable energies: 58.9 %

CO₂ emission factor: 258.6 g/kWh

Heat supply: District heating

Energy source: Gas

CO₂ emission factor: 119 g/kWh

Hot water supply: decentralized, electric

five meters currently available. We plan to install more electricity meters, for example to analyze the electricity consumption of the building technology in more detail and to identify potential savings.

6.3.1. Heat consumption

Heat consumption is calculated separately for each building. Figure 17 shows the total consumption

At 73 kWh/m² a (kilowatt hours per m² of net floor area per year), the heat consumption for all office

space at FIZ Karlsruhe in 2023 was below the reference value for non-residential buildings³⁸ of 110 kWh/m² a. It should be noted that the offices are not used on a daily basis. Due to the change in attendance times as a result of the coronavirus pandemic, heat consumption decreased compared to 2019. After the end of the pandemic, FIZ Karlsruhe introduced a flexible working location concept (“Future Work”), which enables mobile working for up to 80 percent of monthly working hours (see section 5.4). This arrangement is used

³⁸ Energy consumption index for the non-residential building stock from the Federal Gazette “BAnz AT 21.05.2015 B3” - Annex 2, Table 2.1 Section 9.2 Office buildings temperature-controlled and ventilated.

intensively by our employees. This is one reason why heat consumption has not risen again after the coronavirus pandemic.

6.3.2. Power consumption

We can currently determine electricity consumption using five electricity meters, broken down by building, data center (air conditioning) and data center (IT infrastructure). The initial evaluation showed that this breakdown is not sufficient to record energy-intensive consumers such as heating pumps in order to identify significant optimization potential.

Figure 18 shows the total consumption across all buildings plus the data center. At 15 kWh/m² a, our consumption is well below the reference value for non-residential buildings of 85 kWh/m² a. As with heat consumption, the high proportion of mobile employees must be taken into account. In addition, the buildings have no ventilation systems and were only partially air-conditioned.

In order to significantly reduce our CO₂ emissions and increase the proportion of renewable energies, we installed photovoltaic systems on the roofs of buildings 241 (100 kilowatt peak, kWp) and 238 (29 kWp) in 2024. The operation of the data center and the air conditioning of the offices generate a high base load - especially in the summer months - so that we can probably use the electricity generated directly.

Our data center requires considerable amounts of energy. In 2023, consumption amounted to 2,3 gigawatt hours, which accounts for 93% of our total electricity consumption. The data center's air conditioning accounts for the largest share of this. For environmental and economic reasons and due to regulatory requirements, we want and need to identify potential here to reduce energy consumption in the short term. To this end, we have been developing an IT transformation plan since the end of 2023. Among other things, this plans to consolidate the IT infrastructure, significantly reduce the air-conditioned area and introduce mod-

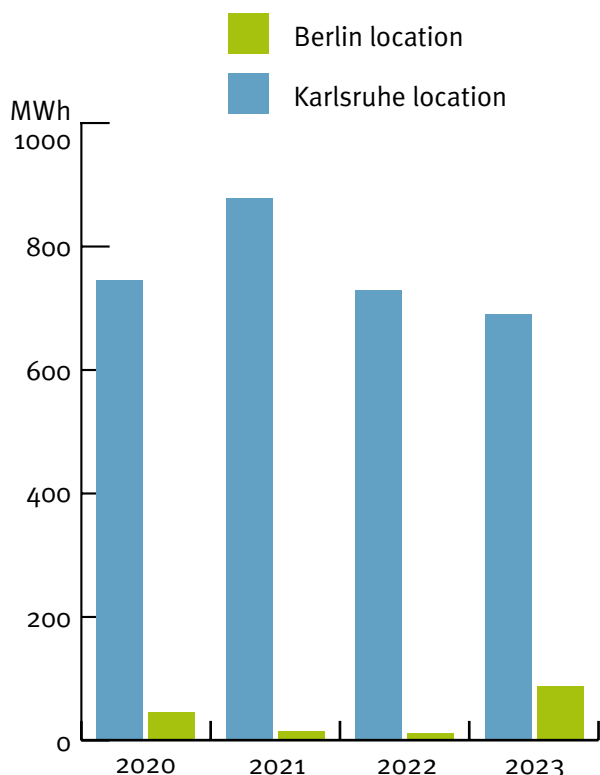


Figure 17: Heat consumption in megawatt hours (MWh) at the Karlsruhe and Berlin sites, *calculated on the basis of the energy performance certificate. The 2023 statement was not yet available at the time of reporting.

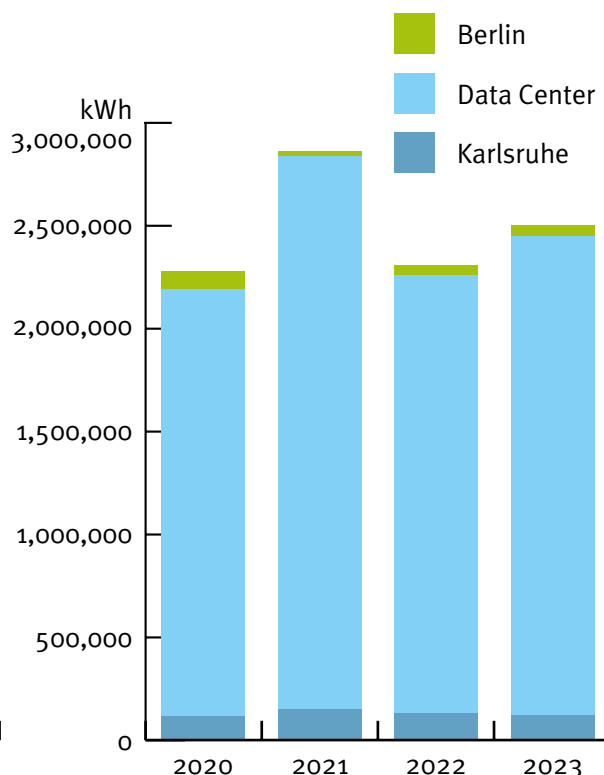


Figure 18: FIZ Karlsruhe electricity consumption across all buildings and the data center at the Berlin and Karlsruhe sites

ern, needs-based air conditioning in the medium term.

As part of the energy audit planned for 2024, we are analyzing further approaches to improve energy efficiency. We will check whether other consumers are assigned to the data center's electricity meters (air conditioning and IT infrastructure). We suspect that these meters also record other consumers that cannot be allocated to the data center.

6.3.3. Greenhouse gas emissions

For the year 2023, we only consider CO₂ emissions resulting from the purchase of electricity and district heating. The calculations are based on the following emission factors:

- District heating: 119.0 g/kWh
- Electricity in Berlin: 258.6 g/kWh
- Electricity in Karlsruhe: 269.0 g/kWh

We are aware that the institute's total greenhouse gas emissions are significantly higher, for example due to the CO₂ footprint of procurements or staff travel to and from the institute. However, we are unable to measure these values reliably at the present time.

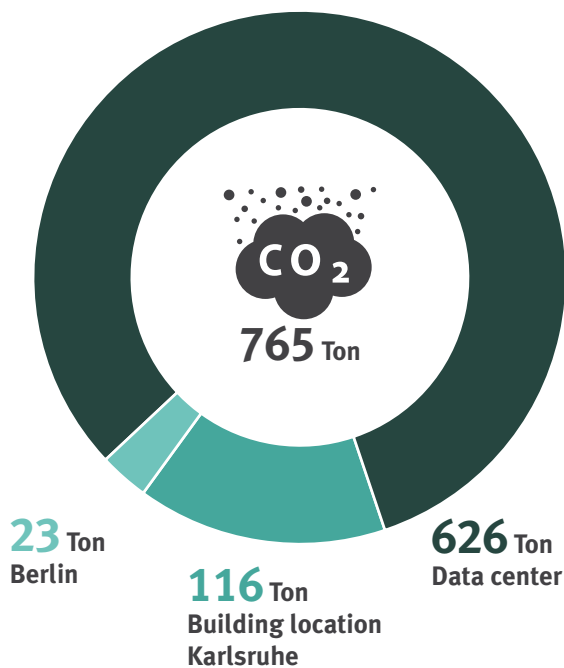


Figure 19: CO₂ balance in tons of electricity and heat consumption (building and data center) 2023, source: Energy audit 2024

6.4. Drinking water consumption

Water consumption at the Karlsruhe site cannot be recorded separately for cold water and hot water. We therefore only have the total consumption available (see Figure 20). Since the winter of 2022, we have not used hot water in the toilet facilities in order to reduce energy consumption.

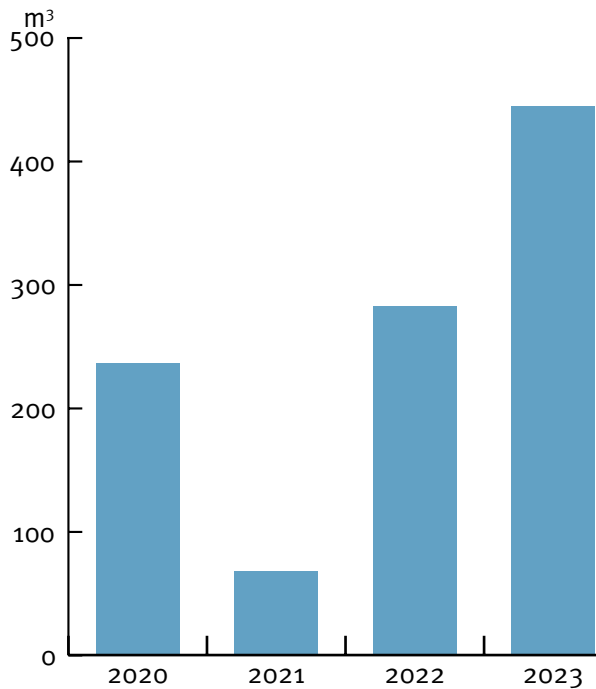


Figure 20: Water consumption at the Karlsruhe site

We cannot determine the water consumption at the Berlin site. There are no water meters available.





»From purchasing to disposal, from business trips to JobRad - there is an opportunity for sustainability in every process, no matter how small.«

Michael Balzer, Head of Controlling

7. SUPPORTING PROCESSES

Sustainable developments always consist of a structure of many large and small processes that interlock and complement each other as smoothly as possible. In addition to the major issues mentioned above, such as building infrastructure and electricity, sustainability also plays an important role in small-scale processes such as the procurement and disposal of equipment or the organization and execution of business trips. In this chapter, we take a special look at this and show which criteria are relevant in the area of supporting processes, where we are already acting sustainably and where there is still a need for action.

7.1. PROCUREMENT

In 2022, we fundamentally revised our “Procurement Regulations” and added important sustainability aspects. Sustainability criteria must now be included in the specifications of all products or services to be procured, which we check during every procurement process.

Our long-term goal is to make our procurement socially and ecologically sound by giving priority to environmentally friendly products that are manufactured in accordance with social standards or are fairly traded. Recognized seals and certificates for certain product groups are very helpful in this regard, such as the Blue Angel³⁹ or the Fairtrade seal⁴⁰. With these seals, independent third parties certify the products. The requirements criteria are also publicly available. In addition, the legally prescribed EU energy label and the EU energy

consumption label help to select energy-efficient products such as monitors.

We are currently developing criteria and creating structures to evaluate and document the sustainability of procurements. On the basis of the key figures collected, we then want to check on an annual or quarterly basis which procured products have a seal or certificate or have designated efficiency classes and how high the proportion of non-certified products is. We are also interested in why no environmentally friendly products were procured. We are still at the very beginning of this process.

7.1.1. Paper

FIZ Karlsruhe participates in a Leibniz initiative for the joint procurement of paper. We have been procuring paper with the “Blue Angel” certificate through this channel since mid-2023. However, in

39 <https://www.blauer-engel.de/de>, accessed on September 03, 2024

40 <https://www.fairtrade-deutschland.de>, accessed on September 03, 2024.

2023 we still used residual stocks in FSC (Forest Stewardship Council) quality⁴¹.

For sustainability reasons, no printed reports, magazines or other brochures have been produced since 2022. The exception is the 2022 Annual Report, which was printed in small quantities (150) on paper certified with the Blue Angel. We also send out meeting documents for the Supervisory Board and the Scientific Advisory Board exclusively in electronic form. Since 2023, we have been documenting our annual paper consumption and tapping into further savings potential. For example, we will introduce an electronic personnel file. Our employees are encouraged to use paper sparingly and only print out documents when absolutely necessary.

7.1.2. Cleaning agent

Taking environmental aspects into account when cleaning public buildings has great ecological potential that we want to exploit. For future tenders, we will therefore draw up a list of services that includes environmentally friendly cleaning agents that are verified by recognized certificates or meet the standards of these certificates.

7.1.3. IT devices and accessories

Hardware such as notebooks, smartphones and desktop computers should be used for as long as possible, as the majority of climate-damaging emissions in the life cycle of devices are generated during their manufacture.⁴² Our aim is therefore to maximize the useful life of the devices. For example, we extend the service life of batteries by charging them carefully and, if necessary, only replace batteries and not the entire device.

Since 2023, the keyboards with which our workstations are equipped as standard have been awarded the Blue Angel certificate. We are constantly reviewing further measures for the sustainable use of IT equipment and accessories.

7.2. OCCUPATIONAL MOBILITY

In the discussion about the CO₂ emissions of a research organization, the indirect environmental impact, which is also influenced by the work-related mobility of employees, is coming into focus. Due to the coronavirus pandemic, business travel

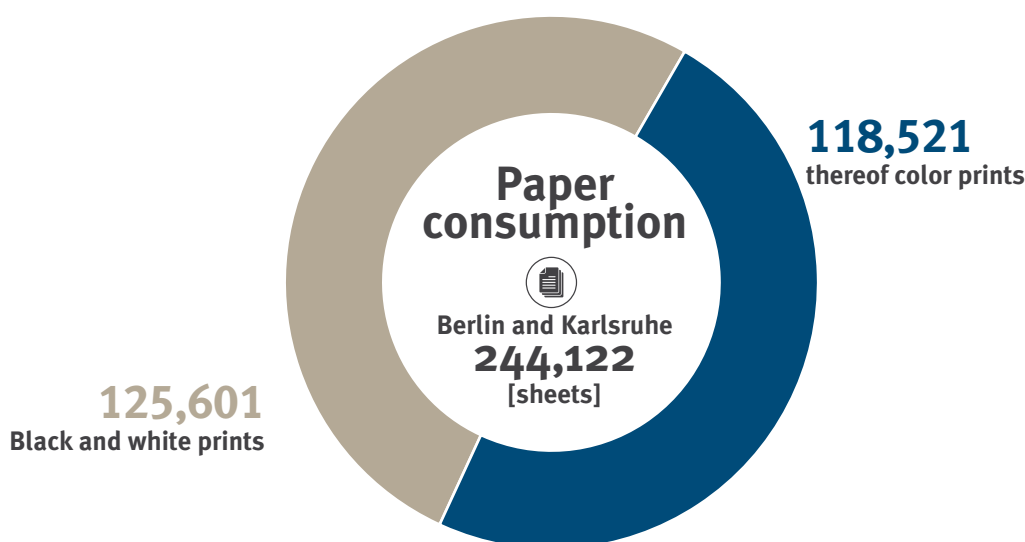


Figure 21: Paper consumption FIZ Karlsruhe (Berlin and Karlsruhe)

⁴¹ International certification system for more sustainable forest management, <https://www.fsc-deutschland.de>, accessed on September 03, 2024.

⁴² <https://www.umweltbundesamt.de/umwelttipps-fuer-den-alltag/elektrogeraete/computer-pc-laptop#so-gehen-sie-nachhaltiger-mit-pc-und-laptop-um>, accessed on September 03, 2024.

initially fell sharply. However, we are seeing a significant increase in travel again.

We continue to make intensive use of the video conferencing systems introduced during the coronavirus pandemic. In particular, virtual participation in meetings or conferences avoids long journeys. Even though video conferencing is not emission-free, it significantly reduces CO₂ emissions.

As a general rule, we encourage our employees to use public transport and trains for work-related travel and only fly in exceptional cases. Car and cab journeys are only permitted in justified exceptional cases. The number of business trips made in 2022 and 2023 is shown in Table 2. An evaluation with regard to CO₂ emissions is shown in figure 6 in chapter 1.

The general works agreement on mobile working (Future Work) gives employees the opportunity to work from home for up to 80% of their working hours. This also helps us to reduce environmentally harmful emissions caused by commuting. We also offer the option of leasing a JobRad bike and purchasing a discounted JobTicket (railway ticket valid throughout Germany).

Cycling can support health, contribute to well-being and reduce the impact on the environment.

That's why we introduced the JobRad in 2022. Employees can lease both bicycles and e-bikes at low cost. As of Dec 31, 2023, 16 employees were using this offer. We have been providing our employees with a free charging station on the FIZ Karlsruhe premises for several years now.

Since November 2023, we have been offering our employees the JobTicket. As an employer, FIZ Karlsruhe covers half of the costs, currently 25 euros. As at Dec 31, 2023, 69 employees had already used this offer.

7.3. AVOIDING AND DISPOSING OF WASTE

Office furniture that is discarded from FIZ Karlsruhe's inventory but is still functional is donated to social institutions or sold where possible. In 2023, we were able to hand over some discarded desks and other tables to a company that restores and resells them. We are currently looking into further opportunities to donate depreciated inventory to social institutions.

Otherwise, FIZ Karlsruhe disposes of its waste professionally and separately according to waste type. We also strive to achieve the highest possible recycling rate.




Work-related travel	2022	2023
Number of all trips*	200	451
Air travel 	14	46
in relation to all trips [%]	7%	10%
Intercontinental in relation to all air travel [%]	4 29%	16 35%
Europe in relation to all air travel [%]	9 64%	27 59%
Domestic in relation to all air travel [%]	1 7%	3 6%
Rail travel 	178	358
in relation to all trips [%]	89%	80%
Germany in relation to all rail journeys [%]	156 88%	336 94%
Europe in relation to all rail journeys [%]	22 12%	22 6%
Traveling by car 	8	47
in relation to all trips [%]	4%	10%

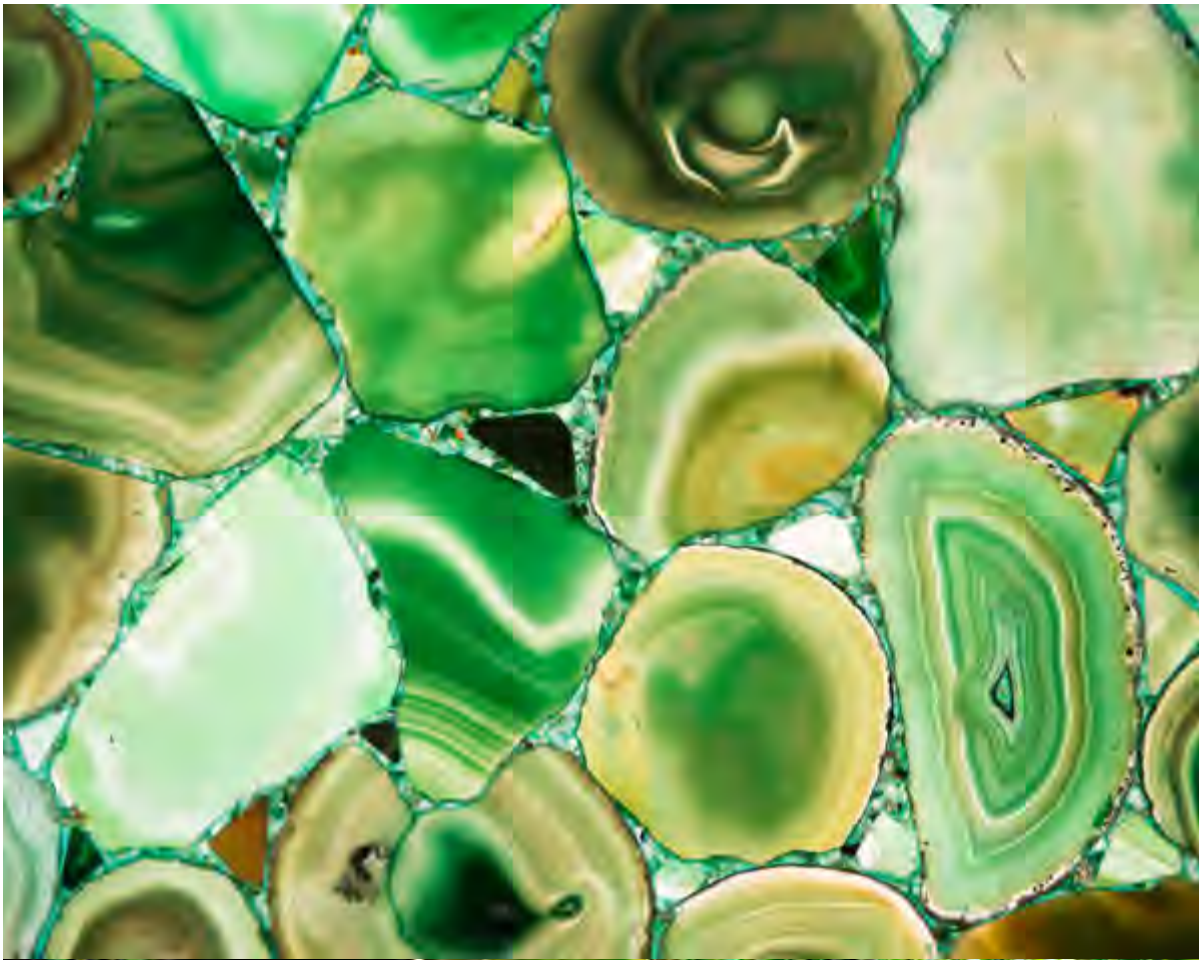
Table 2: Work-related travel by FIZ Karlsruhe (Berlin and Karlsruhe),
* trips are return trips or return flights.

7.3.1. IT devices and accessories

We take functional devices from departing employees into our inventory pool so that they can continue to be used if they are needed spontaneously. Our servers are used until the “end of

life”, i.e., either until they no longer meet the technical requirements or pose a security risk due to a lack of updates.





8. CONCLUSION OF OUR FIRST SUSTAINABILITY REPORT

This first sustainability report shows that FIZ Karlsruhe has already successfully implemented many measures relevant for social issues and sustainable management and is well positioned here. However, we will also examine further measures in these areas, for example on the subject of diversity and work-life balance. When it comes to ecological issues such as climate and environmental protection, we still need to make considerable progress in the future in order to transform FIZ Karlsruhe into a climate-neutral and environmentally friendly institute in the long term. We will therefore prioritize the necessary measures.

We have already identified initial areas for action, such as energy, buildings and infrastructure, IT

and data center as well as procurement. We see great potential in these areas to make a positive contribution to the sustainable development of our institute. Concrete steps are now required. We will therefore develop a specific sustainability plan for FIZ Karlsruhe and define short, medium and long-term goals and measures.

The work on this first sustainability report has shown us that we still have many processes to establish, particularly with regard to data quality and availability. We have overcome the first hurdle with this report and are now well on our way.

We will continue to publish our goals, measures and results in an annual sustainability report.

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Published by

FIZ Karlsruhe – Leibniz-Institut für Informations-
infrastruktur GmbH
Hermann-von-Helmholtz-Platz 1
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