

EXECUTIVE SUMMARY | ENGLISH VERSION

Networking

Researching

Thinking Ahead

FUTURE

Sustainability Report 2014/15



Networking, Researching, Thinking Ahead

PREFACE



This summary refers to the second Sustainability Report of Forschungszentrum Jülich (period under review 2014/2015). A small number of copies of this report was published in May 2017. In the same way as the previous report, the present report conforms to the regulations of the Global Reporting Initiative (currently GRI G4). A declaration of conformity to the Sustainability Code (DNK) is also available.

The aim of this report is to provide an insight for shareholders of Forschungszentrum Jülich as well as its partners, employees and the general public into its working manner, practice of values and developments. Moreover, Forschungszentrum Jülich collaborates with other centers in the Helmholtz Associ-

ation (HGF) and other non-university institutions to create binding guidelines for sustainability reporting in the research context.

The United Nations has set 17 goals for global sustainable development. At the end of 2015, all member nations agreed to these Sustainable Development Goals (SDGs), which now have to be implemented on the national level. Scientific institutions, such as Forschungszentrum Jülich, have a decisive contribution to make in this implementation. Such institutions do not only record the status quo, they also provide assistance in improving the situation and in providing options for a more sustainable world.

In order to document progress on this path and to make such progress transparent, since June 2014 Forschungszentrum Jülich has compiled a Sustainability Report covering a period of two years. In this context, sustainability is explicitly not merely reduced to an ecological and resource-conserving approach. In contrast, it aims to work on as many of the United Nations' sustainability goals as possible and to pave the way to their realization by achieving excellent research results.

The complete Sustainability Report (in German) is available online at:

www.fz-juelich.de/nachhaltigkeitsbericht

The Executive Summary covers the five chapters of the report: Profile and Process Control, Research, Economic, Ecological and Social Responsibility.

We decided to adopt this format in order to provide an overview in the form of a compact summary in addition to the full report. The Sustainable Campus staff unit is the first point of contact for all matters related to the Sustainability Report and the Executive Summary.

We hope that you enjoy reading the summary.

Yours sincerely, Sustainable Campus

PROFILE AND PROCESS CONTROL



Forschungszentrum Jülich regards itself as working on behalf of society. As a member of the Helmholtz Association (HGF), it is involved in the HGF's overall strategy which addresses urgent issues of society, science and industry. Furthermore, Forschungszentrum Jülich is committed to ensuring responsible corporate governance. The central component of this endeavour is a Mission Statement compiled by Forschungszentrum Jülich itself. This Mission Statement will be further developed in the course of a Strategy Process initiated in 2015 and will be covered in detail by the third Sustainability Report.

Forschungszentrum Jülich pursues sustainable research which critically examines the research process as well as scientific research for sustainable development as part of the HGF and the national and international

scientific community. An example of these efforts is Forschungszentrum Jülich's participation in the HGF's sustainability group and the collaborative project LeNa (Sustainability Management in Non-University Research Organizations).

Responsibility as an Enterprise

Forschungszentrum Jülich is committed to entrepreneurial responsibility. It complies therefore with both the Public Corporate Governance Code and a decentralized quality management (QM). With respect to the latter, the individual organizational units are responsible for introducing and implementing their own QM. Sixteen organizational units have already been certified and another four are ready to be certified. The Quality Management organizational unit offers support throughout the whole process.

Forschungszentrum Jülich does not operate a certified environmental management system. However, it is concerned with all aspects of such a system, namely water protection, waste management and pollution control. An energy audit was conducted in 2015 to provide an overview of energy flows and potential savings. Prior to this, consumption statistics on energy, heat and water had been acquired for every building on campus.

In addition, soft factors also play a vital role. Forschungszentrum Jülich developed guidelines, rules and recommendations at an early stage. These frameworks safeguard good scientific practice and ethics in research, as part of anticorruption efforts, as well as for risk management and management of knowledge and ideas.

Internal and External Communication

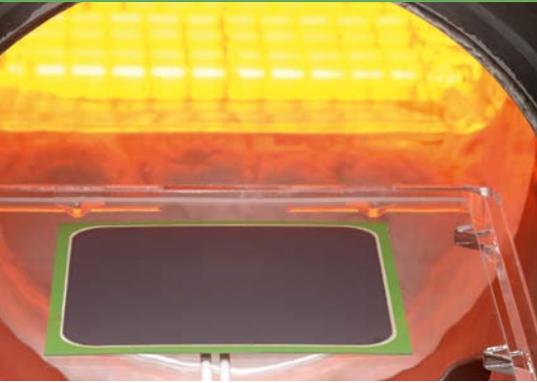
All the efforts outlined in the Sustainability Report as well as the entire work of Forschungszentrum Jülich have to be communicated to the individual stakeholders inside and outside the enterprise. Internal communication, in particular, goes well beyond these goals. Various forms of dialogue are available to employees, such as monthly guided tours, as well as communi-

cation tools such as the intranet, magazines and newsletters.

As an institution, which is for the most part publicly funded, contacts in and with politics are of central importance to Forschungszentrum Jülich. It does not merely present and explain its current research results. Its results may even shape legislation in the direction laid down in the SDGs. However, it also becomes apparent that science is increasingly confronted with expectations from politics and society so that it must examine its own work more critically and also enlist the support of the public.

In 2015, the newly created Jülich Neighbourhood Dialogue established a special dialogue format which regularly brings together local stakeholders and Forschungszentrum Jülich at a round table. It is intended to break down barriers and allows critical issues to be discussed openly. The initial assessment of this new dialogue format is positive and a valuable addition to other existing communication formats. Forschungszentrum Jülich has thus increased transparency, provided information to specific target groups and established a relationship based on mutual trust with the dialogue partners.

RESEARCH



The research profile of Forschungszentrum Jülich is characterized by excellence in all fields, priorities and institutes. The scientific work itself, a constant transfer of technology and knowledge, as well as regional, national and international cooperation and networking enable Forschungszentrum Jülich to play an active role in fulfilling individual SGDs.

Energy and Climate

Above all the Institute of Energy and Climate Research (IEK) is conducting research on energy and climate. However, the Institute of Bio- and Geosciences (IBG), the Peter Grünberg Institute (PGI), the Jülich Centre for Neutron Science (JCNS) and the Central Institute of Engineering, Electronics and Analytics (ZEA) are also involved in some aspects of this field. On the other hand, IEK also has organizational units that deal intensively

with materials, manufacturing processes, process engineering, nuclear waste management and reactor safety.

Research at IEK and other involved institutes is concerned with the status quo and with issues, for example, affecting the Earth's atmosphere. Nevertheless, efforts also target the future. The pioneering basic and application-oriented research at Forschungszentrum Jülich plays a key role in implementing the Energiewende in Germany and around the world.

A research highlight in the area of climate and energy is therefore research on materials for the Energiewende, as used, for example, in thin-film photovoltaic modules, innovative devices for energy storage and solid oxide fuel cells.

Bioeconomy

In addition to energy and climate research, bioeconomy is the second research priority at Forschungszentrum Jülich. In the light of increasingly scarce resources, new solutions for engineering materials and raw materials are required. In a nutshell, bioeconomy is all about the transition from fossil to renewable resources.

At Jülich, this research is primarily driven by the IBG in collaboration with partners from the Bioeconomy Science Center (BioSC). The BioSC involves 65 institutes from RWTH Aachen University, the universities of Bonn and Düsseldorf and Forschungszentrum Jülich which work on integrated solutions for the bioeconomy. For instance, they test and develop microorganisms and enzymes for application as biocatalysts, they analyse terrestrial systems at the interface between biology, chemistry and geology, and they investigate the entire plant system to identify economically useful properties.

Health Research

Jülich's third scientific priority – health research – is concentrated in the Institute of Neuroscience and Medicine (INM) and

the Institute of Complex Systems (ICS). Attention is primarily focused on the human brain arising from Jülich's involvement in the Human Brain Project (HBP). In the project, more than 110 international institutions work together on intensively researching the brain in the next few years, pooling their knowledge and mapping the brain in simulations.

This makes it possible for researchers at Jülich to investigate neurodegenerative diseases with respect to structure and function and to outline potential treatments. In the past few years, the supercomputers at Jülich and collaborations between different institutes have provided improved and entirely new opportunities for in-depth studies. Forschungszentrum Jülich makes a key contribution to the HBP consortium with its interdisciplinary work in this field.

Supercomputers and New Materials

Supercomputers and new materials represent the fourth research priority at Forschungszentrum Jülich. The Jülich Supercomputing Centre (JSC) at the Institute for Advanced Simulation (IAS) is responsible for the JUQUEEN supercomputer which is, as of 2015, Germany's fastest mainframe com-

puter and one of the eight fastest systems in the world. This means that JSC is involved in a wide range of research activities.

In addition, material and particle research is undertaken at the Nuclear Physics Institute (IKP), the Jülich Centre for Neutron Science (JCNS) and PGI. IKP works in the field of hadron research, while JCNS is mainly devoted to neutrons. This research provides unique insights into solid and liquid matter. The key role of these fields is reflected again and again in important interdisciplinary research results, cutting across all institutes and priorities, for example new drive and storage technologies for electric vehicles, new explanations for the side effects of drugs and innovative brain simulations.

Technology and Knowledge Transfer

All these research results must be communicated to the public via a sustainable trans-

fer of technology and knowledge. This is achieved, for example, through spin-offs, collaborations, publications and participation at trade fairs. Forschungszentrum Jülich is the only institution in the HGF which concentrates different aspects of this work in the organizational unit of External Funding and Technology Transfer. A large number of project proposals, diverse events and successful spin-offs demonstrate Forschungszentrum Jülich's excellent performance in this area.

Cooperations

Cooperations are another example of sustainable research at Forschungszentrum Jülich in terms of social impact. Forschungszentrum Jülich is well integrated in regional, national and international networks. It collaborates with diverse partners, including industry, on pioneering research topics and their impact and implementation.

ECONOMIC RESPONSIBILITY



In the holistic sense of a sustainable approach to research, economic aspects also play a crucial role in the work of Forschungszentrum Jülich. The Sustainability Report provides a detailed overview of third-party funding, public grants, expenditure for research and operating costs as well as investments. The latter include extensive work on refurbishing buildings, technical facilities, constructing new buildings and measures for legacy waste as well as investments in European research infrastructures in which Jülich is involved in development and expansion.

Personnel Expenditure

With respect to the social impact of research, personnel expenditure also includes expenditure for tasks of particular public interest. These include funding measures for early-career scientists, Jülich's Visitor Ser-

vice, as well as activities for improving the reconciliation of work and family life.

Economic Outreach

Jülich's economic responsibility does not only comprise a careful look at research expenditure, it also concerns economic outreach. This ranges from the regional impact of wages and salaries to the utilization of accumulated knowledge through patents, licences, collaborations and spin-offs. Such technology transfer is essential in order to acquire further third-party funding. The success of Forschungszentrum Jülich in this area is demonstrated by the fact that Project Management Jülich (PTJ) has the highest turnover in Germany (as of 2015).

Scientific Work and Results

In addition, the scientific work and results produced on a daily basis are presented to the public and the scientific community by a variety of channels – the Internet, social media, publications in scientific journals and lectures on campus and elsewhere. On the one hand, Forschungszentrum Jülich thus lays an important foundation for cooperation and further acquisition of third-party funding. On the other hand, this creates public acceptance for work at Jülich and underlines the outstanding position of research.

ECOLOGICAL RESPONSIBILITY



In order to meet its ecological responsibilities, Forschungszentrum Jülich will pursue a climate protection plan in the next few years. In this context, it will, for example, increasingly promote new mobility concepts and consider sustainability criteria in constructing new buildings and obtaining the corresponding certifications. The Urban Development Master Plan 2050 was already presented in the previous Sustainability Report. Since 2015, work has continued on the Master Plan 2.0 which has been expanded to include a concept for the future energy supply. The plan lays down what the campus of the future will look like and also includes the conservation and sensitive handling of the immediate environment of Forschungszentrum Jülich. The campus is located within Hambach Forest in the fertile plain surrounding the town of Jülich.

Energy

However, the plan deals primarily with the future design of the campus and its individual buildings. It includes a revised energy concept which currently focuses on combined generation of power, heat and cooling. This concept aims to follow the goals of the German government to reduce CO₂ emissions by 80 percent by the year 2050. The special challenge is to reconcile supplying energy for a cutting edge research institution with opportunities for new renewable forms of energy as well as great economic efficiency.

A glance at the proportion of renewable energy in the electricity mix shows that Forschungszentrum Jülich is making good progress. In 2012, this figure was around 27 percent for the whole of Germany and

30 percent in Jülich. By 2015, the share of renewable energy throughout Germany increased to just over 30 percent. In the same period, Forschungszentrum Jülich increased this figure to more than 45 percent and for the first time the proportion of renewable energy exceeded that of fossil fuels and other energy sources, excluding nuclear power.

The Sustainability Report provides detailed data on energy and media flows. In addition, a large number of projects is presented for the period under review which illustrate examples of energy-efficient measures. Altogether they show that energy efficiency plays a key role in sustainable campus development. The step-by-step implementation of an energy management plan, whose first step was successfully implemented by 2014 in the form of decentralized, remote-readable and automated meters, is particularly worth mentioning here. In addition to electricity and energy, water supply plays a key role in environmental compatibility.

Resources

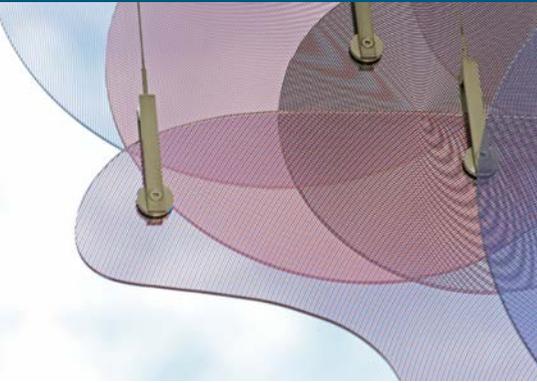
Other resource-conserving measures include digitization at the Central Library and in managing job applications, an open-access strategy, more sustainable purchasing and material use in research and the zero-emission planning and implementation of events at Forschungszentrum Jülich.

The Sustainability Report also highlights methods to constantly improve waste and recycling management on the Jülich campus. This is also reflected in the organizational structure. The Waste Management team and a waste management officer support all the institutes and all other organizational units in integrating efficient and ecological waste management. This also includes the proper disposal of chemicals as well as the collection of assets and packaging which are no longer required.

Mobility

Another constant priority topic in the ecological work of Forschungszentrum Jülich is mobility. In this way, the fleet of company cars is gradually being expanded to include vehicles with alternative drives. Besides, Forschungszentrum Jülich works both on improving connections to public transport and the promotion of the project for a bike-friendly campus. One focus during the period under review was to encourage employees to engage in car sharing. For this purpose, a central platform on the intranet was created in 2015 which supports employees to organize car pools for their way to work. There is, however, still a need for improvement in the field of business travel. Although there are internal regulations, a transparent data base is still lacking. In future a more structured approach to the subject of business travel has to be taken into account.

SOCIAL RESPONSIBILITY



The 5,648 employees, as of 31 December 2015, are a valuable resource for Forschungszentrum Jülich. It is therefore particularly important to create an attractive and safe working environment for all current and future employees, thus making the research process gradually more sustainable. The number of employees has risen steadily in recent years mainly thanks to an increased number of projects and collaborations. Since 2009, it has increased by about 25 percent. The 2014/2015 Sustainability Report provides more detailed figures. For all tasks related to the workforce, the Human Resources division with its six infrastructure divisions is mainly responsible. They coordinate and organize almost all activities of Forschungszentrum Jülich with respect to its employees.

Key Issues in Human Resources

Especially with regard to demographic change and the associated skill shortage, Forschungszentrum Jülich has identified a whole range of key issues that must be addressed in human resources. This includes the reconciliation of work and family life, innovative and increasingly international personnel marketing, schemes for flexible working hours as well as individual courses for continuing professional development. The Sustainability Report details Jülich's activities in this field.

Support for Young Scientists

These efforts are accompanied by intensive, decentralized support for young scientists which is divided into the four areas `juelich_impulse`, `juelich_tracks`, `juelich_chances`,

juelich_heads. The Sustainability Report also contains further details on this issue. These measures are characterized by addressing all stages of education. From kindergarten to the international research project, Forschungszentrum Jülich has established points of contact to specifically target potential applicants, young talents and other interested parties as well as its own employees. Particular attention is paid to inspiring girls and young women to embark upon a career in science and at Forschungszentrum Jülich. Special measures offering further qualifications have been established selectively targeting women. The success of these measures is also reflected in a steadily rising proportion of women. In 2015, it amounted to 36.5 percent of all employees and 23.3 percent in executive positions.

Opportunities for Employee Participation

In order to actively support sustainable change, Forschungszentrum Jülich also has a wide range of opportunities for employee participation. The workforce is not only

invited to respond to employee surveys, but can also actively participate in the further development of Forschungszentrum Jülich by submitting suggestions through the intranet and particularly in the Sustainable Campus Arena. For example a survey resulted in the construction of new foot paths on campus and new opening hours of the bicycle gate.

Occupational Health and Safety

Another aspect of social responsibility is the well-being of all employees in their day-to-day work. Occupational health and safety is of special significance due to the numerous large-scale facilities on campus and the need to handle hazardous substances. Details on equipment safety and safety at work, health protection, and notifiable incidents can be found in the Sustainability Report. Finally, there are also details of intangible aspects of quality assurance to ensure good scientific practice as well as compliance with legislation and internal regulations.

APPENDIX



The 2014/2015 Sustainability Report of Forschungszentrum Jülich is concluded by an extensive appendix which supplements, explains and expands the aspects of sustainable research and research for sustainability. The GRI index (In accordance – Core) lists the indicators and the material aspects.

LIST OF ABBREVIATIONS

- BioSC Bioeconomy Science Center
- BSG Sports Association
- DNK The Sustainability Code
- GRI Global Reporting Initiative
- HBP Human Brain Project
- HGF Helmholtz Association
- IAS Institute for Advanced Simulation
- IBG Institute of Bio- and Geosciences
- ICS Institute of Complex Systems
- IKP Nuclear Physics Institute
- INM Institute of Neurosciences and Medicine
- JCNS Jülich Centre for Neutron Science
- JSC Jülich Supercomputing Centre
- PGI Peter Grünberg Institute
- QM Quality management
- RWTH Aachen
Rheinisch-Westfälische Technische Hochschule Aachen
- SDGs Sustainable Development Goals
- ZEA Central Institute of Engineering, Electronics and Analytics

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In August 2010, Forschungszentrum Jülich became certified as part of the „audit berufundfamilie“ initiative. Jülich has thus committed itself to continuously defining and implementing measures for improving the reconciliation of work and family life.

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EDITION

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