

Rede

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beim Königreich Belgien

Germany's Research and Innovation Policy
- Chances for Belgo-German Cooperation -

Dear Rector Prof. Dr. Mark Waer,
Dear Vice Rector Prof. Dr. De Moor,
Dear Vice Rector Prof. Dr. Marynen,
Dear Vice Rector Prof. Dr. Maex,
Dear President Prof. Dr. Roos,
Dear Director Hendrickx,
Dear ladies and gentlemen,

Innovation, ladies and gentlemen, is the ability to see change as an opportunity - not as a threat. Not everyone in history, of course, has agreed with this statement. Leonid Iljitsch Breshnev, for example, leader of the Communist Party between 1964 and 1982, was once asked by an American journalist: "Mr. Breshnev, how would you describe the state of the USSR in one word". Breshnev answered: "Good". The journalist then added: "And if you had two words, Mr. Breshnev?". - - - "Not good", he said.

Hence, in order to understand Germany's choices in the field of research and innovation policy, we will need more than one or two words, and we must bear in mind the **European and global context**.

Globally, we see a shift of power from the West to the rest, as Samuel P. Huntington put it. Emerging powers like China, Brazil, and Russia will soon have caught up with the EU. In 1900, almost 25% of the world's population was European. Today it is only about 10%, in 2050 it will be barely 7%. Germany's 82 million only account for 1.19% of the world's population, in 2050 this will drop below 1%. China alone is today home to 1.3 billion people or 19.5% of the planet's population. In 2050 China and India will represent one third of the people on the planet. These numbers will naturally translate into economic growth rates and have a political impact¹.

Considering these developments, it becomes clear that Europe can only maintain its importance in tomorrow's world if it upholds its comparative advantage in the key policy field of innovation and technology. If we want to forestall becoming a continent of the past, a museum which Asian tourists will visit to learn about the 20th century, then we need to invest and prop up our research and innovation policies. In a nutshell, if we do not want to become the museum of the world, then Europe has to stand together and form a global hub of research and innovation excellence. While other powers will secure their comparative advantage regarding energy (think of Russia), economically (China is now the number two economic

¹ Figures are based on research done by the United Nations (UN), the Bundeszentrale für Politische Bildung (BpB) and the Deutsche Stiftung Weltbevölkerung (DSW).

power in terms of overall GDP), or militarily (the US) – we, however, could be the research and innovation power in the emerging heteropolar world².

Germany has always been ready to assume its responsibility in the European context. In the 7th **EU Research Framework Program** Germany contributes between 1.5 and 1.7 billion euro annually – i.e. more than 20% of the overall annual budget of 7.2 billion euro³. Germany's engagement makes perfect sense: Germany – a country with nine neighboring countries – can only realize its economic and research goals if it acts in a concerted way with its neighbors. Consider this: Belgium is Germany's 7th most important trading partner, well ahead of China, which ranks 9th in importance for the Federal Republic. Germany imports goods from Belgium worth 64.6 billion euro, and exports 55.1 billion euro worth of goods to Belgium. In terms of research and innovation, interdependencies exist, but more needs to be done to create the densest of networks between the two neighbors and to make the **European Research Area** a reality which was initiated by the European Union as far back as 2000.

This is why the German Embassy in Brussels has organized in cooperation with the Fonds voor Wetenschappelijk Onderzoek (FWO), the Fonds de la Recherche Scientifique (FNRS), and the Helmholtz Association, the **First Belgian-German conference** in 2009. The subject of the conference was “Partners in Innovation and Education”. If I remember correctly, quite a few of you attended this conference, for example Bart De Moor and Minne Casteels. Its goal was to explore possibilities for further cooperation. The first day of the conference used showcases – in, e.g., nano technology and climate change – to illustrate those opportunities first hand. But it also sent an important signal: Belgium and Germany are key partners in innovation, science, and education. We stand together to face the challenges of tomorrow. I hope that all of you will help to keep this good tradition of bilateral conferences alive, and I am happy to receive your comments on future conference topics and focal points.

Investing more in research at a European level is also a target line of the new **Europe 2020 Strategy**, adopted by the European Council in June 2010. It states: “To achieve the target of investing 3% of GDP in R&D in particular by improving the conditions for R&D investment by the private sector, and develop a new indicator to track innovation”⁴.

Its predecessor, the **Lisbon Strategy**, adopted in March 2000 by the European Council, gave the EU a new and ambitious goal: to become by 2010 the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion. However, today it is widely regarded as a disappointment⁵. It certainly had its priorities right though: innovation as *the* motor for economic change. One example of this priority is the extension of **the Joint Technology Initiatives**. What I consider to be the forte of this initiative is that public and private bodies work together closely. This model of public-private partnership for research can also work for our bilateral cooperation.

It should be our common goal to give the new Europe 2020 Strategy the necessary teeth and ensure that it does not become a lame duck, as did the Lisbon Strategy. Too much is at stake and too many chances could be missed. The **Innovation Union** is one of the Strategy's flagship initiatives and could serve as one of those teeth: It seeks to improve framework conditions and access to finance for research and innovation in order to strengthen the innovation chain, and boost levels of investment throughout the Union. The policies in the

² Tobias Felix Franke, *Nosce Te Ipsum: Positioning the EU's CSDP as a Regional Ordnungsmacht*, BRIGG, 2010/2.

³ EU-Haushaltsbericht 2008, p. 67, retrieved at http://ec.europa.eu/budget/library/publications/fin_reports/fin_report_08_de.pdf

⁴ EU 2020 Strategy, February 2011, retrieved at http://ec.europa.eu/europe2020/index_en.htm

⁵ Tania Zgajewski and Kalila Hajjar, “The Lisbon Strategy: Which failure? Whose failure? And why?”, Egmont Paper 6, Royal Institute for International Relations, 2005, Academia Press, retrieved at <http://www.egmontinstitute.be/paperegm/ep6.U701.pdf>

Innovation Union Plan aim to do three things: “make Europe into a world-class science performer; revolutionize the way public and private sectors work together, notably through Innovation Partnerships; and remove bottlenecks – like expensive patenting, market fragmentation, slow standard setting and skill shortages – that currently prevent ideas getting quickly to market”.⁶ Once again, we need to remind ourselves that the effort of a few will not lead to success. All EU member states need to prioritize these issues.

Ladies and gentlemen, **why do we want to talk about research and innovation policy today?** Because research and innovation are – so to speak – the backbone of a post-modern country with a strong industrial culture like Germany. We spend about 2.5% of our GDP on R&D and seek to increase this figure to 3%. The latest figures show an increase to 2.8% at the end of 2010/ beginning of 2011. Investors and companies from Germany have registered 11.7% of global patents – a third place in the international league⁷. Germany spends about 55 to 60 billion euro on research annually – 2/3 come from industry, 1/6 from the universities and 1/6 from research institutes like Max-Planck, Fraunhofer, and Leibniz, which I will deal with in depth later.

Germany’s defining features today are that it is striving for innovation, thorough research, and investing in technologies of the future. Be it the opening of the Neumayer III Antarctic station in 2009, the newly established German Centre for Neuro-Degenerative Diseases, or the visionary plans of Desertec to create a multi-billion solar park in North Africa, Germany’s goal is to maintain its comparative advantage in high tech and research. Since we lack oil, gas, gold, and diamonds, we are condemned to succeed here or perish. In a European Union without borders, this comparative advantage is, however, not only a German advantage but a common European good.

Ladies and gentlemen, let us take a look at **German research policy**. It is centered around four objectives: First, strengthening Germany’s competitiveness by establishing an efficient, world-class science system. In order to achieve this, Germany must attract the best researchers and students from all over the world.

Second, providing state guidance through an innovation-friendly approach. Incentives are necessary for investments in research and development, as are framework conditions that promote research and development and thus enable innovation.

Third, helping resolve global climate, resource, health, and safety challenges through the potential of German research and innovation.

Fourth, enhancing research expenditure to 3% of GDP⁸.

If we want to achieve these goals, we need to bear in mind that research policy is a shared competence between the Federal Government and the 16 Länder. Hence, institutions of higher education usually receive funding from the respective Land. However, joint funding for higher education and research facilities is also common – particularly when costly equipment is purchased. All in all, there are 750 publicly-founded research institutions in Germany, plus research and development centers run by industrial corporations. To give you an idea, the German company **Siemens** invests 5.7 billion euro a year in R&D – making it number 15 worldwide in terms of R&D. Chemical giant **BASF**, also located in the port of Antwerp, invests about 1.5 billion euro a year. Private German companies together spend about 28.5

⁶ Website of the Innovation Union, January 2011, retrieved at http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=intro

⁷ German Federal Foreign Office, January 2011, own sources.

⁸ Overview of Research Policy in Germany – Recent Developments, July 2008, retrieved at http://www.kooperation-international.de/index.php?eID=tx_nawsecuredl&u=0&file=fileadmin/redaktion/doc/Overview_German_Research_Policy_version_July_I-K_3216.pdf&t=1291717619&hash=c68460ea93fdeff1475d478155a6705e

billion euro per year, making Germany Europe's top R&D location. This figure accounts for 7.9% of worldwide R&D. R&D investments by German companies grew by more than 5% above the global average, even during times of economic crisis⁹. The motto of German companies can be summarized as: Accept a smaller turnover today, for increased investments that will pay off tomorrow.

Joint funding is also provided to the 6 main research organizations, which enjoy wide-ranging scientific autonomy. Those are the Max Planck Society (MPG), the Helmholtz Association (HGF), the Fraunhofer Society (FhG), the Leibniz Science Association (WGL), the Alexander von Humboldt Foundation (AvH), and the German Research Association (DFG)¹⁰. Together they receive approximately 9.8 billion euro in annual funding¹¹. Each of these institutes has its own specific approach.

The **Alexander von Humboldt Foundation**, with its seat in Bonn, is an association financing the *mobility* of students and researchers. It has a number of key priorities for Belgium. It seeks to support young scientists from Belgium and to allow young German scientists to study in the Kingdom for 1–2 years. Moreover, Humboldt strives to maintain a lively and coherent network of these scholars. Since 1953, Humboldt has given grants to 186 Belgians. Last year, 7 Belgian students applied – a number that can certainly be increased given the fact that Belgians have a 60% success rate with their applications (the global average is only 30%). Like the other associations, Humboldt takes a holistic approach and grants financial support to scientists from all fields, including the social sciences. It is interesting to note that the majority of “Humboldtianer” in Belgium comes from either Brussels or Leuven.

Research that can be practically applied lies at the heart of all activities pursued by the **Fraunhofer Society**, with its seat in Munich. The research organization undertakes applied research that drives economic development and serves the wider benefit of society. Its services are solicited by customers and contractual partners in industry, the service sector, and public administration.

Fraunhofer maintains more than 80 research units in Germany, including 60 Fraunhofer Institutes. The majority of the more than 17,000 staff are qualified scientists and engineers, who work with an annual research budget of 1.7 billion euro. Of this sum, 1.3 billion euro are generated through contract research. Two thirds of research revenue is derived from contracts with industry and from publicly-financed research projects. Only one third is contributed by the German Federal and Länder governments in the form of institutional funding.

The **Leibniz Science Association**, with its seat in Bonn, comprises 87 research institutes and scientific bodies, as well as two associated members. The focus of Leibniz stretches from nature, engineering, and environment to economy, social science, and space research. The Leibniz institutes tackle questions relevant to the whole of society. They are thus thematic and strategically oriented. Besides research, they focus on services such as knowledge transfer to the political, economic, industrial and academic domains. The German Federal and Länder governments co-finance the institutes. Leibniz employs about 16.100 people, 7.100 of whom are scientists. Some 2.800 of those are young scientists. The overall budget totals 1.3 billion euro as well as 280 million euro are provided by third partners.

The **Helmholtz Association**, with head offices in Berlin and Bonn, is a community of 17 scientific-technical and biomedical research centers. These centers have been commissioned to pursue long-term research goals on behalf of the state and society. The association strives to gain insight and knowledge, so that it can help to preserve and improve

⁹ Figures for 2008/2009. Mirja Pape, „Firmen aus Deutschland sind besonders innovativ“, *Spiegel Online*, 27 October 2009.

¹⁰ The German Embassy in Brussels would like to thank these organizations for their contributions to this speech.

¹¹ Approximate figures for the year 2010.

the foundations of human life. It does this by identifying and working on the grand challenges faced by society, science, and industry. Helmholtz Centers perform top-notch research in strategic programs in 6 core fields: Energy, Earth and Environment, Health, Key Technologies, Structure of Matter, Aeronautics, Space, and Transport.¹² The Flemish Institute for Technological Research (VITO) is Helmholtz's partner in Belgium.

The **Max Planck Society**'s mission statement can be summarized as advancing innovative and interdisciplinary high-risk research at the frontiers of knowledge. With its seat in Munich, it unites 80 research institutes and seeks to promote outstanding researchers from all nations who enjoy autonomy in the selection of their research subjects and methods. Note that since the inception of the Nobel Prize in 1901, 17 laureates have worked at the Max Planck Society. As concerns Belgium, the society has 165 collaborative projects with the Kingdom, 60 of which are with the University of Leuven. Moreover, there are 24 visiting scientists from Belgium.¹³

Finally, with 2.2 billion euro annually, the **German Research Association** (DFG) has considerable leeway in handing out grants and funding. It is – so to speak – the umbrella association of the institutes I have just presented. Among them are the Individual Grants Program and the Priority Program which allow several researchers to collaborate on a topical issue, Collaborative Research Centers which bring together several actors in a long-term 12-year financing mechanism, or Research Training Groups, which focus on involving young researchers. These Training Groups also allow for jointly structured doctoral programs of German and Belgian universities.

It is important to know that all of the above institutes are represented in Brussels.

Recently, four of these institutions have presented themselves to about 35 professors from the University of Antwerp, to identify possible options for cooperation. This initiative is part of the “**Deutschlandjahr**” at the University of Antwerp. In 2009, the Vice Rector of the university, Johan Meeusen, and I had the idea of placing a whole year under the theme of Germany. The initiative was so successful that the “Deutschlandjahr” is being continued in 2011. Our aim was to knit a closer web of contacts and relations between German research institutes, German companies and the University of Antwerp. In return, the University profits from new possibilities for intensified cooperation. It is a great example of a win-win project. If you are interested in the particularities and in this intensified cooperation, or if you desire a similar presentation on the different research institutes at your university, this can be done without delay.

In addition Germany has a system of about **300 universities and universities of applied sciences**. These universities are the backbone of the publicly-funded research system. They are the main producer of the new researchers who are needed for all other institutions and all branches of the economy. Furthermore, with an annual research and innovation budget of about 9 billion euro, they invest heavily in basic and applied research. It is not well known abroad that about 25% of these research funds come from industry and commerce. There is, for example, very close and long-standing cooperation between the chemical and automobile industries and universities.

It should also be noted that the **non-university sector** and the universities are collaborating in an intensive way. The executive staff of the Max-Planck and Helmholtz institutes are usually also employed as professors at the neighboring universities. The Excellence Initiative, which I will discuss later, has further improved this cooperation.

¹² Website of the Helmholtz Association, January 2011, retrieved at http://www.helmholtz.de/en/about_us/

¹³ Figures for the year 2009, based on a personal exchange with Max Planck Gesellschaft.

The universities of applied sciences, the so-called **Fachhochschulen**, also perform an important function in the research and innovation system by educating about 60% of the engineers who work in German industry and commerce. They serve the needs of local and regional industry, in particular small and medium sized enterprises.

The whole research landscape in Germany benefits to the tune of about 55 to 60 billion euro annually. There are approximately 506.000 staff in R&D, and almost 300.000 scientists and scholars.

Naturally, you will be wondering how exactly the Länder and the Federal Government decide on joint cooperation in such a wide field? The Gemeinsame Wissenschaftskonferenz (**Joint Scientific Conference**, or GWK) has functioned as the forum for exchange since 2008. The creation of the GWK was agreed on by Federal and Länder ministers on June 14th, 2007. The reorganization of the common scientific and innovation policy is a result of the German Federal Reform of September 1st, 2006. In this agreement, the Federal Government and the Länder decided to revise federalism in Germany, to make it viable for the 21st century. As a result of this reform, Art. 91 b of our Basic Law (the German constitution) has been refined and expanded¹⁴.

According to this article, the Federal level and Länder can work together in cases of supraregional importance on almost all issues concerning scientific cooperation inside and outside of universities. The GWK ensures the smooth implementation of this article.

As a major project, the Federal Government and the Länder started the so-called **Initiative for Excellence** in 2005. Their aim was to organize a competition to sustainably strengthen research at Germany's universities and to enhance the visibility of German science and research vis-à-vis our international competitors. These were ambitious goals indeed, especially since it meant departure from a long-cherished conception that all universities in Germany are equal and hence should be treated equally¹⁵.

The Initiative for Excellence competition comprises three project-oriented funding lines:

1. Research Schools for young scientists, offering structured PhD programs in excellent research environments and in broad areas of science.
2. Clusters of excellence, establishing internationally visible and competitive research beacons at universities which can cooperate with non-university research establishments, universities of applied sciences and the private sector.
3. Future concepts for top-notch research at universities, aiming to enhance the profile of the selected universities¹⁶.

The first round of the Initiative for Excellence in 2005/2006 already shook up the German science system and continued to do so in the second round in 2006/2007. Germany's universities submitted a wealth of forward-looking research concepts extending across all areas of science. Their proposals were reviewed by a panel of experts appointed by Deutsche Forschungsgemeinschaft and by the German Council of Science and Humanities.

At the end of the two rounds, in October 2007, 85 institutions were chosen: 39 Graduate Schools; 37 Clusters of Excellence, and the 9 universities¹⁷ of Aachen, Berlin, Freiburg,

¹⁴ Website of the GWK, January 2011, retrieved at <http://www.gwk-bonn.de/index.php?id=252>

¹⁵ DFG-Brochure: Excellence Initiative at a Glance, S. 10:

http://www.dfg.de/download/pdf/dfg_im_profil/geschaeftsstelle/publikationen/exin_broschuere_0809_en.pdf

¹⁶ BMBF:

<http://www.bmbf.de/en/1321.php>

¹⁷ BMBF:

<http://www.bmbf.de/de/12156.php?LANG=DEU&N=4>

Göttingen, Heidelberg, Karlsruhe, Konstanz and Munich, all of which receive a total funding in the amount of 1.9 billion euro spread over a period of five years. Another 2.7 billion euro are available for the next period of the initiative until 2017¹⁸.

While the initiative found many admirers, it also sparked harsh **criticism**. The idea of “Eliteuniversitäten” broke with a German tradition. Critics emphasized that a two-class system would emerge where only a few universities would receive the lion’s share of funds. Moreover, some universities feared that their good reputation would fade in the shadow of a few super-universities. Others complained that the German university system is underfinanced anyways – therefore, helping a few universities cannot solve a structural problem. There is also said to be a correlation between being an “excellence initiative university” and receiving additional funds from the private and public sector. In that sense the label “excellence” can lead to unfair advantages in the competition for external funds¹⁹. Finally, the duration of the Excellence Initiative was also criticized: The extra financial resources will not be continued after the 3rd round in 2017.

Hence, one must wonder how the previously established structures can be maintained? Federal Minister for Education, Annette Schavan, has therefore suggested shifting the competence for some of these excellence universities from the Länder to the Federal Government. This would lead to the rather revolutionary creation of “**Bundes-Universitäten**” (Federal Universities)²⁰.

All in all, ladies and gentlemen, you can see that the Excellence Initiative has unleashed new potential, but has also broken with some German traditions, such as an aversion to elitism and the responsibility of the Länder for education.

However, allow me to give you a very concrete example of how Excellence Initiative funding is used: The **RWTH Aachen**, not far from Leuven, is building a new campus for approximately 750 million euro. Total investments will be around 2 billion euro. This campus of more than 800.000 m² consists of 19 research clusters, laboratories, offices, and 250 national and international industries and companies. It is thus seeking to create a true synergy between companies, research institutes, and the university. Altogether there will be 10.000 staff, who have one goal: to make the RWTH Aachen a global leader among technical universities. Aachen managed to obtain funds through all three lines of the Initiative of Excellence. Firstly, the strategy “RWTH 2020: Meeting Global Challenges” was selected. It is the backbone of Aachen’s orientation towards a globally competitive technical university. Secondly, the graduate school “Aachen Institute for Advanced Study in Computational Engineering Science” was created, thus opening the prospect for research in a field that will be critical in the future. Finally, three excellence clusters were awarded funding: “Ultra High-Speed Mobile Information and Communication” (UMIC), “Integrative Produktionstechnik für Hochlohnländer” (production techniques for countries with high salaries) and “Maßgeschneiderte Kraftstoffe aus Biomasse” (tailor-made biofuels). Between 2006 and 2012, 180 million euro will come from these 3 budget lines. All initiatives will be in one way or another linked to the new campus in Aachen. This approach shows that the Initiative of Excellence is not expected to pay for new ideas – it is some time ago that Aachen came up with the idea, plans, and funding for construction of the campus. However, when new ideas are launched, the Initiative of Excellence seeks to prop them up and award the requisite funding. It is, so to speak, the oil that is needed to make machines run.

¹⁸ idem.

¹⁹ „Die Konstruktion einer Elite“, Analyse & Kritik, No. 522, 16 November 2007, retrieved at http://www.akweb.de/ak_s/ak522/22.htm

²⁰ „Schavan will Bundes-Universitäten einrichten“, Welt Online, 13 February 2011, retrieved at <http://www.welt.de/politik/deutschland/article12526769/Schavan-will-Bundes-Universitaeten-einrichten.html#>

The intensification of Aachen's portfolio also benefits its cooperation with your university, and with the University of Eindhoven. It is clear that the ambitious goal of investing 3% of GDP in R&D can only be achieved if cooperation transcends boundaries. Your "triangle"- the so-called **Top Technological Region** - , which links Germany, Belgium, and the Netherlands, is an outstanding example. It builds on an already existing layer of successful cooperation – the Euroregion Maas-Rhein.²¹ This Euroregion has recently initiated the union "**Studying without borders**". It is based on the conviction that the Maas-Rhein region, with its high density of first-rate academic institutions, should not lead to competition but instead generate synergies between these universities and schools. In this initiative 7 academic institutions and the Aachen chamber of commerce, the Dutch province of Limburg, and the office for education in Aachen have formed a consortium to give students access to a world-class education right at their doorstep.²² I could not agree more. In the future I hope to hear of more successes in the effort to further intensify these fruitful relations.

Another example of how the Initiative for Excellence has a tangible impact is to be found in the city of **Karlsruhe**, located in the south of Germany. Karlsruhe's central and winning idea in the competition to become a university of excellence was the fusion of its renowned university with the Forschungszentrum, which is part of the Helmholtz-Association. Together these two players have now formed the Karlsruhe Institute of Technology – called KIT. It is a unique merger between university and research, between education and innovation. For students it means more than studying – it is an environment where theory and practice come together.²³

You have heard a lot about "excellence" now, which does have a somewhat elitist ring to it. It awakens the suspicion that higher education is to some extent still dependent on the families' background and – wealth! This is unfortunately true for Germany as for many other European countries. To counter these tendencies, Germany has since the founding of the Federal Republic granted all students the so-called **Bafög**, or financial support of a maximum of 670 euro per month which should allow everyone to attend university courses. A novelty will now be introduced in April. Students with excellent results can qualify for an additional monthly grant of 300 euro, the so-called **Deutschlandstipendium**. It is based on the idea that results and academic achievement should be rewarded. Also it can contribute to healthy competition between students, consequently lowering the overall time needed to finish their studies. Interestingly, half of this grant is to be contributed by the economy and the private sector. The economy, which profits most from the innovation and skills that young students bring to their enterprises, would thus shoulder some of the costs of their education²⁴. It is high time for Germany to join in this culture of scholarly support, as so far only 1-2% of students receive funding from public or private sources. Especially for private donors, this is not a one-way street. Studies show that students who have received financial support during their studies are more willing to donate once they earn a good income.

Some of you asked me how Germany can afford to start these programmes and investments in **times of economic crisis**. The answer is as simple as it is daring: while most ministries faced budget cuts, funding of the Federal Ministry of Education and Research was increased by 7.2% to 11.6 billion euro in 2011, as compared to 2010. The same holds true for the budget of the DAAD (Deutscher Akademischer Austausch Dienst), or German Academic

²¹ „Top Technologische Regio“, brochure published by the University of Leuven.

²² „Grenzenlos studieren“, Grenz-Echo, 25 January 2011, p. 15.

²³ Website of KIT, retrieved at <http://www.kit.edu/>

²⁴ „300 Euro für Begabte“, Süddeutsche Zeitung, 2 February 2011,

Exchange Service – it grew by 10% from 2009 to 2010, and now totals 385 million euro²⁵. Moreover, we have just mobilized an additional 2 billion euro until 2020 to improve the study conditions at German universities – the so-called Quality in Teaching Pact.

At the same time some German Länder have decided to introduce modest **tuition fees** in order to improve financing of their programs. A lot of students have protested against these tuition fees; however, these protests did not turn violent as they did in the UK. There, tuition fees can be as high as 9.000 pounds annually starting in 2012. Critics have warned that this might impede the liberty to study and the liberty to chose the studies of your liking as opposed to the studies that will yield the highest salaries²⁶. In Germany we are aware of this criticism as well and hope we have found an adequate balance.

This brings me to the national academies for science and their tasks. For a long time, Germany did not possess a national academy for science because education is – as I have outlined before – a competence of the Länder. However, in 2008 the Leopoldina in Bavaria was turned into the **Nationale Akademie der Wissenschaften Leopoldina** and joined the **European Academies Science Advisory Council**, in which Belgium is also represented. The key question that academia in Germany is asking itself though is whether science supports society and politics by *describing* what can be observed, or by giving concrete *advice* based on its analysis. The latter would clearly point in the direction of the national academy also being a sort of scientific consultancy²⁷. I am convinced that in today's world it is crucial that well-financed, well-staffed, and well-informed institutions take on the responsibility of providing their knowledge and findings to shape and inform debates.

Before I go on to talk about innovation policy, let me remind you of the key Internet site for research in Germany, which is conveniently called www.research-in-germany.de.

Ladies and gentlemen, allow me now to elaborate on **Germany's innovation policy**. Good news: General Electric, an American competitor of Siemens, recently conducted a survey, in which it asked 1000 managers in 12 countries which country they consider the most innovative. Germany came in second, after the US and before Japan²⁸.

As Dr. Annette Schavan, Minister for Education and Research, said in her October 8 2010 speech: "Innovationen garantieren Wettbewerbsvorteile. Das gilt für unser Land insgesamt und für die Unternehmen in Deutschland im Besonderen. Ein ressourcenarmes Land wie Deutschland [...] ist auf technologische Meisterleistungen angewiesen. Technologisch fortschrittliche Unternehmen können sich wegen des harten internationalen Innovationswettbewerbes einen Verzicht auf Forschung und Entwicklung nicht leisten. Der eigentliche Wettbewerbsvorteil der deutschen Unternehmen liegt nicht im Preis, sondern in innovativen und hochwertigen Produkten"²⁹.

Innovative products have always been the driving force behind the slogan „Made in Germany“. First and foremost, we have to think of the automobile, which celebrates its 125th birthday this year. Invented in 1886 by Carl Benz, the automobile today is still a pacemaker of innovation. In addition, be it the first glider in 1894, the coffee filter in 1908 or the first jet engine in 1936 – all of these had innovation as their key feature. By the way, the last three inventions stem from East Germans: Otto Lilienthal, Melitta Benz, and Hans von Ohain

²⁵ Judy Dempsey, "With the aid of scholarships, more Germany are opting to study abroad", The Global Edition of the New York Times, 24 January 2011, p. 7.

²⁶ Christopher Metcalf, „Das Vereinigte Königreich verabschiedet die Wissenschaftsfreiheit“, Frankfurter Allgemeine Zeitung, No. 28, 3 February 2011, p. 8

²⁷ Ernst-Ludwig Winnacker, „Zur Beratung verpflichtet“, Süddeutsche Zeitung, No. 20, 26 January 2011, p. 18.

²⁸ Martin Hesse, „Plötzlich vorne“, Süddeutsche Zeitung, No. 20., 26 January 2011, p. 22.

²⁹ Speech by Ms. Schavan, 66. Sitzung Bundestag, 8 October 2010, Berlin.

respectively. To understand why state support is crucial in innovation, we can take the example of **East Germany** in 1990: manpower and knowledge were present but the modern tools to carry out research were missing. Hence the necessity to boost the united German research landscape after the fall of the Wall. For more than 20 years, we have invested heavily in this part of Germany. Today, the East of Germany is an attractive place for technology and investors who seek to carry out research³⁰. With the help of state aid, the new Länder have evolved quickly and now feature some top R&D sites, like Potsdam, Dresden or Halle-Leipzig. Universities have not only more modern facilities but also a better student to teacher/professor ratio than many of their West German counterparts.

With regard to innovation I would like to draw your attention to the **High-Tech Strategy**. Adopted in 2006 by the Federal Government, it is the first comprehensive national strategy for innovation policy. It creates a true interplay between science, the economy and politics. It is cross-ministerial and covers all fields linked to research and development. It has one clear aim: boosting German competitiveness in the most important future markets, such as sustainable energy, climate change, health, mobility, communication, and state-of-the-art technologies. Approximately 15 billion euro were made available through 2009 via this strategy. 12 billion euro have been earmarked for research and the dissemination of new technologies in 17 cutting-edge fields. These include so-called projects of the future: a CO2-neutral, energy-efficient city, and one million electric vehicles in Germany by 2020 are just two of the most striking examples. What is important to note is that special programs for small and medium-sized businesses are included in the strategy. Private research in medium-sized businesses has an enormous potential. The **KMUplus Initiative**, which stands for small and medium sized enterprises, helps them deal with the increasing importance of IT³¹. Usually, only large enterprises can afford a complete digitalization of their sales, marketing, and production. KMUplus ought to help them do just that. The various ministries but also the Forschungsunion Wirtschaft-Wissenschaft (Research Union Economy-Science), have the lead for implementation of the High-Tech Strategy.

We are proud to say that this High-Tech Strategy is now considered a model for a **European Innovation Strategy**. The Council for Innovation has already taken up discussions on it. On the European level, it is key for us to interlink our programs with our European partners. In the heteropolar world to come, we Europeans need to maintain our comparative advantage in innovation and technology. We need to become – so to speak – the pole of innovative excellence. Germany and its European friends still have great challenges ahead of them. To give you a concrete example from my country: how can we create a tax system that gives incentives for research, innovation, and development policy?

Moreover, innovation profits from internationalization. Despite Germany's strong performance, much of the technological know-how it uses is generated outside its borders. To access this know-how and make it available to Germany's industrial, science, and research communities, the German Cabinet approved a **Strategy for the Internationalization of Science and Research** in 2008. It is the Federal Government's answer to the challenges of global competition that the German science and innovation system is faced with. The Strategy pursues four main goals³²: First, strengthening research cooperation with global leaders.

Second, international exploitation of innovation potential. This means that we need to secure a good place in emerging high-tech markets and to ensure that we can convince leading

³⁰ Speech by Ms. Schavan, Bilanzkonferenz, 28 September 2010, Berlin.

³¹ Website of KMU-Plus, retrieved at <http://www.kmuplus-initiative.de/>

³² Overview of Research Policy in Germany – Recent Developments, July 2008, retrieved at

http://www.kooperation-international.de/index.php?eID=tx_nawsecured1&u=0&file=fileadmin/redaktion/doc/Overview_German_Research_Policy_version_July_I-K_3216.pdf&t=1291717619&hash=c68460ea93fdeff1475d478155a6705e

R&D centers to become our partners. To do so, Germany must become more attractive for R&D-intensive companies.

Third, intensification of cooperation with developing countries. Here, the main focus must be on education, research, and development.

Fourth, assuming international responsibility and mastering global challenges. By this, we mean that solutions for global challenges such as climate change, depletion of natural resources, or migration need to be found. In so doing, it is important to better align our own research programs with European and international partners, so as to pool funding. The opportunities that Belgium offers us in this respect cannot be underestimated and have to be seized.

The key to effective internationalization was discussed at the October 2010 forum on the Internationalisation of Science and Humanities, organized by the Humboldt Foundation: it is called *trust*. It is of no surprise that the forum proposed “the creation of “networks of trust” as a soft policy approach, whereby science would be conducted [...] as a “diplomacy of trust”³³.

2011 is also a year of great opportunities for **Belgo-German university cooperation**. As you know, Germany has recently ended its long-standing system of conscription, allowing for young men to directly enter the university market.

Moreover, two Länder have shortened their high school cycles, which leads to two classes graduating in the same year. Since these two events coincide, German universities have to deal with an increase of 70.000 students in 2011. Experts estimate that this will be a major burden for German universities, which already operate at a maximum of 2.2 million students in total and about 440.000 new students every year³⁴. Admittedly the government has provided 5 billion euro in funds to increase the number of available places at university by 275.000 by 2015, but this might not be soon enough in the short term³⁵.

Belgian universities could use this as an opportunity to step up their advertising campaigns on the German university market. The number of German students studying abroad has increased from 52.000 in 2000 to 102.000 in 2008, making Germans the most mobile students in Europe³⁶. Hence, it becomes clear that German students are glad and willing to study abroad, but so far they know little about the excellent reputation of, and programs in, Belgium: In 2008, only 560 Germans were studying in Belgium. Today, there are almost 37.000 students at the KU Leuven, 5.000 of whom are foreigners. Unfortunately, only 182, or 0.5% of the total, are from Germany.. To a student from Cologne, Leuven is geographically much closer than universities in Berlin, Dresden, or Munich. Our challenge, however, is to create an awareness of this fact. Please be reassured that it is my pleasure to assist you with anything you need in order to facilitate your efforts. I hope to see many more German students in Belgium. Even more so because Germany and the University of Leuven have ties that go far back in time. In 1967 you bestowed an **honorary doctorate** on Walter Hallstein – the first German to receive such honors. 38 Germans, amongst them the former German President Richard von Weizsäcker, and the former Chancellor, Helmut Kohl, were to follow, making Germany second only to the United States in terms of honorary doctorates. These ceremonies – I myself had the pleasure to attend them every year – are impressive events which underline the excellent reputation of your university.

At the same time, I would also like to encourage Belgian students to study in Germany. Since 1997 the number of foreign students in Germany has increased from 100.000 to

³³ „4th Forum on the Internationalisation of Sciences and Humanities“, Humboldt Kosmos, 96/2010, p. 48/49.

³⁴ Johann Osel, “Ansturm auf die Unis”, Süddeutsche Zeitung, No. 20, 26 January 2011, p. 7.

³⁵ Ibid.

³⁶ Judy Dempsey, “With the aid of scholarships, more Germany are opting to study abroad”, The Global Edition of the New York Times, 24 January 2011, p. 7.

245.000. With this number, Germany ranks third behind the US and the UK³⁷. In the **ERASMUS** program, for example, more than a 1.000 places are available to Belgian students every year. Unfortunately, only 350 of these are used by Belgian students. Surely, countries like Spain and Italy can offer more sun and beaches than Germany, but statistics show that 90% of Belgian students who have spent a semester in Germany, will return to the Federal Republic. Not only to continue their studies or write a PhD, but also to find work.

To show Belgian students the range of opportunities available to them in Germany, the German embassy in Brussels frequently invites students from Belgian universities to information days. Besides lectures on the Erasmus program and on work in Germany, we also organized a lunch to bring together students and German companies, such as BASF, Evonik, and Audi which are all German but are also firmly rooted in Belgium.

For students it is important to note that there are a dozen or so associations that grant scholarships. The most famous is arguably the **Studienstiftung des Deutschen Volkes** (German National Academic Foundation). With funds of about 50 million euro “[t]he Studienstiftung promotes future excellence in the areas of science, business, public administration, and the arts. Through its sponsorship program it promotes academic consolidation, interdisciplinary dialogue, a cosmopolitan world view and international experience”³⁸.

For workers it is important to note that Germany is in desperate need of **skilled labor**. Due to the ongoing economic recovery and its aging society, the German economy, according to experts, will be lacking, by the year 2015, some three million workers³⁹. Even today we need about 200.000⁴⁰, others say up to 400.000⁴¹, more skilled workers.

This deficiency leads to an estimated annual loss of nearly 30 billion euro⁴². And it will also lead to further job losses. According to Federal Government figures, the supply of labor in Germany of about 43.2 million in 2010 will decline to 39.3 million by 2025⁴³. Some polls even suggest that the supply of labor in Germany will decline by 50% between now and 2050. The main reason for this is demographic change but also the fact that qualified workers are creating more jobs for less skilled workers – the so-called dependent jobs. Hence, if skilled labour shrinks, the number of dependent jobs will decline accordingly.

The figures mentioned above already take into account a net immigration of 100,000 persons per year. But even with 100.000 immigrants per year, we will need between 100.000 and 300.000 more skilled workers, particularly with natural science and technical education⁴⁴. We must close this gap if we want to maintain our current level of prosperity⁴⁵.

³⁷ “Studieren in Deutschland”, Frankfurter Allgemeine Zeitung, No. 23, 28 January 2011, p. B1.

³⁸ Website of the Studienstiftung, <http://www.studienstiftung.de/en/leitbild.html>

³⁹ Handelsblatt-Online, 21.12.2010:

<http://www.handelsblatt.com/politik/deutschland/studie-2015-fehlen-deutschland-drei-millionen-arbeitskraefte;2503059>

⁴⁰ Bundesagentur für Arbeit, dw-Online, 02.12.2010:

<http://www.dw-world.de/dw/article/0,,6288703,00.html>

⁴¹ DIHK, Tageschau-Online:

<http://www.tagesschau.de/inland/zuwanderung136.html>

⁴² Instituts der deutschen Wirtschaft-Studie, Welt-Online, 18.10.2008:

http://www.welt.de/welt_print/article2593249/Fachkraeftemangel-nimmt-bis-2020-dramatisch-zu.html

⁴³ Bundesregierung, Stern-Online, 17.11.2010:

<http://www.stern.de/politik/deutschland/fachkraeftemangel-bundesregierung-befuerchtet-notstand-1624848.html>

⁴⁴ Süddeutsche-Online, 10.12.2010:

<http://www.sueddeutsche.de/karriere/huerden-fuer-zuwanderung-von-fachkraefte-da-blickt-keiner-mehr-durch-1.1034484>

⁴⁵ Brüderle, Business-wissen-Online, 28.08.2010:

<http://www.business-wissen.de/nachrichten/bruederle-plant-konzept-zur-anwerbung-auslaendischer-fachkraefte/>

Just consider the following: Every second girl born in Germany today will have a life expectancy of more than 100 years. So if you have recently had a child or a grandchild, chances are high that she will still be around in the year 2111.

As a possible measure to facilitate the recruitment of foreign skilled workers, German businesspeople are suggesting lowering the gross minimum income for the recruitment of highly-skilled workers, which currently stands at 66.000 euro per year⁴⁶. Others believe that there are enough workers in Germany and that we should invest more in the education and training of these people, instead of recruiting foreign workers⁴⁷.

I think both approaches are justified. There are many young people in Germany looking for work whom we have to educate and train for the job market. But after the previously-mentioned forecasts, it will probably not be enough to prevent the impending decline of the German economic performance.

Germany needs well-qualified workers from abroad! A **European Blue Card**, which is currently being discussed, is certainly a step in the right direction. However, I am convinced that we do not need to look for these workers on other continents, but rather in our **European neighborhood**. Hence, it is important to me, especially here in Belgium, a country with which we have such a good relationship, to encourage well-qualified and motivated people to pursue their career prospects in Germany. This precisely is the key element of the “Deutschlandjahr”, organized by the University Antwerp and the German embassy, which I have previously mentioned.

One asset that is of course highly valued by German employers is the command of the **German language**. In this respect it is deeply regrettable that only 3% of Wallonian and 20% of Flemish students are learning German. The paradox is best demonstrated at the University of Liege: here only 18 of more than 18.000 students decided to spend their Erasmus semester in Germany and hence to improve their German – despite the fact that jobs with minimal German language skills are waiting for them in the Rhine-Maas Euroregion⁴⁸.

We do realize though that the **Bologna educational reforms** – which are also intended to harmonize European university degrees and thus allow for more intra-European educational exchanges – have not necessarily made all students more mobile. Intense studies do not always allow for much socializing or simultaneous part-time work. Also, the 3-year bachelor’s degree was meant to directly qualify students for a first job. In practice many companies demand a master’s degree, and more work experience, before hiring young students.

Today, 75% of all courses of study (i.e. 9.200 out of 12.300) have been adjusted to the BA/MA system⁴⁹. Students can graduate more quickly, results are comparable between European countries, and it is easier to take a break or maternity leave between a bachelor’s and a master’s degree. Nonetheless, Germany still has some difficulties in providing enough master’s programs. While the total number is sufficient, there seem to be some cities which cannot provide sufficient places. Berlin, Hamburg, Cologne, and Munich, for example, are preferred destinations, whereas places in master’s programs in the east of Germany remain vacant. That is deeply regrettable, because **Eastern German universities** are often more

⁴⁶ BDA-Präsident Hundt, dw-Online, 02.12.2010:

<http://www.dw-world.de/dw/article/0..6288703.00.html>

⁴⁷ Gabriel, Handelsblatt-Online, 24.10.2010:

<http://www.handelsblatt.com/politik/deutschland/anwerbungskriterien-gabriel-will-zuwanderung-auslaendischer-fachkraefte-bremsen:2678956>

⁴⁸ Université de Liège:

http://www.ulg.ac.be/cms/a_16261/chiffres-cles

⁴⁹ Bundesministerium für Bildung und Forschung, <http://www.bmbf.de/de/3336.php>, für Wintersemester 2008/2009.

modern and better equipped than their western counterparts. Particularly in the crucial fields of tomorrow, called **MINT** – mathematics, informatics, natural sciences and technical studies – a lot of untaken seats can be found in the auditoriums. Again and again, foreign students have told us how much they enjoyed studying in the new Länder.

Before I finish, please allow me to say a few words about the role of the **German embassy in Brussels** in research and innovation policy: German missions abroad play a dual role: on the one hand, they are expected to make a key contribution towards ensuring that Germany has a high profile and, on the other hand, they have a major coordinating and service function. Despite the Internet and countless direct contacts among scientists, research institutions and companies, international agreements and support in making contacts remain indispensable. To this end, the German Federal Foreign Office has started developing **German Science and Innovation Fora** in Sao Paulo, Moscow, Tokyo, New Delhi, and New York. After a test phase more centers are to follow – hopefully also in our neighboring countries⁵⁰.

Moreover, the Federal Foreign Office is supporting the global knowledge network through its **Research and Academic Relations Initiative** of 2009. In a world where challenges like climate change and infectious disease cannot be treated within the narrow borders of the nation state, connecting people is key. Hence, the above-mentioned Initiative of Excellence does not stop at our borders: In Russia, Thailand, Chile, and Columbia, we have set up centers of excellence in cooperation with German universities. 2 million euro a year will be made available for these centers through 2014. The goal is to create links between scientists and to form a top-notch research community.

As a **guest professor**, I also teach regularly at the College of Europe in Bruges. Why do I do that? Because it has become my habit to teach at all important Belgian universities for at least one semester as a guest professor. I have been invited to the University of Liege last year for two semesters, and now I teach at the University of Louvain-La-Neuve and the University of Antwerp. I believe this is the best possible way to contribute to bilateral relations. Science aside, this is also a great opportunity for me to do public diplomacy first hand to motivate young students to visit my home country Germany, and to foster the relations between our countries.

Please be assured that my embassy will do its best towards this end. That is reason enough to extend my invitation to you to discover Germany, its institutions, and institutes for scientific cooperation, and the many possibilities it offers in research, innovation, and technology – and perhaps to organize the “Deutschlandjahr” 2012 in Leuven.

As Belgian astronaut **Frank De Winne** put it during his video message from space to the participants in the first Belgian-German Conference on 15 October 2009: “From up here I see no border between Belgium and Germany. I look down on two European neighbors that are bound by the closest of ties ...”.

Thank you.

⁵⁰ German Federal Foreign Office, own sources.