



Federal Ministry  
of Education  
and Research

## Federal Ministry of Education and Research



Igniting ideas!

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BMBF

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Christiane Zay, Bielefeld, Germany

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## Preface



Education and research are the foundations on which we build our future. Education forms the basis for our whole lives while research opens up previously unknown opportunities in all aspects of life. The investments in education, science and research made by the Federal Ministry of Education and Research (BMBF) represent an important contribution to securing our country's prosperity for future generations.

We are relying on the best our country can offer in order to create growth and secure it in the long term: that is to say, on the people living, teaching, learning and working in Germany. We want to improve their opportunities for partici-

pation and personal development. At the same time, we aim to strengthen Germany's position as a business location by means of a high-performance science and research system. To do so, we need a new culture of innovation which embraces all areas of society. Our aim is to maintain Germany's competitiveness and to create new jobs through innovative technologies and services.

I welcome your interest in the work of the Federal Ministry of Education and Research. This brochure is designed to give you an insight into the organisation and structure of the Ministry, and into selected fields of our work. More detailed information can be found on the Internet at [www.bmbf.de](http://www.bmbf.de).

The opportunities of the future lie in education and research. Let us make good use of them.

A handwritten signature in blue ink, which appears to read "Annette Schavan". The signature is written in a cursive style.

Prof. Dr. Annette Schavan,  
Member of the Bundestag,  
Federal Minister of Education and Research



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# 1. Political Staff and Organisation

Since 22 November 2005, the Federal Ministry of Education and Research (BMBF) has been headed by Federal Minister Prof. Dr. Annette Schavan. She is supported in her duties by the Parliamentary State Secretaries Thomas Rachel and Dr Helge Braun and the Permanent State Secre-

taries Cornelia Quennet-Thielen and Dr. Georg Schütte. With its offices in Bonn and Berlin, and approximately 950 members of staff, the Federal Ministry of Education and Research is divided into eight Directorates-General.



Prof. Dr. Annette Schavan,  
Member of the Bundestag,  
Federal Minister of Education  
and Research



Dr. Helge Braun,  
Member of the Bundestag,  
Parliamentary State Secretary



Cornelia Quennet-Thielen,  
State Secretary



Dr. Georg Schütte,  
State Secretary



Thomas Rachel,  
Member of the Bundestag,  
Parliamentary State Secretary

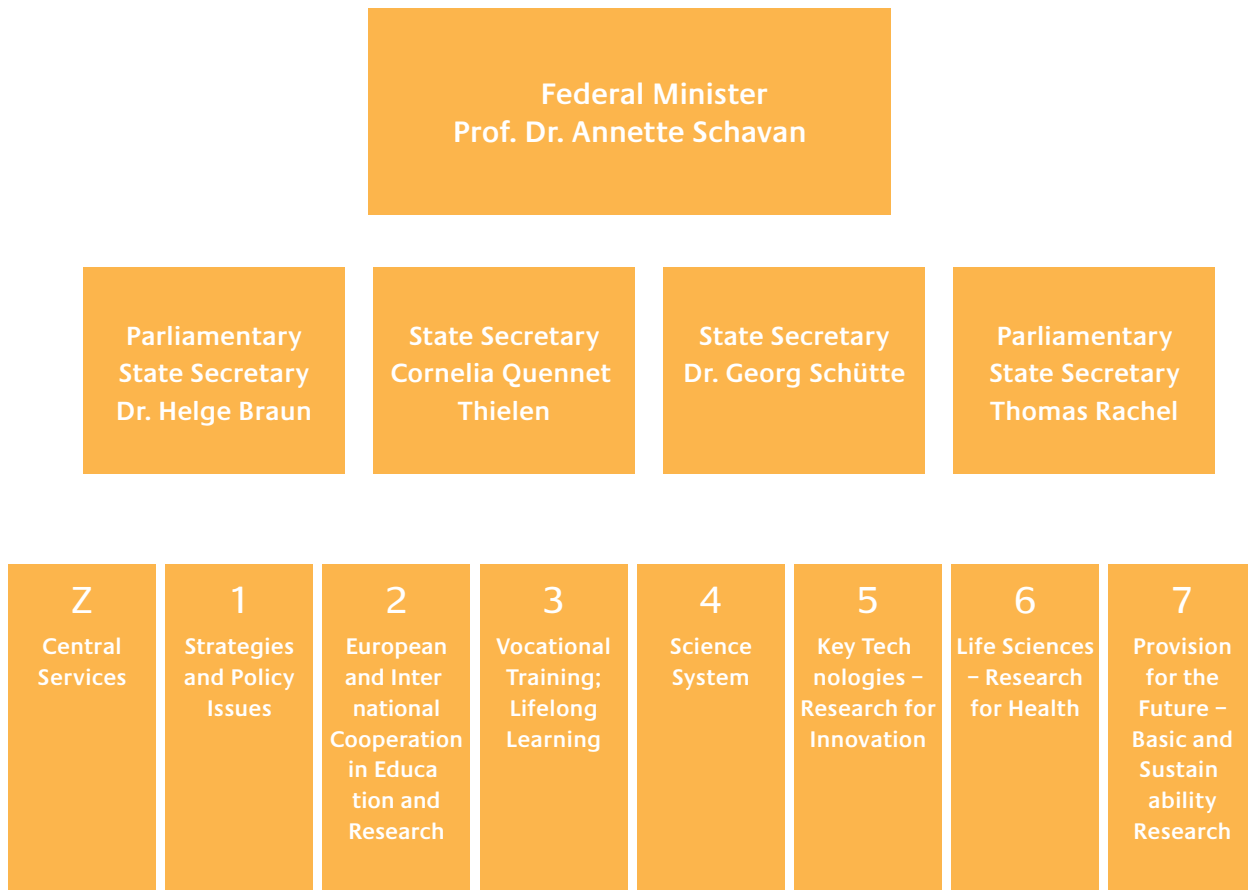
## 2. Tasks of the BMBF

By virtue of the Grundgesetz (German Basic Law), the BMBF is responsible for the promotion of education and research in Germany, whilst school education and university teaching fall under the remit of the Länder. Among the Ministry's most important tasks are research funding (from basic scientific research right up to promoting research in cutting-edge technologies), supporting the

specialty gifted (promoting gifted boys and girls, trainees and students), promoting up-and-coming scientists and funding international exchanges in the fields of initial and continuing training, higher education and research. In addition, the BMBF shares responsibility with the Länder in the fields of non-school vocational training and continuing education, as well as in promoting training.



### 3. The Directorates-General and their Tasks



### Central services Z

The Directorate-General for Central Services comprises the classical cross-sectoral and service functions to ensure that the BMBF can fulfil its tasks. These include in particular the fields of personnel, personnel development organisation, legal affairs, internal services and information technology. In addition, the Directorate-General is responsible for the budget, general and basic regulations of the funding process and controlling procedures.



### Directorate General 1

#### Strategies and Policy Issues

This Directorate-General deals in particular with the political and strategic orientation of the Ministry, with the Science Dialogue and with changing social conditions of the science system. Priorities in Directorate-General 1 are innovation support in interaction with research and industry, the German High-Tech Strategy, the promotion of equal opportunities in education and research, cooperation between the Federal Government and the Länder as well as the promotion of talent.

### Directorate General 2

#### European and International Cooperation in Education and Research

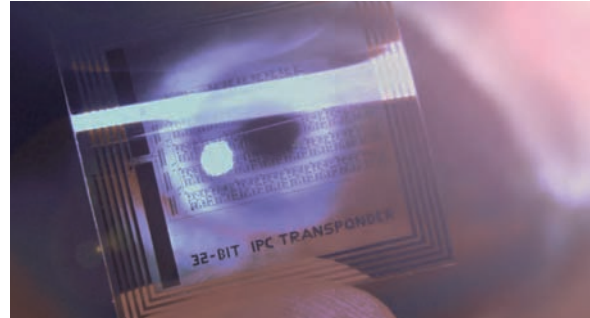
Directorate-General 2 is responsible for the development and enhancement of international relations in education and research. These cover all areas from the European Union and Europe to enhancing worldwide bilateral relations, which are of growing importance for science and research, to representation in European bodies, such as councils, and in multilateral bodies, such as the G8, OECD and UN structures.

### Directorate General 3

#### Vocational Training; Lifelong Learning

Directorate-General 3 is responsible for all issues regarding vocational training. For example, the Directorate-General makes adjustments to the Vocational Training Act, the Vocational Training Promotion Act and the Upgrading Training Assistance Act according to current requirements, creates new training occupations, brings existing occupations up to date and regulates the qualifications required in further training.

Moreover, Directorate-General 3 deals with the areas of lifelong learning, educational research and continuing education. The staff of the Directorate-General monitor international benchmarking studies (e.g. PISA), the national education report that is issued jointly by the Federal Government and the Länder, and the National Education Panel Study in Germany. This comprehensive study analyses how the participants' competencies unfold in the course of lifelong learning.



### Directorate General 4

#### Science System

Directorate-General 4 comprises the central tasks of the BMBF in higher education policy: research funding at institutions of higher education, the Initiative for Excellence, the Higher Education Pact 2020, the promotion of young scientists and international exchanges, the Federal Training Assistance Act (BAföG) and further scientific education.

In addition, the staff of Directorate-General 4 oversee the large German research organisations, like the Max-Planck-Gesellschaft (MPG), the Fraunhofer-Gesellschaft (FhG), the Helmholtz-Gemeinschaft (HGF) or the Leibniz-Gemeinschaft (WGL), the Foundation for German Institutes Abroad and the Academies Programme.

### Directorate General 5

#### Key Technologies – Research for Innovation

All projects related to modern key technologies are located in Directorate-General 5, including optical technology, nanotechnology, or information technology, to name but a few. These technologies open up new market and employment opportunities; they facilitate sustainable business, change vocational requirements and influence our day-to-day life. Nanotechnologies, electronics, optical technologies or microsystems technology are among them just as modern software systems, the further development of the Internet or the development of security research. Groundbreaking projects are also located in this Directorate-General, for example the development of digital libraries and new structures for net-based scientific work.

### Directorate General 6

#### Life Sciences – Research for Health

Man is at the centre of the tasks of Directorate-General 6. All central research areas of the life sciences are located here, from molecular biology to health research and biotechnology right through to questions

of nutrition or basic research for renewable resources. All these areas are promoted by targeted project funding on the one hand and dynamically developed further by institutionally funded research institutions on the other. In addition, the ethical and legal aspects of research are also highlighted.



Federal Minister Schavan congratulates Prof. Dr. Harald Zur Hausen on winning the Nobel Prize.

## Directorate General 7

### Provision for the Future – Basic and Sustainability Research

Directorate-General 7 deals with a broad range of topics from basic scientific research to climate, energy, environmental and sustainability research. This includes studies on the structure of matter on the smallest scale just as the question of the origins of the cosmos, of changes and risks within the Earth system and of the opportunities for sustainable developments in a systems-oriented research approach that gives equal consideration to ecological, social and economic aspects. Particular importance is accorded to finding a solution to issues of climate and energy. In addition, the Directorate-General monitors in institutional terms the major national and international centres that operate large-scale research equipment for basic scientific research and nuclear fusion, like the European XFEL x-ray laser.



## 4. Main Focus of the BMBF

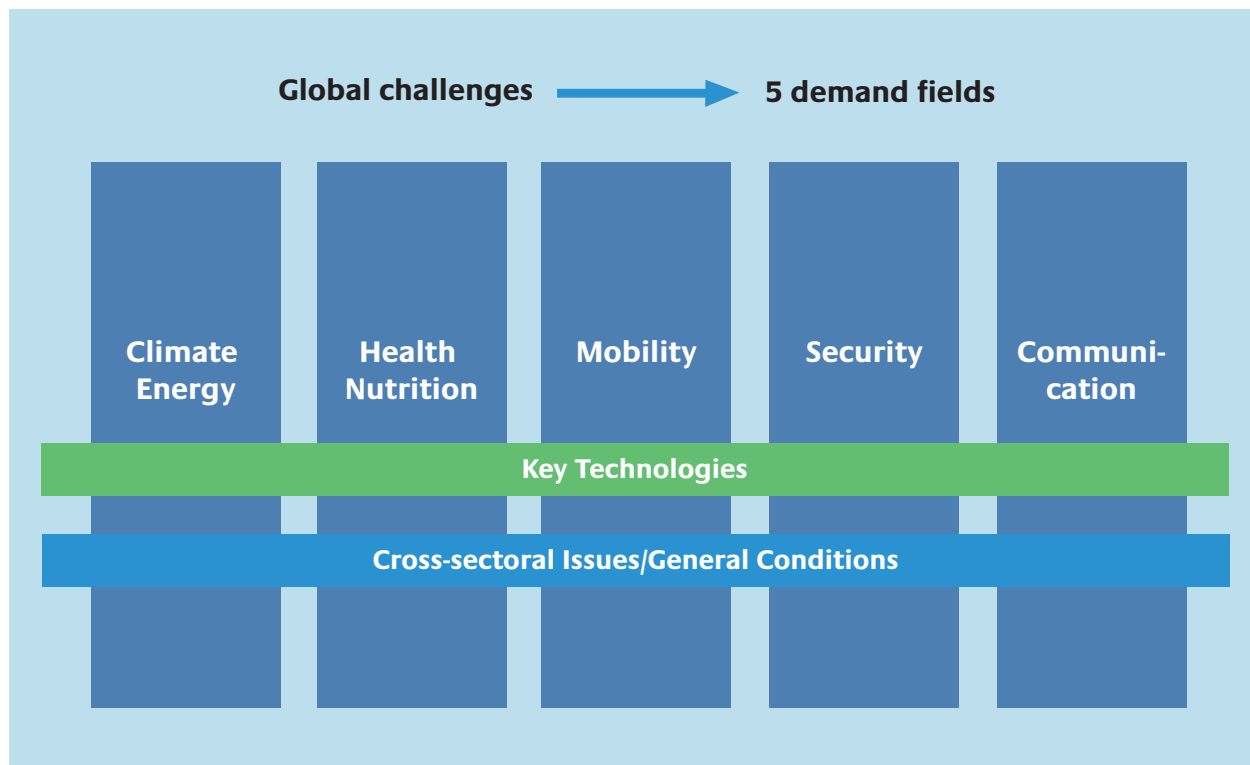
Our aim is to turn Germany into one of the most high-performance sites worldwide for science, research and innovation. It is our goal to invest 10% of the gross domestic product in education and research throughout the country by the year 2015. In 2008, Federal Government expenditure

on research and development amounted to a total of €10.9 billion. This is the highest figure ever. This positive impetus must be safeguarded for the future to ensure that education, research and innovation remain political priorities.



## 5. German High-Tech Strategy 2020

**Ideas.Innovation.Growth.**



Germany is facing one of the largest economic and fiscal challenges for decades. Following the economic and financial crisis, the global race for knowledge is picking up the pace. The international competition for young talent, technologies and market leadership will continue to increase.

Global challenges, like climate change, demographic shifts, the spread of common diseases, safeguarding the world's food supply and the limited resources of fossil fuels and energy sources, demand viable, forward-thinking solutions that can only result from research, new technologies and the dissemination of innovations.

### 5.1 Added Value of the High-Tech Strategy

With its High-Tech Strategy (HTS), the Federal Government is establishing the strategic framework that will make innovative products, processes and services possible in focal areas of social and economic importance. It is conceived as a central instrument for the strategic coordination of national innovation policy. The design and implementation of the HTS are supported by the common determination of the entire Federal Government to position research and innovation on the centre stage of the political agenda.



The HTS will rely on all departments for its future implementation. In particular, forward-looking projects will be developed and implemented above and beyond divisional boundaries.



The HTS aims to create lead markets, intensify cooperation between science and industry and make further progress in the framework conditions for innovations.

- We want Germany to be a pioneer in science and technology-based solutions in the fields of climate/energy, health/nutrition, mobility, security and communication. The HTS is to focus on these fields, which will also give a new impetus to growth and employment in Germany. In its innovation policy, the Federal Government's focus is on these five demand fields with the goal of opening up the new markets of the future. The promotion of important key technologies and the improvement of the general innovation-related conditions will
- be oriented towards the demand fields, according to their contributions to progress.
- National and European research and innovation policy will be closely dovetailed. In "Europe 2020," the Commission and the European Council have initiated an ambitious process that places education, research and innovation at the very heart of a European policy of growth. On this basis, Germany will contribute to a coherent research and innovation policy in Europe.
- The general conditions for innovation in Germany will continue to be improved. This applies particularly to start-up conditions, the special situation of small and medium-sized companies, sufficient funding of innovations and the provision of venture capital.
- Last but not least, research and innovation depend on intensive dialogue with society. For this reason, new dialogue platforms are being set up to enable the general public to conduct more intensive discussions on new technologies and research results, and to present their own views with regard to finding solutions to the major global and social challenges.

## 5.2 Overview of Demand Fields and Projects for the Future

### Climate/Energy

Climate change is one of the biggest challenges now facing mankind. If it is allowed to continue unchecked, it could have considerable impact on our lives and exert a profound influence over the subsistence of society in many countries. If we fail to take effective countermeasures to halt global warming, if we fail to make the necessary adjustments or, at the same time, to reinforce the ability of social and natural systems to adapt to the irrefutable risks and consequences of the climate shift, this very shift will lead to unforeseeable changes in the lives of many people around the globe. We need to improve the courses of action available to politics, science, industry and society by expanding our knowledge base and applying climate protection technologies and customised solutions systematically. To this end, the Federal Government will step up its cooperation with industry and financial institutions. It is developing instruments and structures that will enable it to provide greater support when ruling on climate protection and adjustment. The expansion of international cooperation – both in Europe and further afield – is particularly important in this demand field. The transition to a sustainable energy supply is a major topic for the future. Here, the Federal Government is focusing on

greater reliance on renewable energy sources and on using them efficiently. This can be achieved first and foremost by making the most of innovative technologies. For this reason, research and development in the field of climate and energy is essential.

It is more important than ever before not to lose sight of the socioeconomic and social implications. The forward-looking projects, “**The CO<sup>2</sup>-neutral, energy-efficient and climate-adjusted city**”, “**Intelligent reorganisation of the energy supply**”, “**Renewable resources as an alternative to oil**” and “**More Internet for less energy**” are ideal examples of possible development paths that lead to a sustainable climate policy and utilisation of resources and energy.

### Health/Nutrition

The demographic shift and the spread of infectious diseases will shape society in the future and represent a major challenge to our health system. The research, prevention and treatment of widespread diseases will constitute one of the most important areas of medical activity, not only in Germany but around the world. Research funding must focus on top scientific priorities, without jeopardising fundamental research which has a broad base in Germany. This includes prevention and nutrition research, together with the interdisciplinary investigation of widespread

diseases. A clear orientation on mankind must be the benchmark and focus of research and translation. Allowance must be made for the needs of mankind in developing a new research strategy for individualised medicine and establishing high-performance health care research. The need for medical research and for validation studies to assess the relative clinical benefits is particularly pronounced in the field of individualised medicine. In addition, companies, particularly SMEs, must be involved in the prevention strategy in the form of operational health management systems. Experience of medical processes under everyday conditions is particularly valuable here in increasing the quality and efficiency of health care using limited resources. For example, in rural areas where there is a shortage of doctors, methods of telemedical treatment should be tested and developed further. The forward-looking projects **“More effective treatment of illness using individualised medicine”**, **“Increased health as a result of an optimised diet”** and **“Retaining independence into old age”** demonstrate how the individual lines of research can be combined.

## Mobility

Studies indicate an increase in passenger and freight transport of approximately 70% between 2004 and 2025. In order to be able to transport passengers and freight quickly, safely and comfortably, but at the same time, efficiently and without wasting valuable resources in the future, we need new forms of mobility. The development of new drive systems, fuels and storage technology along with the finalisation and extensive use of the European satellite navigation system Galileo are some of the most important focal points of research and innovation. The development of information, communication and traffic control systems is designed to help make traffic infrastructure more intelligent. Research on smart logistic concepts and the use of mobile electronic services can also help to transport goods and passengers with minimum use of resources. The efficient reduction of traffic noise is a further technical challenge that needs a solution. By introducing hybrid and electric vehicles, the forward-looking project **“One million electric vehicles for Germany by 2020”** is a milestone on the road to making Germany the lead market for electromobility and related information and control systems.

## Security

Owing to the rise of imminent threats on all sides, the security standards that Germany is required to meet as an open society and modern industrial nation have increased – terrorism and organised crime, natural and environmental disasters and pandemics all call for some form of response. In order to ward off danger and safeguard essential infrastructures and goods supply chains, new security solutions must be developed to protect modern democratic societies and their inherent infrastructures against terrorism, sabotage, organised crime and the consequences of natural catastrophes or accidents. Secure access to space-based technologies is required for certain decision-making options and courses of action. In addition to providing protection against possible threats and establishing secure conditions, safety technology products and services offer a great opportunity to develop a specifically German competence profile, thereby making Germany a lead market for safety technology. The forward-looking project **“More effective protection for communication networks”** aims to promote new, tailor-made security solutions that also comply with fundamental democratic principles.

## Communication

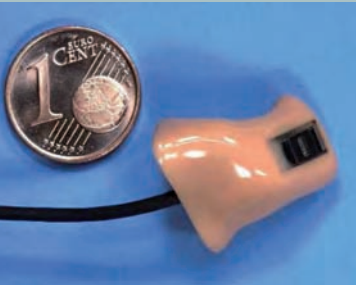
In a globalised world, information and communication are the foundation for efficient value added chains and the basis for the mobility and information requirements of modern society. Henceforth, the field of information and communication technology will focus on the technical and legal development of the Internet of the future, global consensus in standardisation issues and the development of a national roadmap on embedded systems. Using ICT, the forward-looking projects **“Intelligent reorganisation of the energy supply”**, **“More Internet for less energy”** and **“Making the world’s knowledge digitally accessible and tangible”** allow the energy-efficient configuration of supply and production networks, at the same time reducing the energy consumption of the ICT itself. The forward-looking project **“More effective protection for communication networks”** also lends impetus to research activities in the communication demand field.

## Selected projects from the High-Tech Strategy

### A health monitor inside your ear

#### An in-ear sensor monitors risk factors for cardiovascular disease

Lack of exercise, excess weight, a poor diet, stress and smoking all lead to chronic vasoconstriction and, ultimately, to an increase in heart rate. The risk of a heart attack or stroke also increases. Affected patients receive constant support in their efforts to lead a healthier lifestyle, including regular checks of their cardiovascular functions. If patients can monitor their own results they are able to assess the risk factors more accurately.

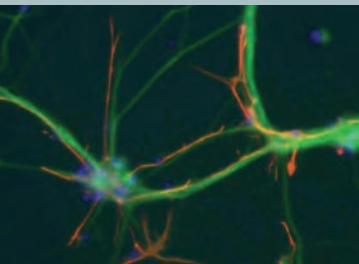


A tiny button with a big impact

### Effective aid against dementia

#### Scientists are researching medication to treat Huntington and Alzheimer's

Morbus Alzheimer and Chorea Huntington are two mysterious and terrible diseases. They occur as the result of a deteriorating nervous system, leading to increasing restrictions in the functions of the brain. The symptoms of decline affect not only the sufferer's physical well-being, but also their mental capability. To date, there are no known effective treatments that are capable of decelerating or even halting the progression of the disease. A substance capable of preventing the proteins from clumping together in the brain could prove to be the key to an effective cure.

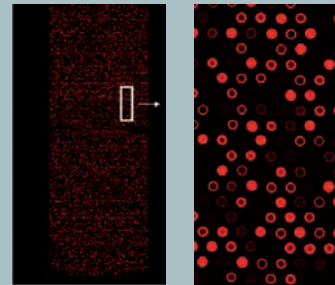


Nerve cells (shown in green) can be cultivated in Petri dishes for research into neurodegenerative diseases. In the photograph, the cell nuclei are shown in blue, while the star-shaped "astrocytes" that support the nerve cells are red. Photo: Wanker/MDC

### Securing evidence in the smallest possible area

#### A gene chip helps by detecting blood poisoning at an early stage

Septicaemia is a life-threatening condition. Therefore, it is essential that it is detected in good time to permit swift, effective treatment. By evaluating the sepsis (blood poisoning), the Functional Genome Analysis project aims to improve considerably the possibilities of detecting and predicting the course of this condition, and of treating its serious symptoms.



CodeLink-Microarray (see left) and detail enlargement of a hybridised gene chip (see right); Copyright Amersham Biosciences.

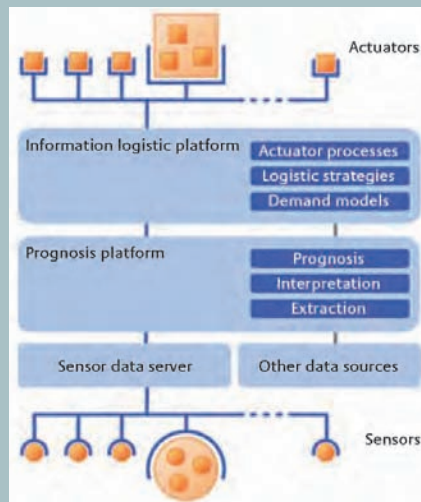
## Living in an intelligent house

### Improved automation systems save costs and energy



A measuring tool, part of the FH Erfurt's "Comfort Zone Measuring Station"

The refrigerator of the future sends a signal when it is out of milk or butter. In the same way, the house of the future can think ahead; it knows when its inhabitants are too hot or too cold. The house also monitors its own energy consumption and knows if a light could be switched off. Technical solutions already exist in the form of building automation systems but they are still too costly. Moreover, many systems go above and beyond the everyday requirements of a house's inhabitants. The "CBS – Customer Bautronic System" research project aims to change all that.



## Yes to decontamination, no to side effects

### Waste water sterilisation procedure

Waste water is often highly contaminated, particularly when it comes from hospitals or factories. In addition to organic substances, bacteria are frequently present that could prove harmful to humans because of their resistance to antibiotics. However, conventional decontamination procedures either have harmful side effects or are not effective enough. A project that aims to decontaminate waste water by means of electronic impulses has developed a physical procedure that perforates the cell membrane of the bacteria, thereby destroying them.



Opened pilot plant for the treatment of cloudy waste water using electronic impulses. On the left: lattice network high voltage pulse generator producing square wave pulses lasting 1  $\mu$ s, with an amplitude of 60 kV and a repetition frequency of 10 Hz. In the middle: high voltage power supply for the impulse generator. On the right: generation of compressed air for the high voltage switching spark gaps.

## Battening down the hatches

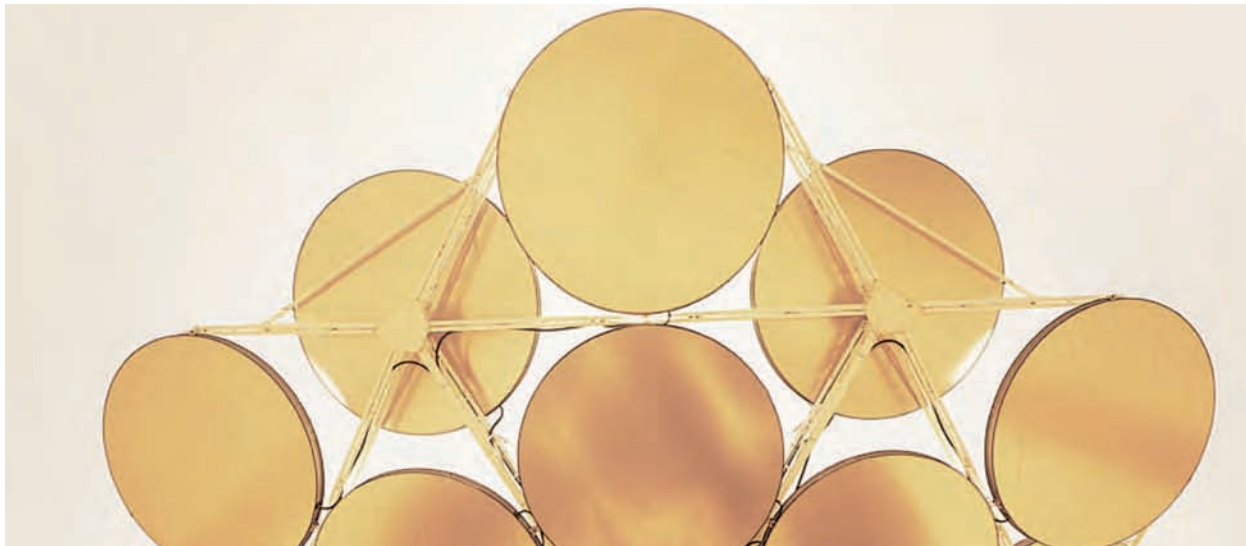
### Early warning system for severe weather conditions aims to prevent damage

The flooding of the river Elbe, the Kyrill storm or hurricane Katrina are only a few of the formidable natural disasters that have left a trail of destruction in their wake and claimed hundreds of lives. Many scientists attribute the growing frequency of these catastrophes to the ongoing climate change. Although not every thunderstorm ends in a natural disaster, lives are increasingly at risk and millions of euros' worth of damage is caused to property. Therefore, we need a system of protection that will avert danger in severe weather conditions. The "Safe" project is working on an interdisciplinary platform in the form of an early warning system.

### 5.3 Research and Innovation in Leading-Edge Clusters

A key element of the High-Tech Strategy for Germany is the building of bridges between science and business. Clusters in which regional partners have a common goal offer ideal conditions for this purpose. Therefore, the BMBF launched the Leading-Edge Cluster Competition in August 2007. Since then, in the course of two rounds of the competition, ten Leading-Edge Clusters have been selected by an independent jury. A third round of the competition is planned for the end of 2010/beginning of 2011.

The funding of Leading-Edge Clusters supports the concentration of regional potential along the entire innovation and value added chains, with the goal of establishing the cluster at the top of the international league in the long term. The clusters boast a unique combination of success factors, for example the scientifically sound, practice-oriented promotion of young talent, long-term research strategies, market-driven technological development, ideal conditions for starting up new companies and the strategic development of international partnerships.



#### **5.4 Promotion of Cutting-Edge Research in the SME sector**

In 2007, the BMBF introduced its KMU-innovativ scheme to significantly ease access to research funding for SME companies involved in world-class research. Under the heading “Priority for cutting-edge research in the SME sector”, the smooth, efficient project-outlining process, six-monthly deadlines and topic flexibility within the technology fields involved all facilitate access to the funding programme. The companies who receive funding through the KMU-innovativ scheme are not only particularly young and dynamic but also, to a large extent, newcomers to funding. At present, applications may be submitted in the following technology fields: biotechnology, production technology, information and communications technologies, nanotechnology, optical technology, technologies for the efficient use of resources and energy/climate protection, security research and microsystem technology.

##### **Validation of research results**

The “Validation of the innovation potential of scientific research – VIP” initiative launched by the BMBF in 2010 assists scientists in taking the decisive first step to tap the full potential of the new results of scientific research for subsequent commercial exploitation. The validation funding aims to verify the technical feasibility and the economic potential of results from official funda-

mental research and to continue to develop them with regard to future application. This creates the right conditions for a successful implementation as innovative products, processes or services.



### 5.5 Cutting-Edge Research and Innovation in the Regions

For the most part, the success factor of a region is linked to the formation of a network that combines the expertise, experience and key technologies of that region: a network that perpetuates regional traditions, develops a joint innovation strategy for the region and gives it a distinctive profile, which sees the emergence of something new, outstanding and unique.

Successful regional networks may also emerge without excellent economic structures being in place. Of particular interest are innovative activities relating to emerging or growing markets and segments.

A sustainable innovation policy is thus also the key to reconstructing the East German Länder. The constraints of an innovation-oriented growth policy for the new Länder are inherent in the special economic structure of East Germany, which is characterised by small and micro enterprises. Therefore, despite a high level of support, only 8.1% of the German economy's expenditure on research and development are deployed in the new Länder.

### 5.6 Development of the Innovation Landscape by the Public Sector

Especially in the new Länder, all the stakeholders in the scientific community must accept their joint responsibility for technological productivity and, by taking concerted action, ensure the availability of a skilled workforce. In so doing, universities and research institutes must cultivate their individual strengths and continue to reinforce their positioning on research and innovation strategy through partnerships with each other, as well as with regional, supraregional and international partners.



Parliamentary State Secretary Thomas Rachel, Member of the Bundestag and State Secretary Dr. Georg Schütte with the Presidents of the Industry-Science Research Alliance, Prof. Dr. Hansjörg Bullinger (President of the FhG) and Dr. Arend Oetker (President of the Stifterverband German industry initiative) and the members of the Industry-Science Research Alliance.



### 5.7 Development of “Innovation Competencies”

We aim to increase the innovative capabilities of the new Länder by bundling expertise on a large scale across organisational boundaries and by focusing on specific topics. This requires a competitive research structure as well as “innovation competence”, in other words, the ability to transfer research findings into the economy. Successful, attractive regions have at their disposal cutting-edge research that meets international standards and a functioning network of innovation-oriented stakeholders from science and



industry. These regions have the necessary critical mass and also operate across national borders. They are able to meet their own need for skilled workers and young scientists in the long term and offer ideal conditions for self-maintaining growth and employment. Such partnerships are fundamental for the new Länder. The objective of the programme “Cutting-edge Research and Innovation in the new Länder” is to achieve a sustained effect by perpetuating partnerships that have proved their worth over time.



The book on the Education Republic of Germany is a collection of educational stories from all parts of the country that demonstrate the different educational backgrounds of the people in our country.

## 6. Germany's Qualification Initiative



At the “education summit” on 22 October 2008, the German Chancellor and the heads of the Länder governments approved the qualification initiative for Germany. Among other things, the initiative earmarks 10% of the gross domestic product for investments in education and research by the year 2015. This serves to promote young talent and improve Germany’s performance in international competition. This type of joint, self-imposed commitment on the part of the Federal Government and the Länder to an education policy advocating specific measures in all areas from early childhood education through to higher education and training is unprecedented in German history. Despite the economic crisis and the limited financial resources, the Federal Government continues to uphold the objectives of the qualification initiative; the BMBF is contributing to the realisation of these objectives with a variety of measures and projects.

### Reinforcing early childhood education

The foundations for the educational future of our children are laid in the first few years of life. Families bear a particular responsibility for a child’s upbringing during this time. In addition, as institutions of early childhood education,

childcare establishments also play an important educational role. They foster gifted children at an early stage and identify those with disadvantages or weaknesses who require specific support as soon as possible.

Therefore, by 2013, the Federal Government, the Länder and the local authorities are increasing childcare facilities for the under-threes to 35%. In addition, we aim to ensure the ongoing professional approach of nursery school teachers and childminders.



Federal Education Minister Annette Schavan presents the book on the Education Republic of Germany in the BildungsWerk Kreuzberg.



A solid command of the German language is of inestimable importance in enabling children to develop, achieve educational success and integrate into our society. Language skills require greater support at an early stage. It is our goal for all young people in this country to have a sound command of the German language, irrespective of their native tongue.

For this reason, we support the Länder's pre-school language endeavours, particularly in promoting research into language tuition and language diagnostics.

### **Qualifications as a gateway – vocational training qualifications at the end of the “education chain”**

Every year, approximately 60,000 young people leave school without any qualifications while others lack the necessary maturity for vocational training. These young people either do not make the transition to vocational training at all, or only with great difficulty. At the same time, in view of demographic developments, it is to be expected that there will soon be a shortage of skilled workers in Germany.

In cooperation with the Länder and social partners, the new BMBF “Education Chain” initiative aims to reverse the imminent shortage of qualified personnel and also facilitate the transition to employment for underachievers. The starting point for the initiative is an analysis of potential among 13-year olds and older, on the basis of which individual school-based and extra-curricular measures are to be introduced.

Under the mentorship of up to 1,200 salaried “education guides,” up to 30,000 pupils who are particularly at risk will be given support on an ongoing basis until they have embarked on their vocational training. These are supplementary to the more than 1,000 career-entry consultants who work for the Federal Employment Agency and currently support over 20,000 students. In

addition to the services of these salaried employees, a further 1,000 senior experts experienced in vocational training will provide services on a voluntary basis under this programme.

### **Recognising foreign qualifications**

The Federal Government has passed guidelines for a legal provision to facilitate the recognition of foreign qualifications. In consultation with the Länder, a corresponding Act of Recognition is to be introduced by the end of 2010.

The flexible process will include partial recognition through to full recognition. In addition, in view of the dual system of vocational education and training in Germany, we must ensure that there is no resulting devaluation of German qualifications.

### **Lifelong learning**

The pursuit of knowledge and skills is increasingly becoming our life's work. This applies both to our private and our professional lives, where ongoing training is gaining in importance. In addition to the established instruments of higher education support programmes, the Federal Government particularly encourages the networking of education and further training courses locally, and improved advisory services. The government offers targeted incentives for individual partici-

pation in further education and has a hand in qualifying vocational training in enterprises.

### **Advancement scholarship**

The advancement scholarship programme is aimed at men and women with professional experience who are particularly talented and highly motivated in both training and their career. The scholarships serve as an additional incentive to embark on a degree course and thus improve the opportunities for the professional advancement of talented and skilled personnel. By means of the advancement scholarships, the BMBF is increasing the degree of permeability between professional and academic education. To date, approximately 2,000 scholarships have been granted. The BMBF is committed to a further extension of the programme.





## 7. Universities and Research Institutes

By extending the Higher Education Pact, the Initiative for Excellence and the Pact for Research and Innovation, the BMBF is sending out a strong signal for forward-looking education and research in Germany. By the year 2019, the Federal Government and the Länder aim to invest approximately €18 billion to create an additional 275,000 university places, grant a long-term perspective to the Initiative for Excellence in cutting-edge research at universities and secure the necessary flexibility for non-university research institutes. The Initiative for Excellence has triggered important reform processes and established new, research-friendly structures within universities, as well as in partnerships between universities, non-university research institutes and industry. The Pact for Research and Innovation II is set to extend the financial security of the non-university research institutes: from 2011 to 2015, the grants to non-university research organisations are to be increased annually by five percent. This amounts to a total of approximately €5 billion in additional research funds over the whole period.

The “Teaching Quality Pact” is the Federal Government’s solution for a successful implementation of the Bologna Process. As the third pillar

of the Higher Education Pact, the government is investing an extra €2 billion in universities over the next ten years. The latter will provide a further 10% of the funds, which are earmarked for additional staff. Priority should be given to appointments and recruitment of non-professorial teaching staff, for example. The government intends to promote mentoring and tutoring programmes. Furthermore, teaching, support and advisory staff are to be offered opportunities to improve their qualifications by additional further training courses, for example. A new academy will implement the “Teaching Quality Pact” via a foundation.

Students are to become more mobile in the European Higher Education Area. To this end, the Federal Ministry of Education and Research will make an additional €90 million available for mobility funding by the year 2015. This will benefit university partnerships, four-year bachelor degree programmes with integrated study periods abroad and language courses. Universities are already showing the first signs that the Bologna reform has been implemented successfully. Among the enhanced aspects are the introduction of interdisciplinary degree programmes, the continual development of study courses and quality assurance

on the part of all stakeholders. Many universities are already working in close cooperation on the further development of their study programmes.

Mobility windows for study periods abroad and international internships are being increasingly integrated into study courses, like at the University of Tübingen. Other examples show how universities are assuring and improving (accreditation). For example, the University of Oldenburg is participating in the interdisciplinary project “Accreditation through quality management”, while the University of Potsdam has appointed an online student panel to be responsible for quality monitoring. Moreover, the University of Applied Sciences Aachen is extending admission requirements by recognising skills and competences acquired in the workplace as an academic achievement for the process technology bachelor degree course.

By means of the “Advancement through Education: Open Universities” competition, the Federal Government and the Länder are sending a clear signal of their commitment to improve the permeability between professional and academic education; they are encouraging universities to develop a visible profile, including lifelong learning in research and part-time study courses. Thus, the objective is to extend further education at universities and establish it as a permanent field of activity for universities. Under the guiding principle of lifelong learning in research,



those universities that win recognition for their innovative and demand-oriented concepts in a competitive process are to receive initial funding to set up and develop study programmes. To fund the competition, the Federal Government is making a total of €250 million available between 2010 and 2018; overall financing is guaranteed by the Länder.

Yet financial reasons should not be an obstacle to embarking on a degree course. To this end, the Federal Government has introduced various

measures. Following significant improvements in payment and structure to the Federal Training Assistance Act, known as BAföG, back in 2008, the entitlements are to be increased by 2% and the allowable deductions by 3%. First and foremost, these are adjustments as part of the Bologna Process. BAföG is introducing other improvements by raising the general age limit for master degree courses, making it easier to switch courses and facilitating the balance between studying and parenting. Furthermore, the measures that simplify administrative procedures (lump-sum accommodation costs, recognising ECTS points as a record of achievement, waiving language certificates as a requirement for BAföG support abroad) relieve the burden significantly.

An important innovation, the National Scholarship Programme is funded by the Federal Government and the private sector (particularly by industry). The Act for a National Scholarship Programme (NaStipG) has already been ratified. The Act aims to award gifted students at all state and state-recognised universities in Germany a scholarship of €300 per month. Thus, this helps to break down financial barriers in the way of a degree course, at the same time creating an incentive for excellence. The three instruments of BAföG, education grants and scholarships complement each other.



## 8. Science Years

We are all affected by the research, inventions and developments that take place in Germany. Therefore, it is important that scientists inform the general public about their work in laboratories and offices. For eight years, the BMBF's "Wissenschaft im Dialog" (Science in Dialogue) initiative has opened up opportunities for exchange. The objective is not merely to inform the general public but also for them to have their say. The events of the Science Years and the Science Summer are designed to spark public interest in science. Since 2000, one scientific discipline has been chosen as the topic of a Year of Science.

- **2000 Year of Physics**
- **2001 Year of Life Sciences**
- **2002 Year of Earth Sciences**
- **2003 Year of Chemistry**
- **2004 Year of Technology**
- **2005 Einstein Year**
- **2006 Year of Information Technology**
- **2007 Year of the Humanities**
- **2008 Year of Mathematics**
- **2009 Research Expedition Germany**
- **2010 The Future of Energy**
- **2011 Research for our Health**

### **Science Year 2010 – The Future of Energy**

Profound climate changes, limited resources and a dramatic increase in global energy demand will combine to represent what will surely be mankind's greatest challenges in the coming years. In order to secure a sustainable supply of electricity and heat that is safe, efficient and environmentally compatible, all industrial nations will have to work together in adapting their energy supply in the future. We cannot achieve this without intensive energy research. Therefore, we require new solutions that take account of this principle of responsibility, solutions that harness natural sources of energy for increased energy efficiency and for a more responsible use of resources.

The Science Year 2010 focuses on the Future of Energy. Numerous formats, some of which are new, like the Research Exchange, the computer simulation game Energetika 2010, the Energy Route of the Museums, hands-on exhibitions and touring exhibitions, the MS Wissenschaft exhibition ship and Science Stations invite visitors to gain exciting new insights into the field of energy.

Special emphasis is placed on dialogue across various disciplines. The expert conferences are rounded off by new formats that are aimed specifically at school pupils and students. There will be new possibilities to explore of initiating debate between the general public, particularly the younger generation, and science, industry and politics. The highlight of the Science Year 2010 was the Day of Energy on 25 September 2010.

### **Science Year 2011**

The theme of the Science Year 2011 will be "Research for our Health." Health is a precious commodity: we all want to live as long and as healthily as possible. This is reflected in the extremely high demands made on health research. For the future, this research is expected to help fight illness more effectively, provide better standards of care for patients and prevent the outbreak of disease wherever possible. However, not only does health research have to develop effective solutions for the future, it also has to keep a watchful eye on the cost-benefit ratio of the healthcare system, particularly in view of the demographic change.

## 9. The BMBF's Budget

Investing in the future of education and research is a top priority. With a total volume of €11.6 billion, the BMBF's budget for 2011 has increased by €782 million, a rise of more than 7.2% compared with 2010. As far as the Federal Government is concerned, budget consolidation and investing in the future of education are not mutually exclusive but two sides of the same coin.

Special priorities include promoting the skilled, young workforce and higher education. For example, compared to the previous year, the BMBF is providing an additional €160 million to increase training assistance under the BAföG law. A total of €910 million has been earmarked to extend the Higher Education Pact (increasing the number of university places and improving research at universities) still further in 2011. Furthermore, in cooperation with the Länder, the Federal Government is investing €140 million in 2011 in the new third pillar of the Higher Education Pact – the Teaching Quality Pact. The BMBF is making almost €327 million available in 2011 for the further development of the successful Initiative for Excellence. In addition, vocational training is also being promoted with the launch of the “Advancement through Education: Open Universities” competition; some €250 million

have been earmarked for this purpose from now until 2018.

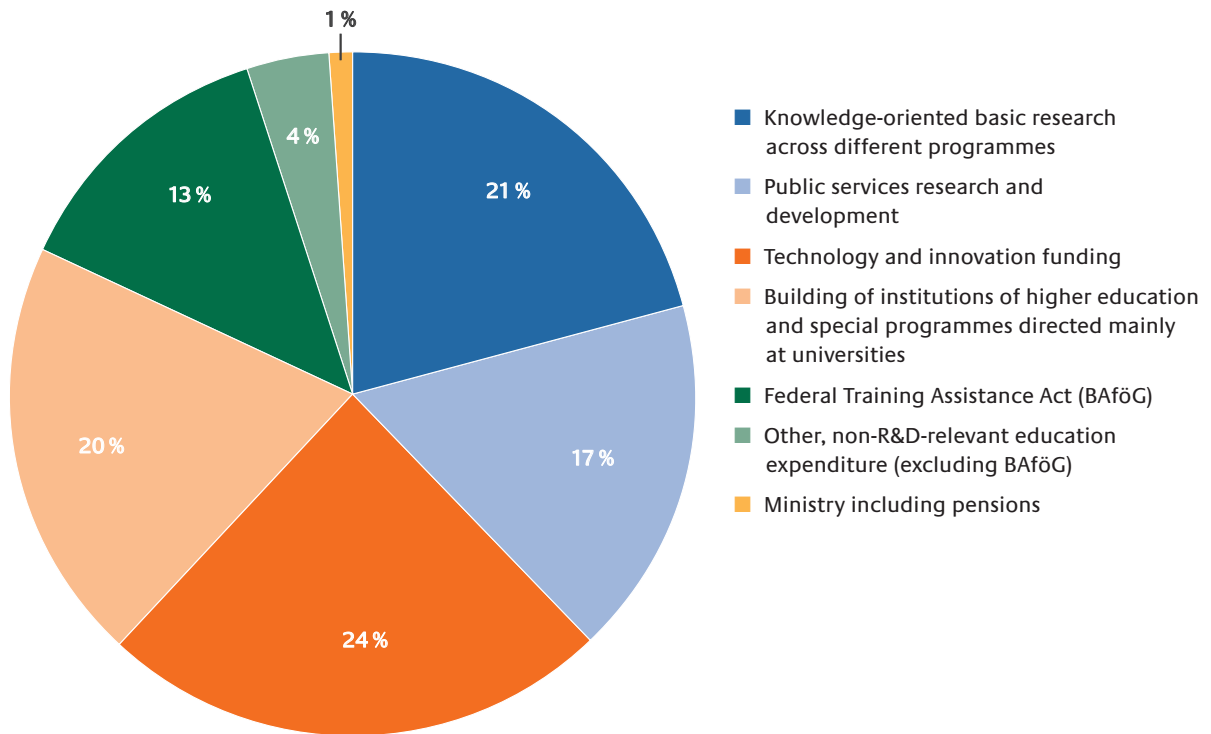
Moreover, in cooperation with the Federal Employment Agency, the BMBF will employ salaried and voluntary mentors, known as “Bildungslotsen” or education guides, in secondary general schools to facilitate the transition into vocational training and ensure individual support for school pupils on an ongoing basis over several years.

The successful Pact for Research and Innovation, that guarantees an annual increase of 5% in grants to German research organisations, is set to continue with an extra budget of €225 million compared to 2010.

Thereby, the further development of German centres for health research is a core element of this coalition's research policy agenda.

Project funding in the life sciences will remain at a high level, with an investment of approximately €500 million. The same applies to new technologies (€709 million) and to the climate, energy and environment sector (€368 million). This means that the electromobility and battery research initiatives and the photovoltaic innova-

tion alliance can be realised according to plan. A total of €131 million will be available in 2011 for new funding instruments in connection with the High-Tech Strategy, particularly the Leading-Edge Cluster Competition, the validation of research results and the industry-research campus.



BMBF (departmental budget 30) – Areas of responsibility 2011  
 Departmental budget 30 – €11.646 billion

## 10. History of the Ministry and Development of its Nomenclature

The ratification of the “Treaties of Paris” on 5 May 1955 made the Federal Republic of Germany an equal partner in the western alliance. At the same time, Germany agreed to forego nuclear, bacteriological and chemical weapons completely. However, the Federal Republic of Germany was granted permission to carry out research in the use of nuclear energy for peaceful purposes. To this end, the Federal Ministry of Nuclear Issues was founded on 22 October 1955. General research funding remained the responsibility of the Federal Ministry of the Interior while the task of funding technological development, particularly for small and medium-sized enterprises, fell to the Federal Ministry of Economics. With the exception of vocational training, the Länder were each responsible for the education system.

The areas of space research, space flight research and technology, and general promotion of science were assigned to the Federal Ministry of Nuclear Issues in the 1950s. In 1957, the Ministry was renamed the Federal Ministry of Nuclear Energy and Water, and in 1962, it became the Federal Ministry of Scientific Research. By the end of the 1960s, marine research and data pro-

cessing had been added to the Ministry’s mission spectrum. In 1969, the Ministry was assigned additional responsibilities, notably in higher education policy, which led to the next change of name: the Ministry was now called the Federal Ministry of Education and Science.



The BMBF building in Bonn.

In 1972, the Ministry was divided by organisational decree of Willy Brandt, Federal Chancellor at the time, whereupon the Federal Ministry of Education and Science was assigned additional responsibility for vocational training. The responsibility for planning, coordination and promotion of basic research, applied research and technological development in key areas fell under the jurisdiction of the independent Federal Ministry of Research and Technology.



The BMBF building in the Hannoverschen Strasse 28-30, Berlin

In 1994, the Federal Ministries of Education and Science, and of Research and Technology were merged into the Federal Ministry of Education, Science, Research and Technology by organisational decree of Helmut Kohl, Federal Chancellor at the time. In 1998 the name was changed to the Federal Ministry of Education and Research, which is still in use today.

Under the “Act for the implementation of the enactment of the German Bundestag of June 20, 1991 for the completion of the German unity,” the so-called Berlin/Bonn Act dated 26 April 1994, the Ministry is one of six departments remaining in Bonn. This means that approximately three quarters of the staff work in the Bonn office and only one quarter at the Berlin office.

## 11. Ministers since 1955

- **Dr. h.c. Franz Josef Strauss, (CSU)**, Federal Minister of Nuclear Issues 1955–1956
- **Dr. Siegfried Balke, (CSU)**, Federal Minister of Nuclear Issues 1956–1962, from 1957 Federal Minister of Nuclear Energy and Water, from 1961 Federal Minister of Nuclear Energy
- **Hans Lenz, (FDP)**, Federal Minister of Scientific Research 1962–1965
- **Dr. Gerhard Stoltenberg, (CDU)**, Federal Minister of Scientific Research 1965–1969
- **Prof. Dr. Hans Leussink, (independent/SPD)**, Federal Minister of Education and Science 1969–1972
- **Dr. Klaus von Dohnanyi, (SPD)**, Federal Minister of Education and Science 1972–1974
- **Helmut Rohde, (SPD)**, Federal Minister of Education and Science 1974–1978
- **Dr. Jürgen Schmude, (SPD)**, Federal Minister of Education and Science 1978–1981
- **Björn Engholm, (SPD)**, Federal Minister of Education and Science 1981–1982
- **Dr. Dorothee Willms, (CDU)**, Federal Minister of Education and Science 1982–1987
- **Jürgen W. Möllemann (FDP)**, Federal Minister of Education and Science 1987–1990
- **Dr. Rainer Ortleb, (FDP)**, Federal Minister of Education and Science 1990–1994
- **Dr. Karl-Hans Laermann, (FDP)**, Federal Minister of Education and Science 1994
- **Prof. Dr. Horst Ehmke, (SPD)**, Federal Minister of Research and Technology, and of Post and Telecommunications 1972–1974
- **Hans Matthöfer, (SPD)**, Federal Minister of Research and Technology 1974–1978
- **Dr. Volker Hauff, (SPD)**, Federal Minister of Research and Technology 1978–1980
- **Dr. Andreas von Bülow, (SPD)**, Federal Minister of Research and Technology 1980–1982
- **Dr. Heinz Riesenhuber, (CDU)**, Federal Minister of Research and Technology 1982–1993
- **Matthias Wissmann, (CDU)**, Federal Minister of Research and Technology 1993
- **Dr. Paul Krüger, (CDU)**, Federal Minister of Research and Technology 1993–1994
- **Dr. Jürgen Rüttgers, (CDU)**, Federal Minister of Education, Science, Research and Technology 1994–1998
- **Edelgard Bulmahn, (SPD)**, Federal Minister of Education and Research 1998–2005
- **Prof. Dr. Annette Schavan, (CDU)**, Federal Minister of Education and Research, since 2005

## 12. History of the Listed Building in Hannoversche Strasse 30

The building in Hannoversche Strasse 30 has been listed since 1995. It was built in 1914 as the soldiers' quarters for the machine gun companies of two guard regiments, as part of a barracks that had been founded under Friedrich II in the garrison city of Berlin. Hans Leip wrote the original text of his song "Lili Marleen" here in 1915. After World War I, the building housed a police barracks, then later on the Berlin-Mitte police training academy.

After being hit by a bomb during World War II, the house was completely destroyed by fire; it was handed over to the German Academy of Sciences Berlin (DAW) for reconstruction and management in 1948. Hans Scharoun redesigned the building completely to house the Institute of Civil Engineering, crowning the edifice with a spacious workshop on the top floor for the Design department. It was here that the most important political decisions were made regarding the rebuilding of Berlin and the development of the construction sector in the GDR. During the era of the German Building Academy, the masters and experimental workshops carried out their work here under the direction of Hermann Henselmann, Richard Paulick and Hanns Hopp.

From 1973–1974, the building was revamped to become the seat of the Permanent Mission of the Federal Republic of Germany to the GDR; a summer house was added in the inner courtyard. In addition to diplomatic assignments and contacts at the highest level, the Permanent Mission



In 1949, Prof. Hans Scharoun converted the top floor into an architect's studio, which was used by the German Building Academy from 1951 onwards. It was here that Prof. Hermann Henselmann planned the redevelopment of Berlin, for example, the Stalin-allee (today known as Karl-Marx-Allee). The Scharoun studio was reconstructed during the renovation of the building and has been under a conservation order since 1995.

administered legal advice and provided information to the general public in accordance with the Basic Treaty that was signed in 1972. As confidential, individual actions at first, later in the form of mass occupation, hundreds of East German citizens flocked to the Permanent Mission to enforce their free passage to the Federal Republic of Germany. As one of the most heavily guarded buildings in the East German capital (state security's "Object 499"), the extra-territorial sovereign territory of the Federal Republic of Germany unexpectedly became part of the East German border protection system, and thus a potential "gap" in the Berlin Wall.

In chronological order, the heads of the Permanent Mission were Günter Gaus (1974–1981), Dr. Klaus Bölling (1981–1982), Dr. Hans-Otto Bräutigam (1982–1988) and Franz Bertele (1988–1990). Their special tasks included representing the interests of the FRG and West Berlin, negotiating contracts like the transit agreement, the cultural agreement or transportation contracts, as well as resolving family reunifications under private law, liaising with detainees and filing legal proceedings on behalf of natural persons.

In the first refugee case in 1975, the lawyer Wolfgang Vogel brokered a paradigmatic solution that proved to be sustainable for numerous other cases. In 1984, and again in early 1989, mass occupations took place over a period of several

weeks which led to the Permanent Mission being temporarily closed to visitors. During the summer of 1989, at the peak of the mass exodus, the summer house served as a temporary dwelling for 130 people.



Today, the seat of the Permanent Mission is protected by a conservation order that includes the original furnishings from the 1970s. The songwriter Wolf Biermann lived on the second floor of the building opposite until 1976, when he was stripped of his East German citizenship. The Stasi occupied the third floor in order to observe and spy on the Permanent Mission – and Wolf Biermann.

Among the cultural highlights hosted by the Permanent Mission was an East-meets-West German jam session in 1976, following a jazz concert given by the Manfred Schoof Quintet, Joseph Beuys' guest appearance and his first exhibition in the GDR in 1981, and the exhibition by the "Junge Wilde" (or wild youth) staged by Rainer Fetting and Salomé, among others, in 1982.

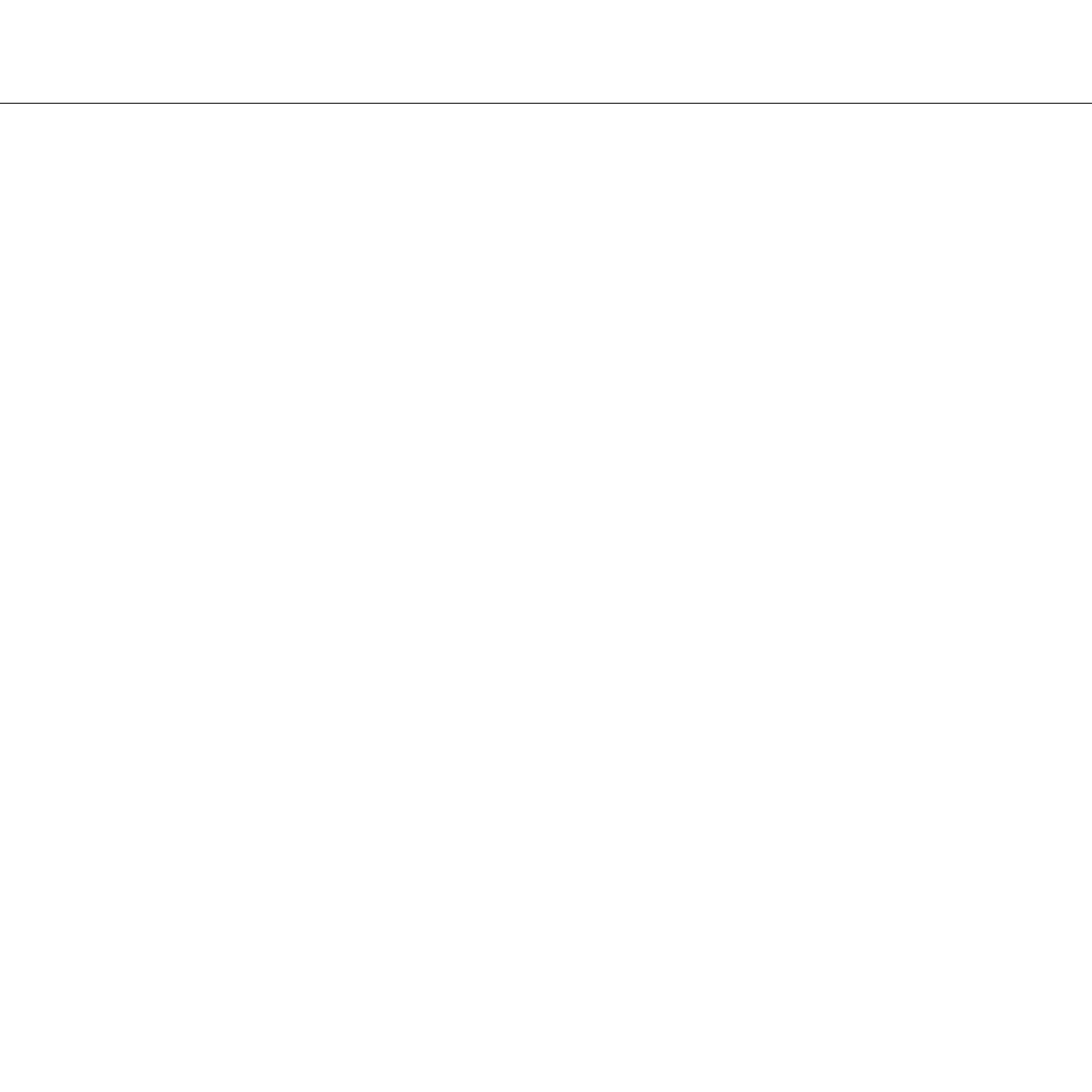
The Permanent Mission completed its work on 3 October 1990, the day of German reunification. Initially, the building served as a representative



Added in 1974, the summer house was modelled on the Federal Chancellery in Bonn. Since then it has been used for receptions, debates, concerts and exhibitions. From September to October 1989, it served as a refuge for 130 citizens of the GDR seeking free passage into the FRG, which was granted them in the end.

office for the Federal Ministry of Research and Technology, becoming the Berlin office of the Federal Ministry of Education and Research in 1999. An extension was added for this purpose.

During the renovation and construction work, the office belonging to the Head of the Permanent Mission, the summer house with the splendid seventies-style furnishings of the ceremonial and state rooms and the original entrance hall of the Mission, including the gate, were preserved under a conservation order; at the same time, the Scharoun studio was extensively restored to its original condition.



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