

**Speech**  
**by the Parliamentary State Secretary**  
**Thomas Rachel, MdB**

**Federal Ministry of Education and Research**

**at the opening of the**  
**“EuroNanoForum 2007“**

**in Düsseldorf**  
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Dr. Hartley,  
Dr. Fitzmaurice,  
Ladies and Gentlemen,

I would like to welcome you warmly to the EuroNanoForum 2007 in Düsseldorf. For the first time ever, Europe's largest specialist conference on nanotechnology is being held in Germany, as part of the German EU Council Presidency. For this reason, I am especially pleased that so many of you were able to follow our invitation. One thousand participants from over fifty different countries – these figures clearly reflect how important nanotechnology has become across the world.

The EuroNanoForum 2007 was jointly organized by the European Commission's Research Directorate General and the German Federal Ministry of Education and Research. I would like to thank Dr. Hartley and his colleagues for the excellent and constructive collaboration in preparing this conference.

## **I. Nanotechnology – A Technology of the Future**

Ladies and Gentlemen,

We have chosen "Nanotechnology in Industrial Applications" as the focus of this year's EuroNanoForum. After all, nanotechnology is one of the most important future technologies for high-technology locations across the world. Nanotechnology know-how makes it possible to design unusual materials and functions in a targeted way. It enables industry to find new approaches for the production of highly innovative products and the optimization of products that are already on the market. The market potential of nanotechnology-based products is enormous. Its volume is estimated to reach up to one billion euros by 2015.

Ladies and Gentlemen,

Nanotechnology is already being applied very successfully. Consider the clinical use of nanoparticles to combat tumours with great precision. Or nanocoated, dirt-repellent surfaces for cars; or low-reflection coatings for solar cells.

However, Ladies and Gentlemen,

Nanotechnology has the potential to do even more – I am absolutely convinced of it. In fact, I would go so far as to say that nanotechnology must do more. Nanotechnology must contribute to our search for specific answers to key challenges that face our society. In this context, two

areas that come to mind are climate protection and health. It is important for nanotechnology to keep its promises – not in 20 or 30 years, but in the very near future.

Research laboratories across Europe have developed ideas, research results and project outlines for almost all industry sectors – for the automotive industry, the energy sector, the construction trade and for medical technology. These ideas, research results and project outlines must not be left to gather dust in drawers. That is something Europe simply cannot afford. The ball is now in the court of businesses across Europe – large companies as well as SMEs – to take up the results provided by researchers, develop them, and transfer them to the market in the form of innovative products and services. For that is the quintessential role of industry, and nobody can or will take this responsibility off the hands of the business community. Least of all the state. I would like to remind you that it was decided, as part of the Lisbon Strategy, that one third of research expenditure should be borne by the public purse. However, the bulk of the costs – two thirds, to be precise – is to be provided by industry.

## **II. Europe as a Site for Opportunities**

Ladies and Gentlemen,

The reason why nanotechnology is so important for Europe's competitiveness is that it is what is known as an "enabling technology" – it sparks new incentives in almost all industry sectors. This great potential is increasingly being recognized in other areas of the world, as well. The global race for the best ideas and minds, innovations, production locations and lead markets in nanotechnology has already begun.

This raises the question of how Europe is positioned in comparison with the international competition. Will we be able to cope with the challenges that face us?

The good news is that Europe is the world leader in the area of nanotechnology. We have excellent scientists, a very good research infrastructure and open-minded businesses that develop new products and bring them to market.

At the same time, however, we have a dynamic group of competitors. Countries like Korea, India and China have become serious contenders and are making great efforts to catch up with the world leaders:

- China has now moved up to third place in the league of the most research-intensive countries.
- India takes tenth place.

- In both countries, we can witness a rapid acceleration in the development of research potential and the training of qualified staff. For example, India is training approximately three times as many engineers per year as the whole of Europe; and the increase of researchers in China over the last ten years is higher than the total number of all researchers working in Germany.

For these reasons, I strongly believe that

- We need a coordinated research and innovation policy for Europe more than ever to enable us to remain competitive in the future. We must concentrate our strengths.
- Europe cannot win a competition over costs. This means that our products must always be a shade better than those of our competitors. Competitive advantages and the resulting opportunities for growth can only be gained through innovations.
- We in Europe must continue to make great efforts to maintain our leading position in nanotechnology. It would be a great mistake to assume that we can simply rest on our laurels.

### **III. The 7<sup>th</sup> EU Research Framework Programme**

Ladies and Gentlemen,

The European Union's 7<sup>th</sup> Research Framework Programme is a significant pillar in our efforts to maintain Europe's pole position in the area of nanotechnology. The Research Framework Programme concentrates European research efforts in key areas at an early stage, thus preventing a duplication of work. It brings together the best groups of researchers across Europe. They can plan their projects together, use resources more efficiently, and so reduce frictional losses.

With a duration of seven years, the 7<sup>th</sup> Research Framework Programme is the longest framework programme ever. It is also the world's largest public funding programme for research and development, with a total budget of approximately 54 billion euros. Over 1.5 billion euros are available for the area of nanotechnology alone. This ensures that the funding measures are reliable, calculable, and more effective.

The 7<sup>th</sup> Research Framework Programme proves our determination to strengthen Europe as a research base. For this reason, Germany will continue to do all it can to support the Commission in implementing the 7<sup>th</sup> Research Framework Programme even after the end of the German Council Presidency. We will engage in constructive dialogue to bolster the Framework Programme, thus doing our part to ensure that it is as successful as its predecessors.

#### **IV. The Lisbon Target – The Role of the Member States**

Ladies and Gentlemen,

In 2000, the European Union's heads of state and government set themselves the target of increasing expenditure in R&D across Europe to 3% of the GDP by 2010. This is the only way of making Europe the most competitive and dynamic knowledge-based region in the world.

With the 7<sup>th</sup> Research Framework Programme, the European Commission is making an important contribution to this endeavour. But that alone is not enough. The principal responsibility lies with the member states to do their part. After all, Europe can only be as strong as its member states together. This means that each member state must increase its R&D expenditure considerably. That is a gargantuan task that cannot be tackled by the public sector alone. Industry too must carry its weight and invest more in research and development. This in turn means that member states must create appropriate conditions that enable businesses to bring new products and ideas to market more quickly. The motto of the German Council Presidency puts it in a nutshell: In Europe, we can only succeed together.

#### **V. High-Tech Strategy**

Ladies and Gentlemen,

The German government knows that research and innovation are the keys to the future. Without research and technological innovation, future growth, prosperity, global environmental protection, and the fight against poverty are unthinkable.

Germany is already doing quite well – R&D accounts for 2.5 percent of our GDP. However, if we want to reach the Lisbon target, we must all intensify our efforts. As part of the High-Tech Strategy for Germany, the Federal Government will invest 15 billion euros in research and development, cutting-edge technologies and cross-technology measures by 2009.

The High-Tech Strategy will help Germany, the Land of Ideas, turn its ideas into reality. For the first time ever, a Federal Government has developed a national strategy across all government departments, with the aim of placing Germany at the top of the most important future markets. This strategy incorporates all fields of politics that affect research and development.

#### **VI. Nano Initiative – Action Plan 2010**

Ladies and Gentlemen,

Nanotechnology is a hugely significant field for the future, and we are investing in it through the High-Tech Strategy. Together with high-ranking representatives from science and industry, Federal Minister Annette Schavan presented the Federal Government's "Nano Initiative – Action Plan 2010" in November. A total of seven Federal Ministries are actively participating in

this programme. The Federal Ministry of Education and Research alone is providing approximately 300 million euros per year to the initiative.

In our efforts to strengthen and extend Germany's leading position in nanotechnology, we are concentrating on issues that are highly relevant for our society. One such area is the fight against climate change. The potential of nanotechnology must be translated into energy-efficient and CO<sub>2</sub>-saving products and production techniques. And what is especially important to me is that this is done promptly, rather than being postponed to some point in the future.

An example of the activities of the Federal Ministry of Education and Research is the planned funding priority "Nanotecture – Nanotechnology in Architecture ". Its aim is to save materials and energy in the construction sector. Here is a concrete example to illustrate the relevance of this industry:

Two billion tonnes of cement are made per year, making it the world's most-produced industry product in terms of quantity. During the production of one tonne of cement, almost one tonne of CO<sub>2</sub> is emitted, making cement responsible for 5% of CO<sub>2</sub> emissions worldwide. Researchers are currently working on Ultra High Performance Concrete, an alternative product that is more environmentally friendly and is produced using nanoparticles. As this concrete is 10 times stronger than normal concrete, approximately 60% of raw materials and 40% of CO<sub>2</sub> emissions could be saved in the construction of buildings. I think that these figures speak for themselves

Other areas in which nanotechnology is expected to make significant contributions to climate protection are the development of ultra-high performance solar cells with an efficiency of over 50%, the use of organic photovoltaics, the development of highly efficient batteries for the automotive industry and the development of lightweight materials for vehicle construction.

## **VII. Collaborative Research – Technology Transfer**

Ladies and Gentlemen,

Our funding activities are primarily aimed at strengthening collaborative research between universities, non-university research institutions and industry. There are two main reasons for this:

- I. Many industries, and especially small and medium-sized enterprises, have not yet fully recognized the opportunities that nanotechnology has to offer. Thanks to their close cooperation with science in collaborative projects, businesses can get to know the full potential of nanotechnology. In this way, new ideas for tomorrow's products and services are born.

- II. A difficulty that continues to affect not only Germany, but Europe as a whole, is the problem of transferring research results into practice. Scientific excellence in nanotechnology must be converted into forward-looking products and services even faster and more efficiently. We cannot afford to risk our ideas being implemented in other regions of the world; their value added benefiting Asia or the USA. That is why we are putting the entire value chain, from research right up to production, at the centre of our activities. This is the only way to create new, safe jobs that will secure our prosperity in the long term.

The EuroNanoForum 2007 aims to accelerate these transfer processes and to help overcome the challenges I have mentioned. That is why we chose "Nanotechnology in Industrial Applications" as the headline of our forum, and that is why we want to bring representatives from science and industry from across Europe around one table here in Düsseldorf over the next three days.

### **VIII. Future generations**

Ladies and Gentlemen,

There is one thing we must not overlook when discussing this subject. International competition is not only a competition for costs, infrastructures and general conditions. It is, first and foremost, a competition for the world's best minds. Nanotechnology too is increasingly dependent on highly qualified experts.

In the field of engineering in particular, the lack of skilled staff and young scientists is already noticeable and will only get worse in coming years. In Germany alone, almost 50,000 positions for engineers are currently vacant.

The best innovation strategies and the highest investment levels are useless if we cannot find enough creative people to contribute their skills and knowledge to innovation and research.

The European Commission and the member states have recognized this and are working intensively on the three following lines of action:

- I. Increasing mobility and ease of transfer between member states and within the European research community. This will make Europe more attractive for top scientists from Germany and abroad.
- II. Recognizing qualifications acquired across Europe. This would make study and research stays in other EU member states common practice, which would broaden young people's horizons in addition to enriching their professional careers.

- III. Facilitating the transfer between universities and industry for researchers across Europe. This is something that should become a matter of course.

However, Ladies and Gentlemen,

It is not enough to simply increase the number and improve the quality of university places and training vacancies. Young people must want to take up these offers. In other words: nanotechnology in Europe needs to be attractive. We need leading scientists to act as role models for young people. Europe must promote itself with the help of outstanding achievements that are internationally visible. This will make Europe attractive for young talents from all over the world.

Ladies and Gentlemen,

I hope that you have three interesting and productive days at the EuroNanoForum 2007 here in Düsseldorf. Take advantage of this opportunity to conduct discussions that cross the boundaries of nationalities and specialist fields. For this is the most distinctive feature of nanotechnology: more than almost any other technology, it depends on cooperation across all disciplines. This is what makes it literally boundless.

Thank you very much.