The German Research Landscape

Who does research in Germany?

AN INITIATIVE OF THE

Federal Ministry of Education and Research

Research in Germany

Land of Ideas

www.research-in-germany.de

Preface

Dear Readers,

Germany has a long tradition of outstanding research and development. With research facilities that enjoy international prestige and a high degree of innovation, it is one of the top research locations in the world.

Germany offers a unique network of university and non-university research organisations, which work closely together with industry and commerce. The interconnection of science and industry is growing stronger every day and will help ensure Germany's success on the global market.

These are exciting times for research in Germany. With initiatives like the "Internationalisation Strategy", the "High-Tech Strategy 2020" and the "Excellence Initiative", the Federal Government is investing more in research and development now than ever before and is increasing its focus on internationalising key sectors in the future.

Highly qualified academics from all over the world find a warm welcome and excellent working conditions in our network of top-level research, which is nurtured by the international exchange of ideas and people.

This brochure has been designed to give you an overview of the major research-performing institutions in Germany.

You will find the core data relating to the profiles, tasks and goals of these institutions. If you want to know more about any specific organisation or programme, the institutions presented here would be pleased to hear from you.

Further contacts and background information on the German research landscape and much more can be found online at www.research-in-germany.de.

Convinced of the quality of German research, I invite you to come and spend some time conducting research here. You will discover a friendly country at the heart of Europe which is justifiably proud of the broad cultural diversity it offers.

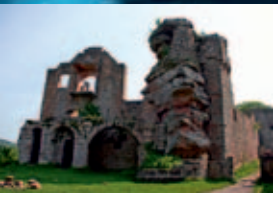
Yours sincerely,

Prof. Dr. Max G. Huber

Special delegate of the Federal Government
for the Promotion of German Universities
and German Research Organisations abroad



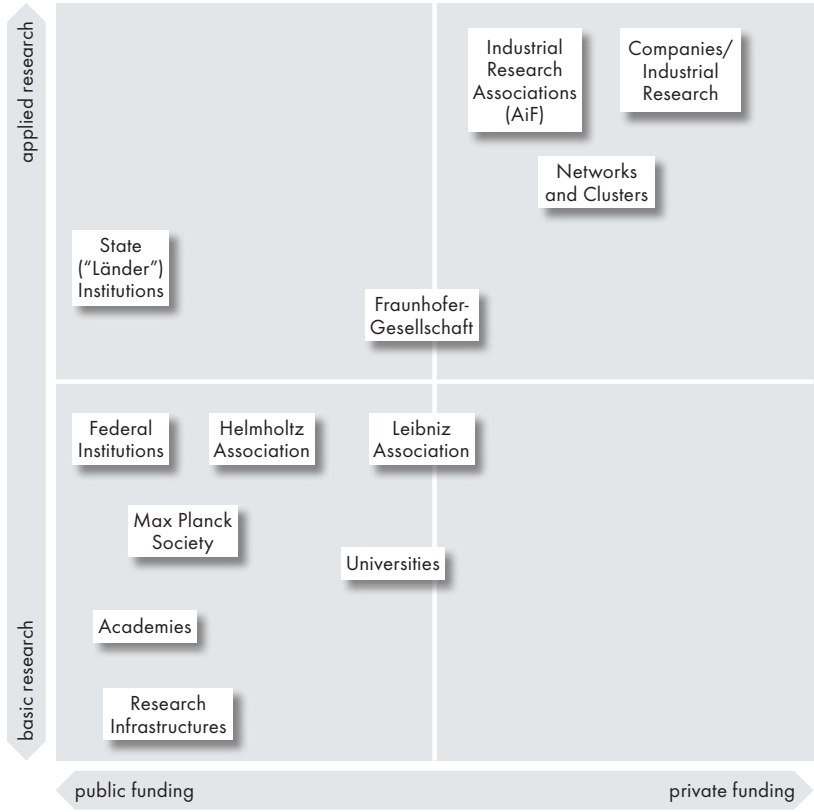




Contents

Research-Performing Organisations

Overview of research-performing organisations in Germany
Research institutions differ in terms of their type of research (basic/applied) and financing (public/private).

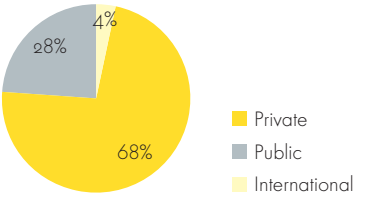


Science and research in Germany are characterised by an excellent infrastructure, a wide variety of disciplines, well-equipped research facilities and competent staff. Germany offers various forms of research locations: universities, universities of applied sciences, non-university institutes, companies and institutions run by Federal or State ("Länder") authorities. All in all, there are approximately 750 publicly funded research institutions in Germany, plus research and development centres run by industrial corporations.

In selected fields or regions, these industrial and academic institutions pool their research and development activities in networks and clusters to work more efficiently and to benefit from a higher level of knowledge. Also, cooperation at European as well as international level has become an essential dimension of sciences and humanities in Germany.

Research Budget

In 2007 the Gross Domestic Expenditure on Research and Development (GERD) was 61.5 billion euros with more than two thirds of research funding provided by industry. Nearly 28% comes from Federal and State authorities, and the remaining 4% from foreign investment. The proportions of public and private funding vary according to the type of institution and the kind of research it conducts (basic/applied).



Facts and Figures

- approx. 750 publicly funded research institutions
- 506,000 staff in R&D; including 291,000 scientists and scholars
- bilateral, European and multilateral cooperation with more than 40 countries
- Gross Domestic Expenditure on Research and Development (GERD): 61.5 billion euros

More Information

Portal "Research in Germany":
Germany offers an extensive range of research institutions – university and non-university institutes, universities of applied sciences, company institutes, and state- or Federally funded institutions. For an overview, visit the Research in Germany website.
www.research-in-germany.de/research_landscape

Research Explorer:
This database contains more than 18,000 institutes at German universities plus non-university research institutions, searchable by name, geographic location, subject and other criteria.
www.daad.de/research-explorer

Fraunhofer-Gesellschaft

The Fraunhofer-Gesellschaft conducts applied research for both private and public enterprises, as well as for the general benefit of the public. The association takes its name from Joseph von Fraunhofer (1787–1826), the illustrious Munich researcher, inventor and entrepreneur.

The Fraunhofer-Gesellschaft is the largest organisation for applied research in Europe. It conducts research under contract for industry, the service sector and public administration and also offers information and services. One of its most famous inventions is MP3, which was developed by the Fraunhofer-Institute for Integrated Circuits (IIS). MP3 is the most widely adopted method for encoding and decoding digital audio data.

MP3 was invented by Fraunhofer IIS.

Fraunhofer

Facts and Figures

- more than 80 research facilities
- 18,000 staff
- research centres and representative offices in Europe, USA, Asia and the Middle East
- annual budget: approx. 1.65 billion euros

Organisational Details

Fraunhofer has more than 80 units worldwide, including 60 Fraunhofer Institutes in Germany.

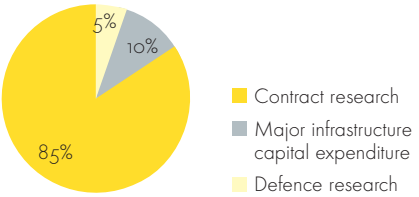
Research Activities

The Fraunhofer-Gesellschaft works on different areas of research such as information and communication technology, life sciences, microelectronics, surface technology, photonics, production, defence and security, materials and components.

International Cooperation

The Fraunhofer-Gesellschaft has research centres and representative offices in the world's major economic regions:

- European liaison offices
- Fraunhofer Centres in the USA
- representative offices in Japan, China, Indonesia, Korea and the United Arab Emirates
- several joint programmes with European institutes



Research Budget

The annual research budget amounts to 1.65 billion euros. Of this sum, 1.4 billion euros is generated by contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from arrangements with industry and from publicly financed research projects. Almost 30 percent is contributed by the German Federal and State ("Länder") Governments in the form of base funding.

Contact

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V.
Hansastraße 27 c
80686 München
Germany
Phone: +49 89 1205-1399
Email: info@zv.fraunhofer.de

More Information

Fraunhofer-Gesellschaft, Fraunhofer Institutes and Research Establishments: www.fraunhofer.de

Helmholtz Association of German Research Centres

The Helmholtz Association of German Research Centres provides top scientific achievements to society, science and industry for addressing the major challenges of today.

The Helmholtz Association is the largest scientific organisation in Germany. Its work follows the tradition of the great natural scientist Hermann von Helmholtz (1821–1894). Scientists in 17 Helmholtz Centres work on a wide variety of topics in areas ranging from health, the environment and energy to fundamental research such as elementary particle physics.

Solarthermal power station (Plataforma Solar de Almería).

HELMHOLTZ | ASSOCIATION

Facts and Figures

- 17 research centres
- 30,000 staff in total
  including approx. 9,700 scientists and 4,500 visiting scientists (in 2009)
- international collaborative research projects in Europe, America and Asia
- annual budget: approx. 3.0 billion euros

Organisational Details

The Helmholtz Association is comprised of 17 scientific-technical and biological-medical research centres with approximately 30,000 staff, including 9,700 scientists and 4,500 visiting scientists.

Research Activities

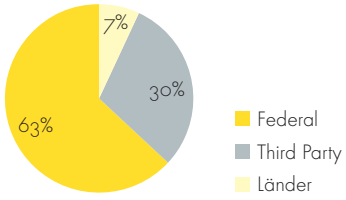
Helmholtz Centres perform top-level research in strategic programmes in six core fields: energy, earth and environment, health, key technologies, structure of matter, aeronautics, space and transport. The Association's research centres provide the most modern scientific infrastructure, particularly large-scale facilities and instrumentation also used by the international scientific community.

International Cooperation

The Helmholtz Association maintains research projects with international collaboration in Europe, America and Asia. It is involved in promoting young scientists at an international level with a special focus on China and Russia.

Research Budget

The total budget of the Helmholtz Association amounts to approximately 3.0 billion euros, with two thirds provided by public sponsors (with a 9:1 ratio allocated by Federal and State ("Länder") authorities). Each individual Helmholtz Centre is responsible for acquiring the remaining 30% as contract funding from public- and private-sector sponsors.



Contact

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Helmholtz Association
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10178 Berlin
Germany
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Email: org@helmholtz.de

More Information

Helmholtz Association:
www.helmholtz.de

International Helmholtz offices and research projects:
www.helmholtz.de/international
Read more about the international Helmholtz network and how it supports young scientists and its offices abroad.

Leibniz Association

The Leibniz Association is the umbrella organisation for 87 research institutions which address scientific issues of importance to society as a whole. The Leibniz Institutes conduct research and provide infrastructure for science and research and perform research-based services – liaison, consultation, transfer – for the public, policy-makers, academia and business. The Berlin Museum for Natural History (Museum für Naturkunde), one of the ten largest scientific collections in the world, is a prominent example of a Leibniz Association member.

The Leibniz Association makes direct reference to its eponym, Gottfried Wilhelm Leibniz (1646–1716), who was the epitome of a great universal scholar.

Research at the Leibniz Association.

Leibniz Association

Facts and Figures

- 87 research institutes
- 7,100 scientists
- 16,100 staff in total
- annual budget approx. 1.3 billion euros (2009)

Organisational Details

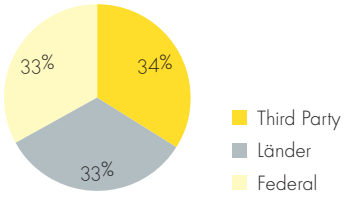
The Leibniz Association is known for its enormous diversity of themes addressed by the institutes. With the majority of institutes being scientifically and organisationally independent, the Leibniz Association provides a decentralised organisational structure. The 87 Leibniz Institutes employ more than 16,100 people and dispose of an annual budget of more than a billion euros.

Research Activities

The research centres focus on the humanities and social sciences, economics, spatial and life sciences, mathematics, natural sciences, engineering and environmental research.

International Cooperation

Most international cooperative projects at the Leibniz Association are coordinated by its institutes. The headquarters send delegates to various committees who represent the association in their relations with authorities and the international scientific community. The headquarters are particularly involved in committees convened by the Federal Ministry of Education and Research (BMBF) and the German Academic Exchange Service (DAAD) regarding "Scientific and Technical Cooperation" (WTZ) and "International Marketing for Higher Education in Germany".



Research Budget

The budget totals approx. 1.3 billion euros (2009) and is funded almost equally by the Federal Government (33%), the German States ("Länder") (33%) and third parties (34%).

Contact

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Berlin Office
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Email: berlin@leibniz-gemeinschaft.de

More Information

Leibniz Association: www.wgl.de

Max Planck Society (MPG)

The Max Planck Society (MPG) is an independent, non-profit research organisation named after the world-famous physicist Max Planck (1858–1947). With its focus on basic research in the natural sciences and humanities, the MPG complements research projects at universities. The MPG is well-known for its excellence in research. Since it was established in 1948, seventeen scientists at the MPG have received the Nobel Prize.

Gerhard Ertl, physicist and surface chemist at the Fritz Haber Institute of the MPG, received the renowned award in 2007 (Nobel Prize in Chemistry).

Research and development at the Max Planck Society.

MAX-PLANCK-GESELLSCHAFT

Facts and Figures

- 80 research institutes
- 13,300 staff
- annual budget approx. 1.3 billion euros (2009)

Organisational Details

More than 13,300 people are employed at 80 MPG Institutes. The MPG headquarters are located in Munich.

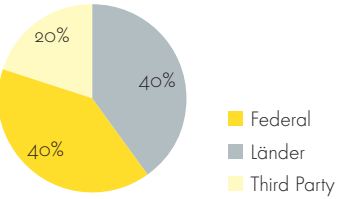
Research Activities

The MPG research institutes conduct basic research in the interest of the public. The fields of research are natural sciences, life sciences, social sciences and the humanities. Some institutes also perform services for university research, providing equipment and facilities to scientists, such as telescopes, large-scale equipment, specialised libraries and documentary resources.

International Cooperation

Max Planck Institutes frequently rely on the formation of international networks in order to create the critical mass for specific research topics. Almost 5,000 foreign visiting scientists at the Max Planck Institutes as well as approximately 2,300 ongoing international research projects are testimony to the fact that scientists at the MPG are sought after and appreciated as esteemed research partners worldwide.

As a partner in research, the MPG works collaboratively with numerous institutes abroad, partner groups and multinational research facilities.



Research Budget

The budget totals approx. 1.3 billion euros (2009) and is borne equally by the German States and the Federal Government. Additionally, third-party financing accounts for roughly 20% of basic funding.

Contact

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More Information

Max Planck Society (MPG):
www.mpg.de
Max Planck Institutes:
www.institutes.mpg.de
International Max Planck Research Schools: www.imprs.mpg.de

Universities

Germany is home to almost 400 universities which offer the entire range of disciplines. The educational system is characterised by a close link between instruction and research. German universities do not see themselves as "schools" for undergraduates and doctoral candidates, but as centres where "research and teaching are united". This principle has a long tradition and was coined by Wilhelm von Humboldt (1767–1835), the philosopher and founder of Humboldt University in Berlin.

Approximately 245,000 international students are enrolled at German universities. Currently, 18,000 international doctoral students are enrolled and 26,000 foreign academics work in German higher education. That makes Germany one of the world's most attractive research and higher education nations – after the USA and the UK.

Germany is one of the world's most attractive countries for international students.

Facts and Figures

more than 370 universities (including approx. 200 universities of applied sciences)

573,000 staff in total, 300,000 scientists; 2.12 million students in total, 245,000 foreign students (12%)

Gross Domestic Expenditure on R&D at institutions of higher education: 11.1 billion euros (2008)

HRK German Rectors' Conference
The Voice of the Universities

The German States ("Länder") and the Federal Government have set up the Excellence Initiative which supports research activities in various diciplines at German universities. From 2006–2017 a total of 4.6 billion euros will be invested to promote top-level research and to improve the international competitiveness of German higher education and research.

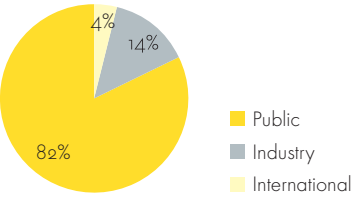
German University System

There are more than 370 universities in Germany, approx. 200 of which are universities of applied sciences (Fachhochschulen). They offer students a more practice-oriented education based on scientific research.

The German Rectors' Conference – Hochschulrektorenkonferenz (HRK) as the association of state and nationally accredited universities in Germany is the political and public voice of the German universities and the forum for the higher education institutions' joint opinion-forming process. It currently has 264 member institutions at which more than 96% of all students in Germany are registered.

Research Activities

Universities offer a broad spectrum of research activities, including basic research, applied research and development. 28% of researchers work in the natural sciences, 25% in medical science, 23% in the humanities and social sciences, 20% in engineering sciences and 4% in agricultural sciences.



Research Budget

The Gross Domestic Expenditure on R&D at institutions of higher education totals approx. 11.1 billion euros (2008) and is borne by the public (82%), industry (14%) and international funding (4%).

More Information

Hochschulrektorenkonferenz (HRK): www.hrk.de
The German Rectors' Conference/ Hochschulrektorenkonferenz (HRK) is the non-profit association of state and nationally accredited universities and other higher education institutions in Germany.

Search engine for universities: www.higher-education-compass.de
The Higher Education Compass provides extensive information on Germany's higher education institutions.

Types of Higher Education Institutions: www.daad.de
To get information about the German university system, click on the menu headings "Information for Foreigners" > "University" > "Type of University".

Contact

German Rectors' Conference
Hochschulrektorenkonferenz (HRK)
Ahrstraße 39
53175 Bonn
Phone: +49 228 887 0
www.hrk.de

Academies of Science

The German National Academy of Sciences Leopoldina was founded in 1652.

The main function of the German academies of science is to provide guidance and advice to policymakers and society as a whole relating to general and specific issues of science, including emerging issues. They run symposia and public events, contributing to dialogue between science, society and industry. With considered opinions, the academies support policymakers and the public in finding suitable answers to current issues and problems.

In addition, a key mission of the academies is the coordination and support of long-term basic research projects and the development and cultivation of interdisciplinary dialogues.

Two examples of these academies are German National Academy of Sciences Leopoldina and the German Academy of Science and Engineering.

Leopoldina – German National Academy of Sciences

The German National Academy of Sciences Leopoldina was founded in 1652. Today it provides academically sound advice to both politics and society and serves a representative function in international academies, organisations and bodies.

acatech – German Academy of Science and Engineering

acatech – the German Academy of Science and Engineering – is the exponent of German scientific and technological fields in Germany and abroad. As a working academy, acatech supports policymakers and society with technically qualified evaluations and forward-looking recommendations.

Leopoldina
Nationale Akademie
der Wissenschaften

acatech
GERMAN ACADEMY OF
SCIENCE AND ENGINEERING

More Information

German National Academy of Sciences Leopoldina:
www.leopoldina.org

acatech – German Academy of Science and Engineering:
www.acatech.de

Union of the German Academies of Sciences and Humanities

Eight German academies of sciences, located in Berlin, Düsseldorf, Göttingen, Heidelberg, Leipzig, Mainz, Munich and Hamburg, constitute the "Union of the German Academies of Sciences and Humanities". The aim of the Union is to coordinate the basic research of the Union's member academies and to enable them to present themselves more effectively to other science organisations in Germany and abroad. Some 1,900 scientists and scholars, representing a wide range of disciplines, have been elected as ordinary, corresponding or extraordinary members of one of the eight academies.

Facts and Figures

- 8 academies in the Union
- 1,900 members of the Union
- annual budget of the Academies Programme (2011) approx. 51.8 million euros

Research Areas

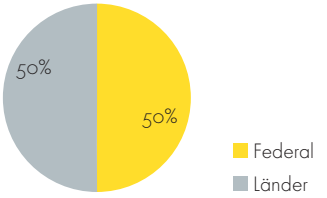
The Academies Programme (Akademienprogramm) is coordinated by the Union of the German Academies of Sciences and Humanities. As of 2011, it comprised a total of 146 projects with 195 working groups. The projects consist of 23 dictionaries, 111 editions, 10 long-term studies in the natural sciences and two basic research projects in social science and cultural studies.

Academies Programme

In keeping with their service role, the academies also carry out the Academies Programme, which is funded equally by the States ("Länder") and the Federal Government with a total budget of 51,8 million euros (2011). The basic budgets of the academies of science, which are Länder institutions, are funded solely by the respective host state.

The eight academies in the Union are:

- Berlin-Brandenburg Academy of Sciences and Humanities (1992/1700), seat: Berlin and Potsdam
- Göttingen Academy of Sciences and Humanities (1751)
- Bavarian Academy of Sciences and Humanities (1759), seat: Munich
- Saxonian Academy of Sciences in Leipzig (1846)
- Heidelberg Academy of Sciences and Humanities (1909)
- Academy of Sciences and Literature, Mainz (1949)
- North Rhine-Westphalian Academy of Sciences, Humanities and the Arts (1970), seat: Düsseldorf
- Academy of Sciences and Humanities in Hamburg (2004)



Research Budget

The budget totals to approx. 51.8 million euros a year (2011) and is financed equally by the German States and the Federal Government.

More Information

Union of the German Academies of Sciences and Humanities:
www.akademienunion.de

Click on the menu headings "The Union" > "International Relations" to find further information on the international memberships of the Union.

Federal Institutions

Germany's Federal Ministries fund 38 Federal R&D institutions. This departmental research is always directly related to each ministry's field of activity. The main objective of the research is to support the respective ministry's activities and provide the necessary scientific basis for the execution of sovereign tasks.

One example of a departmental research institute is the Robert Koch Institute which is responsible for disease control and prevention. It is the central Federal reference institution for both applied and response-oriented research, as well as for the public health sector. Another example is the Federal Institute for Materials Research and Testing (BAM). BAM is responsible for the development of safety and reliability in chemistry and materials technologies, including legal regulations on safety standards and threshold values.

German Federal Ministries fund 38 Federal R&D institutions that perform research in nearly all areas.

Facts and Figures

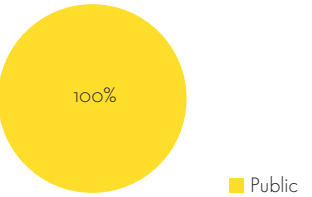
- 38 research organisations
- 19,000 staff; including 8,700 scientists (2007)
- planned budget for R&D in 2010: approx. 856 million euros

Research Activities

German Federal research institutions perform research in nearly all areas: society, security and defence, science, infrastructure, animal protection, strategic issues, nature conservation, environmental protection, consumer protection, healthcare, development policy and economic policy.

Research Budget

The departmental research institutes are 100% publicly funded. The total budget planned in 2010 is approx. 1.7 billion euros, with 856 million allocated for research.



More Information

Robert Koch Institute: www.rki.de

Federal Institute for Materials Research and Testing (BAM): www.bam.de

Interactive map and list of Federal research institutions: www.bmbf.de
Click on the menu headings "Science" > "Maps of Research" > "Federal Institutions" to find an interactive map of Federal research institutions in Germany provided by the Federal Ministry of Education and Research (BMBF).

State ("Länder") Institutions

The Federal States of Germany ("Länder") act as research funding bodies and operate several research institutes which support the research activities of the States. There are more than 100 institutes covering a broad range of research areas.

Flexible photovoltaic module.

Facts and Figures

- 130 research organisations in 13 Federal States
- 8,000 including 3,600 scientists and researchers (including Municipal institutions)
- 269 million euros (2007) (including Municipal institutions)

One example is the Centre for Solar Energy and Hydrogen Research (ZSW). The co-founder of ZSW, Professor Dr. Werner H. Bloss, has been conducting pioneering research on unconventional energy transformation since the late 1950s. In 1988, the state of Baden-Württemberg set up ZSW as a non-profit foundation together with universities, research institutes and companies. One of the key research goals of ZSW is to develop technologies for generating sustainable and climate-friendly electricity. With its approx. 170 staff, ZSW has established itself as one of the key European institutes in its focal areas.

Research Activities

Research activities are conducted in engineering, the humanities and natural sciences.

Research Budget

State ("Länder") institutions with research missions are primarily state-funded with occasional external funding.

More Information

State research institutes in Germany: www.bmbf.de
Click on the menu headings "Science" > "Maps of Research" > "Land Institutions" to find an interactive map and a list of State research institutions in Germany provided by the the Federal Ministry of Education and Research (BMBF).

Centre for Solar Energy and Hydrogen Research (ZSW) in Baden-Württemberg: www.zsw-bw.de

Companies/Industrial Research

German companies are among the most innovative in Europe. Industry-based and financed investments account for almost two thirds of all R&D funding in Germany. Companies are especially involved in the field of applied research, working together with the global network of Fraunhofer Institutes (see p. 8) and the German Federation of Industrial Research Associations "Otto von Guericke" (AiF) (see p. 28). Environmental research is an example of successful technology transfer, as is evident by the growing markets for renewable energies that range from photovoltaics to wind energy.

Research Activities

Roughly 38% of internal R&D spending in industry was invested in the automotive sector, some 19% in the electrical engineering sector, a good 14% in the chemical industry and just under 11% in mechanical engineering.

Innovation made in Germany: The automotive sector.

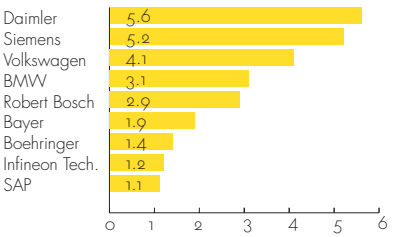
Facts and Figures

	shares of the internal industrial research budget: 10.1% small enterprises (up to 249 employees), 5.3% medium-sized enterprises (250–500), 84.6% big enterprises (more than 500 employees)
	322,000 research staff, including 174,000 scientists
	annual budget (2008): approx. 46.1 billion euros (internal R&D expenditure)

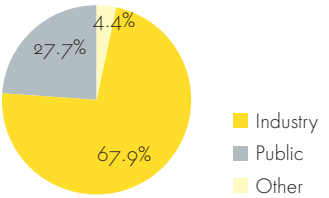
Where does industrial research take place?

The Federation of German Industries (BDI) is the umbrella organisation for enterprises and industry-related service providers. The BDI coordinates the views and recommendations of its members and provides business support, i.e. the information covering all fields of economic policy.

Particularly in the field of applied research, companies are working together with universities and research institutes on joint projects which are co-funded by public institutions. Shares of the industrial research budget are distributed as follows: small enterprises (10.1%), medium-sized enterprises (5.3%) and big enterprises (84.6%). The nine big enterprises listed below account for the lion's share of the total industrial research budget.



R&D expenditures in billion EUR (2005)
Source: Eurostat



Research Budget

German industry spends approx. 46.1 billion euros on internal research (2008). Industry is responsible for carrying out and funding at least two-thirds of R&D activities.

Company Links

- Daimler: www.daimler.com
- Siemens: www.siemens.com
- Volkswagen: www.volkswagenag.com
- BMW Group: www.bmwgroup.com
- Robert Bosch: www.research.bosch.com
- Bayer: www.bayer.com
- Boehringer: www.boehringer.com
- Infineon Tech.: www.infineon.com
- SAP: www.sap.com

More Information

German Business Portal: www.german-business-portal.info

Federation of German Industries (BDI): www.bdi.eu
Read more about the umbrella organisation for industrial businesses and industry-related service providers here (in German only).

Company Register: www.unternehmensregister.de
All the important company data requiring publication are centrally consolidated in this database.

German Federation of Industrial Research Associations (AiF)

The German Federation of Industrial Research Associations (AiF) was founded in 1954. As a registered non-profit association, the AiF promotes research and development (R&D) in all industrial sectors in favour of small and medium-sized enterprises (SME). The association acts at Federal as well as European level.

The AiF is organised by industry and is particularly involved in increasing the competitive strength of SME by supporting the efficient usage and advancement of R&D programmes. This includes a variety of applied research fields, e.g. process control, building industry, medical technology, food science and agricultural science.

Fuel technology at the Gaswärme-Institut (GWI) e.V. in Essen, a member of AiF.

Facts and Figures

101 non-commercial research consortia, 46 research facilities of their own and more than 700 closely connected institutes

annual budget 553.5 million euros (2010)

Organisational Details

AiF promotes R&D for small and medium-sized enterprises in several ways:

- Organisation of industrial collective research for the benefit of entire industrial sectors
- Executive management of programmes for governmental R&D-support measures
- Promotion of R&D through open innovation processes
- Networking within and between industrial sectors and politics

Research Budget

As a programme manager of public funds, AiF oversaw in 2010 an annual budget of 553.5 million euros in public funds. Currently, it is a partner to the Federal Ministries of Economics and Technology (BMWi) and of Education and Research (BMBF) as well as the Ministry of Innovation, Science, Research and Technology (MIWFT) of North Rhine-Westphalia.

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More Information

AiF – German Federation of Industrial Research Associations: www.aif.de

Research Infrastructures

The Neumayer-Station III is a German research station in the Antarctic operated by the Alfred Wegener Institute for Polar and Marine Research (AWI).

Germany is home to several research infrastructures with global significance.

These include:
- Deutsches Elektronen-Synchrotron (DESY) (see p. 32)
- German Climate Computing Centre (DKRZ) (see p. 34)
- Research Vessel "Polarstern" (see p. 36)

Research Activities

Research activities are performed in physics (fundamental research), earth sciences, climate research and humanities.

Germany also contributes to the funding of infrastructures in other countries, e.g. the European Organization for Nuclear Research (CERN) in Geneva, Switzerland. Germany provides 20% of CERN's budget, making it the largest contributor of funding to this most renowned centre of fundamental physics.

Research Budget

The Federal Government provides the majority of funding for large-scale equipment in basic research with an annual budget of 855 million euros (2010). The budget is also supplemented by international funding sources.

More Information

Database of European Research Infrastructures: www.riportal.eu
This database provides information on a large number of research infrastructures (RIs) of pan-European interest in all fields of science.

European Organization for Nuclear Research (CERN): www.cern.ch

Deutsches Elektronen-Synchrotron (DESY)

Founded in 1959, DESY is an internationally renowned centre of fundamental research and one of the world's leading institutions investigating the structure of matter. DESY is a member of the Helmholtz Association and is supported by public funds.

View along the storage ring PETRA III with bending magnets (blue), focusing magnets (red) and undulators (yellow) in the range of the photon experimental hall.

DESY

HELMHOLTZ ASSOCIATION

Facts and Figures

- 2 locations (Hamburg and Zeuthen)
- approx. 2,000 staff, more than 3,000 visiting scientists each year
- annual budget 192 million euros

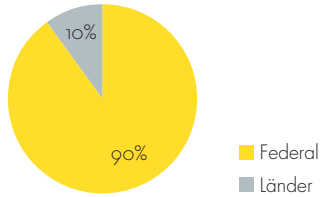
DESY has one location in Hamburg and one in Zeuthen, with about 2,000 staff (650 scientists) in all. The centre's principal working areas are accelerators, photon science and particle physics. More than 3,000 scientists from over 40 countries visit DESY each year. Approximately 700 graduate students, PhD students and postdocs work at DESY, which trains more than 100 young people in commercial and technical vocations.

Research Activities

DESY develops, runs and uses accelerators and detectors for photon science and particle physics.

Research Budget

DESY has an annual budget of 192 million euros. As a research centre of the Helmholtz Association it is chiefly funded by the Federal Government (90%).



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More Information

DESY: www.desy.de/en

German Climate Computing Centre (DKRZ)

The German Climate Computing Centre (DKRZ) provides services for climate researchers. Its task is to install and operate a high-performance computer system for basic and applied research in climatology as well as related disciplines.

The total system peak performance of the High Performance Computer (HPC) cluster is 158 teraflops/s, making it one of the most powerful computers worldwide. As a result, the DKRZ plays a vital role in the infrastructure of climate-change research. Its results complement research on observable changes in climate to form the basis for a sustainable policy.

DKRZ operates one of the most powerful computers worldwide.

DKRZ
DEUTSCHES
KLIMARECHENZENTRUM

Facts and Figures

- 1 centre in Hamburg
- 60 staff
- non-profit limited company, turnover in 2008: approx. 29 million euros

Organisational Details

Founded in 1987 as a limited liability company (GmbH), the DKRZ is a non-profit and non-commercial research centre.

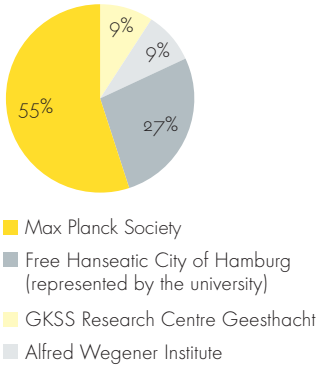
Research Activities

DKRZ's high-performance computing facilities are used to conduct research on climate modelling. Its computing power enables the application of sophisticated, realistic numeric models for the quantitative computation of complex processes in the climate and earth system.

In addition to this, the DKRZ installs and maintains software tools and hardware infrastructure for storage, management and analysis of extremely large data sets. The centre is a coordinating node in the national and European network of climate researchers.

Research Budget

DKRZ operates as a non-profit limited company. The Max Planck Society holds 55% of the institute's shares.



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More Information

German Climate Computing Centre – DKRZ: www.dkrz.de

Research Vessel "Polarstern"

The Polarstern was first commissioned in 1982. Since then, the ship has completed more than fifty expeditions to the Arctic and Antarctic. Specially designed for working in the polar seas, the Polarstern is currently the most sophisticated polar research and supply vessel in the world.

The ship is equipped for research in the areas of: biology, geology, geophysics, glaciology, chemistry, oceanography and meteorology. It has nine research laboratories and may be equipped with additional laboratory containers.

The Polarstern is a polar research vessel operated by the Alfred Wegener Institute for Polar and Marine Research (AWI).

AWI
Alfred Wegener Institute
for Polar and Marine Research
in the Helmholtz Association

Facts and Figures

- 44 crew members, approx. 50 scientists
- daily cost of operation: 55,000 euros

Organisational Details

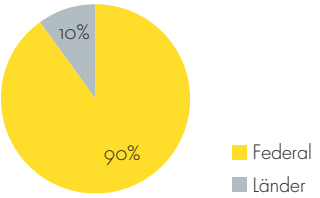
This ice-breaking vessel is operated by the Alfred Wegener Institute for Polar and Marine Research (AWI) in Bremerhaven and owned by the Federal Government, represented by the Federal Ministry of Education and Research (BMBF).

Research Activities

Scientists on the Polarstern conduct polar, earth, marine and climate research.

Research Budget

Because the Alfred Wegener Institute, which operates the Polarstern, belongs to the Helmholtz Association, 90% of its annual budget comes from Federal funds, with 10% provided by three German States ("Länder").



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More Information

Alfred Wegener Institute for Polar and Marine Research (AWI)/Polarstern: www.awi.de
The AWI carries out research in the Arctic and Antarctic as well as in the high and mid latitude oceans. To read more about the research vessel "Polarstern", its detailed expedition schedule and much more: www.awi.de/en/infrastructure/ships/polarstern

Networks and Clusters

Over the last few years, the Federal Government has initiated a series of projects which aim to create networks and clusters that promote new technologies. They pool both industry and academic institutions in their research and development activities.

One key aim of these aggregations is to accelerate the process of making new technology products marketable.

Networks and clusters are arranged with respect to
- regional representation
- research topics
- specific application areas and future markets.

Both the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Economics and Technology (BMWi) support these types of aggregations with different programmes and competitions such as:

- Kompetenznetze Deutschland Initiative (see p. 40)
- Leading Edge Cluster Competition (see p. 42)
- Innovation Alliances (see p. 44).

Example: The Innovation Alliance on Lithium-Ion Battery LIB 2015

The Innovation Alliance on Lithium-Ion Battery LIB 2015 is comprised of BASF, BOSCH, EVONIK, LiTec and Volkswagen, and supported by the Federal Government. 15% of the research project is financed by the Federal Government (60 million euros) and 85% by the consortium of firms (360 million euros), an example of how government incentives can advance research and development. The framework of networks and clusters also strengthens the country's contribution to international research cooperation.

Research Activities

Research activities are performed in a variety of fields, e.g. engineering, biotechnology, energy and environment, chemistry and nanotechnology.

Research Budget

Statistics on the total budget are not available. Public funding is provided as seed money to form networks and clusters and support research projects on the precondition that industry and private investors share the financial costs.

More Information

Federal Ministry of Education and Research (BMBF): www.bmbf.de

Federal Ministry of Economics and Technology (BMWi): www.bmwi.de

Kompetenznetze Deutschland Initiative

The Kompetenznetze Deutschland Initiative of the Federal Ministry of Economics and Technology (BMWi) brings together the best-performing innovation clusters in Germany. These are divided into nine thematic groups and are situated in eight specific regions in Germany. The Initiative supports its members in the generation of distinct regional and sectoral profiles, strengthens intercommunication between commerce and science, pools information about Germany's innovation networks and clusters and supports the participating networks in terms of strategic development, processes of change and horizontal networking.

KompetenznetzeDeutschland
networking for innovation

Federal Ministry
of Education
and Research

Facts and Figures

more than 100 networks comprised of:
more than 450 large enterprises, over 6,000 SME, over 1,600 research institutes and over 1,000 service providers

The members of the initiative are supported by a portfolio of services by the office of the initiative.

Organisational Details

The Federal Republic of Germany is composed of 16 Federal States ("Länder"). Their structure is the result of political and historical development and reflects today's economic structures to only a limited degree. In contrast the Initiative Kompetenznetze Deutschland is divided into eight regions. The single regions are characterised by several economic similarities, especially by a typical, long-term grown economic structure: Coast, North German Lowlands, Middle Germany, Rhine-Main-Neckar, Berlin-Brandenburg, Rhine-Ruhr-Sieg, South West Germany and South Germany.

Research Activities

The members of the networks in Kompetenznetze Deutschland are active in a wide range of research areas, such as biotechnology, health and medical science, transportation and mobility, materials technologies and chemistry, production and engineering, aviation and space, energy and environment, information and communication and micro-nano-opto technologies. They focus especially on collaborative research with the industry.

Contact

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More Information

Kompetenznetze Deutschland:
www.kompetenznetze.de
For an overview of all networks in the Kompetenznetze Deutschland Initiative, click on the menu heading "The Networks".

The Leading-Edge Cluster Competition

The Leading-Edge Cluster Competition was launched by the Federal Ministry of Education and Research (BMBF) in 2007 as part of the High-Tech Strategy for Germany. A core element of this strategy is building bridges between science and industry. Clusters are constituted by companies, scientific institutions and policymakers.

One successful example is Solarvalley Mitteldeutschland. This cluster is one of Europe's leading centres of photovoltaic research and development. Solarvalley concentrates its activities on generating photovoltaic electricity at a cost equal to or even less than grid power.

INVENTED IN GERMANY

Facts and Figures

- up to 15 clusters in three rounds of competition; 10 clusters so far (January 2010)
- up to 200 million euros over each period (Federal Government budget only)

About the Competition – First and Second Round Winners

Three rounds are planned in the competition. The emphasis is on innovative approaches to a long-term cluster strategy. Clusters are arranged with respect to regional representation. The first and second round winners are:

- BioRN – Biotech Cluster Rhine-Neckar (www.biorn.org)
- Cool Silicon – Energy Efficiency Innovations from Silicon Saxony (www.cool-silicon.org)
- Forum Organic Electronics, Rhine-Neckar Metropolitan Region (MRN) (www.m-r-n.com; www.innovationlab.de)
- Aviation Cluster Hamburg Metropolitan Region (www.hamburg-aviation.com)
- Solarvalley Mitteldeutschland (www.solarvalley.org)
- Software-Cluster, Hesse, Rhineland-Palatinate, Saarland, Baden-Württemberg (www.software-cluster.com)
- Munich Biotech Cluster – m⁴, Bavaria (www.m4.de; www.bio-m.org/en)
- Medical Valley Europäische Metropolregion Nürnberg, Bavaria (www.medical-valley-emn.de)
- MicroTEC Südwest, Baden-Württemberg (www.microtec-suedwest.de; www.mstbw.de)
- EfficiencyCluster LogistikRuhr, North Rhine-Westphalia, Hesse (www.logistik-ruhr.de)

Research Budget

In each round of the competition, up to 200 million euros are made available to form up to five excellence clusters (40 million euros each) over a period no longer than five years. Implementation requires a matching level of financial participation by industry and private investors.

More Information

The Hightech-Strategy:
For more information on the Leading-Edge Cluster Competition, click on the menu headings "Science and Businesses" > "Leading-Edge Cluster Competition"
www.hightech-strategie.de

Innovation Alliances

Innovation Alliances represent a new instrument for research and innovation policy within the framework of the High-Tech Strategy initiated by the Federal Ministry of Education and Research (BMBF). Currently, there are nine Innovation Alliances and a large number of "strategic partnerships" created by the BMBF, the scientific community and industry.

Innovation Alliance on Molecular Imaging.

Facts and Figures

- 9 Innovation Alliances
- total research budget so far: approx. 3.1 billion euros

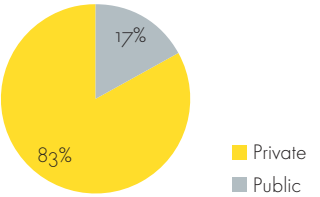
One prominent example is the Innovation Alliance "Molecular Imaging for Medical Engineering" formed by Bayer Schering Pharma AG, Boehringer Ingelheim Pharma GmbH & Co. KG, Carl Zeiss AG, Karl Storz & GmbH Co. KG and Siemens AG. This alliance has set its sights on creating new diagnostic agents and imaging procedures for clinics and the development of pharmaceuticals. Molecular imaging technologies aim at detecting biological processes at the cellular and molecular level. They offer an opportunity to detect diseases earlier and more specifically, thereby improving current procedures of medical imaging and therapy control. The research budget totals approx. 900 million euros, including 150 million euros of Federal funding.

Target of Innovation Alliances

Innovation Alliances are arranged with respect to specific application areas or future markets. They exercise a particular economic leverage effect. The funding premise is that every euro of Federal money should be matched by five euros from industry. This investment policy is also important for small and medium-sized enterprises (SME) since knowledge of future technological developments together with the commitment from large companies enables SMEs to remove some of the uncertainty from the high level of risk involved in R&D investment decisions.

Overview Innovation Alliances

- EENOVA Innovation Alliance for automotive electronics
- OLED initiative for energy-efficient lighting
- Organic Photovoltaics for the use of renewable energy
- Lithium-Ion Battery for the storage of energy
- Molecular Imaging for Medical Engineering
- European Initiative 100 GET for network technologies



Research Budget

Together with the BMBF, science and industry have created a total of nine Innovation Alliances (500 million euros provided by the Federal Government, more than 3 billion euros by industry).

More Information

The High-Tech Strategy and Innovation Alliances: www.hightech-strategie.de
For more information on Innovation Alliances, click on the menu headings "Science and Businesses" > "Innovation Alliances".

About Research in Germany

The Federal Ministry of Education and Research (BMBF) launched the initiative to "Promote Innovation and Research in Germany" in 2006.

Under the brand "Research in Germany – Land of Ideas" various promotional measures and events presenting German innovation and research in key international markets have been organised on behalf of BMBF. The initiative seeks to strengthen and expand R&D collaboration between Germany and international partners.

The following "Research in Germany" publications are available at www.research-in-germany.de/downloads:

- "FAQs – Preparing your research stay in Germany"
- "FAQs – Doing a doctorate in Germany"
- "German Funding Programmes for Scientists and Researchers"
- "Discover the Future of Research.now – Germany – Europe's leader in science"
- "Keeping the Blue Planet Green"
- "Welcome to Nanotech in Germany"

We hope that our brochures will provide useful information about the German research landscape. For more information about "Research in Germany", please visit our website at www.research-in-germany.de and subscribe to our bimonthly newsletter at www.research-in-germany.de/newsletter.

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Note: Research in Germany places special emphasis on using language that treats women and men equally. The grammatical male form is occasionally used alone in this publication purely as a means of improving legibility. Naturally, these terms are meant in a gender-neutral way.

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Land of Ideas
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