austrian council

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foreword

The European Innovation Scoreboard has recently confirmed that Austria is one of the most innovative countries in Europe, holding sixth place among the 27 EU member states and hard on the heels of the group of innovation leaders. The reasons for this success are varied. But they are mainly the result of steadily rising investments in research and development by the federal and provincial governments as well as the business sector. The result of this international comparison validates the approach to research and technology policy adopted almost ten years ago. We now have to do all we can to ensure that Austria remains in the fast lane. The current difficult economic situation makes it all the more necessary to use investments in research and development to stimulate growth with the aim of giving Austria a competitive edge over other international business locations and safeguarding employment. Two thirds of our economic growth are attributable to research and development. Federal government, the provinces and business are therefore all called upon to view the current crisis as an opportunity and increase their level of investment in R&D. The Council for Research and Technology Development has made a substantial contribution to the success that has been achieved in recent years. The government and the ministries responsible for science and research expect that the RTI Strategy 2020 that is currently being drawn up will provide considerable impetus for research and technology policy in forthcoming years. We therefore wish the Austrian Council for Research and Technology Development much success in this important task and we, for our part, will continue to make an active contribution to the discussion. ■

Doris Bures
Minister of
Transport, Innovation
and Technology

Dr. Johannes Hahn
Minister of
Science
and Research

DI Josef Pröll
Vice Chancellor
and Minister
of Finance

Dr. Reinhold Mitterlehner
Minister of
Economic Affairs,
Family and Youth

We are living in an age that is characterised by rapid change. This has become especially evident in recent months as global economic developments have swept over us in a way that no-one could ever have anticipated even a few months ago.

Knut Consemüller
Chairman of the Austrian Council

2008: The Year in the Shadow of the Incipient Economic Crisis

Austria – like the rest of the world – is currently experiencing the most difficult economic situation since the end of the Second World War. For many companies, the financial crisis and its subsequent spill-over into the real economy pose a threat to their survival. The consequences are the loss of jobs and possibly bankruptcies. The prosperity we have built up with many decades of hard work is under threat.

Research is not immune to these pressures. Companies are already responding to the changed situation and are no longer increasing their research expenditure to the same extent as in previous years. In this situation, the public sector in particular is called upon to play a crucial role, for if Austria is to emerge strengthened from this financial and economic crisis, sustained support must be given to investments in education, research and development. If this support is not given, we will later on face a shortage of both the human resources and the products we need to gain a market edge before the economic recovery and safeguard Austria's competitive situation in the medium and long term.

2008: The Year Dominated by Preparations for the Strategy Paper

Despite the fact that at the start of 2009 we are labouring under the impact of the global economic crisis, the balance for the research year 2008 is on the whole a positive one. According to Statistik Austria, Austria achieved a research quota of 2.63 percent and according to the European Summary Innovation Index ranks among the innovation followers, right behind the group of innovation leaders. Business invested a total of EUR 3.6 billion in R&D; a figure that even a few years ago was regarded as illusory, and in >

Photo (from left to right):
Hans Schönegger
Knut Consemüller
Albert Hochleitner
Gabriele Zuna-Kratky
Reinhard Petschacher
Jürgen Stockmar
Dervilla Donnelly
Günther Bonn

Günther Bonn
Deputy Chairman

the Seventh EU Framework Programme Austria now participates in almost three percent of all approved projects.

The Austrian Council for Research and Technology Development spent 2008 working intensively on formulating its RTI Strategy 2020 and this is now nearing completion. This strategy should and will equip Austria for the next decade of research, development and innovation. Although we need to take account of the changed framework conditions, we must not lose sight of the aim of positioning Austria among the leading three countries in Europe. To this end, funding structures must be made more flexible and transparent, red tape cut and areas of strength further expanded. In the past Austria has taken major strides forward in this area, but further efforts and bold decisions are still needed to overcome future challenges.

It is still possible to achieve the goal that has been pursued so consistently in recent years of spending three percent of GDP on research by 2010, but even if this target could only be realistically achieved in 2012 or 2013 it would still be a great success for Austria. We must continue on the growth path that we have adopted, as this is the only way of securing our future competitive position.

We would like to thank all those who supported our work last year and request them not to relax their commitment to continuing along the path that we have followed so successfully in the past. ■

If Austria wants to be amongst the best in Europe in the RTI sector it must offer the research community perspectives for the future. This means creating the financial and structural conditions that offer research and technological development the greatest possible intellectual and creative freedom. In 2008 the Austrian Council therefore focused on the development of its RTI Strategy 2020.

Strategy 2020: RTI Strategy for Austria

As the advisory body to the Austrian government, the Council for Research and Technology Development has a legal mandate to draw up recommendations and proposals for research, technology and innovation policy (RTI) strategies. The Austrian Council has carried out this task by, among other things, formulating the Strategy 2010 and the Strategy for Excellence. In view of Austria's strong RTI policy position, the Austrian Council believes it is essential to consistently continue the approach that has been adopted so successfully. The Council has therefore started drawing up proposals and recommendations for an Austrian RTI strategy to cover the period up to 2020.
In recent years Austria has completed an exemplary catching-up process in the area of RTI policy. This is confirmed by numerous international comparisons. Thus the European Commission's Summary Innovation Index (SII) puts Austria in sixth place among the 27 EU member states. In an international comparison Austria, together with countries such as France, Ireland, Belgium and the Netherlands, falls into the category of the innovation followers.
The vision formulated by the Austrian government of advancing Austria "out of the category of followers" and into the group of innovation leaders[1] and thus becoming "one of the most innovative countries in the EU" requires a strategic framework if it is to become reality by 2020.

Goal: Long-Term, Binding RTI Strategy

The development of a long-term RTI strategy for Austria with the involvement of all stakeholders is a necessary precondition for keeping up in the international competition between research nations.
A long-term and binding strategy for the Austrian RTI system can only be successfully developed if it is a joint project supported by all stakeholders in the RTI system. The importance of a generally shared vision and a binding strategy for the Austrian RTI system was most recently confirmed by the CRES[2] EExpert Group (see page 51 of this report). The Austrian Council will therefore involve all important partners in the project.

Strategy Process and Content

The Austrian government has already taken significant steps toward strategically orientating the Austrian RTI system. Core elements of a research strategy are being developed with the help of input from the Austrian Research Dialogue initiated by the Ministry of Science and Research (BMWF) and the system evaluation commissioned jointly by the Ministry of Transport, Innovation and Technology (BMVIT) and the Ministry of Economic Affairs and Labour (BMWA). The results of the former were presented in Alpach by Minister Johannes Hahn and the interim results of the latter by Minister Werner Faymann just before the Alpbach Technology Forum.
The Austrian Council will now incorporate all the available results when formulating proposals and recommendations (see the diagram on page 7).
Furthermore, the Austrian Council has also used studies and analyses to identify other strategy areas that are necessary for obtaining an overall strategic picture. Each area of the strategy was developed on the basis of a thorough gathering of facts, the identification of areas where there is a need for additional information and action, and on the consequent decisions regarding necessary further steps such as further analysis, studies or workshops etc. Accordingly various study presentations, workshops and discussions were organised which then provided input for strategic guidelines and recommendations.

[1] Government Programme for the XXIV Legislative Period, Chapter on Research, Technology, Innovation, p. 39.
[2] European Union Scientific and Technical Research Committee.

In the opinion of the Austrian Council, the following five strategic areas are of central importance for the future development of the Austrian RTI landscape: People, Money, Structures, Internationalisation and the EU and Thematic Areas.

People

Research in Austria is defined by the people who carry it out. Every monetary target defined as part of strategic policymaking must focus on the availability of qualified human capital. Measures in the area of human resources and the relationship between science and society are therefore crucially important.

The strategy area "People" comprises the following two elements:

- Human Resources
- Science – Society

The two strategy elements "Human Resources and Science Society" deal with the strategic planning of human resources development and the dialogue between science and the public.

Money

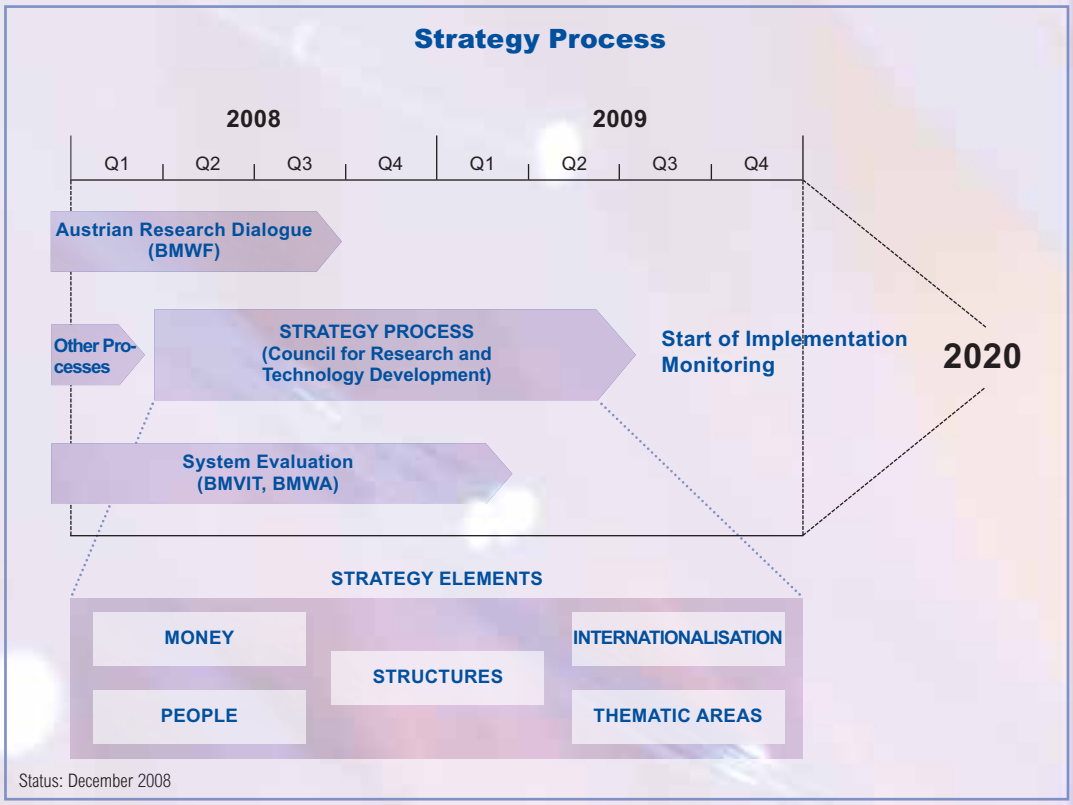
Austria is one of the few EU countries to have a realistic chance of achieving the 3 percent target laid down in the Lisbon strategy. If growth in R&D spending is sustained, Austria will meet the 3 percent target by 2012 at the latest. This raises the question which goals should then be defined.

The strategy area "Money" comprises the following two elements:

- Figures, Data, Monitoring
- Economic Impacts

The collection and analysis of R&D financial data is the prerequisite and starting point for strategic recommendations in this regard. The basis for this is created in the strategy element "Figures, Data, Monitoring".

Calculating the impact of spending on economic >



growth and productivity is also of relevance in this context. This is done in the strategy element "Economic Impacts."

Structures

Further structural development and optimisation are basic requirements for improving the attractiveness and efficiency of the Austrian RTI system. Structural deficits must be systematically eliminated if Austria is to continue to hold its own in the competition between research nations.

The strategy area "Structures" comprises the following three elements:

- Governance
- Infrastructure
- Instruments

Taking into account the results of the system evaluation, the three strategy elements "Governance, Infrastructure and Instruments" focus on the organisation of structures and processes within the RTI system as well as upon the necessary measures in the infrastructure sector and the adjustments that need to be made to the funding instrument mix for the year 2020.

Internationalisation

In addition to the development of human resources, monetary support for research, and suitable framework conditions, internationalisation is one of the strategic cornerstones that will constitute the terms of reference for Austrian RTI policy in the next few years.

The strategy area "Internationalisation" comprises the following element:

- Internationalisation and the EU

The strategy element "Internationalisation and the EU" focuses upon increasing international mobility, integration in international networks and developing strategies for closer collaboration with neighbouring countries.

Thematic Areas

Identifying priorities and emerging thematic areas in the Austrian research landscape will become increasingly important. However, in this context it is important that the discussion only concerns that (small) area of the RTI system that is not defined by processes that are of necessity open and bottom-up.

The strategy area "Internationalisation" comprises the following element:

- Key research areas in the Austrian RTI landscape

The aim of this strategy element is to point out ways and means of supporting areas of scientific and technological strength in Austria and stimulating specific RTI activities to deal with important social issues. ■

Interview with the Chair of the Parliamentary Committee for Research, Innovation and Technology, Ruperta Lichtenecker

Ruperta Lichtenecker

What significance do research, technology and innovation have for the economy and society in Austria?

Ruperta Lichtenecker: Research, technology and innovation are key stimulants for Austria's future social and economic development. Investing in this area strengthens peoples' skills and knowledge base, safeguards the quality of life in our country and creates new high-quality jobs. Everyone benefits from innovation at the societal level and a fresh wind blowing through our country. And in times of crises of differing dimensions, new ideas and stimuli are all the more valuable and indispensible.

What should be the aim of RTI policy in Austria?

Ruperta Lichtenecker: One of the key questions is: With which strategy can we achieve social progress and environmentally and socially compatible economic development? Creating employment, improving living standards and safeguarding our natural environment – despite the current crisis – requires an increasingly knowledge-based society and economy that are networked even more intensively with Europe and the international environment. Another central theme of RTI policymaking is the orientation of RTI strategies and RTI programmes toward social and economic needs.

How can the vision formulated by the Austrian government of putting Austria among the most innovative countries be achieved?

Ruperta Lichtenecker: Adequate resources and framework conditions that are conducive to research are essential and must be guaranteed. Only multi-year planning certainty guarantees research institutions the necessary scope for action. Strengths in the funding landscape should therefore be concentrated and access to funding instruments made easier. Awareness must be created that everyone in this country benefits from RTI. In my view, a broad public discussion should finally take place about the aim of RTI – the Austrian Research Dialogue was a good start. Austria needs goals that are based on a broad consensus and a long-term RTI strategy that has been democratically legitimised through broad-based public debate. National research plans should therefore be debated by the relevant parliamentary committees and communicated to society. Structured cooperation between the many RTI actors in Austria also offers potential.
The strategy and measures should be regularly evaluated and, where necessary, adapted.

What is the importance of a long-term RTI strategy for Austria's further development as a centre of research?

Ruperta Lichtenecker: The long-term RTI strategy is the basis for effective packages of measures and systematic development. No economy can afford to spend money without a strategy, nor is there any justification for doing so. An intensive discussion must take place and a broad consensus reached as to how the RTI strategy is defined and how resources are to be used in the years to come. A clear and implementation-orientated strategy is essential for professional RTI policymaking in Austria.

How can parliament, the government and the Austrian Council jointly – as is envisaged in the Government Programme – develop a long-term RTI strategy for Austria?

Ruperta Lichtenecker: On the basis of the proposals made by the Austrian Council, the preliminary work in the Austrian Research Dialogue and taking into account the results of the system evaluation, the government should submit a research strategy as a proposal to parliament. Parliament can then, as a first step, hold a committee of inquiry at which the strategy proposal can be discussed by international experts and all stakeholders and insti- >

tutions. Within the framework of the Parliamentary Committee for RTI and Science, this proposal should then be made the subject of a broad discussion in which the general public will also be invited to participate. The deliberations of these committees should be supported by the expertise of experts, e.g. of the Austrian Council. The strategy should then be adopted by parliament. It should subsequently be regularly evaluated and adapted.

How can research, development and innovation contribute to overcoming the current global economic crisis?

Ruperta Lichtenecker: The field of research, development and innovation is a crucial building stone for social and economic development and plays a central role in safeguarding and creating high-quality jobs. The quality of research and development is extremely important for company headquarters and thus for a region's knowledge and economic potential. Moreover, it is especially important in our current situation to define key research areas that provide answers to the main questions raised by the crisis and which also have strong potential for creating employment. These include topics such as energy efficiency, renewable energies, environmental technology, medical technology, materials technology and non-controversial areas of biotechnology

Which framework conditions are necessary for enabling even more outstanding achievements in RTI in Austria?

Ruperta Lichtenecker: A secure supply of financial resources, investments in education, development of the research strategy, strengthening basic research, measures to promote corporate research, especially in small and medium-sized enterprises, independence and freedom, interdisciplinary cooperation, an open society, courage, risk capital, international networking and a concentration of resources.

How can framework conditions in Austria be structured so that they promote excellent researchers and research teams, support the long-term production of quality in competitive processes and are open for new players?

Ruperta Lichtenecker: The urgently needed increase in resources is a major element. In addition, opportunities for young scientists need to be improved. The complaints from young scientists at universities that they have no real perspectives for the future finally have to be taken seriously. International cooperation needs more flexible and open approaches. Initiatives to promote excellence are part of this strategic orientation and concerted efforts must be made to encourage cutting-edge research. The lack of courage and capital for high-risk research must be eliminated. The securing of strong and independent basic research and scope for action are an important foundation for cutting-edge research.
Appreciation, openness to what is new, and a commitment to innovation on the part of those in positions of responsibility and throughout society as a whole, also constitute positive framework conditions.

Thank you very much for the interview. ■

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Successful innovation policy achieves a balance between strengthening existing strengths and changing inadequate structures.
As the advisory body to the Austrian government, the Austrian Council has a duty to implement measures in both directions in order to safeguard and increase Austria's competitiveness. Its recommendations are therefore based on international benchmarks, taking into account specific Austrian needs.

Recommendations 2008

The Austrian Council for Research and Technology Development is the strategic advisory body to the Austrian government on all issues of research, technology and innovation policy (RTI). It draws up recommendations for the medium and long-term strategic orientation of Austrian RTI policy.

In 2008 the Austrian Council made the following statements and recommendations:

- Private Equity / Venture Capital for the Austrian Innovation System (14 March 2008)
- Raising the Profile of the National Foundation for RTD and Ensuring Planning Certainty (14 March 2008)
- Further Development of the Humanities, Social and Cultural Sciences (2 April 2008)
- Recommendations for RTI Policy in Austria (8 October 2008)
- ICT Research and Development Strategy (28 October 2008)
- Recommendation Concerning the Use of Funds from the National Foundation for RTD in 2009 (3 December 2008)
- Austrian Start-up Activities in Knowledge- and Technology-Intensive Areas (9 December 2008)

Private Equity (PE) / Venture Capital (VC) for the Austrian Innovation System – Recommendation dated 14 March 2008

The Austrian Council has for several years emphasised the importance and relevance of an ambitious start-up and growth policy that includes both a functioning private-equity market and the selective promotion of research- and technology-intensive start-ups (see Council Recommendation Concerning Start-up and Growth Financing, 8 July 2005).

The Austrian economy needs innovative businesses. Young companies in particular require more capital, a need that in many cases cannot be met from traditional sources of financing. Institutional risk capital can make a major contribution to meeting this need. The careful assessment and selection of the projects, the continuous monitoring and support of companies through the specialised management of the investment can reduce information problems so that some of those business segments affected by the failure of the traditional market can be profitably financed by the private sector.[1]

At present, the national innovation system has a relatively low volume of PE/VC. There is a growing trend among Austrian funds to finance expansion and internationalisation projects, while early and high-risk phases are neglected (see Table). However, it is precisely in these early phases that there is a greater need for financing.

Against this background, the Council for Research and Technology Development formulated four recommendations for action that aim to strengthen Austria's position as a knowledge-based economy in international competition:

Development of VC/PE in Austria 2005/2006[2]

	PE as a percentage of GDP	Fundraising	Investments	Seed and Start-up Investments
2005	0.058 %	EUR 217 mn.	EUR 143 mn.	~ 20 %
2006	0.062 %	EUR 279 mn.	EUR 158 mn.	~ 6 %

[1] Peneder, M. / Schwarz, G. (2007): Die Wirkung von Private Equity und Venture Capital auf Innovation und Wachstum der Unternehmen. WIFO on behalf of the BMWA.

[2] Jahrbuch Unternehmensfinanzierung 2008. Eds.: Gemeinsames Jahrbuch der Venture-Capital- und Private-Equity-Verbände in Deutschland und Österreich, VÖ: September 2007.

1. Private Equity Law

The Austrian Council recommends the rapid implementation of a private equity law based on international standards for the purposes of creating suitable structural conditions for internationally attractive fund structures.

This PE law should meet the needs of investors and the holding companies and should not therefore be subject to any restrictions whatsoever of a geographical, investment or other nature. The venture capitalists should ideally join forces in the form of a limited partnership (Kommanditgesellschaft KG) and decide for themselves in which industries, company sizes and phases they wish to invest. With regard to the oversight and transparency of the funds, the Austrian Council recommends adopting investor relations guidelines[3] based on those of the industry. Appropriate transitional periods should be provided for the new PE law. Moreover, a PE law is a key prerequisite for all other measures and recommendations.

2. Implementation of a Fund Initiative for Early Phases with the Public Sector Holding a Minority Interest

The Austrian Council recommends a fund initiative, within the framework of which the public sector acts as a financier in funds that are geared especially to the needs of young, innovative companies in their early phases. The public sector investments should be made exclusively on customary market terms.

There must also be a strong focus on private sector principles such as a professional and independent fund management.

The necessary annual volume, of which no more than 30 percent should be provided by the state, must be established during the development of the concept. The individual funds should not fall short of a substantial volume (EUR 30 million as a reference value) in order to ensure adequate funding for subsequent rounds. Other sources of financing, besides federal government funds, are the Competitiveness and Innovation Programme (CIP), the EU's main funding programme for innovation and competitiveness, and the provinces. As the first step, those institutions should be identified that could take on the management of the investment for the public sector.

This type of fund initiative will lead to a multiplication of venture capital due to the incentive effect of the public funding.

3. AplusB Centres as Regional Contact Points for Financing-Enquiries

The Austrian Council recommends positioning the AplusB centres more strongly as PE/VC advisory bodies for new entrepreneurs and expanding their area of work in this regard to cover non-university start-ups and the related need for additional resources. To ensure a critical mass of start-up projects for investors, the centres should be networked to a greater extent through the existing Austria-wide AplusB platform.

To this end, financing consultancy services should focus above all on the start-ups' capacity for innovation, while the advisory services should be extended to cover non-university start-ups. Coordination with other advisory bodies must be continued.

Due to the essential importance of the AplusB centres for start-up dynamics in Austria, appropriate arrangements must be made to ensure their sustainable development in the future. The Austrian Council therefore wishes as a matter of urgency to examine the concept and draw up a recommendation for the AplusB centres.

4. Awareness-Raising Measures Regarding Venture Capital

The Austrian Council recommends drawing up a joint action plan to coordinate the current and planned awareness-raising measures of the responsible ministries (in particular the BMWA, >

[3] See http://www.avco.at/upload/medialibrary/AVCO_Investor_Relations_Richtlinien_(Version from _ _vom_13.06.05)_100306.pdf

BMVIT und BMF) both with one another and with those of organisations representing industry. In this connection, a joint, long-term and centrally coordinated approach by all stakeholders would be advisable.

To coordinate and harmonise existing measures, a joint campaign must be started that will provide information to both investors and companies. As well as improving acceptance of VC among new entrepreneurs, the investment readiness of existing and potential investors (such as business angels, foundations, pension funds as additional pillars of the private equity market) should be addressed.

In addition to a basic shared understanding – for example regarding the definition of high-tech or venture capital and private equity – other important elements of this type of awareness campaign include specific content such as information on advisory services and national success stories.

Raising the Profile of the National Foundation for RTD and Ensuring –

Recommendation dated 14 March 2008

The budget of the National Foundation for Research, Technology and Development that is paid out annually has fallen from EUR 125 million in 2004, when the Foundation was established, to EUR 80 million in 2008. The Austrian Council is of the opinion that in the medium term, funds from the National Foundation should be directed toward key areas of research that conform more closely with the provisions of the RTD National Foundation Act and the guiding principles. Furthermore, despite budgetary constraints, action should be taken to make it possible for the National Foundation to fulfil its statutory tasks. Measures are also required to safeguard the funding budget of approximately EUR 125 million per year originally laid down in the explanations to the National Foundation Act.

To assist the National Foundation in properly fulfilling its legal responsibilities, the Austrian Council recommends that stricter criteria be applied when assessing the basic compliance of applications with the guiding principles of the National Foundation. In future, only those applications should therefore be submitted for comment to the Austrian Council that allow the National Foundation to be independently positioned as a financing instrument in accordance with the guiding principles.
In order to realise and safeguard this independent positioning in the long term, an appropriate volume of funding is required. The Austrian Council therefore also recommends securing a funding budget for the Foundation amounting to EUR 125 million per year, as originally laid down in the explanations to the Act. Appropriate measures (pursuant to § 4 para. 3 of the RTD National Foundation Act) must be taken to ensure medium-term planning certainty, and a medium-term financial plan tailored to the Foundation's future tasks should be drawn up for the funds to be disbursed.

Further Development of the Humanities, Social and Cultural Sciences –

Recommendation dated 2 April 2008

The Austrian Council presented its first recommendation for the humanities, social and cultural sciences in 2003 and gave them due consideration in its recommendations regarding the use of funds from the action programmes. It is apparent that despite considerable financial investments (also on the part of the FWF) only a small proportion of the Austrian Council's recommendations have been implemented. The Council has, therefore, found it necessary to once again issue a recommendation regarding the further development of the humanities, social and cultural sciences in Austria, which should form the basis for evaluating and structuring what has been achieved so far.
Research funding for the humanities, social and cultural sciences in Austria suffers from three problems:

- Grants are short-term and fragmented.
- The funding schemes have an inadequate thematic and programmatic orientation.
- Almost no strategic use is made of research results with relevance for social policy produced by the humanities, social and cultural sciences.

This leads to:

- Structural fragmentation, thematic and organisational segmentation
- Lack of transparency in terms of resource allocation (with regard to human resources and existing scientific expertise and key research areas) and scientific output
- Separation of basic and applied research as well as between the university and non-university sector

The recommendation focuses on the following areas:

- Medium-term thematic priorities should be set with a view to encouraging collaborative research and facilitating new structures. An evaluation should be carried out to ensure that these key areas will be useful in the long run.
- Thematic priorities should be defined according to socio-political urgency. Issues of high social relevance and dynamism are to be tackled in a manner that helps develop structures but also corresponds with international practice in terms of thematic depth and breadth.
- The necessary structural reform of research funding for the humanities, social and cultural sciences includes bundling and coordinating all funding measures by means of concentration at the planning level and direct consultation with the management level.
- Every award of a grant must be designed as an instrument of quality assurance. Quality in the humanities, social and cultural sciences should be measured and safeguarded by forms of evaluation that make allowance for the differing innovation cycles and systems of work and organisation of the various disciplines.
- Care should be taken that priority is given to allocating funds to research in the humanities, social and cultural sciences that at least allows a doctoral project (3 years) to be completed within the funding period.
- Existing measures that were not designed for >

the humanities, social and cultural sciences should be examined to see if they are basically suited to these disciplines. This compatibility must be ensured in the case of planned measures, e.g. the excellence clusters.

- Following a detailed study of international research funding models, greater tax incentives must be introduced to encourage corporate research funding and the establishment of foundations specifically to promote the humanities, social and cultural sciences.

Recommendations of the Council for Research and Technology Development for RTI Policy in Austria – Input to the Government Programme dated 8 October 2008

In 2008 Austria stood at the beginning of a new legislative period. The starting point for shaping research, technology and innovation policy is today extremely positive. However, those in positions of political responsibility must still give their full attention to this area if Austria is to become a leading centre of research. If Austria is to continue the path so successfully adopted in the past, the government must take the following key aspects into consideration:

1. Research and development must remain political priorities in the current legislative period, as they form a basis for prosperity.

2. Framework conditions for expanding the knowledge base and promoting world-class research must be improved.

3. The results of the Austrian Research Dialogue and the system evaluation should be taken into account when shaping future RTI policy.

The Most Important Challenges in the Current Legislative Period

The Austrian Council recommends tackling the most important RTI policy challenges in a determined manner with the aim of implementing an RTI policy suited to achieve the following goals:

- Responsibility and competence in the RTI sector should be concentrated at no more than two ministries
- Particular attention should be given to human resources in the forthcoming research policy period. Research in Austria is defined by the people who carry it out. Consequently, every monetary target defined as part of strategic policymaking must focus on the availability of qualified human capital
- Greater efforts than in the past must be made to foster excellence and competition. Several world-class research institutes or clusters of excellence must be successfully established in all sectors. The aim here is to offer Austrian scientists in the higher education, corporate and collaborative research sectors excellent framework conditions that will enable them to play a leading international role in their disciplines
- Austrian universities must position themselves better in international competition. The aim must be to join the ranks of the 50 best universities in the world. In support of this, the instrument of performance agreements must be structured and employed more effectively than in the past
- Regionally-specific features of research promotion must play a central role in all RTI policy considerations. In this connection, allowance must be made for the differing thematic foci and structures of the regional funding systems (e.g. diverse areas of emphasis in industry, tourism etc.)
- Austria wishes to move up into the group of front-runners. The Austrian Council is therefore working on the various areas with the stakeholders with a view to being able to recommend new quantified orders of magnitude. The following targets are therefore under discussion:
- GDP for basic research

According to Minister Johannes Hahn in the "Zukunftsdialog Innovation" in November 2007: one percent

- GDP for the tertiary education sector

Parliamentary decision taken in November 2007: two percent

- GDP for research and development by 2010

Lisbon Agenda adopted in 2000: three percent

- GDP for research and development by 2020

Proposal put forward by the BMVIT and BMWF in Alpbach in 2008: four percent

The Austrian Council assumes that the financial resources needed to achieve a leading position in

Europe (tenured professors, National Foundation, special funding) will be made available.
The Research Strategy 2020 (see page 6 of this report) with the five strategy elements defined by the Austrian Council (People, Money, Structures, Internationalisation and Thematic Areas) will show how these goals can be reached. The Austrian Council will present extensive details for each element.

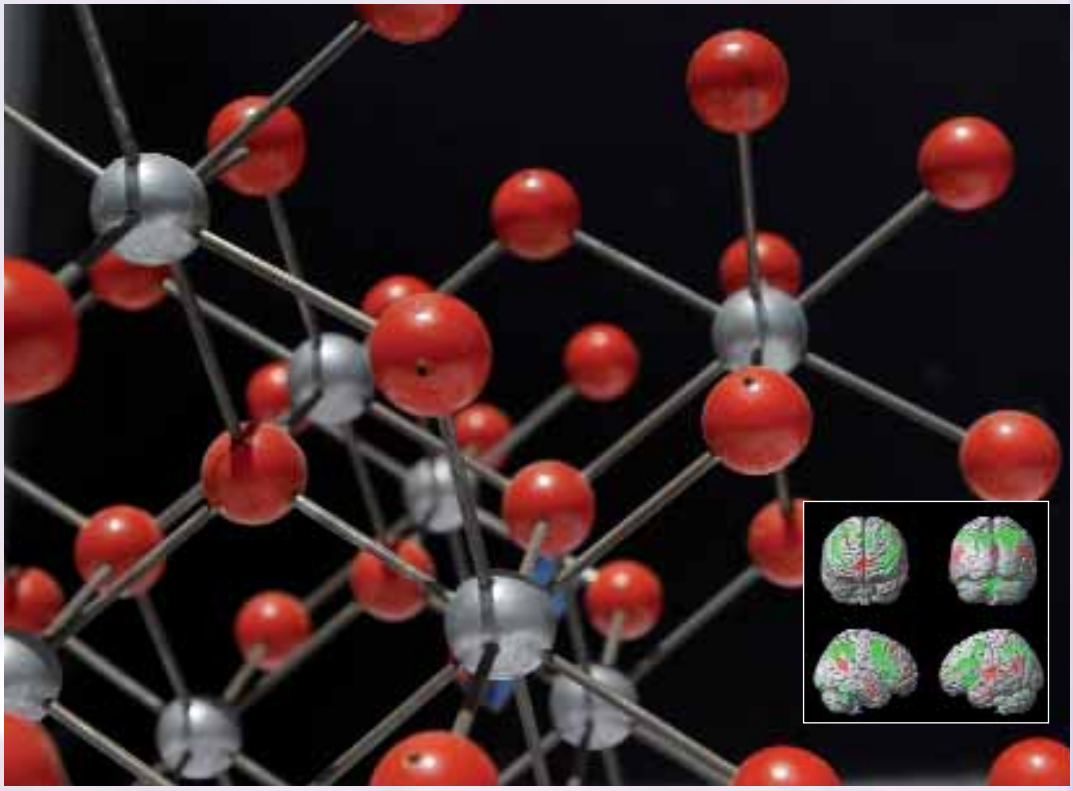
ICT Research and Development Strategy 2020 – Recommendation dated 28 October 2008

ICT – The Lifeblood of the Global Economy

Over the last ten years, information and communications technologies (ICT) have increasingly become an integral part of our infrastructure and an essential driver of value creation at a global level. As a cross-sectional technology that pervades all areas of society, ICT is the lifeblood of the global economy. Decades of uninterrupted growth in productivity give reasonable cause to hope that ICT will prove to be a motor of economic and employment growth, even in a challenging global economic climate. In spite of this, the social and political discussion of ICT in Austria has not yet attracted a great deal of attention.

Austria has a Chance of Joining the Front-Runners

Austria is well positioned in the middle of the league tables, both in terms of application and research, and development. In 2005 the ICT industry employed roughly 110,000 people and generated total revenues of EUR 27.15 billion with a production value of EUR 18.39 billion. The Austrian ICT research sector is one of the most important in the country and employs the largest number of researchers.
Austria has good chances of joining the international leaders in the field of ICT research. At both universities and in companies, we have in- >



ternational research strengths in areas such as embedded systems, micro-electronics, visual computing, semantic systems, quantum informatics and opto-electronics.
The specific objective: To become one of the 3 leading EU states in terms of the ICT-R&D intensity of the corporate sector – and join the international front-runners among the ICT nations by 2020. This requires an inter-ministerial strategic initiative designed to clearly position Austria as an excellent location for ICT research. This is also important with a view to the continued promotion of national strengths, the recruitment of sufficiently qualified researchers and the implementation of a suitable framework for boosting the innovative ability of companies and public institutions alike.

Many Paths – One Goal

This move to the top of the league tables requires a bundle of measures which together will deliver the decisive impetus. Above all else, what we now need is an adequate supply of qualified research personnel and the coordination of key research areas at companies and universities. Institutions of higher education must expand their own research activities in those areas where industry is strong, and industry must utilise the strengths of the universities with start-up initiatives. A clear push is needed here in order to achieve an internationally recognised position. Moreover, ICT must be broadly integrated into school curricula and the number of students starting and completing ICT degree courses increased with a view to cultivating human resources. And Austria must become an immigration destination for ICT professionals in both academia and industry. To this end, more attractive conditions and better services must be created for foreign researchers who wish to live and work here. Furthermore, leading companies (leading competence units) must be supported and new ones attracted from abroad by offering an optimal supply of resources and internationally competitive framework conditions in Austria. Continuous monitoring should verify the success of the strategy's implementation. Increased participation in EU programmes, the doubling of the share of the budget allocated to ICT in projects funded by the Austrian Science Fund (FWF), efforts to attract ICT companies and spin-offs, the bundling of programmes and measures to avoid duplication in research funding, an increased number of ICT-specific patents and generally more intensive cooperation between ICT research and business are just some of the ICT-R&D indicators named in the strategy that will be used to measure whether we have adopted the right approach.

Turning the Dream into Reality

The Austrian ICT Research and Development Strategy 2020 can only be successfully implemented if all parties – the responsible ministries, research institutions, universities and business – pull in the same direction, both with regards to content and financing. The aim is to achieve total funding of at least 0.8 % of GDP for ICT research and development by the year 2020. 83 % of this funding should be provided by business. Assuming an 8 % annual increase in the share of corporate R&D funding and annual GDP growth of 4.1 %, this is the equivalent of roughly EUR 3.3 billion and EUR 650 million in corporate and public funding respectively in 2020.
Within the next five years, the share of public funding should be set at approximately 25 % in order to jump start this development and should then decline to 17 % by 2020. Over the next five years this will necessitate a total volume of roughly EUR 2 billion from the public purse. A monitoring board comprising the BMVIT, BMWA, BMWF and the Austrian Council for Research and Technology Development should monitor the process until 2020.

How will Austria Benefit?

The implementation of the ICT Research and Development Strategy 2020 should position Austria among the leaders in international ICT research. This is also expected to stimulate dynamic economic growth. The revenues generated by Austrian ICT companies abroad will also continue to rise from EUR 12 billion in 2006, with an

increasing proportion attributable to SMEs. In particular, the role of IT as a creator of jobs in Austria must be emphasised. Altogether, 170,000 jobs are either directly or indirectly linked to the IT sector. It is predicted that over the next four years a further 17,000 jobs will be created and some 500 new businesses started.[4]

ICT already accounts for 45 % of productivity growth in the EU; 0.8 % of economic growth in the OECD states is attributable solely to investments in ICT and the upward trend is continuing. Austria must therefore seize the excellent opportunities it has to safeguard long-term economic growth and value creation in this sector.

Recommendation Concerning the Use of Funds from the National Foundation for RTD in 2009 – Recommendation dated 3 December 2008 Preamble

In recent years there has been a rapid decline in the resources of the National Foundation for RTD which now fall well below the amount proposed in the Notes to the Act. The National Foundation estimates that in 2009 it will have only EUR 60 million at its disposal, less than half the amount originally anticipated and also significantly less than the average amount available in recent years. The Foundation as an additional source of funding for research only makes sense if it is also adequately endowed (see also the Notes to the Act). This raises the question of whether the original aims and purpose of the Foundation can still be achieved and fulfilled given the massive reduction in resources.

To enable the Foundation to fulfil its aims and also guarantee multi-year planning certainty, the necessary volume of funds must be made available on a regular basis. The law offers a framework for the endowment of the Foundation:

"Paragraph 4 (3) Furthermore, the Foundation may also be endowed with funds earmarked for this purpose in the yearly Federal Finance Act."

The Austrian Council once again notes that the discussion regarding the use of Foundation funds can only be conducted taking into account other sources of R&D funding (ordinary budget, indirect funding). One consequence of the principle of communicating vessels is the need for a comprehensive approach in the form of bundled recommendation activities on the part of the Austrian Council and bundled decision-making activities on the part of the Foundation Board.

In 2007 the Austrian Council issued its recommendation for 200 "*…subject to the condition that the next decision to be taken regarding the award of funding from the National Foundation for RTD in 2009 fully complies with the purpose of the National Foundation".* (Recommendation concerning the National Foundation for RTD 2008 dated 3 December 2007, page 2)

The proposal to attract applications by means of nationwide calls in future is not an attractive one. We must not lose sight of the underlying idea of using existing structures and institutions instead of creating new and additional structures. Neither can the focus be upon generating greater publicity for the Foundation; however, transparency must be guaranteed during the application process and with regard to the selection procedures (including the criteria), as well as during the handling by the beneficiaries and use of the funds by the beneficiaries and the respective project initiators.

The Austrian Council welcomes the revision of the guiding principles and has already offered to become actively involved in the restructuring process and has taken first steps in this regard.

In this connection, the Austrian Council explicitly draws attention to the recommendation it issued on 14 March 2008 to sharpen the profile of the National Foundation for RTD and ensure planning certainty.

Recommendation Concerning the National Foundation for RTD 2009

Pursuant to Paragraph 11 Section 1 Line 1 of the Act establishing the National Foundation for RTD,

[4] Maierbrugger, Arno, Die IKT-Wirtschaft wächst. In: MONITOR-Jahrbuch IT-Business in Österreich 2008.

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the Chairman of the National Foundation on 23 September 2008 invited the Austrian Council for Research and Technology Development to issue a statement and recommendation by 3 December 2008 concerning the use of the Foundation's resources in 2009 based on the applications received from beneficiaries.

The Council for Research and Technology Development has discussed the applications submitted and unanimously reached the following result:

Beneficiary / Applicant	Recommendation
FFG Bridging Programme (Bridge)	National Foundation financing can be recommended if sufficient funds are available.
FFG Headquarter	The Austrian Council considers that FFG applications qualify for the RTD National Foundation and recommends that funding should be provided. In particular, the Council welcomes the fact that the programme line "Research Headquarter" will be financed from a single source. The programme should be fully funded by the RTD National Foundation.
FWF Lise Meitner Programme for Foreign Researchers	In accordance with the recommendation made on 3. 12. 2007, the Austrian Council recommends that the programme should be funded. However, this funding should not come from the National Foundation but once again from the ordinary budget.
FWF Thematic Programmes (special research areas, national research networks)	The Austrian Council considers that FWF applications qualify for the RTD National Foundation and recommends that funding should be provided.
CDG Christian Doppler Laboratories	The Austrian Council considers that FWF applications qualify for the RTD National Foundation and recommends that funding should be provided.
LBG Ludwig Boltzmann Institute	The Austrian Council recommends financing the programme with funds from the National Foundation. On the basis of the applications, it is recommended that full funding already be provided to a selected institute from the funds for 2009. The Austrian Council suggests selecting for example, the LBI for Cancer Research for support and full funding.
ÖAW Austrian Academy of Sciences	In accordance with the recommendation made on 3. 12. 2007, the Austrian Council recommends that no National Foundation funding should be made available. Instead, all funding should be provided from the budgets of the relevant ministries.
▪ Biomedical Ageing Research	
▪ Molecular Epigenetics and Development Genetics of Plants	
▪ Space Research	
▪ Demographic Program	
▪ Climate Research	In connection with the Institute for Climate Research it should be noted that, in the interests of transparency, this should be funded by the Climate and Energy Fund.
AWS Venture Capital Initiative	In principle, the Austrian Council welcomes the use of the Foundation for venture capital activities, however, funding should not be provided until the model has been revised. The Austrian Council recommends first of all defining suitable framework conditions and identifying possible options. Once the content has been revised and the model adapted, consideration should definitely be given next year to the option of making adequate (to be defined in the course of the revision) long-term funding available from the National Foundation for venture capital initiatives. The Austrian Council therefore recommends that no funding should be provided in 2009. An external report commissioned by the Austrian Council has been forwarded to the Foundation Board.
Sustainable use of energy and renewable resources	Funding is not recommended.
HDS / Frame Sleepers for the USA	Funding is not recommended.

Austrian Start-up Activities in Knowledge- and Technology-Intensive Areas – Recommendation dated 9 December 2008

Based on the results of a prior survey of Austrian start-up activities, the recommendation defines five fields of action for which the following recommendations were formulated:

1. Education and Further Training

The Austrian Council recommends:

- Placing greater emphasis on business and technology in tertiary education, also by making suitable optional subjects available
- Providing interdisciplinary know-how within the framework of training measures for new entrepreneurs and bundling and communicating such measures in a targeted manner

2. Interface Between Science and Industry

Attitude of the Universities to Spin-Offs

The Austrian Council recommends:

- Sending a positive signal to the universities regarding the importance of spin-offs, for example, by providing incentives in the performance agreements or by including them in the university ratings of the Ministry of Science and Research (BMWF)
- Involving Universities Austria in a dialogue on start-ups and patenting, possibly within the framework of the existing working group on patenting

Technology Transfer

The Austrian Council recommends:

- Supporting the use of (interdisciplinary) start-up teams, e.g. partner exchanges or applying the concept of the innovation cheque in the form of a start-up cheque
- Increasing information about supporting measures within the framework of financing intellectual property rights for suitable target groups

AplusB – Redesign

The Austrian Council recommends:

- Increasing the period that start-up projects spend in the AplusB centres from one and a half to two years and, in justifiable cases to three years, with appropriate financial support for the entrepreneurs[5]. The aim is to ensure that innovative business ideas can be sustainably established on the market and increase the probability that young companies will survive. This requires sustained assistance for new enterprises up and into the early growth stages. Subsequently, variable support modules need to be developed and implemented for the period after the company has left the centre
- Provision must be made for financing beyond the end of the programme in 2012 in order to safeguard a stable basis for advising knowledge-based innovative new enterprises and preventing the loss of expertise and contacts before the end of the current programme period. The estimated programme costs run to EUR 60 million for a five-year period; how this amount is to be divided between federal government, the provincial governments and project participants has yet to be decided. This sum includes the costs of the AplusB centres and their employees as well as (based on a calculated average rate) the costs for supporting the founders; The Austrian Council assumes that a total of 400 start-ups will receive support
- The cooperation between AplusB and uni:invent within the framework of the planned redesign of the AplusB programme once the programme period has ended should be placed on a broader footing
- The Austria-wide AplusB platform should in future ensure greater networking between the centres; this should be achieved by involving the centres to a greater extent
- The range of services offered by the AplusB centres should be expanded to include support for non-academic start-ups with a focus on new enterprise projects from the non-university research sector and the knowledge-based service sector. This should be accompanied by the provision of additional resources. The infrastructure of existing centres should be used to support >

[5] In exceptional cases, the support period may be extended to two years, however, no additional funding may be provided.

highly innovative non-academic business start-ups as well as purely academic spin-offs. The degree of innovation at new enterprises should serve as the main criterion for distinguishing them from general start-ups

- Links to universities and their technology transfer centres should be encouraged above all with a view to obtaining university funding. If necessary, the new programme should be included in the universities' performance agreements
- When developing the programme, consideration must be given to the following points:
- Coordination with business representatives
- Clarification of the applicable guidelines

3. Funding

Direct Funding

The Austrian Council recommends:

- Transparency and harmonisation of funding measures between the federal government and the provinces with the aim of creating uniform framework conditions and coordinating key thematic areas. The goals of the individual programmes and their boundaries to start-up promotion schemes should also be clearly presented
- Creation of central points of contact for founders of knowledge- and technology-intensive companies in the regions, e.g. by officially expanding the AplusB centres to include innovative high-tech entrepreneurs with no direct academic background
- Expanding pre-seed and seed funding from high-tech companies to cover creative combiners
- Stronger consideration of risk aspects (both development and market risk) in the assessment of funding applications with the aim of transposing the risk aspect from start-up related funding programmes to subsequent funding applications (e.g. FFG General Programmes)

Indirect Funding

The Austrian Council recommends:

- Examining the applicability of international tax models for funding start-ups and young companies; the participation of WIFO should be secured within the framework of the system evaluation and the tax reform

Follow-up Financing

The Austrian Council recommends:

- Securing uninterrupted funding in the sense of a smooth transition from public funding to private sector finance by laying down suitable milestones such as proof of fitness for the capital market, a financing concept, contact with investors etc. in the conditions for funding at later stages of a company's existence

4. Social Perception

The Austrian Council recommends:

- Awareness-raising measures to establish a positive perception of business start-ups and the role of the entrepreneur in society. Such measures could include improved marketing of existing competitions, awards and campaigns as well as representative role modelling with various typical and atypical business personalities, and expanding the Start-Up Day to include high-tech start-ups, all in consultation with the relevant ministries and interest groups

5. Data

The Austrian Council recommends:

- Regularly and consistently gathering statistics regarding Austrian start-up activities in the knowledge- and technology-intensive sector in cooperation with Statistik Austria. This should be done on the basis of a specific and uniform definition of a company (e.g. NACE Code, research intensity, number of patents)

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The Austrian Council's work is based on the principle of facilitating innovation and talking about it. In 2008 the intensive work in the Council's areas of activity was continued.

Update: What has been accomplished

Facts and Figures – Key Thematic Areas in R&D

Little is known about how key thematic areas are defined in the Austrian research system. Although Statistik Austria regularly collects R&D data from the large sectors "industry" and "universities" classified according to branches of industry and science, the extent to which this data can be sorted according to research topics is limited. In April 2008, a first step was taken toward achieving greater transparency when the Austrian Council asked the funding agencies to list grant-funded projects according to topic.

Together with selected universities and companies, the Council considered what conclusions could be drawn from the data that is already available and how a picture of R&D topics could be obtained in future. As a first step, special surveys could be carried out to gain experience in categorising R&D activities according to topic. A workshop in October with representatives of Statistik Austria, FWF, FFG and the Stifterverband für die Deutsche Wissenschaft completed this experience-gathering process. Work will be continued in 2009.

Impact Analysis: Study on the Effects of R&D

Proof that R&D activities have a positive impact on economic growth is an important prerequisite for legitimising the funding of corporate research.

In view of the strong interest in Austria in the impact of R&D on growth and employment, the

Austrian Council commissioned the Austrian Institute of Economic Research (WIFO) to carry out a study on the growth effects and determinants of the increase in research and development expenditure of Austrian companies ("Wachstumseffekten und Bestimmungsfaktoren der Zunahme der Forschungs- und Entwicklungsausgaben österreichischer Unternehmen 1995–2006" – M. Falk, M. Hake 2008). On the basis of funding data provided by the Austrian Research Promotion Agency (FFG), the study analysed the impacts of rising levels of spending on research and development by companies in Austria between 1995 and 2006. To answer the research questions, the FFG funding data was made available in an anonymised form. The study shows that a high level of research at a company can have a positive and significant impact on the headcount just one year later.
Different methods of econometrics and impact monitoring, such as those implemented to monitor projects financed by the Structural Funds and research programmes, were presented in a study of new developments in the impact analysis and assessment of RTI policy measures (Neue Entwicklungen im Bereich der Wirkungsanalyse und -abschätzung FTI-politischer Maßnahmen – Austrian Research Centers 2006).

Monitoring: Plenty of Information, Lack of Insight

The growing importance of research and technology policy in recent years has been accompanied by an increased need for information about this policy area. The Austrian Council wanted to look into the question of which information on this subject is regularly made available and whether it is suitable for meeting the specific information needs of key RTI policymakers. The Council also wished to examine whether existing sources and systems of information are suitable for meeting demand or whether there is indeed a uniform need for a comprehensive and cross-sectoral monitoring of research and technology policy. Technopolis was commissioned to carry out the study.
It emerged that there are currently myriad documents, reports, data on the research and technology scene in Austria (Research and Technology Report) and on the universities (University Reports) that compile and analyse key data. Furthermore, within the field of research and innovation, Appendix T to the annual federal budget documents the budget allocations that are of relevance for the research quota.
Not least because of the wealth of information, interviews with decision-makers and experts did not reveal a need for a centralised information system or a basic restructuring of research and technology information (reports and data). Instead, a need for action was identified on two levels: On the one hand, there is a need for a better understanding of research and technology policy information, on the other for a correct, but nevertheless user-friendly presentation of key information for individuals who do not have many years of expertise in the field but who, owing to their position, need to be able to gain a rapid understanding of the most important key points.
In one respect, however, even experts see a need for information. This goes beyond the presentation of the federal research budget and concerns actual spending on research and development. Capturing the allocated budget in its entirety as well as all other expenditures would make it possible to present and explain critical figures and contradictions and also increase the transparency of the complex system.
Information from experts from scientific institutions, the ministries and Statistik Austria should be passed on to users.

OECD Symposium: The Role of Evaluation in the Budget Cycle in RTI Policy

On 3 and 4 July 2008 the OECD (*Budgeting and Public Expenditures Division of the Public Governance and Territorial Development Directorate*) and the Spanish Ministry of Economic Affairs and Finance held a symposium entitled "International Comparison of the Budget Cycle in R&D and Innovation Policies." Experts from the field of RTD evaluation and budgeting from 14 OECD countries came to Madrid to systematically compare the use and usefulness of evaluations for the allocation of resources in RTD and innovation. Austria was represented by experts from the BMF >

and the Austrian Council. The symposium was structured in sessions that dealt with the following questions:

- How do countries fund their RTI policy?
- How do countries evaluate the results of public sector RTD policy?
- To what extent are the results of evaluations used in the budget process?

The OECD used a balanced scorecard model to make an international comparison based on the relevant factors. This made it possible to look at several relevant factors simultaneously and analyse suitable indicators in an international comparison. Budget-relevant and effective performance budgeting requires clear and suitably differentiated structures for implementation and decision-making, a consistent data basis and the regular collection of data.

In session 4 (Evaluation of Publicly Funded Research Development and Innovation: the Institutional Framework) Michaela Topolnik from the Austrian Council secretariat presented the Austrian RTI system and the role played by evaluation in this system. Compared to other countries, Austria has a high standard of programme evaluation and a high rate of penetration. Other countries, in particular France, described their experiences with monitoring systems. Spain presented an ambitious project on data collection and monitoring as the basis for the allocation of resources. This should be implemented over the next two years.

German Evaluation Society: Annual Conference in Klagenfurt

In September 2008 the annual conference of the German Evaluation Society (DeGeval) was held in Klagenfurt. The subject of the conference was the relationship between steering and evaluation. The working group RTI policy that was organised by Austrian counterparts arranged two workshops: One on System Evaluation – Policy Evaluation – Strategy Evaluation, the second on the Importance of Evaluations for Funding Measures in RTI policy. The latter included two presentations and a discussion in which representatives of the FFG, the BMVIT and Michaela Topolnik from the Austrian Council participated. Discussions focused on the role of evaluation as a steering instrument and current challenges in RTI policy and developed along the following lines of inquiry:

- With what intention or expectations are tenders typically invited for studies to evaluate innovation policy funding measures? What are the conflicting priorities between external pressure and a clearly outlined research interest?
- To what extent and how are the results of evaluation studies usually incorporated into the programme design and implementation of innovation policy measures?
- Is it possible to identify types of studies (methodological approach, type of evaluation etc.) that are particularly useful for a funding agency?

In its statements, the Austrian Council drew attention to its role as a target group for, and user of, evaluations. The following issues were raised:

- What positions/expectations does the Austrian Council have with regard to invitations to tender for evaluation studies in the RTI sector?
- How does the Austrian Council believe that the utilisation and implementation of evaluation results can be improved?
- What types of study does the Austrian Council consider to be particularly useful for the Austrian RTI system?

It became clear that there is currently an increased need for information on evaluation – especially about what happens to evaluations and their results once they become available. How do evaluations impact programmes and the agencies? Which requirements and expectations can evaluations actually satisfy? It also emerged that there are differing perceptions between the evaluators on the one hand, and politicians and civil servants on the other, as to how recommendations are incorporated in further programme measures and how they are implemented. As a consequence, it was suggested that the Evaluation Day 2009, an event organised jointly by the Austrian Council and the Austrian Platform for Research and Technology Evaluation, should focus on this topic.

The next DeGEval symposium to be held between 7 and 9 October 2009 in Münster will deal with the topic Evaluation and Society.

Human Resources: Focus on People

In its audit of Austrian research policy, the National Audit Office recommended examining whether Austria has the human and not just the financial resources to achieve ambitious research quotas.

The Austrian Council had already noted in Strategy 2010, and once again in the Strategy for Excellence, that it must be a prime Austrian objective to raise the country's quality and attractiveness as a centre of research and technology, and improve its international competitiveness.

Against this background the Austrian Council awarded a research contract to the University of Vienna in the form of a study. The results of this meta-study were presented in February 2008 and show a considerable need for action at all levels (see page 40). A catalogue of measures was subsequently drawn up which has been incorporated into the Austrian Council's human resources strategy (see page 41).

Working Group Humanities, Social and Cultural Sciences

In 2003 the Austrian Council presented a first recommendation for the humanities, social and cultural sciences. However, as only a small number of the Council's proposals have been implemented to date, a new recommendation has been formulated (see page 15).

It was against this background that the working group on the humanities, social and cultural sciences met on 26 June 2008. As well as a brief survey of the current situation, the agenda also included a discussion of the diverse reactions to the Austrian Council's recommendation. Furthermore, steps were developed for the implementation of the Council recommendation and approaches for this area prepared for inclusion in Strategy 2020.

Working Group Universities and Fachhochschulen

On 14 July 2008 a working group comprising representatives of the Austrian Council, the Austrian Chamber of Commerce (WKO), the Austrian Association of Universities of Applied Sciences (FHK), the Federation of Austrian Industries, Upper Austria University of Applied Sciences, the Institute of Atomic and Subatomic Physics as well as business representatives met to discuss Research at Fachhochschulen.

At its 52nd meeting, the Austrian Council issued instructions to put the topic of research at Fachhochschulen back on the agenda so that the Council's position on this question could be discussed. Further bilateral talks will be held.

The current preference within the FH sector is for a bottom-up model. Decisions concerning locations, profiles and the size of degree courses are not based on long-term centralised planning. As a result, the system is very flexible. Decentralised initiatives on the part of potential supporting organisations are only retrospectively coordinated. As a result, the sector has no strategic orientation.

This flexibility and the way in which Fachhochschulen are funded (funding for places but no general funding), means that the individual institutions are compelled to redefine themselves rapidly in order to respond to changed demands on the part of the supporting organisations or students. Without a strong long-term commitment on the part of the supporting organisations, FH expansion remains remain extremely risky. As a result, both the sector as a whole and the individual Fachhochschulen are rather small compared to the universities.

These characteristics have varying and sometimes even contradictory effects on research and teaching. For example, the focus on regional needs, without at the same time consistently ensuring supra-regional and international links, can lead to significant competitive disadvantages in research. This is not true to the same extent in relation to excellent teaching.

In connection with safeguarding and increasing research activities at Fachhochschulen, the supporting organisations also emphasise the need for basic funding provided by the federal government, something that has been lacking so far.

The opinion-forming process on this issue will be continued in 2009. However, it is already becoming clear that the FH Act needs to be amended soon.

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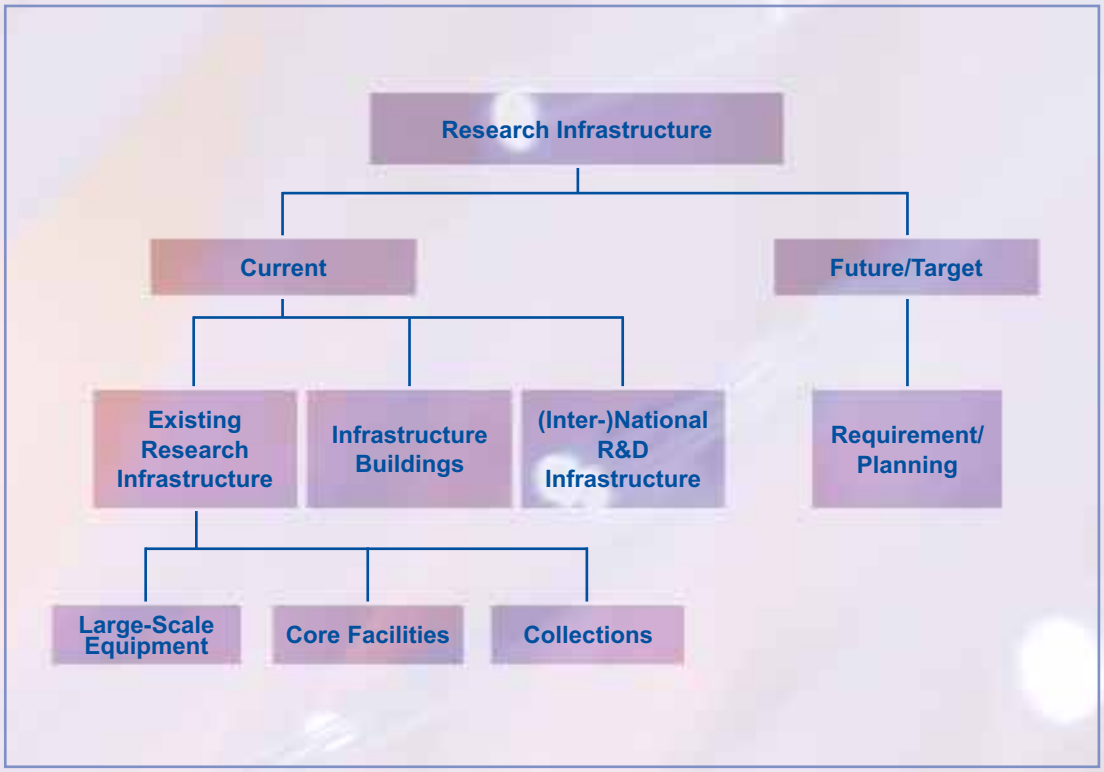
Research Infrastructure

R&D infrastructure is a key determinant for the performance of an innovation system. The international trend is for RTI infrastructure to be increasingly perceived as a variable in its own right, which requires separate consideration just like other determinants of a country's national innovation performance such as human resources, financing or instruments. The importance of R&D infrastructure as a key factor for successfully positioning the European Research Area has also been recognised at the European level. This is underlined not least of all by two comprehensive initiatives for large-scale infrastructure that are of pan-European interest: "Trends in European Research Infrastructure" of the European Commission in cooperation with the European Science Foundation, which focuses on ascertaining the current status, and the "European Roadmap on Research Infrastructure" of the European Strategy Forum on Research Infrastructure, which is drawing up an outlook for the future. The Austrian Council has in the past intensified its focus on this topic and also issued a number of recommendations.

Unlike other components of the innovation system that are crucial to its success, there is no comprehensive nationwide survey and analysis of this important indicator pertaining to the Austrian research profile, especially where coverage of generally accessible R&D infrastructure at companies and in the non-university sector is concerned. This type of database on orders of magnitude, research disciplines, geographic distribution etc. makes a significant contribution to a better understanding of the Austrian research landscape and offers an important basis for targeted RTI policy measures. For this reason, it was also the subject of a study commissioned by the Austrian Council (see page 45).



R&D infrastructure is an indispensible basis for cutting-edge, internationally prestigious research. Due to the unique nature of the services it provides, it is an important resource for strategically positioning individual organisations and the entire research location alike. A high-quality infrastructure is a strong "pull" factor for leading Austrian and international scientists. Moreover, it forms the basis for unique services for science and industry, and thanks to day-to-day operations and associated projects, is an important engine of employment. There are three different infrastructure levels that are of importance for the innovation system:

1. International participation in R&D infrastructure
2. Cutting-edge research infrastructure in Austria
3. Basic research infrastructure in Austria

International Participation in R&D Infrastructure

Without participation in international research infrastructure, Austrian science and industry will only ever attain second rate status. Cutting-edge research requires links with international R&D infrastructure in specific key thematic areas. Furthermore, there are niche areas in which Austria can play a leading role in European R&D infrastructures. It is also important to build up large-scale infrastructure facilities in thematic niches that possess international potential; however, redundancies at the national level must be avoided.

Cutting-Edge Research Infrastructure in Austria

Participation in, and above all the creation of, international R&D infrastructure in Austria also has an impact on Austria's overall importance as a location for science and research. To date, the Austrian funding sector has coordinated the topic of R&D infrastructure to only a limited degree. Instead it is dealt with at differing levels by differing organisations within the framework of a variety of different initiatives and programmes. The existing programmes and initiatives tend to cover costs in the early phases of the infrastructure lifecycle, i.e. planning and acquisition costs, and less the running costs, costs of data archiving or expenditure on plant replacements.

Basic Research Infrastructure in Austria

The poor quality of basic infrastructure is also problematic. Basic research infrastructure at universities and non-university research establishments is generally only partially covered by the core or performance budget. Resources from core funding are also frequently used for purchasing special equipment as there are no adequate alternatives available. In terms of basic infrastructure, universities are, on average, underfunded and poorly positioned in an international comparison. Basic infrastructure is distributed between institutes very differently and frequently subcritically.

Additional funding is usually obtained within the framework of research projects financed by the FWF or the European Commission. In addition to the Seventh EU Framework Programme, at the national level companies mainly avail themselves of the general programmes of the FFG, as only the university sector has a funding pot specifically for R&D infrastructure (university infrastructure programme, key area raising the competitive profile). The current project-focused nature of funding structures has a negative impact on the development of RTI infrastructure.

To sum up, there is generally no systematic approach to the financing of large-scale R&D infrastructure, which is frequently funded through stand-alone solutions and special programmes. Large and more long-term projects usually fall victim to a "project mentality" or a lack of willingness to cooperate on the part of the users.

What is missing are suitable top-down approaches and contact persons with clear responsibility for research infrastructure in the bottom-up programmes. In terms of the strategic development of R&D infrastructure, balanced top-down and bottom-up strategic approaches are needed. A roadmap should be drawn up to provide a long-term focus.

Excellence and Risk: Implementing the Strategy for Excellence

With the presentation of its Strategy for Excellence in 2007 the Austrian Council successfully secured a place for excellence on the RTI policy >

agenda. As the publication of the strategy document was positively received, it was assumed that the recommendations would be adopted and implemented by those in positions of political responsibility.

In 2008 the Austrian Council followed up by investigating the extent to which these recommendations had been implemented. The Strategy for Excellence contained forty recommendations. One year after the adoption of the strategy document these were also subjected to a systematic evaluation. This focused on whether a recommendation had already been implemented or not. The result of this status survey shows that three recommendations have been implemented, 17 are in the process of implementation and 20 have not yet been implemented.

Based on this result, the Austrian Council will examine those recommendations that have not yet been implemented and if necessary incorporate them into Strategy 2020.

Start-ups

The macro-economic importance of young, innovative and growing companies lies both in their contributions to employment and value creation and in the indirect effects associated with them. Start-ups and companies that use innovation to bring new and improved products and processes onto the market increase product differentiation as well as the diversity and quality of goods and services. Innovative new entrepreneurs open up market niches, identify new markets or find new solutions for familiar markets. By defi-

nition they contribute to structural change and, within the overall context of start-up activities, also have relatively good chances of achieving sustainable employment growth and creating value. By now there is no disputing the link between business start-ups and economic growth. Despite the pleasing development in recent years – the number of companies engaged in research and development has grown in almost all business sectors – Austria still suffers from a structural deficit in the form of a comparatively low level of specialisation in dynamic, technology-orientated industries. In the long term, this structural deficit can harm the growth prospects of the Austrian economy.

Against this background, the Austrian Council for Research and Technology Development has in the past already emphasised the importance of actively supporting start-up activities. A commitment to provide public sector support is needed because in an international comparison Austrian start-up activities still have deficits in respect of technology and knowledge-intensive start-ups, especially in terms of the actors' willingness to assume risk, but also in terms of the structural framework.

The differing demands involved with starting a new company and coping with the first growth phases, as well as a complex funding environment, often present potential founders and young entrepreneurs with seemingly insoluble problems. Over the last decade, the public sector at both the national and regional level has established a host of funding and support schemes designed to improve start-up dynamics. The forms of support differ in terms of their content (e.g. legal matters, financing, marketing, intellectual property), depth of advice and service (information, tools, support with implementation), duration of support (from a few hours to more than eighteen months) and the costs and the amount of funding that can possibly be awarded to founders and young entrepreneurs.

Within the framework of a study on Austrian start-up activities commissioned by the Austrian Council and subsequent working group discussions with relevant stakeholder groups, the efficiency and interaction of support measures was studied within the framework of a comprehensive analysis of start-up activities, and recommendations for their optimisation were issued. The key question that needs to be answered is how those in positions of political responsibility can shape the framework conditions to ensure that they are conducive to promoting the establishment of knowledge and technology-intensive companies and thus expanding the R&D base of the Austrian economy. The following five areas of action and related recommendations (see page 21) for improving start-up dynamics were identified: Education and further training, the interface between science and industry, financing, social perception and the data base.

Austrian Research Dialogue: Visions for Austria

At Alpbach 2007 Johannes Hahn, the Minister of Research, called upon the Austrian research community and all those with an interest in science and research to collect ideas for positioning Austria as an attractive location for research and science by 2020.

The **Austrian Research Dialogue** was a one-year, broad-ranging discourse and consultation process involving more than 2,200 participants. Events in a variety of formats (a total of 18 dialogue forums, fireside talks and joint ventures) were held at locations throughout Austria and three online discussions were also organised. The Austrian Research Dialogue covered a wide range of topics, the relevance of which was first evaluated by means of an online survey and then focused by specialists from the various areas. The Austrian Research Dialogue was also designed in a way that would permit important regional topics and concerns to be included in the RTI Strategy 2020. The Dialogue was carried out in cooperation with the Ministry of Transport, Innovation and Technology, and the Ministry of Economic Affairs and Labour.

The Austrian Council took part in the following Research Dialogue events:

- On 8 April in Salzburg on "New Models in Research and Innovation: The Integration of the >

Humanities and Social and Cultural Sciences." The Austrian Council also presented its study on the humanities, social and cultural sciences here.

- On 17 April 2008 in Krems on "Women in Science, Research & Technology."
- On 19 May 2008 a Dialogue Forum took place in Innsbruck on "Basic Research on New Paths" at which Prof. Bonn gave a keynote presentation on the topic "Basic Research – Prerequisite for Successful Science and Technology Development."

A comprehensive documentation – including the contributions from the Austrian Council – can be found at http://www.forschungsdialog.at/.

The aim was to motivate all the actors and opinion makers who are of importance for this process to actively participate in the Dialogue and also to obtain an outside perspective using a peer review procedure. To this end, European experts – members of the European Union Scientific and Technical Research Committee (CREST) – were invited to Austria and involved in the process of generating ideas.

The following overarching areas of action were identified as being relevant for the further development of the strategy:

- Focus upon human resources as the basis of our future prospects
- Expand world class basic research and infrastructure
- Safeguard institutes of higher education for the knowledge society
- Launch a new "excellence initiative"
- Promote research in the service of society to solve the "grand challenges"
- Use the interaction between science and industry to make Austria a more attractive location for research
- Support successful companies with good framework conditions for research
- Give a Austria a better profile in the global research environment
- Improve the efficiency and effectiveness of the research system

To realise these areas of work, the Minister wishes to maintain the discussion at the high level at which it has been conducted in the past and also incorporate the Austrian Council, Parliament, the Austrian Science Council and other important actors. As part of this process, institutional reforms that have already begun at research establishments and funding agencies should be continued.

System Evaluation

In its Strategy 2010 the Austrian Council called for an inter-ministerial analysis of the entire RTI funding system and in 2007 at its 45th meeting reiterated the urgent need for this type of system-wide analysis.

The BMVIT subsequently picked up this proposal and in autumn 2007 launched an international tendering process for the contract to evaluate the system. The contract was awarded to an international consortium led by the Austrian Institute of Economic Research (WIFO). The BMVIT and the BMWA act as the lead commissioning parties. The other ministries with research responsibilities and the Austrian Council were involved through the establishment of an advisory panel and a steering board. While the advisory panel ensures the strategic focus with the support of moderators, the steering board is responsible for preparing and monitoring the planned evaluation of the funding system in terms of content.

The analysis was completed in April 2009. In 2008 the work packages for the analysis of the framework conditions, governance, indirect and direct research funding, RTI institutions, target groups and user behaviour were completed. For this purpose, existing evaluation results were supplemented by two surveys to obtain primary data that would enable an assessment of the funding system from the perspective of both companies and research institutes. To this end, a questionnaire was sent to approximately 6,000 companies and some 1,400 scientific institutes, degree course organisers, non-university research establishments and competence centres.

The first preliminary results of the system evaluation were presented to the public by Minister Werner Faymann in August shortly before the

Alpbach Technology Forum. The central theme was the extent to which companies of different size categories actually avail themselves of different types of indirect research funding instruments. The following core findings were reported:

- An increasing number of companies – especially SMEs – have made use of indirect funding measures in recent years.
- The volume of tax-incentivised research promotion is lower than originally assumed by the Ministry of Finance.
- Indirect research funding measures safeguard the quality of research on a broad level, while direct funding instruments strengthen excellence at the top.

In October, the contractors presented the latest interim results of the evaluation process at a meeting of the advisory panel. The first three modules to be completed (the political-strategy level, instruments and participants) were presented, in particular the results of the survey of the corporate and scientific communities.

As this information is exclusive status information intended for the members of the advisory panel, it is not yet possible to publish these results at this point. Neither is it possible to draw conclusions at the political level; these are expected for the first quarter of 2009. A detailed report will be provided in the Annual Report 2009.

ICT-R&D Strategy

ICT – Dynamic Economic Driver with Huge Potential

The Austrian ICT industry is the "lifeblood of the economy." With total revenues of EUR 27.15 billion (2005) and a production value of EUR 18.39 billion and employing 110,000 people (5,800 of whom in R&D) this branch of the economy is one of the most dynamic.

In 2008 the Austrian Council and the responsible ministries BMVIT, BMWA und BMWF initiated the process of developing an inter-ministerial strategy for the period up to 2020. The specific objective: To become one of the 3 leading EU states in terms of the R&D intensity of the corporate sector – and join the international front-runners among the ICT nations by 2020. In detail, this involves continuing to promote national strengths, recruiting sufficiently qualified researchers and implementing a suitable framework for boosting the innovative capability of companies and public institutions alike. One of the central requirements of the ICT-R&D strategy is that Austria be positioned with a clear profile as an attractive location for ICT research. This is the only way that we will be able to recruit highly qualified researchers who will further strengthen the innovative capability of companies and public institutions.

Based on the insights gained from a preliminary study of the Austrian situation in this area that was completed in 2007, five main areas of work were identified and working groups set up to tackle them (see page 17 of the ICT Strategy). Depending on the particular field of action, the working groups included representatives from the responsible ministries and other relevant institutions such as Universities Austria, the funding agencies, the Federation of Austrian Industry, WKO, associations, industry and research establishments, .

The Technology Forum in Alpbach was an important milestone in the strategy process as the interim results were presented to a wider audience here on a web platform.

The ICT-R&D Strategy 2020 was adopted on 28 October at the 53rd meeting of the Austrian Council and presented to the public in November at a press conference.

Energy: Strategic Coordination Initiated

After the Austrian Council issued a recommendation in 2007 supporting the energy research programme jointly put forward by the ministries of infrastructure and economic affairs, an additional player was established in the Austrian funding environment in the form of the Climate and Energy Fund (KLI.EN).

As KLI.EN had already disbursed almost EUR 50 million for energy research in 2007 and planned to distribute a further EUR 150 million >

in aid of the energy research programme New Energies 2020 (NE2020) recommended by the Austrian Council, the Council felt compelled to focus more intensively on KLI.EN. The result was a catalogue of questions addressed to KLI.EN, the FFG and responsible ministries with which the Austrian Council hoped to gain an overview of energy research-related activities.
Based on the responses from these organisations, the Austrian Council eventually organised a workshop that was held on 26 May 2008. The aim was to bring all those involved in the KLI.EN programme line NE2020 to the table to discuss the problems that had arisen and develop solutions.
The workshop's main conclusion: An overview of energy research in Austria is needed that can form the basis for drawing up long-term strategic guidelines. Without this overview and a joint strategic orientation there can be no coordinated funding policy in the field of energy research. The Austrian Council thereupon took steps to develop these guidelines, the results of which will be incorporated into the development of Strategy 2020.

Research Studios Austria

The BMWA has been financing the pilot project Research Studios Austria (RSA) since 2002. As part of this project small, flexible research units (studios) were set up for selected topics in the emerging thematic area of information and communications technologies (ICT). Working closely with university institutes, they pick up knowledge generated in academic research and then develop it further until it can be brought to market. However, the Research Studios Austria, and in particular their organisational and structural design, became a subject of fierce controversy within the Austrian scientific community. In 2007 the Austrian Council therefore recommended that the Research Studios Austria be - refocused and established as a separate programme under RTD guidelines and operated by the FFG under the overall responsibility of the BMWA. The twofold aim was to achieve competition between the studio applications, which are managed by the FFG in the form of invitations to submit bids, and to ensure the transparent application of the regulations governing state aid required by the research framework of the EU, in particular for market-oriented activities. On the basis of these criteria laid down by the Austrian Council, a suitable concept for the programme was to be developed and subjected to an ex ante evaluation before being submitted to the Austrian Council for recommendation.
As recommended by the Austrian Council the BMWA, together with the Structural Programmes division of the FFG, drew up a draft programme for the restructuring of the Research Studios Austria.
The programme is managed by the Structural Programmes division of the FFG. The first call for the Research Studios Austria programme ran from 29 February to 30 April 2008. A total of 36 studio applications were received, 14 of which were recommended for funding by an independent jury and then approved by the BMWA. The volume of approved federal funding amounts to roughly EUR 9 million, with a total project volume of approximately EUR 13.2 million. The programme is scheduled to run until the end of 2013.

RTI Platform Austria

On the initiative of the Austrian Council, cooperation between the federal government and provinces was placed on a more professional footing at the end of 2006. The RTI Platform Austria is designed as a meeting of permanent representatives of the provinces, the funding agencies (AWS, FFG, FWF) and the Austrian Council who gather twice a year to discuss issues relating to the content and structure of research, technology and innovation policy. The participants were nominated by the respective ministers and provincial governors. In accordance with a rotation principle, each province hosts the Platform once before it moves to Vienna for the next meeting.
The purpose of the Platform is to facilitate systematic and regular cooperation between federal and provincial representatives of the research,

technology and innovation funding sector. The clear intent is to develop joint activities and projects that will benefit all participants and partners and, as far as possible, to formulate a nationwide coordinated approach to research, technology and innovation support. A core element is the exchange of insider information that is not available in this form, or at such an early date, to individuals who do not belong to the Platform. This maximises the benefits and thus ensures the sustained commitment of the members to participating in the Platform.

The Platform in 2008

The first meeting in 2008 took place on 8–9 May in Salzburg at the invitation of Salzburg Research. Due to the political situation, the second meeting was postponed from November 2008 to January 2009 and took place in Dornbirn at the invitation of WISTO.

The discussion in Salzburg focused on the humanities, social and cultural sciences, which are a key area of strength of the host province. The Austrian Council used the occasion to present its humanities, social and cultural sciences study and the recommendations based on it in order to obtain feedback from the participants as to the feasibility of the proposals, especially from a regional policy perspective. Another point was the ongoing strategy process for the ICT research and development strategy jointly developed by the Austrian Council, BMVIT, BMWA and BMWF (see page 17). Besides a progress report on the strategy development, the main concern was to >

From left to right: Siegfried Reich (Salzburg Research), Birgit Strimitzer-Riedler (Styrian Provincial Government), Erich Prem (eutema), Gerhard Kratky (FWF), Constanze Stockhammer (Austrian Council), Johann Binder (Technologiezentrum Burgenland), Irma Priedl (Lower Austrian Provincial Government), Hans Schönegger (KWF),Gerald Hackl (Trigon), Helmut Steurer (WISTO), Ludovit Garzik (Austrian Council)

actively involve the provinces and their respective ICT funding activities through the participating provincial representatives. Given the strong regional foci in this area, activating the Platform proved to be an urgently needed and highly effective course of action.
Much the same can be said with regard to the Austrian Council's planned human resources strategy. Following the presentation of the preparatory study on this topic commissioned by the Austrian Council, the members of the Platform were asked for their input for the Council Strategy and the possibilities for cooperation across provincial boundaries were discussed.
The meeting was concluded with a further discussion of the future of the RTI Platform Austria.

Possible Further Development of the RTI Platform Austria

The starting point for the discussion was the way in which the Platform is currently used to present funding schemes and other RTI policy measures planned by the government and the provinces. The initiators of such programmes are able to obtain feedback and information regarding similar initiatives from the governmental and provincial representatives on the Platform.
As the next step – and this would require an amendment of the statutes – it was proposed that the RTI Platform Austria be established as a provincial advisory board. This advisory board could address enquiries or assignments to the Austrian Council with a view to bringing the results generated in the Platform to the next level of implementation as Council recommendations. Conversely, enquiries to the Platform from other institutions could be submitted via the Austrian Council to the advisory board which would then reply by making proposals.
A systematic exchange of information in the form of a proactive clearing office was also discussed as a means of ensuring and optimising the Platform's important information function. This clearing office could approach the Platform participants at regular intervals to obtain information concerning a wide range of RTI policy measures. This information could then be bundled, structured and prepared for distribution to all members of the Platform.

Long Night of Research

Three years have passed since the first Long Night of Research. But on 8 November 2008 it was finally able to celebrate its continuation. This large-scale event is modelled on other Long Nights and aims to give the Austrian populace a deeper understanding of science and innovation in an exciting and informative way. At six locations in six provinces, visitors were bussed to the research facilities of the participating institutions from science and industry. At these "stations" young and old had the opportunity to watch researchers at work and conduct the one or other experiment themselves.
For the research institutes, on the other hand, the evening was a good opportunity to introduce themselves and their achievements to a wide audience and attract potential young talent – a win-win situation for all parties.
Drawing more than 15,000 visitors, the first Long Night of Research in 2005 was the flagship project of the dialogue programme "Innovatives Österreich" that can essentially be traced back to an Austrian Council recommendation made in 2001 and which, in its second phase, lasted until the end of 2006. Despite repeated urging by the Austrian Council to continue "Innovatives Österreich" beyond 2006, a lack of agreement among the responsible ministries unfortunately meant it was impossible to continue the biggest awareness campaign in Austrian history. "Innovatives Österreich" had succeeded in bringing together the fragmented system of research policy awareness measures and giving it a single profile in the form of a common brand. It was, therefore, all the more important to the Austrian Council that at least the highly successful Long Night of Research had taken place again this year. What is particularly pleasing is that the addition of a further four participating regions has given broader exposure across the country. While in 2005 the three cities Vienna, Innsbruck

and Linz took part, this time Graz, Salzburg, Klagenfurt and Wiener Neustadt also joined in. Linz had early on committed itself to the European Researchers Night, but in principle wishes to take part in the next Long Night of Research.

At the University of Vienna, the Chairman of the Austrian Council, Knut Consemüller, together with the Minister of Science, Johannes Hahn, opened the Long Night by symbolically opening the doors punctually at sunset at 16.25. Behind them, the throngs of visitors were already streaming towards the scene of the action to engage in a little research themselves, e.g. gold-plating cent coins in a sulphite bath, or learning how stem cells heal wounds or how quantum cryptography can be used to encrypt video messages. The highlight for all the younger visitors was a "Research Rally" organised by the physicists.

As well as the university, the main hall of the Academy of Sciences also provided a setting for the Long Night of Research. The emphasis here was upon research accomplishments in the humanities, social and cultural sciences – ranging from the Byzantine Empire to court proceedings from the 14th century that could be interactively explored.

After an exciting Long Night the Chairman of the Austrian Council applauded the quality of the event. He also expressed his delight with the huge number of visitors who had even outnumbered those at the first Long Night of Research. With even more locations and more visitors it was a superlative night. Over 1,000 researchers in six locations ran 375 stations that were visited 240,000 times. This success story should definitely be continued. The momentum and enthusiasm that were generated here must be carried forward unchecked by political consensus-building processes. In the view of the Austrian Council, the Long Night of Research must become a key fixture in the scientific calendar! ■ >

Basic Expertise: Reports and Studies 2008

Humanities, Social and Cultural Sciences: The Structural Fragmentation of the Research Landscape

In order to obtain an overview of the situation of the humanities, social and cultural sciences in Austria, the Austrian Council commissioned a study to take stock of research and working conditions and also analyse the quantitative and qualitative structure of these disciplines. In particular, the survey focused on the links between funding policies, human resources and career opportunities as well as on key research areas and forms of cooperation between university and non-university research institutions. Ultimately, the aim was to draw up measures to safeguard expertise and provide strategic support for scientific excellence in the humanities, social and cultural sciences.

The survey comprised a quantitative part (a database containing a list of the institutes, their funding, legal status, main research areas and staff), a qualitative part (guideline-based in-depth interviews with proponents from the scientific communities) and a collection of international examples of research policy practice in the humanities, cultural and social sciences.

The study revealed that, as things stand at present, there are 583 institutes in Austria working in the humanities, social and cultural sciences. Of these, 272 are university departments while 306 are institutes from the non-university sector. The latter include 36 institutes of the Austrian Academy of Sciences (ÖAW), 17 institutes belonging to the Ludwig Boltzmann Gesellschaft (LBG) and 253 other non-university institutes. These 583 institutes employ 7,859 members of staff in research-related positions (5,334 at university institutes: 2,525 at non-university institutes).

The ratio between the number of employees and institutes is an indication of the dominance of small structures, especially in the non-university sector. The average number of scholars engaged in research and teaching at one of the 272 university institutes is 19, while the average figure at the 306 non-university institutes is between eight and ten.

In terms of legal forms and financing, the institutes belonging to the universities, the Austrian Academy of Sciences and Ludwig Boltzmann Gesellschaft are integrated into the relevant legal and budgetary structures, while the majority of the many non-university institutes are constituted as non-profit organisations. There are a small number of GesmbHs (limited company) or OGs (partnerships), although institutes with these legal forms tend to be found in the social sciences – and there mainly in the sphere of application-orientated, policy-advisory activities. More rarely, institutes are organised as foundations, in most cases in the humanities and cultural sciences.

In as much as financial details were disclosed, they showed that external funding for the universities and the Academy of Sciences is generally obtained from the Austrian Science Fund (FWF), from thematic funding programmes run by the ministries or from EU programmes; in exceptional cases, research is also financed by means of direct government contracts or, especially at universities in the provinces, contracts awarded by local government. The institutes of the Ludwig Boltzmann Gesellschaft, especially those founded after the structural reform of 2002, contribute an agreed amount of co-financing. In individual cases, German foundations act as additional sponsors for basic research in the humanities, social and cultural sciences in Austria.

Basic subsidies in varying amounts and for differing periods (in rare cases in the form of "standing orders") from funding bodies usually cover the costs of at least the infrastructure of 50 % of the other non-university institutes. However, due to the conflicting nature of the available information, this figure is only a very rough estimate.

Interest groups, other NGOs, companies, political parties, provinces and municipalities are also important sources of funding for application-orientated research in the humanities, social and cultural sciences but offer no guarantee of continuity. Thus the structure of financing, in particular of the other non-university institutes, can be described as a patchwork of diverse funding bodies.

Basic research at the other non-university institutes is also, if resources allow, funded through EU projects or, more usually, by the research programmes and funding schemes operated by the relevant ministries. Much more rarely than is the case at the universities, the FWF also funds the other non-university research institutes.
The Jubilee Fund of the Austrian National Bank is no longer relevant as a source of funding for the humanities, social and cultural sciences; according to representatives of the scientific communities it would be difficult to obtain funding for urgently needed basic research. In the qualitative interviews, the funding bodies in Austria were generally adjudged to lack faith in the research activities of the humanities, social and cultural sciences, and in the relevance of existing and new research topics. The orientation toward the impact criteria used in the natural sciences, a lack of willingness to take risks, as well as the reactive and retrospectively orientated award of funding, hamper advances in terms of content and methods, and also the opening up of new areas of research.

Human Resources: Study Shows Urgent Need for Action

Within the framework of its audit of Austrian research policy the National Audit Office recommended, among other things, examining whether Austria has the personnel and not just the financial resources required to achieve ambitious research quotas. The Austrian Council therefore commissioned Dr. Marita Haas from the Faculty of Economic Sciences of the University of Vienna to carry out a comprehensive study of the literature on "Human Resources in Austria."
On the basis of a comparison of supply and de- >

mand in relation to personnel in Austria, the meta-study presented in February 2008 showed that sectoral changes, the impacts of globalisation and the development of the Austrian economy to a knowledge-based economy, require an increasing number of university graduates. In the next 18 years, demand for science graduates is expected to rise five times faster than overall employment growth. Nevertheless, the number of individuals who complete tertiary education is too low to meet this demand. This increased demand is not just for Austrian males, who traditionally tend to work in technical professions, but also for female graduates and well-educated immigrants.

In the Austrian **education system**, the small proportion of university graduates was shown to be a problem. This is attributable to the equally small proportion of high school graduates but also to high drop-out rates at institutes of higher education. At the same time, the entire education system is characterised by a high degree of selectivity that follows the principle of status reproduction. Statistically, those social strata with poor educational opportunities have few chances of completing higher education. This situation is aggravated by the lack of permeability of the school system and the resulting difficulty in catching up with missed qualifications at a later date. When choosing a scientific career doctoral students come up against financial and organisational limits. Universities offer no uninterrupted career paths for scientists and young scientists are not very well integrated in the early phases of their scientific work.

With respect to **Gender**, it became clear that long-term preferences on the part of girls and women lead to specific educational and vocational choices which then have negative consequences for the technical sectors in particular. It is still the case that society's image of technical professions is that of male dominated professions. Women are also rarely to be found in the sciences. This is partly attributable to the traditional role models in which women take care of children and the family while men are the breadwinners. On the other hand, academic life is highly demanding, as career advancement is closely linked to the number of publications and years of scientific experience. Thus discontinuous career paths – which mainly affect women – automatically put them at a disadvantage in relation to their male colleagues.

The analysis of **Migration** showed that the desire for highly-qualified personnel cannot currently be met by either past or future immigration. Immigrants of working age already living in Austria have a significantly lower level of education than the Austrian comparison group. This is then aggravated by inadequate language skills. The aforementioned selectivity of the educational system and the lack of early support measures leave immigrants permanently at the bottom of the social ladder. Furthermore, there is no integrated strategy or suitable framework for current or future efforts to attract well-educated individuals to Austria. It is still the case that administrative and legal hurdles as well as the perceived xenophobia deter foreign academics from relocating to Austria. Social awareness of the need for an open and multi-cultural economic and scientific environment is still largely lacking.

On the basis of these results, a human resources strategy was developed consisting of five strategy fields, 13 lines of action and 39 measures.

- The first strategy field "Educational and Training System" comprises two lines of action and seven measures. These aim to make university careers more attractive and increase the number of graduates from the tertiary education sector
- The second strategy field "Women in Research and Technology" also has two lines of action as well as five measures designed to increase women's preferences for careers in science and technology and improve conditions in these areas
- "Mobility", the third strategy field, is defined by three lines of action and ten measures. The core topics are the mobility of the education and training system, the development of a brain-gain strategy and improved framework conditions for experience gained abroad
- The fourth strategy field "Lifelong Learning" focuses on the learners and defines rules for companies and education providers. It includes three lines of action and eleven measures

- "Public Awareness for Austria as a Knowledge Base at Home and Abroad", the fifth strategy field, is intended to build up qualified human resource capital. It comprises three lines of action and six measures. These focus on improving location marketing and making Austria more attractive for highly-qualified international employees. Continuous monitoring of the international location rankings is also required

Communication Under the Microscope: Comparative Country Report "Governing Science and Society"

The penetration of all areas of life by scientific knowledge as well as rising levels of public spending on science and research make it necessary to reflect upon and reshape the relationship between science and society.

The Austrian Council therefore commissioned the agency Science Communications to analyse existing models of steering and supporting RTI communication in selected countries and to compare them with the situation in Austria within the framework of comparative report.

The core messages of the comprehensive study that was presented in June 2008 are:

- As "Innovatives Österreich" came to an end in 2006 and has not been replaced, there is now a lack of centralised coordination, networking and support for measures in the area of science and RTI communication
- A comparison with Germany, Switzerland and the United Kingdom shows that one of Austria's most conspicuous deficits is the lack of a differentiated landscape of national programmes and players as well as an underdeveloped culture of public debate on questions pertaining to the "techno-society"
- Official rhetoric in the political discourse is dominated by the terms "promoting acceptance" and "promoting young scientists." Despite repeated calls for a dialogue with society, in practice there is a discrepancy between the rhetoric and reality. The emphasis is still very much upon "selling science"

In the countries studied by Science Communications, private sponsoring and fundraising, but also foundations, contribute significantly to funding science communication. This contrasts with the situation in Austria, where such funds are provided almost exclusively by the state; there is no legal framework for foundations. Political decision-makers are therefore called upon to take a lead with regard to financing and the development of dynamic financing models. In the opinion of Science Communications, private sector funding in the form of sponsoring, private public partnerships or collaborative fundraising can only be tapped on a relevant scale on the basis of comprehensive and sustainable structures.

It should be noted that in the area of science education, which is of eminent importance for "Science/RTI and Society", the development of new forms of tuition and learning in the comparison countries is increasingly geared to educational concepts such as "real science", i.e. a form of learning that is akin to the real-life research process. Activities at the interface to schools have also been successfully developed and expanded in Austria since 2000. Furthermore, the money that has been freed up by the ending of "Innovatives Österreich" has increasingly been deployed in the area of science education – not least of all because of a growing political awareness of the importance of building the next generation of scientists. However, it is frequently overlooked that young scientists cannot be cultivated by means of selective measures, but only by generally improving science education and the powers of judgement of all those participating in education. Science Communications therefore takes the view that future activities should increasingly be geared to new educational concepts, such as "research-based learning", and their integration into school curricula along the entire educational chain. One of the crucial keys to a competitive knowledge-based society is scientific literacy or scientific citizenship.

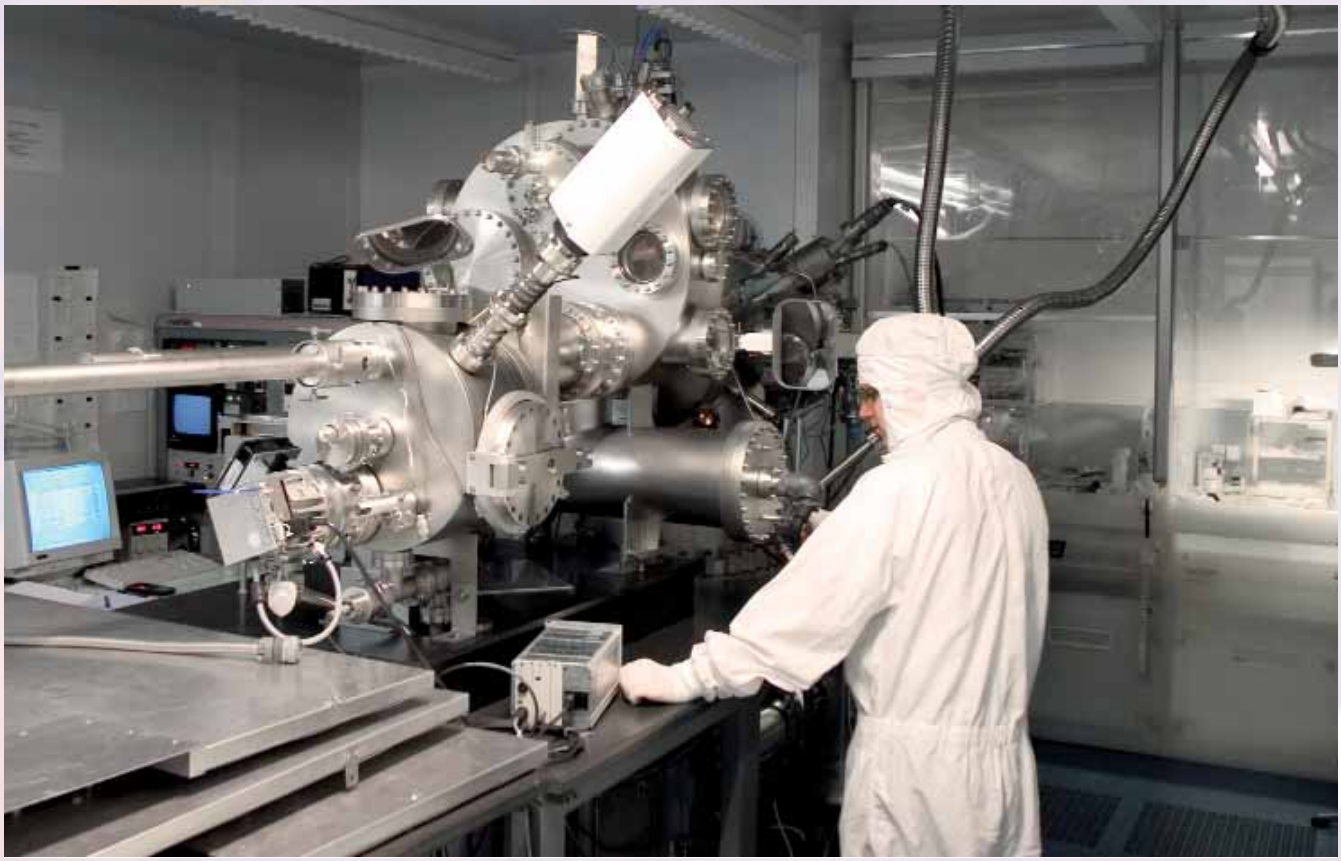
Finally, the report drew attention to the fact that Austria has only a weak tradition of consultation and dialogue processes in regard to science and technology policy. In view of the deep scepticism about research and technology among broad >

sections of the population and the strong influence of populism on opinion-forming, experience in this area is highly relevant. The development of new forms of citizen involvement and participation should be firmly established as political objectives and the interaction between government, parliament, research, communication and civil society improved.

For a New Partnership: Report: "Science and Society – Relationship, Impact, Involvement"

In addition to the comparative country study on RTI Communication carried out by Science Communications, the Austrian Council also commissioned a study that reflects upon the dynamic, tense and complex relationship between science/RTI and society from the perspective of several scientific disciplines. Specifically, the views of science research, social scientific technology impact research, political science and the cultural sciences were examined.

It was discovered that the relationship between "Science/RTI and Society" cannot be reduced to the appropriate form of communicating information. On the contrary, it involves questions of representation, participation and legitimacy but also a debate on norms and values. This means that forms of communication and negotiation have to be sought that not only satisfy increasing democratic demands but which are also capable of assuming a translation function in cases where there are conflicting values. For in the relationship between science/RTI and society there a wide variety of tasks that must be tackled: Eliminating uncertainties, promoting acceptance,



reflecting on the ideas of experts about laypersons and vice-versa, transparently shaping the development of "relevant" questions, building trust, supporting the production of "socially robust" knowledge, fulfilling the criteria of good governance – in a nutshell: achieving a "democratic knowledge-based society" through greater and improved public participation.

The report shows that procedures in Austria for involving citizens and laypersons are rather thin on the ground and receive little widespread public attention. It also became clear that the path to a new "democratic knowledge-based society" requires structures that can assume a special bridging function between science/RTI and society. They should permit conflicts but encourage compromise and in this manner serve the needs of society and the preparatory stages of the political decision-making process. At the same time, an appropriate form of institutionalisation characterised by extremely close ties with the established institutions of representative democracy must be meaningfully combined with a willingness to experiment with methods of participation.

Foreign Funding: High Level of Dependence on Foreign R&D Funding

An extremely large, and therefore strategically relevant, proportion of Austrian R&D expenditure is financed from abroad. According to Statistik Austria, 19.5 % of total gross domestic spending on R&D in 2004 was raised abroad; by 2008 this figure had declined to 15.5 %. The majority of foreign funding goes to the corporate sector. A preliminary study carried out in 2007 by AMC Management Consulting for the Austrian Council estimated that between 60 and 65 % (2004) of all corporate R&D was subject to either direct or indirect foreign influence via funding. In 2008 this estimated high level of dependence was examined in greater detail in a second study. For this purpose, a special survey carried out by Statistik Austria investigated the extent to which research is directly commissioned by foreign headquarters and their influence on budget and coordination processes.

Statistik Austria estimated that in 2006 alone, foreign funding in the business sector (including EU funds) amounted to EUR 854 million or some 21 % of total expenditures. The new study calculated that if coordination processes in international corporations are taken into account, this figure rises by a further 15 %. Altogether, approximately 36 % (or EUR 1,450 billion) of R&D carried out in the business sector is steered and co-determined from abroad. The Austrian Council gave consideration to the consequences arising from this dependence on foreign funds when drawing up the Strategy 2020.

Growth Effects and Determinants of the Increase in Research and Development Expenditure of Austrian Companies 1995-2006

In recent years Austria has registered a sharp increase in total R&D spending relative to GDP. The corporate sector in particular has substantially increased its expenditures in recent years. In 2006 research expenditures in the corporate sector (business and collaborative venture sectors) as a percentage of GDP amounted to 1.7 %, more than double the figure in 1993.

However, the question as to the impact of R&D spending on economic growth and productivity remains largely unanswered. Up to now there have been almost no definitive research results available, neither is there much empirical evidence at the corporate level regarding the determinants of R&D activities. In view of the strong interest in this subject in Austria, the Austrian Council commissioned the WIFO (M. Falk, M. Hake) to carry out a study.

The study was supposed to answer two questions: What impact do research and development expenditures have on companies' growth performance and how can the factors that determine R&D activities be measured?

To answer these research questions, the study drew upon anonymised funding data provided by the Austrian Research Promotion Agency (FFG) and which was ideally suited for empirical analysis. Using econometric models, the key factors behind the growth in R&D expenditures and their >

influence on company growth were examined. The results show that company R&D intensity (defined as R&D expenditure as a percentage of turnover) has a positive impact on sales and employment growth. This effect can, to a large extent, be proven for all periods covered by the study and is intensified among newly founded and highly export-orientated companies.

The empirical results show that, depending on the period, an increase in R&D intensity on average leads to an increase in employment growth in the following two years. Panel estimates also corroborate the positive effects on growth of R&D expenditures, whereby the growth effects at small companies (1–49 employees) are marginally higher than at medium-sized and large companies (50 and more employees). Young companies (which at the same time have fewer than 50 employees) also report higher employment growth the higher the R&D intensity in the baseline year. Young companies lead the field in terms of employment dynamics with growth increasing in line with the research intensity at the company. The level of R&D intensity in the baseline year is also an important driving force for future employment growth at established companies of a given size. Although young companies account for only a relatively small percentage of total R&D expenditures in the random sample of companies with research activities, over time the percentage of R&D expenditure attributable to young companies has risen from 7 to 12 %. Companies that are engaged in research also boast significantly higher growth and employment dynamics than the economy as a whole.

One important result is that the dynamic growth in R&D spending in the individual size categories has continued unabated since 2000. Thus irrespective of their size, all types of companies have contributed to the overall increase in the R&D quota in the corporate sector. The results based on the FFG data also support the results of the R&D survey conducted by Statistik Austria, according to which, growth in R&D spending and R&D intensity has again accelerated since 2004. A relationship between economic development and R&D expenditures can also be observed at small and medium-sized companies (SMEs). On the whole, R&D expenditure shows relatively weak pro-cyclical fluctuations. Micro-companies are the exception, as growth in their R&D expenditures does not run parallel to the economic cycle.

As expected, export success goes hand in hand with R&D activities. Large companies (at least 250 employees) with an export ratio of 40 percent and more have an R&D intensity that is five times higher than companies that have no or fewer exports.

Proof of the positive growth effects of R&D activities is an important and necessary prerequisite for legitimising the funding of corporate research.

Start-ups

To survey the current situation in the research and technology-intensive start-up sector, Brimatech, a market research company specialised in technology-intensive industries, was commissioned in May 2008 to conduct a study that in particular addressed the current funding environment and the related drivers and obstacles for young entrepreneurs. The aim of the project was to collect and present data on the promotion of start-up dynamics in the R&D intensive sector as the basis for a more far-reaching Austrian Council recommendation for the overall optimisation of the RTI policy landscape. This recommendation was then adopted at the meeting of the Austrian Council on 9 December (see page 21).

The data was generated in an empirical survey of the Austrian start-up scene that asked respondents to identify problem areas and actions that could be taken to tackle them. As well as experts from the funding system and successful founders, entrepreneurs who had failed were also interviewed. The information obtained from these sources was analysed and documented in the form of a final report. Proposals for a catalogue of measures were also presented.

On 15 September a working group meeting was held at which the preliminary results were dis-

cussed with officials from the relevant ministries and stakeholders, and potential further-reaching support measures were identified. The study itself was completed in November and, together with the results of the working group, provides an important basis for a recommendation concerning support for Austrian start-up activities in the knowledge and technology-intensive sector (see page 21).

Research Infrastructure Survey

Against the background of the Austrian Council's previous recommendations, Austin, Pock and Partners were asked to carry out a study that would provide a highly consistent overview of the R&D infrastructure available both nationally and internationally to Austrian scientists, its capacity utilisation and anticipated future demand. This survey provides important input for the RTI Strategy 2020 that is being drawn up and a starting point for further proposed measures.

After sifting through the databases that are already available (at universities, ministries, funding agencies, in particular the FFG and FWF) and other sources of information (e.g. the current BMWF evaluation regarding "Vorziehprofessuren"[6] and the university infrastructure programme, ESFRI reports), a survey was carried out of the actual capacity utilisation of infrastructure and the anticipated development of future demand.

Within the framework of this analysis, the supply of relevant R&D infrastructure, as well as its national and international capacity utilisation, was examined with a view to assessing the extent of demand and how it would develop in future with a view to the strategy horizon 2020. As well as physical R&D infrastructure, intangible R&D infrastructure in the form of networks and associations was also included and analysed. Research units that were taken into consideration included centres of higher education, non-university research institutes and also companies which provide or use publicly accessible RTI infrastructure.

Given this current situation and the way it is projected to develop over time, the size, distribution and focal points of the target infrastructure for 2020 that are needed to safeguard Austria's attractiveness and its efficiency as a research location constitute an important element of the Austrian Council's RTI strategy.

Integrating Excellence and Risk in the Austrian Research, Technology and Innovation Landscape

The closer one operates to the technological frontier, the greater the importance of excellence, risk and radical innovation. For at the top end, progress is only possible through independent innovation; and a willingness to take risks and excellent advance work are the prerequisites for realising these innovations.

The study carried out by Hannes Leo examined the question of how excellence and risk can be reflected in scientific and economic policy instruments. In principle, it would, of course, be possible to introduce new programmes to support excellence and risk. This would certainly be in keeping with Austrian tradition and the Austrian Council also recommended this approach in its Strategy for Excellence. It would also be possible to introduce a bonus for excellence to be awarded to outstanding projects on the basis of a jury decision. For this, one would have to specify from which existing programmes the participants would come and how the selection mechanism and selection panel would be designed. This would be a suitable approach if the funding system were unwilling to reform and structures could only be supplemented (and thus made more complicated) but not streamlined.

The study advocates embedding incentive structures in the system and steering as little as pos- >

[6] Vorziehprofessuren are a mechanism designed to retain high calibre personnel under which a suitable candidate can be appointed to a chair before the position actually becomes vacant.

sible via specific funding measures. This approach does not make the direct science and technology funding measures superfluous but does attempt to focus their areas of application. Programmes to support science and the economy should not be a panacea for the failings of economic or science policy, although they have often been used as such in Austria. It was evidently simpler to create one or more funding schemes for each problem than to carry out the necessary reforms of the general framework for economic and science policy or efficiently manage inter-ministerial measures. In this systematic perspective, measures that embed excellence and more radical innovation strategies in the system are given preference over new funding programmes to solve problems that are the result of failures of economic or science policy. The basic recommendations aim firstly to incorporate clear quality criteria in tertiary education sector performance agreements and to steer these through university funding, and secondly, in the corporate sector, to change the economic framework conditions (competition laws, labour and product market regulation, macro-steering, environmental legislation, building regulations, risk capital) to such an extent that they support riskier and more radical innovation strategies. Changes to education policy, universities, competition policy, the regulation of product and labour markets and macro-economic steering not only increase innovation performance, they also make the business location significantly more attractive.

Systems of Basic Research – An International Comparison

In recent months, basic research in Austria has featured prominently on a number of occasions in the research policy discussion. This should be seen against the background of the fact that Austria's impressive catching-up process in terms of increasing its R&D quota is now well advanced, and that what for a long time was considered to be the very ambitious goal of spending 3 % of GDP on R&D, is now close to being realised. Austria's research quota is now above the average of the EU 15 (and the EU 27) and the OECD. As a result, the discussion of targets is now shifting to the individual types of research. At the same time, there is an information deficit as regards the present situation and policy systems in other countries. The study set out to contribute to this discussion by providing an overview of basic research-related goals, institutions and measures in a selected group of countries (Denmark, the Netherlands and Switzerland – which like Austria are all small, open economies with high levels of income and well-developed research and technology policy systems).

The study analysed the genesis of the basic research systems and the processes behind them in the selected countries. It also examined the research policy objectives, strategies and programmes, not just in retrospect, but also in terms of the outlook for the future (which concepts, goals etc. exist for the coming years). The research systems in the chosen countries were characterised along differing dimensions with basic research receiving particular consideration in each case. Basic research as a share of research expenditures, its structure, the distribution between basic research – applied research – experimental development, the focal points of basic research activities and institutional sponsors, for example, were described in greater detail.

The analysis was based on qualitative research (study of existing literature, strategy and policy papers etc.) as well as quantitative data (e.g. OECD). The role of (research) policy, its goals and guidelines were explicitly elaborated, and the strategies, programmes and measures that build upon them were identified.

In principle, there is no doubt about the importance of basic research. As what is essentially the "raw material" for the knowledge-based society, basic research forms the basis for technological change and consequently economic growth and ultimately for increasing potential prosperity. A sufficient volume of high-quality basic research is an indispensible element of a well-developed innovation system and functioning innovation infrastructure.

Survey of Demand for a Comprehensive Information System for R&D Policy

The growing importance of research and technology policy in recent years has been accompanied by an increased need for information about this policy area. The Austrian Council wanted to examine the question of which information is continuously available and whether it is suitable for meeting the specific information needs of key RTI policymakers. It also wished to examine whether there is actually a uniform need for a comprehensive and cross-sectoral monitoring of research and technology policy. Technopolis (K. Warta) was commissioned to carry out the study.

The study accordingly built upon an overview of existing sources of data and interviews with potential users of this data. These were then asked which information they need in their daily work, how they obtain it and whether they are satisfied with the supply of information in Austria. The results of the survey constituted the core element of this study.

The results of the interviews with decision-makers and experts did not reveal a need for a centralised information system or a basic restructuring of research and technology information (reports and data).

However, a need for action was identified on two levels in particular: Firstly, in the area of promoting a better understanding of research and technology policy information, secondly, in terms of a correct, but nevertheless user-friendly presentation of key information for individuals who do not have many years of expertise in the field, but who owing to their position need to be able to gain a rapid understanding of the most important key points.

Appraisal and Positioning of Austrian RTD Programmes and Initiatives with an International Focus

Austria has a wide range of instruments and initiatives to support the internationalisation of Austrian RTD. These are complemented by European programmes and measures.

In the area of internationalisation, the Austrian Council commissioned the Centre for Social Innovation (ZSI, K. Schuch) to carry out a study that would deliver a survey of the status quo and >

an analysis of the situation in Austria. The study describes and systemises the most important and innovative public sector measures. The analysis focused mostly on Austrian initiatives as well as upon programmes and other instruments that aim to promote RTD cooperation with third countries, i.e. all states that do not belong to the European Union. European measures – with the exception of the ERA-NETS, BILAT projects and INCO-NETS that are specifically geared to third countries – were not explicitly addressed in this study.

In relation to Austria, a summary was provided of the main approaches adopted by the ministries to internationalisation strategies for research, technology and development. In detail, a large number of Austrian RTD internationalisation instruments, current important and innovative measures and initiatives were described in terms of their mission, attribution to policy field, geographic scope, thematic focus, budget, implementation procedures and formats etc. Foreign RTD missions in Austria and Austrian state missions abroad that implement RTD-relevant agendas were also listed.

Here, some results of the study: The internationalisation of RTD is an important topic in many countries. There is a consensus that excellence in research is nurtured by competition between researchers, but also between countries seeking to attract the best brains. It is important in this context that administrations, funding agencies and university and non-university research institutions work together across national borders.
It therefore seems only logical to promote RTD cooperation with international partners. At the same time, however, research priorities and third-country partners must be carefully chosen and sufficient resources must then be made available – something which is not currently the case. Austria should, therefore, extensively use and support the European instruments and programmes for dialogue, joint learning and joint coordinated research endeavours.
Developing an effective strategy for international cooperation requires making a long-term commitment, reducing ad hoc actions and developing a strategy and institutionalised approach in terms of partners, instruments and financing. This would leave Austria well equipped and well positioned to meet the challenges of progressive internationalisation with appropriate strategies.
It is the intention of the Austrian Council to use this study to develop hypotheses concerning the strengths and weaknesses of Austria's international RTD policy and then encourage an exchange of ideas about them. ■

Internationalisation

Bilateral Contacts with Switzerland

From 7 to 8 February 2008 a delegation from the secretariat accompanied by representatives from the funding agencies and ministries visited institutions in the Swiss innovation system. Switzerland was chosen because it has one of the highest GDP per capita rates in the world. In nearly all indicators that describe science, technology and innovation Switzerland achieves absolutely world class values.

The following institutions were visited:

- Rat für Wissenschaft und Innovation (SWTR)
- Swiss Science and Technology Council (SWTR)
- Federal Office for Professional Education and Technology (OTEP)
- Swiss National Science Foundation (SNF)
- Swiss University Conference (CRUS)
- ETH Zurich Department of Macroeconomics, Innovation and Politics

Some of the lessons learned are:

- Once the political decision about programmes has been made, the agencies work completely independently.
- The closure of university institutes or study programmes is achieved through financing mechanisms
- Switzerland actively pursues internationalisation
- No infrastructure is financed from funding for applied research awarded by OTEP, an organisation that only supports universities
- The cantons have educational sovereignty and this is something that causes problems
- New law on universities adopted in autumn 2008, the law on research has been amended accordingly (research follows education)
- The Confederation funds two federal institutes of technology; other universities (10) and universities of applied sciences are funded by the cantons
- There is a shortage of human resources in the sciences, engineering and medicine

International Meeting of the National Councils in Warsaw

"Brain drain, brain gain, brain circulation": This was the motto of the international meeting of the national councils for science and research policy held on 16 May 2008 in Warsaw at the invitation of the Polish Research Council. The >

purpose of the meeting was to discuss the topic of human resources from the perspective of all the European councils and to develop a common position.

The greeting and opening addresses were given by Michal Szulczewski, Chairman of the Polish Council for Science, and Wojciech Tygielski, the Deputy Rector of the University of Warsaw, as the host institutions. The Under-Secretary of State from the Ministry of Science and Higher Education, Jerzy Duszynski, provided an insight into the Polish research and development sector. A round table discussion of current national developments in the various European countries represented at the meeting was followed by presentations on specific topics by Cornelis Mario Vis from the Directorate General for Research at the European Commission, the Human Resources Manager at Philips, Luc Holthof, and the head of the Institute of Social Studies of the University of Warsaw, Prof. Krystyna Iglicka-Okólska.

During the subsequent debate it emerged that the following key areas were regarded as crucial for the sustainable development of European human potential:

- Mobility between the sectors both within science and industry
- Supporting measures to make scientific careers more attractive
- Greater efforts to motivate and integrate women in research; especially in fields of science where they have been underrepresented in the past

One of the main items of discussion was the friction between those countries that fear a loss of human capital abroad and those that wish or have to absorb these people. It was agreed that a concerted approach is appropriate here and should be suggested to the relevant government ministers of the countries represented at the conference.

Vienna was chosen as the venue for the next summit meeting of the research councils. As the host of this meeting, the Austrian Council for Research and Technology Development will issue the invitation to the international council representatives for May 2009.

At present, almost all 27 members of the European Union have a body similar to the Austrian Council of Research and Technology Development whose purpose it is to advise the governments or responsible ministries on issues relating to research, technology and innovation policy.

CREST Peer Review: Input for the Council's Work

In May 2008, a group of experts from the European Union Scientific and Technical Research Committee (CREST) led by Ken Guy, subjected the Austrian RTI system to a peer review. The Country Report presented in August at the Alpbach Technology Forum is based on a visit by seven RTI policy experts from several EU member states and an observer from the European Commission. During their visit, they met and interviewed all major stakeholders and interest groups. The Austrian Council supported the peer review with its own contributions and in discussions. Finally, Austrian Council representatives participated in three working groups organised by the BMWF to discuss the conclusions for Austrian RTI policy that should be drawn from the recommendations of the CREST Report.

The Austrian Council believes the results of the peer review provide valuable information concerning current problem areas in the national RTI systems. The recommendations made by the CREST experts were discussed in detail at the meeting of the Austrian Council held on 9 September 2008. It was decided that the CREST results should be dealt with in preliminary work for Strategy 2020 and that this document should suggest appropriate measures.

Meeting of the Secretariats of the European Research Councils in Paris

On 7 November 2008 the meeting of the secretariats of the European research councils met in Paris at the invitation of the French Research Council. Besides providing an opportunity to exchange views and ideas about current national developments in Europe, the main purpose

of the meeting was to prepare for the forthcoming international meeting of research councils that will take place in Vienna at the invitation of the Austrian Council for Research and Technology Development. The preparations focused above all upon finding a joint topic. Following a discussion of the suggestions, the development of long-term innovation strategies in the light of the current activities of the Austrian Council and other ongoing strategy processes in other European countries was chosen. Edouard de Pirey, for example, from the French Ministry of Higher Education and Research, presented the French research and innovation strategy that is currently being developed. In a presentation on "Public Engagement in Science" at the European level, Dyonisia Lagiou from the European Commission DG Research emphasised the great importance the European Commission attaches to this topic. François de Coster, also from the French Ministry of Higher Education and Research, offered an insight into his country's RTI activities within the framework of the French EU presidency.

OECD Mission

From 2 to 5 December 2008 representatives of the secretariat of the Austrian Council attended two meetings of an OECD mission at the expert level that was examining Tertiary Educational Reforms and Research and Technology Policies. The mission was carried out as one of the annual fact finding missions but also as part of the preparations for a high-level OECD mission at the political level.

The working group "Tertiary Education Reforms" focused on seeking to explain the considerable discrepancy in an OECD comparison between the relatively high percentage of those completing secondary education (vocational and upper schools) in Austria and the more modest figures for the tertiary education sector >

From left to right:
Jerzy Duszynski
Michal Szulczewski
Karin Lochte
Wojciech Tygielski

(university and Fachhochschulen). A lack of modularity in the "segmented" educational system was identified as the main factor, as it hinders individual optimisation behaviour. The system is also characterised by a lack of encouragement for newcomers and lateral entrants as well as difficult conditions for those wishing to obtain qualifications at a later stage in life.

The working group "Research and Technology Policies" discussed the changes that had taken place in the Austrian RTI system since the previous mission. The Austrian Research Dialogue and the system evaluation, but also the formation of the government and its research, technology and innovation programme played a central role in the discussion. Finally, the working group focused on the RTI Strategy 2020 that is being developed, highlighting its importance for achieving the targets laid down in the Government Programme. ■

austrian council

All knowledge-based societies are based on communication and the exchange of information. The Austrian Council therefore regularly invites Austrian and international experts from science, research and industry to discuss a host of important issues.

"The Day of Networks" – 31 January 2008

On 31 January 2008 the Federal Chancellery (BKA) hosted **"The Day of Networks: Innovation – Cooperation – Motivation"**. The event, which was held in Vienna, was jointly organised by the Federal Chancellery, four ministries (BMWF, BMVIT, BMWA, BMLFUW), network and coordination units and also the Austrian Council, which contributed in a variety of ways.

The Day of Networks was dedicated to innovation, cooperation and motivation, topics with a particular relevance for networks, and provided an opportunity to discuss the future perspectives for networks in Austria. The aim was to illustrate the importance of networks for cooperation and thus for innovation, and at the same time provide the various networks with an opportunity to present themselves and their achievements and engage in networking.

The Austrian Council was represented by one of its members, Hans Schönegger, who took part in a discussion of experts and practitioners. This discussion focused on possible scenarios for development and the (future) perspectives for working with networks in terms of time, place and also content, and was pointed and at times heated. Numerous participants from a variety of policy areas and networks took part in this exchange of views and experiences.

Today, networks are regarded as crucial to both competitive success in business and to regional development. For many years Austria has had numerous networks that pursue direct regional policy goals or which are of importance for regional development in a wider sense. A multitude of differing networks is engaged either directly or indirectly in innovative and collaborative work for the benefit of people in the regions. They combine knowledge and experience from the policy areas labour market and social affairs, education, women and equality, gender mainstreaming, research and technology, innovation, agriculture and forest management, sustainability, regional development, economics and the environment.

The Day of Networks presented the diversity and achievements of the networks in Austria that are working for sustainable development in the regions. Among those presented were Local Agenda 21, the Actors Network Sustainable Austria, Leader Austria, CIPRA Austria, Regional Manage-

ment Austria, Territorial Employment Packages in Austria, FEMtech – Women in Research and Technology, the Austrian Regional Development Conference (ÖROK) and the Austrian Association of Technology Centres (VTO).

Panel Discussion "Gaps in Research Networks" – 24 April 2008

A study on "Networks of Knowledge Production" conducted by Harald Katzmair, head of FAS. research on behalf of the Austrian Council, the BMWA and FFG identified gaps in the networks of research. At a panel discussion organised by the Austrian Council, the author of the study, Helga Nowotny (European Research Council), discussed the implications this has for the competitive strength of the Austrian innovation system, as well as the possibilities for improvement, with Edeltraud Stiftinger (Siemens Austria), Josef Hochgerner (Centre for Social Innovation) and Georg Stonawski from VRVis (Centre for Virtual Reality and Visualisation).

In his keynote speech, Harald Katzmair confirmed that the network analysis of the Austrian research environment carried out as part of the study showed a significant gulf between basic research and collaborative research, between the cultural and natural sciences and an antagonism between traditional industry and the creative industries. In the tableau of basic research, the biological disciplines emerged as a highly-networked centre with strong links to medicine and physics and, through these, to the formal sciences. The humanities, social and cultural sciences, on the other hand, form a strong and internally well-networked cluster, but are largely isolated from other branches of science. The situation of knowledge networks in collaborative networks is even more dramatic: The humanities, social and cultural sciences disappear almost completely from the picture. The formal and technical disciplines constitute the dominant centre here based around computer-aided simulation and applied mathematics.

But what does this diagnosis mean for the productivity of the Austrian innovation system? Is productive potential squandered where there is a lack of contact and links between different disciplines? Is it not the case that radical innova- >

From left to right:
Harald Katzmair
Edeltraud Stiftinger
Georg Stonawski
Johannes Steiner
(moderator)
Josef Hochgerner
Helga Nowotny

tion in particular requires a new combination of existing knowledge from very diverse fields? What should be the response of research and technology policy?
These and other fascinating questions were discussed by a panel of experts from science and industry.

FameLab 2008: Young Communicators on the Stage – 26 April 2008

As in 2007, the Austrian Council this year once again supported FameLab, a talent competition for young science communicators. For the first time, preliminary rounds of the contest were also held in Graz, Linz and Vienna to select ten candidates for the grand final held on 26 April 2008 at the Technisches Museum in Vienna.
FameLab is a format for communicating science introduced to Austria and nine other European countries by the British Council. It targets young scientists working in the areas of science and technology. Candidates have only a few minutes to present their scientific work to a panel of expert judges in a way that is both exciting and original. The winner of the competition in 2008 was Bernhard Weingartner, a research assistant at the Vienna University of Technology. In an entertaining presentation about chaotic and regulated behaviour illustrated with catchy examples, e.g. how glow worms adjust their blinking rhythms to attract partners, he explained how order is ultimately derived from chaos.

Standard Standpoint Discussion on Human Resources – 30 April 2008

Within the framework of a comprehensive review of the literature carried out on behalf of the Austrian Council, the Faculty of Economic Sciences analysed the area of human resources (see Reports and Studies, page 40). The exciting, but at the same time disquieting, findings were presented to the public at large on 30 April at a "Standard Standpoint Discussion" organised in cooperation with the Standard newspaper. Judith Brunner, Secretary General of the Christian Doppler Research Association, Monika Kircher-Kohl, CEO of Infineon Technologies Austria, Michael Litschka, Scientific Director of the Competence Centre for Human Assets, and Gabriele Zuna-Kratky representing the Austrian Council discussed the results of the study under the heading "Human Resources: Where are the Next Generation of Researchers?" The discussion was led by Thomas Rottenberg.

From left to right:
Thomas Rottenberg (moderator)
Judith Brunner
Michael Litschka
Monika Kircher-Kohl
Gabriele Zuna-Kratky

Theme Dialogue "The Research Venture" – 2 Juni 2008

In June 2008 everything in Klagenfurt in Carinthia revolved around the strat.at+ process, which was launched to develop a strategy for the use of EU Structural Funds in the next few years. The Chairman of the Austrian Council, Knut Consemüller, and the Secretary General of the Council Secretariat, Ludovit Garzik, were invited to introduce the Council's activities. The event was also honoured by the participation of the European Commission at the directorate level.

Representatives of the federal government, the provinces, and towns and cities were involved in initiating this National Strategic Framework Plan within the framework of the Austrian Regional Development Conference, ÖROK, together with economic and social partners and representatives of non-governmental organisations. Priority 1 "Regional Knowledge Base and Innovation" aims to promote research and development. The strategies for achieving this include building partnerships and networks, developing RTD infrastructure and boosting the innovative capability of companies. The strat.at process was developed to implement this and other strategy fields and regularly takes up these topics together with all relevant players. A key factor is the interaction between research, innovation and the corporate environment in terms of collaborative research. Those who flourish in global markets link new research results with demand from industry and users faster than was the case in the past. Close, early cooperation with research institutes gives small and medium-sized companies significant impetus for innovation. The theme dialogue "The Research Venture" in Klagenfurt threw light on the framework conditions, strategies and practical experience of collaborative research in Austria and internationally. The event addressed experts from the fields of research, business and regional policy in Austria, its neighbouring states and the European Commission.

Symposium "Science Needs Society: Dialogue as a Political Agenda" – 16 October 2008

Science and research are fundamental building blocks for the development of our society. However, they can only fulfil their role if the relationship between science and society is a productive one. The prerequisite for this is a continuous, multi-layered dialogue between science >

and society. Numerous formats have been developed in Austria for this purpose in recent years, but compared to other countries they have institutional and conceptual deficits, especially now that the dialogue programme "Innovatives Österreich" has been discontinued. There is a lack of overall coordination, networking and support for attempts at dialogue.

The Austrian Council considers that improving this situation is an important political task within the framework of an all-embracing RTI strategy. As well as commissioning studies (see the chapter Studies), the Council therefore organised the symposium "Science Needs Society: Dialogue as a Political Agenda" that was held on 16 October. As well as a workshop with Elisabeth Veya from the Science et Cité foundation in Switzerland, Ekkehard Winter (Deutsche Telekom Stiftung, Germany), Ulrike Felt (Institute for Economic Research of the University of Vienna) and Alexander Martos (Science Communications, Vienna), the event also included a discussion forum with Peter Weingart (Institute for Science and Technology Research), Roland Haring (Future Lab, Ars Electronica Center Linz), Günther Mayr (science department, ORF), Ulrike Felt and Gabriele Zuna-Kratky (Council for Research and Technology Development).

By launching this symposium, the Austrian Council has opened a new platform for discourse that should serve as a forum for critically examining important issues pertaining to research, science and technology development in Austria. The guiding principles are: looking beyond the obvious, obtaining international expertise and promoting open discussion with and between all stakeholders.

Long Night of Research –

8 November 2008

The Long Night of Research, a large-scale event organised jointly by the BMVIT, BMWA and BMWF, and initiated by the Austrian Council with the aim of giving the Austrian populace a deeper understanding of science and innovation in an exciting and informative manner, was held for the second time on 8 November of this year. The continuation of this event, that was held for the first time in 2005, surpassed all expectations. Over 1,000 researchers in six locations ran 375 stations that were visited 240,000 times. Based on the concept of other Long Nights, the event lasted from sunset to midnight and offered visitors an opportunity to watch scientists at work at research centres or plunge in at the deep end and carry out an experiment themselves.

This year, for the first time, the participating stations were also able to take part in a competition for the best communication and presentation of content. The prize "The Magnifying Glass" was awarded in three categories:

- Industry by the BMVIT
- SMEs and start-ups by the BMWA
- Science (universities, Fachhochschulen and institutions) by the BMWF

at a special ceremony. The winners were selected by a jury and a public vote. The latter cast their vote by text message and as well as rating the stations also judged visitor numbers. To motivate visitors to vote there was a prize draw among all participants.

To facilitate the organisation of the event, the government granted a licence to provide a service. The organisers – the agency GPK and their sub-contractors, brainiacs – used sponsoring agreements to obtain other forms of support.

Further information can be found under:
www.langenachtderforschung.at

austrian council

The Austrian Council has been entrusted with the task of defining roadmarks for Austrian RTI policy. Its expertise is rooted in its members' many years of experience in the fields of basic and industrial research and it is committed solely to those concepts that facilitate the optimal development of Austria's innovative capability.

Ludovit Garzik
Head of the Secretariat

Review 2008: Crisis also Hits Research

From a research point of view, 2008 was characterised by rising budgets in the public and private sectors, as a result of which the percentage of GDP spent on R&D developed very positively. In an international comparison, Austria will be able to overtake several more countries. At the same time, once again as a result of the collapse of the government, there has been a long period of political uncertainty that has had a negative impact on the system as a whole.
Exacerbated by the global panic on the financial markets, the crisis hit the economy in Austria with full force toward the end of the year, in many companies leading to a rethinking of past planning structures. Research has definitely taken a massive blow. The planned funding in the private sector is suddenly no longer available while uncertainty is also growing with regard to the availability of public funding due to unclear statements in the Government Programme. It remains to be hoped that the importance of anti-cyclical investments in research will be recognised despite the tense economic situation. Furthermore, the hope remains that industry will interpret the signs of the times correctly and will be able to use the crisis – as the Greek word implies – as a cross-roads for taking innovative paths. ■

Outlook 2009

In 2009 the work of the Austrian Council for Research and Technology Development will focus upon drawing up proposals for the long-term RTI Strategy 2020 for Austria. Extensive preliminary work has already been carried out by the secretariat in terms of content-related and process-orientated planning measures and the first draft texts have also been completed. Numerous studies carried out by external partner institutions and the results of important preliminary and parallel processes, such as the Austrian Research Dialogue and the system evaluation, are already, or will become, available in the next few weeks. Work will now focus on important internal and external discussion processes and coordination meetings with stakeholders in the system as well as with an interested public. During the critical reflection upon the proposals that have been drawn up, the ideal visions for the future will clash brutally with the forces of resistance wishing to preserve the status quo. It will not be possible to please everyone. If agreement were to be reached with everyone, the strategy would bring us precisely to where we are now. If we are to move forward and develop, forward-looking and feasible compromises will have to be made. Ultimately, there has to be the political will to shoulder responsibility for the change processes.
The Austrian Council and the secretariat firmly believe that system-compatible changes can be agreed and jointly realised with the responsible stakeholders. This will level the path to the top in Europe. The economic crisis – no matter how severe – must be taken into account but must not be allowed to block this path. ■

Secretariat

New to the Team:
Margit Kamper
In May 2008 Margit Kamper joined the back office at the secretariat. With her coordination and communications skills, Ms. Kamper is an ideal addition to the team. She brings with her a wealth of experience gained in previous positions as an assistant to management boards and similar functions and will enhance the efficiency of the secretariat by relieving her colleagues of administrative tasks.

Fredy Jäger
Fredy Jäger has been well-known to the research community for many years in a variety of capacities, most recently in industry, and will complement the team at the secretariat with valuable experience in modelling and simulation. His skills in data analysis and processing provide the basis needed for the long-term strategy, but also for many individual recommendations. ■

Public Relations Work
In the fulfilment of its legal mandate the Austrian Council uses a variety of instruments to communicate with society at large. Thus a total of 13 press releases and several press conferences were organised as part of the Council's public relations work. The press releases can be viewed on the - Austrian Council website at www.rat-fte-at.
As well as organising events, the Austrian Council cooperated with a wide range of media partners in an effort to inform a wider audience beyond the narrow specialist community about RTI policy. Members of the Austrian Council and the secretariat staff also produced a host of guest articles and took part in a large number of lectures and discussions. ■

The Secretariat Team

Knut Consemüller
Chairman of the Austrian Council
Knut Consemüller was born in Dortmund, Germany, and studied ferrous metallurgy and economics. In 1991 he was appointed to the management board of the Böhler-Uddeholm group with responsibility for research and development. From 1976 to 1984 he was a member of the German technology advisory board.

Günther Bonn
Deputy Chairman of the Austrian Council
Günther Bonn studied chemistry at the University of Innsbruck. Following several research fellowships in the USA, including one at Yale, he was appointed to a full professorship at the University of Linz. Since 1995 he has held the chair for Analytical Chemistry and Radiochemistry at the University of Innsbruck. Until 2003 Bonn was a member of the FWF where he worked as a department head. He is currently a member of the University Council at the Medical University of Innsbruck.

Dervilla Donnelly
Dervilla Donnelly was born in Dublin and studied chemistry at the University of Ireland. In the mid-1980s she was appointed professor of photochemistry. Donnelly was a member and vice president of the executive council of the European Science Foundation and the European Science and Technology Association (ESTA). She is also the chairperson of the Dublin Institute for Advanced Studies.

Albert Hochleitner
The former CEO of Siemens AG Austria studied physics at the Vienna University of Technology. In 1965 he joined Wiener Schwachstromwerken where he soon took over the software development department. In 1992 he was appointed to the Management Board of the Group and became its Chairman in 1994. Albert Hochleitner has served as an expert on the industry-related aspects of research and technology policy for several years now..

Reinhard Petschacher
After studying communications engineering at the Vienna University of Technology, Reinhard Petschacher worked on optical systems for Daimler-Benz in Ulm before moving to the Siemens' microelectronic development centre in Villach in 1980. He subsequently took over the management of telecommunications components development at the plants in Villach and Munich. Reinhard Petschacher is head of development at the Automotive, Industrial and Multimarket division of Infineon Technologies AG.

Hans Schönegger
Hans Schönegger studied business administration and business education at the University of Innsbruck. In 1995 he joined the Carinthian Economic Promotion Fund (KWF) as head of the funding department, and was appointed to the management board in 1998. Hans Schönegger has been managing director of Kärntner Betriebsansiedelungs- und BeteiligungsgmbH since 1998 and since 2002 has been responsible for the Lakeside Park Project.

Jürgen Stockmar
Jürgen Stockmar was born in Germany and after obtaining his degree in mechanical engineering worked for Audi and then Steyr-Daimler-Puch, where he was appointed to the management board with responsibility for research and development in 1985. After serving on the management board of Audi AG, he returned to Steyr-Daimler-Puch in 1990. In 1998 he assumed responsibility for global development and technology activities at Magna. He also teaches at the Vienna University of Technology.

Gabriele Zuna-Kratky
In the late 1980s Gabriele Zuna-Kratky worked at the media department of the Ministry for Education and Art. In October 1997 she was appointed director of the Österreichische Phonothek. On 1 January 2000 she became the first female director of a technical museum, the Technisches Museum in Vienna. She is also a member of the University Council of the Vienna University of Technology, a trustee of the Deutsches Museum Munich and of the Berlin Museum of Technology.

Constitution

The Austrian Council for Research and Technology Development became a legal entity under public law on 1 September 2004 following an amendment of the Research and Technology Funding Act. It consists of eight members with voting rights, four of whom are appointed by the Minister for Science and Research and four by the Minister for Transport, Innovation and Technology. Four members of the Government serve on the Council in an advisory capacity. The members of the Austrian Council with voting rights are appointed for a five year term of office and may be reappointed for one further period.

Advisory Members
until 2 December 2008

Martin Bartenstein
Minister of Economic Affairs and Labour

Werner Faymann
Minister of Transport, Innovation and Technology

Johannes Hahn
Minister of Science and Research

Wilhelm Molterer
Vice Chancellor and Minister of Finance

Advisory Members
from 2 December 2008

Doris Bures
Minister of Transport, Innovation and Technology

Johannes Hahn
Minister of Science and Research

Reinhold Mitterlehner
Minister of Economic Affairs, Family and Youth

Josef Pröll
Vice Chancellor and Minister of Finance

Secretariat

The secretariat supports the Austrian Council both in terms of organisation and content, in particular with regard to preparing and organising the meetings of the Austrian Council and working groups, and in respect of communication both within the Council and externally. Day-to-day operations of the Austrian Council are financed by the Ministry for Transport, Innovation and Technology.
The head of the secretariat and members of staff (in alphabetical order):

Ludovit Garzik, MBA
Head of the secretariat, responsible for the management and coordination of the secretariat's activities and external representation.
l.garzik@rat-fte.at

Johannes Gadner, MSc
Monitoring and support for the development of strategic processes with a long-term focus (e.g. Strategy for Excellence, Strategy 2020), precompetitive and business-related research, cooperation between science and industry, research for sustainable development, energy and environmental research.
j.gadner@rat-fte.at

Fredy Jäger
Collection, processing and analysis of statistical data and facts for strategy development.
f.jaeger@rat-fte.at

Margit Kamper
Back Office.
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Silvo Korez
Basic and pre-competitive research, humanities and social and cultural sciences, biotechnology, international research cooperation, human resources, institutes of higher education.
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Margarete Rohrhofer
Accounting, personnel and office management.
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Bettina Ruttensteiner-Poller
Public relations work, advancement of women and gender mainstreaming, science/RTI and society, ethics in research, back office.
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Constanze Stockhammer
Business-oriented research, awareness raising for R&D, start-up and growth financing, SME and innovation funding, cooperation between the federal government and the provinces, nano-technologies, information and communication technologies, transport technologies.
c.stockhammer@rat-fte.at

Michaela Topolnik, M.A.
Evaluation and new instruments of technology counselling, internationalisation and networking, especially RTI in the European Structural Funds, EU Framework Programmes for RTD, scenarios and modelling, monitoring, Austrian Academy of Sciences, indirect research funding, security research.
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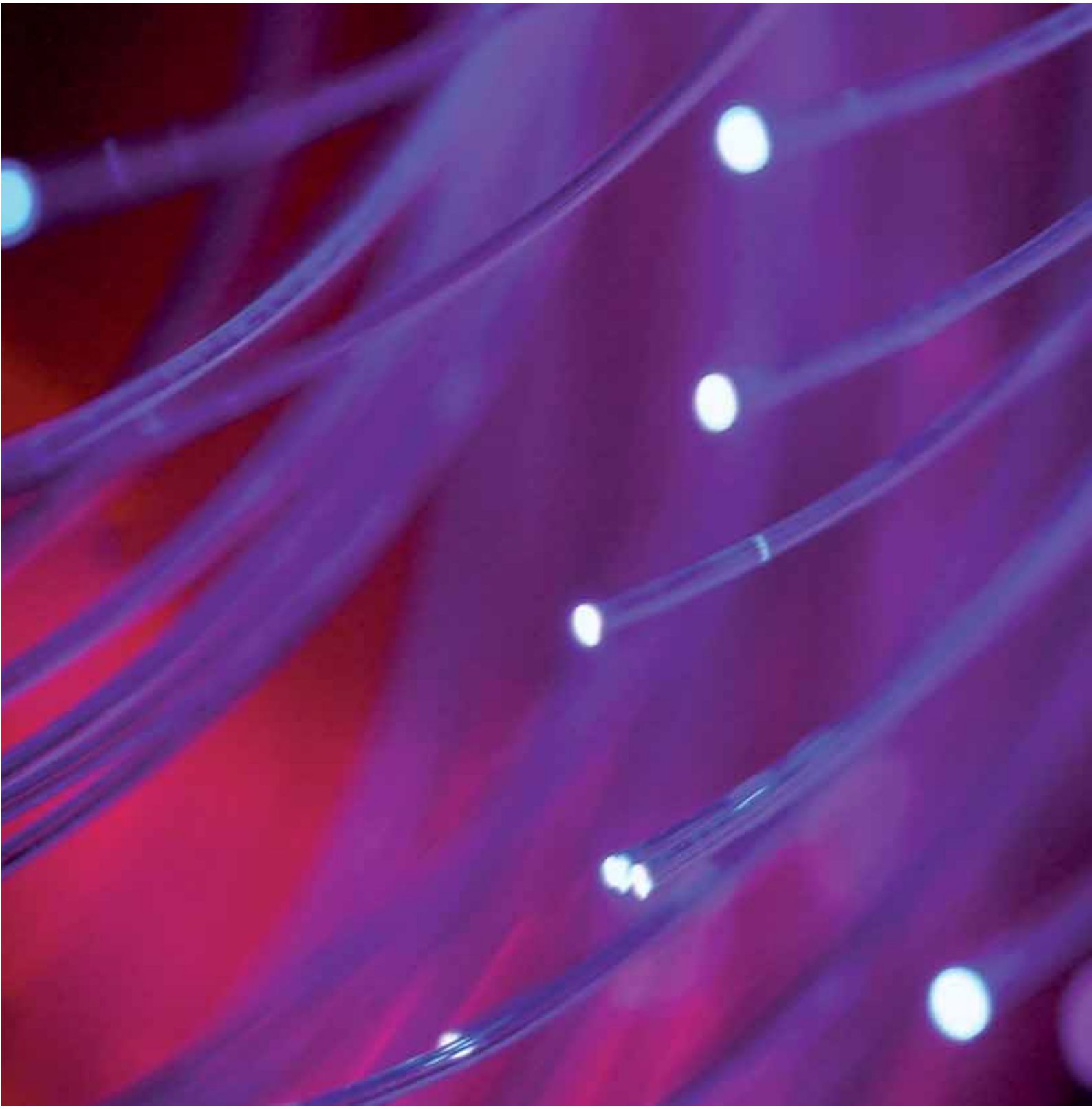
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