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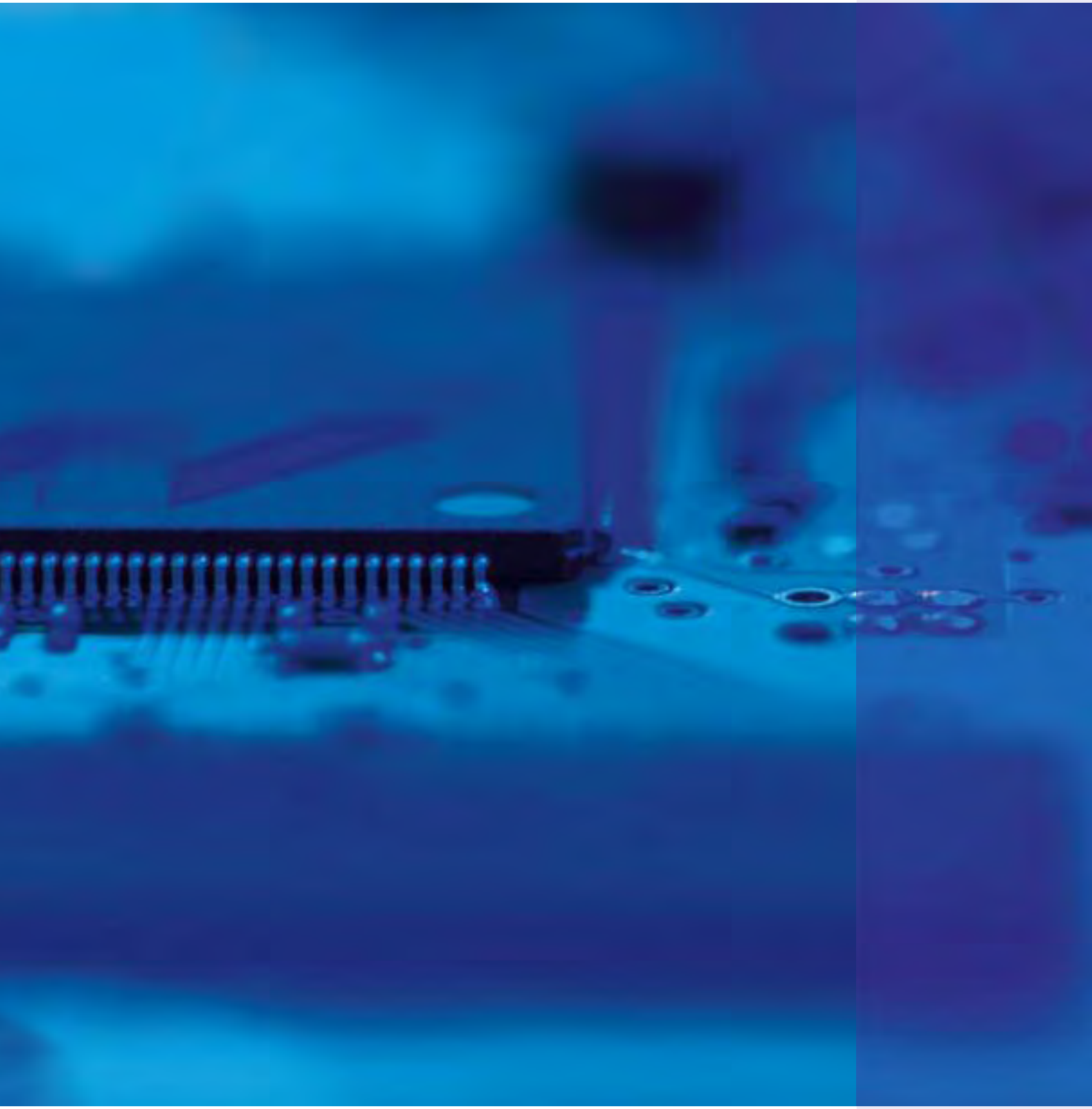

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foreword

2009 was a year in which research and technology policy faced an array of challenges, with economic conditions necessitating massive cutbacks. Despite this, the federal government has intensified its efforts in the area of research, technology and innovation and created a budgetary framework that will ensure planning certainty for research funding up to the year 2013.

At the strategic level, an important baseline study was completed in the form of the system evaluation, and the Austrian Council for Research and Technology Development also successfully completed its strategy development process.

After an intensive discussion process that also included an online debate, the Strategy 2020 was published and presented to ministers at the Alpbach Technology Forum. On the basis of existing material – including the Austrian Council's strategy document, the system evaluation and the Austrian Research Dialogue – the government initiated a comprehensive process to draw up the new RTI strategy.

The federal RTI strategy should lay down the main objectives and guidelines for Austrian research, technology and innovation policy in the period up to 2020. The working groups set up for this purpose will present a first interim report in February 2020.

One thing is clear: By integrating the relevant policy areas and subsequently making the right investments in education, research and development, Austria has the chance to emerge from the crisis stronger than before and in the medium term to achieve its goal of becoming an "innovation leader". However, this requires a joint effort by all actors. We therefore wish the Austrian Council for Research and Technology Development the best of success with its continuing activities and we will work intensively together to ensure the positive development of Austrian RTI. ■

Doris Bures
Minister of Transport,
Innovation and
Technology

Dr. Beatrix Karl
Minister of
Science and
Research

DI Josef Pröll
Vice Chancellor
and Minister
of Finance

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

Ever since it was established, the Austrian Council has focused its activities on positioning Austria among the top three European nations for research, technology and innovation (RTI) with a place in the country cluster for innovation leaders. In 2009 real progress was made towards achieving this goal with the publication of Strategy 2020.

Knut Consemüller
Chairman of the
Austrian Council

Strategy 2020 under the Motto "Innovation means Growth – and Growth Safeguards Prosperity"

The work of the Austrian Council reached a milestone in 2009 with the formulation and presentation of Strategy 2020, which for the time being forms the last of the Austrian Council's strategic recommendations. The Austrian Council started from the premise that research not only increases a country's competitiveness but also safeguards national prosperity, promotes social inclusion and helps solve societal problems. The ambition to join the ranks of the innovation leaders is not therefore an end in itself, but is designed to achieve societal objectives.

Nevertheless, a policy that were to focus exclusively on research, technology and innovation would fail to adequately exploit existing potential.

In the final analysis, the areas of research, innovation, education and training must be developed jointly with a view to improving economic development potential.

Treating the Educational and Research System as a Single Entity

Education and RTI form a single entity and as such are the prerequisite for new ideas, new products and new services. They form the indispensible basis for the kind of successful economic and growth policy that is needed if Austria is to perform successfully in a competitive global environment.

In recent years, the Austrian Council has therefore increasingly focused on human resources, emphasising the importance of this topic by making "People" the first chapter in the Strategy >

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
of the Austrian Council

2020 document. The basic message is that without well-educated people there can be no innovation. A strategy that envisages joining the ranks of the innovation leaders must therefore integrate the planning and development of education and RTI. Put plainly: We need to make significant improvements to our educational system and adapt it to current conditions and the needs of the future. Every young person must have access to education and training in order to ensure that talents are not lost for the country. Parallel to this, additional measures are required to effectively promote life-long learning in Austria.

Crisis as an Opportunity

The impact of the global economic and financial crisis on research policy has radically changed the framework conditions which had previously been assumed for the development of the RTI system. It became clear last year that the global economy will be very different after this crisis and that some countries will be among the losers while others will emerge as winners. Those countries that win the race to the top in 2020 will definitely be those which succeed in using scarce financial resources and the most highly qualified people to enhance those national strengths that give them a competitive edge over other countries.

Provided that a wise and yet bold policy is implemented, Austria has the chance to emerge strengthened from this crisis. The part played here by research, technology and innovation cannot be underestimated, for which reason it is all the more important to pay the utmost attention to structuring these areas in a way that meets future needs. In this context, the Austrian Council explicitly welcomes the federal government's efforts to draw up a national research strategy that will emphasise the importance of education and RTI for our country.

We would like to thank all those who supported our work last year, thus contributing to the success of Strategy 2020. Great challenges lie ahead for Austrian research policy in the next few years and equally great efforts will be required if we are to continue along the path that we have followed so successfully in recent years. ■

austrian council

Effectively supporting research and development in Austria requires a long-term strategy.

Strategy 2020: Perspectives for an Innovative Austria

On 24 August 2009, the Council for Research and Technology Development presented its strategy document "Strategy 2020" containing proposals and recommendations for the development of the Austrian RTI system to the government ministers Doris Bures and Johannes Hahn. The Strategy's aim is to position Austria as a successful and internationally recognised innovation nation by 2020.

The basis from which we start is a good one. In recent years, Austria has completed a rapid catching up process in terms of its RTI performance and is now at the front of the cluster of innovation followers, i.e. it is now one of those countries in the European Union with an RTI performance that is above average in many areas.

Weaknesses in the national innovation system show up above all in the ability to translate input into output (i.e. Austria invests a disproportionally large share of resources in the RTI system and generates only lower than average output in comparison) and in the below-average percentage of the population with a tertiary education qualification and the small number of science and engineering graduates.

The biggest challenge that Austria has to overcome in the next few years is to take the step from being an innovation follower to an innovation leader. However, this move requires a fundamental change in the focus of research, technology, innovation and educational policy. The Austrian Council's strategy structures the reforms that are necessary for this fundamental change and sets the necessary accents with eight strategy elements.

The Strategy Process

The strategy was developed in several stages with a thorough analysis of the current Austrian RTI system forming the point of departure for the entire process. The Austrian Council started by reviewing the implementation status of Strategy 2010 and then systematically surveying and updating the available data. Thereafter, the Austrian Council commissioned studies to provide scientific corroboration of the analysis of the current status of the RTI system. The analysis phase led to the selection of specific strategy elements, the main purpose of which was to provide a structure for the discussion.

This analysis phase was originally to be followed by a working group phase that would commence once sound results had become available. However, the Austrian Council was requested on several occasions by the responsible government ministries to formulate strategic guidelines autonomously.

Confronted with this new starting position, the Austrian Council decided to modify its approach. To support the strategy process, plans were drawn up for a web-based discussion to deepen and intensify the process by means of virtual interaction with the stakeholders and RTI community. A concept was then developed that provided the basis for the technical implementation of the discussion platform.

The Austrian Council adopted a working draft of the strategy at its closed conference on 5-6 February 2009.

Prior to initiating the broad public discussion process, the Austrian Council discussed the factual accuracy of the proposals contained in the draft strategy with selected scientific and advisory institutions.

On 14 May 2009, the Council finally presented the draft Strategy 2020 which was made accessible to a wider public on the discussion platform www.forschungsstrategie.at.

All those with an interest in Austrian RTI policy were given until 7 June 2009 to submit their comments and debate the individual chapters of Strategy 2020 and vote on the proposed recommendations. The scientific community participated in the discussion very intensively: approximately 50,000 visits were recorded, with visitors remaining on the site for more than 16 minutes on average. More than 400 users registered and took part in the discussion, offering both constructive criticism and a host of innovative proposals.

In addition, key institutions in the RTI system such as the Austrian Institute of Technology (AIT), the Austrian Science Fund (FWF), the Austrian Research Promotion Agency (FFG) and Universities Austria (UNIKO) also issued statements in response to the draft strategy.
Twenty-two individuals from the RTI community also contributed to the process with VIP blogs of their own. Besides the four responsible ministers, these included the president of the FWF, the management of the FFG and Austria Wirtschaftsservice (AWS), the president of the Austrian Academy of Sciences, Universities Austria, the Chamber of Commerce and the Chamber of Labour as well as the Director of the Austrian National Library.
Feedback from the community and the stakeholders regarding the discussion process was generally positive. The Parliamentary Directorate, for example, praised the approach as "a shining example for comparable processes" and a "model for the planned electronic support for parliamentary consultation and petition processes."
Finally, to ensure that the strategy was soundly based and also to increase its acceptance, a coordination process was organised with the responsible ministries. The original plan had been to carry out this coordination process in the form of an expanded meeting of the Austrian Council or as a working group comprising all ministries. As this idea was rejected by the members of the Austrian Council representing the ministries, the discussion process was concluded with bilateral talks with the individual ministries.
The comments from the bilateral talks with the ministries, the contributions generated by the public discussion process as well as the statements received from the stakeholders were reviewed and summarised. These summaries formed the basis for the Austrian Council's intensive debates about the individual evaluations of the external inputs. Several of these inputs were incorporated into the strategy document according to their relevance.

Strategy Elements

Based on a host of studies and analyses, the following eight strategy elements were identified:

- People
- Society
- Input/Output
- Key Research Areas
- Infrastructure
- Instruments
- Governance
- Internationalisation

Each element of the strategy was developed on the basis of a thorough gathering of facts and further analyses, studies and workshops etc. Accordingly, an array of study presentations, workshops and discussions were organised, which then provided key input for strategic guidelines and recommendations. Finally, existing strategy documents and the results of the Austrian Research Dialogue and system evaluation were also incorporated into the proposals and recommendations for the strategic focus in the period up to 2020.
Of course, there are overlaps between the main areas of the strategy in terms of content: People are at the heart of all activities in the RTI system. Depending on the subject of the research, the nature and scope of the resources that are required vary. Strategic goals are pursued by defining key structural and thematic areas. The adequate deployment of resources based on efficient steering by governance ensures the successful interaction of people, resources and key research areas. The third dimension differentiates between the regional, national and international levels. The first two levels are dealt with jointly in the individual strategy elements; due to its increasing importance, the international level is dealt with in a separate element of its own.

People

Joining the innovation leaders means increased demand for higher qualifications. Austria needs more and better educated workers. The importance of higher education rises disproportion- >

ately with the rising level of development. The Austrian Council therefore recommends improving access to education, making tertiary education more attractive, positioning science as an attractive career and making greater use of and encouraging immigration. An early start to education and later segmentation in particular are absolutely essential. Balanced ratios of staff to students at universities and more attractive curricula, especially in science and engineering, are basic prerequisites for improving tertiary education. Doctoral training also needs to be improved and contracts brought into line with international standards. Furthermore, qualifications acquired abroad must be uniformly recognised throughout Austria and the immigration of top researchers made easier.

Society

The growing importance of science, research, technology and innovation for our society requires new forms of dialogue. It is important to create sustainable space and opportunities for social participation which strengthen "social robustness", i.e. social acceptance of technological advances. The development of a strategy to shape this dialogue by the ministries, Austrian Council, scientific and research community and stakeholders will therefore be essential. To this end, the Austrian Council also recommends the institutionalisation of this dialogue, ideally in the form of an independent institution, as well as a system of incentives to encourage scientists to participate in the dialogue.

Input/Output

In recent years Austria has been particularly successful at mobilising financial resources for RTI. In the current unstable economic climate, however, new targets need to be developed in order to achieve steady growth in R&D spending. The three percent research quota should be defined as an interim target and the present structure of the various types of research should be balanced and developed further with a focus on output. The need to catch up in terms of turning resource input into result output necessitates a better understanding of the entire RTI system, both in quantitative terms and with regard to internal linkages. This requires substantial improvements to the information and data pool for RTI policy, and the further development of methods of data analysis and impact research.

Key Research Areas

Identifying priorities and emerging thematic areas in the Austrian research landscape will become increasingly important. For selected thematic areas and key technologies that are of social or strategic importance for Austria, overarching priorities should be defined across all ministerial jurisdictions and comprehensive RTI instruments developed. This applies only to that area of the RTI system that is not defined by a process that is of necessity thematically open and bottom-up. The aim of the strategy element is therefore to point out methods and paths for arriving at a holistic definition of key areas and laying the basis for future priorities in the RTI system.

Infrastructure

RTI infrastructure is an indispensible basis for cutting-edge, internationally prestigious research. Due to its unique nature it represents a good means of strategically positioning the research location. An appropriate infrastructure, especially in the field of basic research, not only drives employment, it also acts as a magnet that draws Austrian and international researchers. The Austrian Council therefore recommends linking the area of RTI infrastructure to international infrastructures with consideration for key thematic areas, and coordinating planning activities with regional, supra-regional and European levels. Greater joint (supra-regional) use should also be made of large-scale infrastructures.

Instruments

The extensive portfolio of potential instruments for intervention in the RTI system must be used in a targeted and coordinated manner if the overarching goal of strengthening the Austrian

innovation system and positioning it among the front runners is to be achieved by 2020. A key element of the Austrian Council's RTI strategy is, therefore, to present a way of using the instruments that focuses on streamlining the multitude of programmes that do not achieve a critical mass and concentrating the use of resources on a small number of broadly-based key research areas that are of strategic, economic and/or social relevance for Austria. The instrument for the corporate sector should be diversified in accordance with the specific problem under consideration. In order to increase R&D intensity in the business sector, a special effort should be made to address small and medium-sized enterprises, as their potential is still far from exhausted in Austria.

Governance

In the area of governance, the main objective is to optimise the steering and interaction of the institutions that are responsible for the implementation and management of public interventions in the RTI system. It is therefore essential to develop a model for the target state of the RTI system in 2020. Changes to the structures and processes can only be successful if they are based on clear objectives. In the opinion of the Austrian Council, the changes that need to be made concern the concentration of research agendas at the ministries responsible for applied and application-orientated research (BMVIT and BMWFJ), the merging of the supervisory and steering structures of the funding agencies (also with a view to being able to allocate funding to the key areas flexibly and as needed) and the autonomy of the agencies based on the strategic requirements of the ministries.

Internationalisation

Changed global conditions require decentralised, flexible yet sufficiently coherent approaches to >

The Chairman of the Austrian Council, Knut Consemüller and Council member Reinhard Petschacher present Strategy 2020 to ministers Hahn and Bures

international cooperation. Communication, which in the past was handled by state bodies, will in future take on a more immediate and direct form and will be carried out by funding agencies and research institutions. A realignment of responsibilities at the ministries is therefore needed and the coordination function should replace the handling function. The establishment of the European Research Area in particular will lead to a further strengthening of this trend. Participation strategies for European approaches to internationalisation (e.g. ERA-NET) will therefore have to be jointly developed.

Federal RTI Strategy

In its Government Programme for the XXIV Legislative Period, the Austrian government acknowledged the central importance of research, technology and innovation for Austria's future. If the government is to achieve its stated aim of making Austria one of the most innovative countries in the EU, a networked approach must be adopted toward research policy that is based on cooperation between all actors and which takes into account the reciprocity of knowledge generation and its application. The development of a comprehensive RTI strategy is therefore the logical consequence. On 1 September 2009, the Austrian government therefore gave the go-ahead for the formulation of a federal RTI strategy designed to put Austria on the path to becoming an innovation leader by defining the strategic objectives, tasks and key areas of an integrated RTI policy.

Over the last two years, a sound information base has been created, which the government intends to use as the starting point for its strategic measures: The cornerstones of the federal RTI strategy are the results of the Austrian Research Dialogue, the evaluation of the research funding system and the recommendations put forward by the Austrian Council in August 2009 for the period up to 2020.

Six ministries (BKA, BMF, BMVIT, BMWF, BMWFJ, BMUKK) are involved in developing the federal RTI strategy in consultation with parliament and key stakeholders. The cabinet decision stipulates that a binding strategy document for research, technology and innovation in Austria should be adopted by June 2010. ■

austrian council

The Austrian Council for Research and Technology Development is the advisory body to the Austrian government on all issues of research, technology and innovation policy. Its core remit is to draw up recommendations to safeguard and increase Austria's competitiveness.

Recommendations 2009

Recommendation Regarding the Austrian Cluster Initiative – 12 May 2009

Background

Since the launch of the Lisbon process, the EU has implemented an array of long-term measures to strengthen innovative capabilities and the knowledge base in Europe.

In the process, clusters have received increasing recognition as a key innovation policy tool.

As a consequence, the main EU programmes (Structural Funds, FP6/FP7, CIP etc.) have given increasing consideration in their programme definitions to clusters or corporate networks with a predominance of SMEs. In Austria – as in other European countries – a host of further networks and clusters have been created in recent years that have generated considerable value added for their members. While activities and structures exist for clusters in Austria at both the regional and international levels, this is not the case at the national level.

Austria was an early mover in terms of cluster policy, both in Europe and globally. There are currently approximately 40 cluster and network initiatives in Austria, numerous partnerships between the provinces and the first visible federal-provincial partnerships (e.g. LISA). Clusters have positioned themselves as important actors and instruments of innovation policy and of a strength-orientated economic and regional policy. Developments within the European Union must be carefully observed in order to respond to them appropriately. In this context, it is an advantage that the regions (provinces) already have excellent structures in place that must not and should not be changed. Despite the differing approaches adopted by the provinces, common topics can be identified that can

be worked on with federal support. For this, it is necessary to adopt a longer-term approach to the topics and develop a culture of cooperation. In early 2008, the Ministry of Economic Affairs, Family and Youth (BMWFJ), therefore launched a coordination process for the cluster initiatives under the name Cluster Platform Austria.

Recommendation

For the reasons stated above, the Austrian Council supports the Austrian cluster initiatives in general and the cluster process (Cluster Platform) of the BMWFJ in particular. To ensure that the cluster process receives the proper support from Austrian innovation policymakers at both the regional, but especially the national level, the Austrian Council recommends:

- •The role played by clusters in the Austrian national innovation system is still insufficiently clear. A sound expert report should therefore be used to ascertain this role and how it can form the basis for further activities. The question of clusters covers a number of fields – innovation, SMEs, special technologies etc. – and is currently the subject of intense discussion, but is not essentially a new issue.
- Clusters are currently a largely region-/province-specific topic. While there are appropriate structures and activities at the regional and international levels, they are lacking at the national level. These should therefore be created, building upon existing and tried-and-tested structures.
- Austria must adopt a corresponding focus at the EU level, for example by positioning Austria within the framework of the EU initiative Towards World Class Clusters or by coordinating national measures with the EU Cluster Policy.
- Some of the most important aspects of the cluster platform of the BMWFJ are the focus on federal-provincial cooperation, the involvement of the funding agencies (FFG, aws and FWF) as well as active participation in shaping European programmes.
- The potential of clusters in Austria has not yet been fully leveraged, but at the same time, it should be remembered that it is also possible to have too many clusters. The scale of cluster activities in Austria's national innovation system can only be optimised within the framework of a comprehensive strategy.
- Joint, supra-provincial topics must be identified that can be tackled with the support of the federal level. For this purpose, it is necessary to adopt a longer-term approach to the topics and develop a culture of cooperation. A concept or a strategy must be drawn up that includes a definition of those framework conditions that are essential for this collaboration. The Austrian Council is willing to pay a key role in formulating and implementing the strategy.
- The BMWFJ's initiative can contribute to increasing the efficiency of cluster activities by providing a national focus and through cooperation. Prompted by this common interest, the Austrian Council will also accompany the BMWFJ's cluster process.

Recommendation Regarding Key Areas for the National Foundation – 5 June 2009

On 3 April 2009, the Foundation Board of the National Foundation adopted revised guiding principles, which among other things, stipulate that its strategic priorities will be defined by the Austrian Council. The Foundation therefore requested the Austrian Council to provide it with a list of key thematic areas that are coordinated with those of the ministries and which should also form the basis for decisions concerning applications submitted in 2010. In future, priority when awarding funds should be given to:

- Strategic RTI initiatives (e.g. venture capital and the like)
- Socially relevant RTI initiatives and
- Test phases for new national RTI programmes and projects.

The aim must be to allow new programmes, ideas and initiatives to be financed from Foundation funds. In terms of the allocation of funding, the National Foundation should place a clear emphasis on "high trust" organisations and "high risk" projects.

>

The Austrian Council recommends that consideration be given to those key areas that were defined in Strategy 2020 in the forthcoming round of calls and when making the funding decisions. Thus, the following requirements can be laid down for the individual institutions:

Austrian Science Fund: Excellence in basic research (e.g. also at clusters of excellence) should be supported. In view of the current difficult situation, an appropriate share of funding should be allocated within the Foundation.
Austrian Research Promotion Agency: Particular consideration must be given to programmes to safeguard Austria as a business location, e.g. the programme lines Research Headquarters and the Bridge programme. The Austrian Council considers that inter-sectoral mobility facilitates innovation. In its Strategy 2010 and subsequently in the Strategy for Excellence, it therefore recommended expanding the existing FFG and FWF programmes for the promotion of inter-sectoral mobility and developing them further with a view to promoting excellence.
Austrian Academy of Sciences: Programmes are to be submitted that conform to the Foundation's criteria and the key thematic areas defined by the Austrian Council. To ensure planning certainty, the core budget should be completely financed from the ordinary budget. In the view of the Austrian Council, the current imperative is to reduce a substantial shortfall in the remaining budget.
Christian Doppler Research Association: The Austrian Council attaches growing importance to programmes that build bridges between universities, applied research and industry, especially in times of crisis. In particular, the Austrian Council recommends supporting those institutes that are consistent with the current

priorities defined by the Austrian Council in terms of their content.

Ludwig Boltzmann Gesellschaft: Funding should be targeted at those institutions or key research areas that are consistent in terms of their content with the priorities as defined and ranked by the Austrian Council.

Austria Wirtschaftsservice: In principle, the Austrian Council welcomes the use of Foundation funds for venture capital activities and recommends that suitable framework conditions be defined and courses of action identified in advance. Sufficient (to be defined during the application process) and long-term funds should be made available by the Foundation for venture capital initiatives.

Recommendation Regarding the Statistics Act – 18 September 2009

In 2009 the Statistics Act of 2000 was amended on the basis of a bill submitted by the Federal Chancellery. Paragraph 31 of the earlier version of the Statistics Act prohibited Statistik Austria from passing on statistical data concerning individual cases to other institutions.

The social sciences refer to such statistical data as micro-data and its use in scientific analyses is standard international practice. On 11 March 2009, the European Parliament and the Council of the European Union issued a Regulation (No. 223/2009) allowing policy advisors and scientists to access micro-data that has been de-identified. In other countries, too, for example, Germany, the use of such statistical information, is also standard practice. Not least of all for this reason, the Austrian Council considers it essential to influence the reform of the legal framework governing the use of statistical data.

On the basis of Strategy 2020, the Austrian Council recommends creating a legal framework that will allow the scientific community and the Austrian Council, as the highest government advisory body on RTI policy, to access micro-data that has been de-identified. This will take into account developments in the use of micro-data and ensure that policymakers receive advice of the highest quality.

Recommendation Regarding the International RTI Monitor – 1 December 2009

Background

"The biggest challenge that Austria has to overcome, is to take the step from being an innovation follower to an innovation leader, or from being a country that is engaged in a catching up process to one that produces at the cutting edge of technology, i.e. is a front-runner." This is how the Austrian Council for Research and Technology Development described Austria's current objective, which also enjoys broad political support. On the way to becoming a leading European research nation, defined by the government as being one of the three leading states in the European Union, it will be necessary to pay close attention to the development of these leading innovation nations. The Austrian Council therefore suggests continuously monitoring these countries and conducting comparative analyses with Austria.

This monitoring should focus upon the most important areas and key data of the countries concerned. In order to ensure comparability and limit data collection expenses, most of the data to be monitored is extracted from the international statistics of the EU and the OECD. The Austrian Council's Strategy 2020 and the system evaluation carried out on behalf of the BMVIT and the BMWFJ have shown that in future it will be necessary to concentrate more on research, technology development and innovation output variables. Internationally, these are measured in the European Innovation Scoreboard. In addition to these output variables, the Scoreboard also includes various input variables. The Austrian Council closely studies the indicators and thematic areas upon which the scoreboard is based, and attaches a great deal of importance to the analysis of the data, especially in comparison with the innovation leaders.

Recommendation

The Austrian Council recommends subjecting the RTI performance of the innovation leaders (and where necessary, other relevant countries) to a systematic monitoring. This data would pro- >

vide a benchmark for measuring political measures with best practice examples from the leading innovation nations. The availability of data in suitable categories and at a suitable aggregation level is indispensible for political advisory work. It is therefore essential that this data is also available in a form that compares Austria with the leading countries.

The Austrian Council considers that the compilation of the RTI monitor falls within its statutory remit, as it supports the presentation of the leading benchmarks. ■

austrian council

As facilitating innovation is the core principle of the Austrian Council's work, intensive efforts were continued in 2009 to advance progress in the strategic fields.

Update: What has been Accomplished

RTI Monitor: Learning from Comparisons

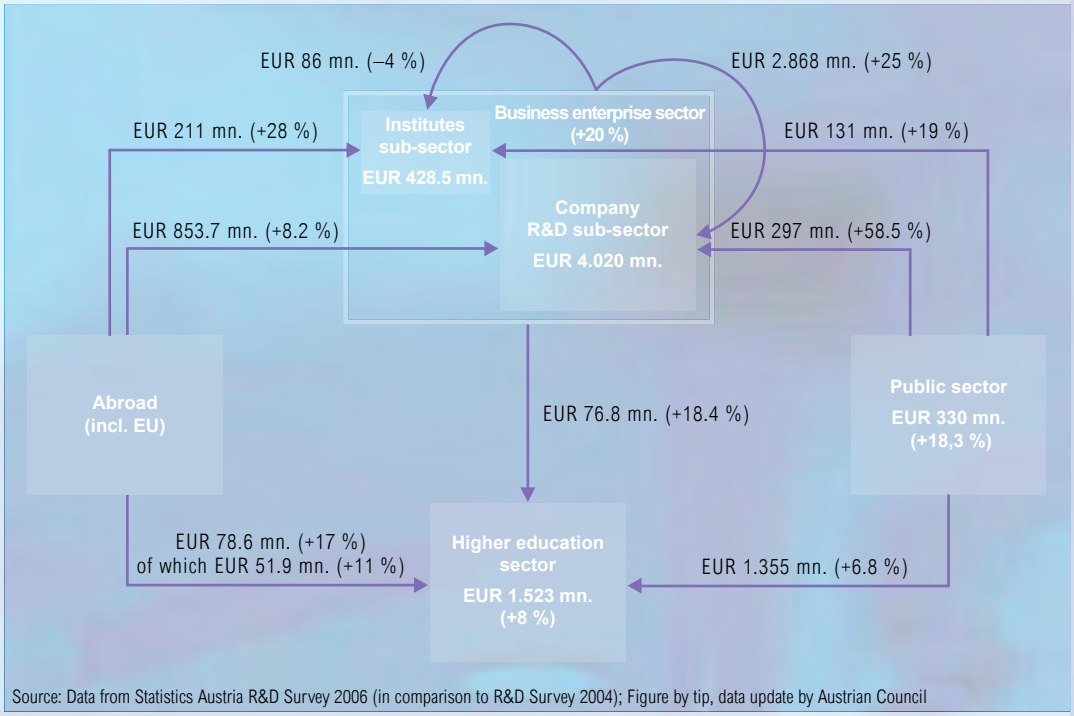
Austria's goal is to close the gap on the leading European research nations. To measure the progress it has made, a continuous comparison needs to be made with the front-runners among EU member states. The Austrian Council has therefore suggested continuously monitoring these countries and carrying out comparative analyses with Austria. The focus in terms of countries will be upon Switzerland, Sweden, Finland, Denmark, Germany and the United Kingdom.

Most of the data upon which the ongoing analyses are based have been extracted from the available international statistics of the EU and the OECD. Here, one has to distinguish between input variables (e.g. state or corporate investments in R&D) and output variables (corporate revenues generated with new products or the number of graduates as a percentage of the total population).

The Austrian Council closely studies the indicators and information upon which the European Innovation Scoreboard is based. During the course of the system evaluation, it became apparent that in future it will be necessary to focus more strongly on output variables. The Austrian Council has drawn up a proposal for the structure of the RTI monitor and will in future update the monitor with the latest data.

Key Thematic Areas in R&D

The definition of key thematic areas for the Austrian RTI system played a very important role during the development and formulation of Strategy 2020. The Austrian Council succeeded in drawing up a list of key research areas that represent current strengths or exhibit significant future potential, both in an international context and within the Austrian RTI landscape. The Council then roughly calculated corporate R&D expenditures for these areas and published the results in Strategy 2020.



Source: Data from Statistics Austria R&D Survey 2006 (in comparison to R&D Survey 2004); Figure by tip, data update by Austrian Council

Figure 1: Financing and performance of R&D in Austria in 2006 (compared to 2004)

The experience that it was only possible to make these estimates with the help of a number of secondary assumptions and not possible at all in the case of the university sector, led the Austrian Council to recommend the development of a process for collecting data in cooperation with those organisations that collect the data (Statistik Austria, funding agencies, ministries). It is recommended that in future, data with a strategic relevance for RTI policy should be regularly collected and evaluated while avoiding overlapping surveys.

Model of the Austrian RTI System

For its work, the Austrian Council uses the statistics on the financing and performance of research and development that are collected on a regular basis by Statistik Austria, in particular the 2-yearly survey and the annual global estimate of gross domestic expenditure on R&D. On the basis of this data, supplemented by additional studies, alternative trajectories are calculated and budgets analysed. The cash flows between the financing and the performance sectors are nicely shown in a structure diagram that was developed by the research and consultancy programme tip and which is used by the Austrian Council.

In 2006 an Austrian Council working group started using a simulation programme (POWER-SIM) for these calculations. In 2009 the Systems Research division of Austrian Research Centers (ARC) completed the switch to the VENSIM system, providing the Austrian Council with a balance model for the cash flows within the research system that can also be extended to examine additionality effects and other interdependencies.

Fiscal Incentives in an International Comparison

In order to arrive at a better understanding of the effectiveness of indirect research funding, i.e. support that is given mainly in the form of tax allowances, the Austrian Council carried out an analysis of this instrument within the frame- >

work of an international comparison. The relevance of this analysis is shown by, among other things, the discussion among Austrian research policymakers about the reform of the research tax allowance and the research premium by combining both instruments in a higher research premium.

Given the complexity of indirect funding instruments and their interdependency with the tax system, it is essential that a synthetic index – the B Index – is used for international comparisons. An analysis carried out by the Austrian Council, which examined the generosity of fiscal incentives toward SMEs and large corporations, produced some surprising results: Thus one euro spent on research and development in Spain receives a subsidy of approximately 40 cents. The figure in Austria is only 8.8 cents. It is noteworthy that the sums in both the United Kingdom (approx. 10 cents) and Denmark (approx. 16 cents), both of which are among the innovation leaders, are above the Austrian figure, and in the case of Denmark, well above it.

Thus Austria cannot lay claim to any distinct advantage in the international competition between business locations on the grounds of its indirect research funding. On the contrary: It is very clear that, in recent years, Austria has lost the competitive advantage of earlier year's vis-à-vis the EU and the OECD average.

In summary, and this is consistent with the recommendations of the Austrian Council and the results of the system evaluation, it must be concluded that increasing the research premium as a key indirect funding instrument is of crucial importance for safeguarding Austria's quality as a business location in an international comparison.

RTI Platform Austria: Meetings in Klagenfurt and Pamhagen

The platform for cooperation between the federal government and the provinces, Platform RTI Austria, met twice in 2009. The first meeting was held on 2 and 3 July in Klagenfurt at the invitation of the Kärntner Wirtschaftsförderungsfonds (KWF), the second on 15 and 16 October in Pamhagen at the invitation of the provincial government of Burgenland.

RTI Platform in Lower Austria (from left to right) Lindorfer, Garzik, Kratky, Reich, Stockhammer, Hammerschmid, Weiss (moderator), Priedl, Schönegger, Stangl, Binder

The meeting in Carinthia was dominated by a brainstorming process regarding concrete possibilities for cooperation and joint areas of action. The results of this process were fleshed out in more detail at the second meeting and packed into specific areas of work which were then assigned to specific provincial representatives to be dealt with by them.
The Platform identified the following seven areas of work for the period up to 2015:
1. Human Resources: Supra-regional coordination
2. Research Infrastructure: Ascertainment of demand and strategic planning of supra-regional investments
3. Strategic coordination between the provinces, including internationalisation, when setting strategic priorities
4. Increased awareness-raising and public relations work for RTI
5. Paths to more radical innovations in Austria
6. Technology Transfer: Sharing of regional best practices and experiences regarding the transfer of patent rights between publicly-funded research institutes and companies
7. Governance Structures: Improvement of the structural and organisational interfaces between the provinces, and between the provinces and federal government.
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. For this purpose, a closed group was set up comprising one representative from each of the federal agencies and one representative from each of the provinces, the latter each with authorisation to make decisions. These representatives were nominated by the political leaders in the provincial and federal governments (i.e. provincial governors, members of regional governments, ministers). Substitutes are not permissible.

Human Resources: Motivating and Strengthening People

The Austrian Council gave ample consideration to the topic of human resources in its Strategy 2020. Following the studies presented by Marita Haas and Gerlinde Pöchhacker in 2008, the Austrian Council also put forward a thorough analysis of the issue under the heading "People" in the Strategy 2020. This then formed the basis for three strategic guidelines and a total of 17 recommendations.
The findings are based on the assumption that in knowledge-based economies, the future of a location depends on the qualifications, commitment, creativity and motivation of the people. To maintain and increase its prosperity, Austria therefore requires more and better qualified, committed and creative workers – both university graduates and highly qualified skilled workers. An all-embracing approach is crucial here: Education, research and innovation have a mutual impact on one another and if decisions in these areas are made in isolation from one another this can result in a very inefficient system.
Joint planning and concerted implementation are therefore needed. The strategic guidelines in the "People" chapter of Strategy 2020 are:

- Improve Access To Education
- Raise the Profile of Science as a Career
- Use and Promote Immigration

These recommendations were fleshed out in greater detail in a further project with the title "Strategic Approaches and Lines of Action to Strengthen Human Capital in Austria." The first project results were presented to the public by the Chairman of the Austrian Council, Knut Consemüller, at a press conference on 30 November 2009. These included the four pillars, which the Austrian Council believes should form the basis for an education offensive:

- Early childhood education
- A joint framework for 10 to 14 year olds that at the same time provides individual support for children
- Greater initiatives to support children from sections of society with poor educational opportunities or from immigrant families

and

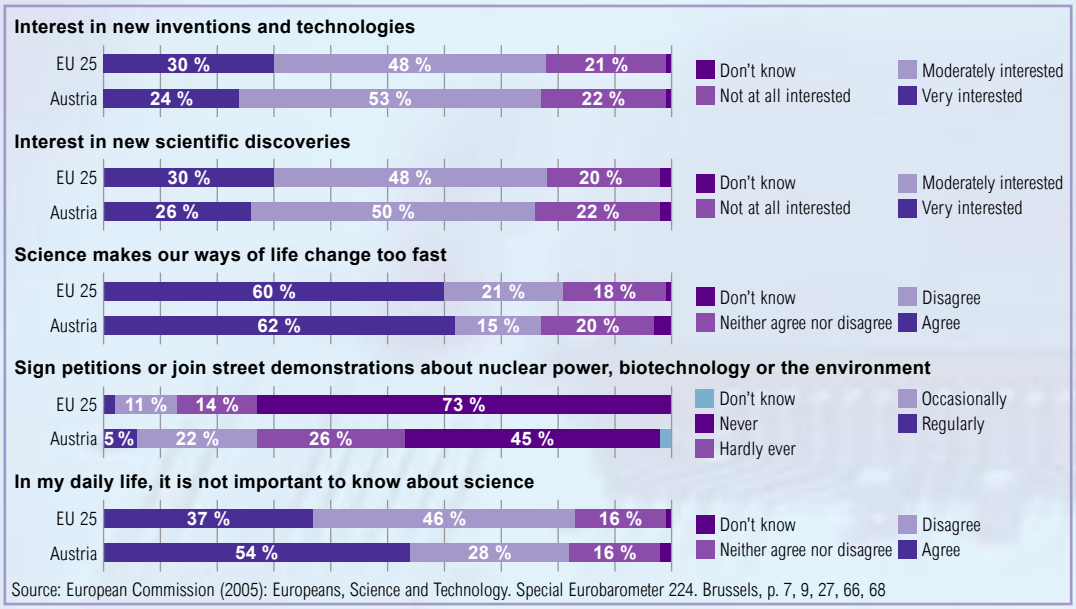
- Broadening of scientific and technical skills >

Science and Society: New Paths to Dialogue

As the "Innovatives Österreich" initiative was discontinued in 2006 without anything else being put in its place, the Austrian Council has commissioned several studies in recent years that explore support measures for science and RTI communication, as well as questions surrounding social participation.

In response to the results of these studies, the Austrian Council gave extensive consideration to this topic in Strategy 2020 – not least of all, because the relationship between science/RTI and society cannot be reduced solely to the question of the most appropriate form of communicating information. It is a relationship that is also influenced by debates surrounding values and norms, and classic questions of democratic

The attitude of Austrians to science, research, technology and innovation in a European comparison



Source: European Commission (2005): Europeans, Science and Technology. Special Eurobarometer 224. Brussels, p. 7, 9, 27, 66, 68

[1] Martos, A. / Pay, F. / Weiß, W. (2008): "Governing" Wissenschaft und Gesellschaft. Comparative report by Science Communications, Vienna; http://www.rat-fte.at/tl_files/uploads/Studien/0810_FINAL_Governing%20Wissenschaft%20und%20Gesellschaft_Studie_ScienceCommunications.pdf. Kozeluh, U. (2008): Wissenschaft und Gesellschaft. Verhältnis – Auswirkungen – Einbindung. A report on behalf of the Austrian Council for Research and Technology Development, Vienna; http://www.rat-fte.at/tl_files/uploads/Studien/Endbericht%20Wissenschaft-Gesellschaft_UK_FINAL%20mit%20Deckblatt.pdf. See also the Annual Report 2008 of the Austrian Council for Research and Technology Development, Vienna 2009, S. 41-43; http://www.rat-fte.at/tl_files/uploads/Taetigkeitsberichte/ACbericht2008_screen.pdf.
Also: Kozeluh, U. / Müller, J. / Schütz, O. / Streicher, B. (2009): Good-Practice-Elemente von dialogisch/diskursiven Verfahren und niederschwelligen Science-Center-Aktivitäten zur Unterstützung von Good Governance im Bereich Wissenschaft und Gesellschaft, Wien; http://www.rat-fte.at/tl_files/uploads/Studien/ScienceCenterNetzwerk_Goodpractice%20Elemente%20von%20dialogisch-diskursiven%20Verfahren.pdf .

theory, such as: Who participates in discussions of "relevant" questions and who does not, for what reasons and with what consequences?
The more science, research, technology and innovation touch the lives of each one of us, the more necessary it becomes to broach the issue of possible changes and consequences. While more information does not automatically mean greater acceptance or approval of controversial areas of science and research, it is, however, necessary for a dialogue that can provide a framework for dealing with conflicts more transparently, comprehensively and in a more structured way. The area of "Awareness" that the Austrian Council has dealt with ever since it was established, has therefore been broadened to "Science/RTI and Society."
In terms of content, this will also include possibilities for social participation as well as science and RTI communication. The focus on ethics in science and RTI is also new. As science and research are not just about "knowledge" but also always imply "acting" and "shaping," they ultimately also present an ethical and moral challenge.

Expert Paper: Energy Research Strategy for Austria

The energy system today faces hitherto unseen challenges. Fundamental changes will therefore have to be made if we are to respond effectively to climate change while at the same time satisfying the rising demand for energy and guaranteeing a sustainable security of supply. New technologies play a central role in this structural change. Only long-term measures in research, technology and innovation can decisively contribute to developing a new and sustainable energy system.
In its Strategy 2020, the Austrian Council for Research and Technology Development defines energy as a key area of research within the Austrian RTI system. The Austrian Council recommends giving high priority to energy research and developing an overall strategy as quickly as possible with the involvement of all actors and programmes. As a first step, the Austrian Council has therefore given its support to the further development of the strategy process initiated by the BMVIT, e-2050, and in cooperation with the BMVIT, the Austrian Energy Agency and the Austrian Society for Environment and Technology, has drafted an expert paper with the title Energy Research Strategy for Austria: Proposals for Measures in the Area of Research, Technology and Innovation.
The Austrian Council regards this paper as a basis for the discussion of a forward-looking development of Austrian energy research. In the view of the authors, it includes the most important elements of a future-orientated energy research in Austria. In particular, these include governance, the effectiveness of the promotion system, thematic priorities and the definition of key areas as well as budgetary developments. A suitable research infrastructure and human resources are major prerequisites for an energy-innovation policy that will prove successful in the long term. However, international partnerships are also becoming increasingly important. Last but not least, framework conditions – including those from other policy areas – that are conducive to innovation can be crucial for the successful implementation of the policy and will be addressed accordingly.
The discussion that is now necessary and which will hopefully soon take place, especially in connection with the Energy Strategy for Austria being developed by the ministries of economic affairs and the environment (BMWFJ and BMLFUW), will help to substantiate and implement the proposed measures and recommendations. ■

Basic Expertise: Reports and Studies 2009

Reshaping the Relationship Between Science and Society

A spirit of partnership between science/RTI and society is a prerequisite for a "democratic knowledge society".

A number of countries – such as Norway, Denmark, the United Kingdom and Switzerland – took this idea on board a long time ago and are already using differing forms of social debate, not just to improve the relationship between the two spheres, but also for research policy instruments such as developing strategies or different forms of foresight assessment.

In the case of Austria, the studies commissioned by the Austrian Council (Martos et al. 2008, Kozeluh 2008) highlighted the following problems:

- The lack of systematic coordination of possibilities for dialogue processes between science and society
- The lack of institutionalised coordination of research policy strategies with social reflection processes and a foresight assessment
- Inadequate public feedback from participative processes that have already been carried out
- An emphasis upon traditional information and awareness-raising methods

The Austrian Council consequently commissioned the Science Center Network to carry out a study to explore the following questions:

1. In which countries are dialogue and discursive processes between science and society using institutionalised procedures already systematically coordinated and in what form?

2. What form could such coordination take in Austria?

3. Which low-threshold procedures exist that have the potential to intensify the relationship between science and society?

4. Which international experiences could be useful for Austria in this respect?

The results of this study in brief:

To influence the relationship between science and society in Austria, the dialogue should be structured using a comprehensive spectrum of methods. As many forms of communication as possible, the level of existing knowledge and different sections of the population should be embraced and a variety of goals should be aimed at: From participatory processes, the results of which can be directly incorporated into parliamentary and strategic policy work, to low-threshold methods that lay the groundwork and build trust. In each case, the role and competence of the intermediary is crucial. Thus, low-threshold dialogue methods require trained mediators (explainers or scientists), while institutionalised methods require an organisational unit with political contacts and a corresponding portfolio.

Doing More for People

Strategy 2020 devoted considerable space to the subject of human resources under the heading "People" (see the chapter "What has been accomplished: Human Resources"). Pöchhacker Innovation Consulting was therefore commissioned to conduct the study "Strategic Approaches and Lines of Action to Strengthen Human Capital in Austria" with the aim of advancing and deepening the topic in terms of content.

The analysis section of the study confirms and reinforces the findings underlying Strategy 2020. It was found that if Austria is to make the transition into the group of innovation leaders, far-reaching measures will have to be taken in the area of education and research policy. Demand for more highly-qualified workers will continue to rise, especially in the sciences and engineering (see fig. 3).

If these developments are contrasted with Austria's starting situation, it becomes clear that the qualification structure of the population, and in particular that of women, has steadily improved in recent decades, but not to the extent that would have been necessary. In particular, children from those sections of society with poor educational opportunities and those from immigrant families too often fail to achieve greater educational success than their parents,

primarily because of the early social selection in the Austrian education system.
As a consequence of this and other factors, Austria has too few young people entering tertiary education and a disproportionately low percentage of university graduates compared to other OECD countries.
Based on these findings, the study identified the following strategic areas where action urgently needs to be taken:

- Reorganisation of the Austrian education system by
  - increasing pre-school education and support for children from the age of 3 onward
  - ending early segmentation at the age of 10
  - tapping the potential of children from immigrant families
- Improve the interface between education and research by
  - increasing the proportion of high school graduates, students and university graduates
  - professionalising educational and careers advice
  - a continuous dialogue between education and research, in particular by means of work experience at schools
  - improving permeability between teaching and research at universities and Fachhochschulen
- Increase interest in the sciences and technology by means of
  - early and targeted promotion of scientific literacy among children
  - targeted measures to raise awareness and improve the qualifications of science and technology teachers
  - general, interdisciplinary science tuition at schools
  - sharpening the focus of the many technology initiatives in Austria
- Strengthen the innovation base through cooperation between science and industry by
  - increasing cooperation between science and industry
  - supporting professional PhDs between science and industry
  - strengthening the role of Fachhochschulen as research partners for industry

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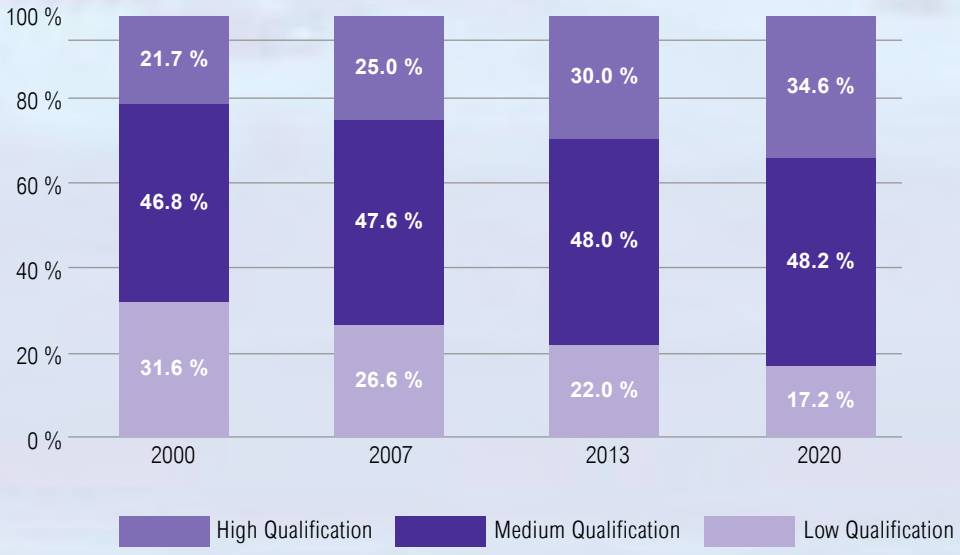


Source: CEDEFOP – European Centre for the Development of Vocational Training: Skill Needs in Europe – Focus on 2020 (IER, ROA, EC estimates), 2008, S. 17

Figure 3: Predicted change in the employment structure in the period up to 2020 broken down by qualifications, EU-25+

- Make the profession of a "scientist in Austria" significantly more attractive by
  - increasing the financial resources of universities (target: 2 % of GDP)
  - making scientific careers more attractive
  - easing access to Austria's RTI system for top international scientists
- Make Austria more attractive for highly qualified individuals from abroad by means of
  - international awareness campaigns to position Austria
  - targeted immigration of highly-qualified individuals from abroad

Table 1: Forecast growth in demand for scientists and engineers

	Employees in 2006	Employees in 2012	Annual Growth %
Classification 2	301,600	343,700	2.2 %
Technical and scientific graduate professions	89,300	110,200	3.6 %
Teachers in the tertiary, primary and secondary sectors	134,400	142,000	0.9 %
Other scientists	77,900	91,500	2.7 %

Source: WIFO Employment Forecast; "Unselbständige Beschäftigung, 2006 und 2012 nach Ausbildung", Vienna 2008

Vienna University of Economics and Business: Dissertation on the Impact Analyses

There is increasing demand from the public, politicians and industry for plausible proof of the effectiveness of political measures and programmes in the research sector. Moreover, they also want an assessment of the potential effects even before such measures are implemented. In this context, questions concerning the impacts of RTI policy measures on investments in R&D, scientific and technological progress, innovative capability, technological competitiveness, economic growth and employment are of particular importance. However, political objectives that may also involve issues such as sustainability, safety or cohesion are also gaining relevance.

In a partnership between the Austrian Council and the Vienna University of Economics and Business represented by Prof. Weiss, a dissertation project was initiated to explore the topic of impact analysis in relation to research, development and innovation.

Impact analyses employ a variety of methods and techniques to identify the correlation between RTI policy measures or packages of measures and their effects on a number of different levels. Given the topics currently being dealt with by the Austrian Council, a focus on the impact of R&D investments on employment suggested itself. The following questions are therefore being investigated as part of dissertation project:

- Which impacts can be/are being measured?
- Which impacts should be quantitatively and/or qualitatively measured?
- What cannot be measured?
- What methods are used in modern impact analyses?
- International comparison – how is the subject of impact assessments approached in other countries and how can the impact of R&D in Austria be classified in comparison with other countries.
- Which indicators point to economic effects?
- Which indicators point to positive effects on employment?
- Which indicators are generally used?

Research Infrastructure: The Basis for Innovation

While sound data and analyses of areas such as human resources, research volumes and funding are already available in Austria, there are only a small number of analyses concerning another important parameter of the Austrian research profile, namely research infrastructure. A solid database on research infrastructure could provide important information for a better understanding of the Austrian research sector and offer an important basis for targeted research, technology and innovation policy measures. The Austrian Council for Research and Technology Development therefore commissioned the consultancy firm AUSTIN, Pock & Partners to examine the topic of research infrastructure from a variety of different perspectives. The emphasis was upon

- A review of existing research infrastructure and large-scale planning/needs and upon
- Identifying strategic areas of action.

The study focused upon cutting-edge infrastructures and Austrian participation in large-scale international research infrastructure facilities.

International Trends – The importance of research infrastructure as a key factor for a long-term positioning on the European level has been recognised and much greater importance than in the past attached to the topic of "research infrastructure" at both the pan-European level and in many EU member states. Long-term strategies and multi-year budgets have been laid down for infrastructure development.

Where it makes strategic sense, access to cutting-edge research is being promoted via participating interests in transnational infrastructure facilities or partnerships. However, support is also given to the development, expansion and networking of large-scale research infrastructure in the individual countries. Instead of creating >

several small-scale research infrastructure facilities, the trend is moving toward the creation of national hubs with large-scale research infrastructure for cutting-edge science. In terms of the key thematic areas, there is a shift away from the watering can principle toward a concentration on areas that are of sufficient strategic importance and a focus on the topics of the future.

Current Situation in Austria – While Austria has a perfectly acceptable number of research infrastructure facilities, it is so far underrepresented in terms of large-scale research infrastructure, i.e. infrastructure with a certain degree of international importance.
Inter-organisational partnerships are only rarely formed with a view to acquiring and operating research infrastructure facilities. As a result, it is not always possible to utilise the full scientific and economic potential.
All too often, research infrastructure is not used as a strategic instrument to position Austria either thematically or strategically. Frequently, discussions about providing the necessary basic infrastructure overshadow the opportunities that could arise from the professional establishment and operation of larger (internationally visible) research infrastructures.
A first review of research infrastructure in Austria carried out as part of the study produced the following results:

- 739 existing research infrastructures, of which
- 204 items of large equipment/large-scale facilities
- 200 core facilities (single sited or integrated systems of distributed facilities)

- 65 collections and habitats, including electronic databases
- 126 other infrastructures
- 144 building infrastructures
- 189 external (inter)national research infrastructures that are in use and
- 233 needed/planned research infrastructures.

On the basis of this data, 57 % of all identified research infrastructures can be categorised as belonging to the universities. The thematic areas "life sciences", "nano- and materials sciences" as well as "environment, energy and sustainability" account for more than half of all the research infrastructures named in the study. The regional distribution of the research infrastructures reflects demographic conditions, and points to university and industrial locations (with a particular concentration in Vienna, Graz and Innsbruck, as well as Salzburg and Leoben).
62 % of the aforementioned existing research infrastructures was acquired or taken into operation during the past five years, whereby more than half had acquisition costs in excess of EUR 500,000. Almost half the acquisition costs of research infrastructure are predominantly (80 to 100 %) publicly funded. The same applies to the public funding of operating costs. The majority of those scientists who use research infrastructures belong to the organisation that operates the infrastructure. Approximately two thirds of the aforementioned infrastructures are used more than 75 % of the time by scientists based at the organisation housing the equipment.

Strategic Areas of Action – Research infrastructures should be regarded and used as a means of creating long-term structures – both for basic research and applied research and development. There must be awareness in the public sector that research infrastructure projects initially require high levels of investment.
Ideally, a cluster comprising organisations from science and industry, renowned researchers and ambitious projects should grow up around large-scale research infrastructure. With regard to research content, the goal should be to achieve internationally-acknowledged scientific excellence. In this context, research infrastructure constitutes a wise, long-term investment in the future.
Research infrastructures must be seen as an important factor for Austria's long-term positioning as a European research location. Their development therefore requires long-term strategies and multi-year budgets.
Where it makes strategic sense, access to cutting-edge research must be promoted via participating interests in transnational infrastructure facilities or partnerships. Above and beyond this, the development, expansion and networking of large-scale research infrastructures in Austria must be supported. Instead of creating several small-scale research infrastructure facilities, the trend should be moving toward the creation of national hubs with large-scale infrastructures for cutting-edge science. In terms of the key thematic areas, the trend is toward areas that are of sufficient strategic importance for Austria and a focus on the topics of the future. Redundant acquisitions are to be avoided, profile building the logical consequence. Care must also be taken to ensure a balance between research infrastructures for basic research and applied research. Both the scientific relevance and the ratio of projects to infrastructure are important.
However, this requires an adequate level of core public funding for start-ups, and where necessary, for the further development and maintenance of research infrastructure. Separate cost estimate and invoicing cycles for the infrastructure and project level or for one-off costs, overhead costs and project costs, will produce greater cost-transparency, making the investment easier to calculate for the public sector.
The development of a business plan, including a comparison of total expenditures with usage and project revenues, encourages long-term planning with the corresponding financing security.
Partial financing through usage and project revenues, and the associated provision of research >

services not only enhances financing possibilities but also openness, and encourages partnerships and the active marketing of research infrastructures. This in turn makes them accessible for new user groups. National and international cooperation with partners from science and industry contributes to raising international visibility. In this way, research infrastructure can act as a beacon for Austria as a centre of science and research. ■

austrian council

All knowledge-based societies are based on communication and the exchange of information. It is all the more important to remember this when setting key strategic targets for the future.

Evaluation: From Understanding to Implementation –

Workshop on 23 March 2009

Especially in times of stagnating or shrinking budgets and a global economic crisis, the importance of, and need for, evaluations are beyond dispute. The Austrian research, development and innovation system is strongly committed to evaluation. The Evaluation of Austrian Research and Technology Policies published jointly by the Austrian Council and the Platform FTeval in 2007, provides details of more than 60 RTI evaluations for the years 2003 to 2007 with the aim of improving transparency both with regard to the methods used and the results. However, as the international CREST Report notes, an evaluation alone is of little use if the results do not lead to improvements in the system. Consequently, greater emphasis must be given to the implementation of results.

The Austrian Council and the Platform FTeval therefore organised a workshop under the motto "Evaluated – what next?" to which international experts were invited. The aim of the workshop, which was held in March 2009, was to seek answers to the following questions: How can the results of evaluations be incorporated into research policy and the use of public funds in order to

achieve an improvement? What is the role of evaluations as a learning instrument in the governance system? Which factors can guarantee that evaluation results are implemented more effectively?

The opening address was given by Prof. Donnelly, currently a member of the Austrian Council. Other speakers included Prof. Cunningham, Chief Scientific Advisor to the Irish Government, Martin Weber, European Audit Office, and Michael Dinges from Joanneum Research. The event was rounded off by a panel discussion with various representatives of the national stakeholders and with active audience participation.

FameLab 2009: MicroRNA on the Stage – on 4 April 2009

As in previous years, the Austrian Council in 2009 again supported the FameLab talent contest developed by the British Council. The competition, which has been held simultaneously in ten European nations since 2007, gives young scientists an opportunity to present a topic from their research area in an exciting and informative way in just a few minutes. Rhetorical and presentation skills are of the essence, as in order to prove themselves to the jury, candidates have to be able to talk about their research area in a way that is entertaining, scientifically accurate but also engaging to a non-scientific audience without the use of complicated speaking aids.

The winner of the competition in 2009 was Lucia Aronica, a PhD student at the Institute of Molecular Biotechnology of the Austrian Academy of Sciences at the Campus Vienna Biocenter, who impressed the audience with her presentation "Dr. Jekyll and Mr. Hyde" about RNA interference. RNA interference is a natural mechanism of gene regulation in plants, animals and humans, i.e. as well as genes it is micro RNAs that determine our individual characteristics.

Research and Innovation as Ways out of the Crisis – International Meeting of the National Councils in Vienna on 14 and 15 May 2009

At the invitation of the Austrian Council for Research and Technology Development, this year's meeting of the European research councils took place in Vienna on 14 and 15 May 2009. This annual meeting of the RTI advisory bodies from the various EU countries provides a forum where they can discuss joint initiatives and strategies. Almost every European country has a body similar to the Austrian Council. In recognition of the current strategy development process, the topic of this year's meeting was "The Development of Long-Term Innovation Strategies."

The official part of the meeting was opened by Minister Johannes Hahn personally. 30 participants from 15 EU countries (including France, the UK, the Netherlands, Luxembourg, Germany, Belgium, Ireland, Denmark, Finland, Greece, Poland, Lithuania and Estonia) had come to Vienna for the meeting. The keynote speaker, Prof. Zaneta Ozolina, head of the Institute of Political Science at the University of Latvia, who is also a representative of the European Research Area Board, gave an insight into current developments and the future perspectives of the European Research Area.

As well as insights into national RTI policy developments and projects, topics of discussion focused on the various strategies and measures adopted by the different countries in an effort to combat the economic crisis. The main emphasis, of course, was upon the contribution that research and innovation can make to stimulating the economy. Many countries reported that they are increasing their investments in research and development during the crisis to ensure they have a head start once the recovery sets in. Overall, the meeting served as an important source for suggestions and input for the Austrian Council as it formulated its Strategy 2020.

Symposium – RTI Strategies in an International Comparison – 15 May 2009

On the occasion of the international meeting of the national councils in May 2009, the Austrian Council organised an international symposium on "RTI Strategies in an International Comparison."

The aim of the symposium was to analyse and discuss the importance of strategic frameworks >

for RTI policy in the various European countries. In addition to this, the cornerstones of the development processes of national RTI strategies as well as possibilities for their implementation were examined. The insights that were gained from the symposium also provided input for the Austrian Council's Strategy 2020 document.

One important result of the symposium was the recognition that the area of human resources is accorded high priority in all countries. However, despite this and other areas of agreement, for instance with regard to the grand challenges and research themes, the individual countries have adopted a wide variety of approaches and different policy models. It became clear that a national RTI strategy has to be specifically geared to the development level and needs of the respective scientific community.

Panellists included Dr. Knut Consemüller, the Chairman of the Austrian Council for Research and Technology Development, Prof. Dimitris Nanopoulus, Chairman of the National Council for Research and Technology, Greece, Dr. Gerard Coutin, General Secretary of the Conseil Supérieur de la Recherche et de la Technologie in France, and Dr. Carlo Duprel, Programme Manager of the Fonds National de la Recherche in Luxembourg. The welcome address was given by Dr. Ludovit Garzik, the Secretary General of the Austrian Council for Research and Technology Development, who also acted as the moderator. Besides the delegates from the international meeting of the national councils, forty selected stakeholders also took part in the symposium.

Alpbach Technology Forum 2009: Working Group "An International Comparison of Research, Technology and Innovation Policy (RTI) Strategies" – 28 August 2009

As part of the Alpbach Technology Forum 2009, the Austrian Council organised a working group on "An International Comparison of Research, Technology and Innovation Policy (RTI) Strategies."

The focus of the working group was upon the development of national RTI strategies, their importance for individual RTI systems and their implementation within the respective political contexts. The discussion centred upon experiences with the development of RTI policy strategies and the prerequisites for the sustainable implementation of the proposed measures. The contributions to the discussion showed that debates regarding the necessity of RTI strategies have been gaining international momentum in recent years. National RTI-relevant policies and specific science and innovation strategies have become an essential feature in most OECD countries.

For that reason, governance structures, which in the final analysis are what constitute a successful RTI system, were also discussed. RTI governance is not just about politics, but also about the interplay between the various actors who together define strategies, goals and priorities for an effective and functioning RTI system.

Speakers at the working group included Knut Consemüller, Chairman of the Austrian Council for Research and Technology Development, Karin Kjaer Madsen, General Secretary of the Centre for Research Policy of the Danish Agency for Science, Technology and Innovation, Antti Eskola, economic advisor at the Innovation Department of the Finnish Ministry for Employment and Economic Affairs, Dervilla Donnelly, Chair of the Dublin Institute for Advanced Studies, Andrzej Jelenski, Member of the Polish Science Council and Sabine Herlitschka, head of the European and International Programmes division at the Austrian Research Promotion Agency. The working group was opened by Ludovit Garzik, Secretary General of the Austrian Council for Research and Technology Development, and led and moderated by Hannes Leo, an economist and business consultant in Vienna.

Visitors from Thailand – 16 September 2009

The main topic of discussion when a delegation from Thailand visited the Austrian Council on 16 September 2009 was the strategic advisory

process which is used to develop bases for decision-making in Austria. Strategy 2020 is an excellent example of this.
Preparations for the visit were made together with the Electrical and Electronics Institute in Bangkok, represented by Ms. Duangduan Chattiptadathorn. The delegation itself was made up of representatives of the Ministry of Industry (Mr. Arthit Wuthikaro, Mr. Nat Chulkaratana, Mr. Itichai Patamasiriwat and Ms. Piengjai Chairungsinun) and of the Electrical and Electronics Institute in Bangkok (Mr. Charuek Hengrasmee and Mr. Kiattiporn Wangpattarapong).

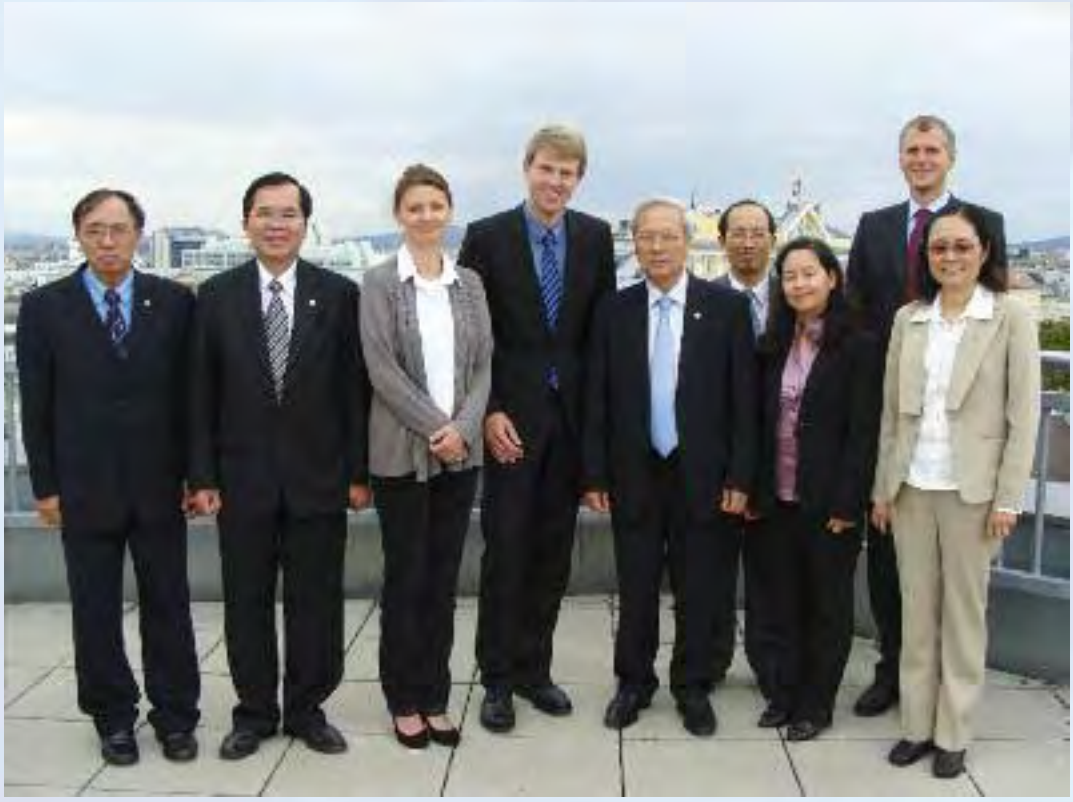
Vienna Knowledge Space: "Research Strategy Goes Public" – 17 September 2009

As the closing event of the online discussion project, the Austrian Council organised an unconventional public presentation of its Strategy 2020 on 17 September 2009 at the Vienna Knowledge Space. Under the title "Research Strategy Goes Public" the Austrian Council for Research and Technology Development presented and discussed its proposals and recommendations for the Austrian research system and discussed individual questions with an interested public.
The Vienna Knowledge Space, within the framework of which the event was held, is a platform for the communication of science in the public space. From May to October 2009 it was situated in Resselpark, in front of the main entrance to the Vienna University of Technology, and was open to all members of the public; participation in the discussion was free of charge. Members of the Austrian Council and secretariat staff were available to talk to the many passers-by and visitors who stopped to engage in discussion. >

Delegation from Thailand and representatives of the Austrian Council

Visitors from Vietnam – 2 October 2009
On 2 October 2009 the Austrian Council welcomed a delegation from Vietnam made up of representatives of the Vietnamese National Council for Science and Technology Policy (NCSTP), including its chairman, Prof. Do Trung Ta, and Ms. Nguyen Thi Thu Huong representing the Embassy of the Socialist Republic of Vietnam. The stimulating discussions centred on the Austrian innovation system, the role of the Austrian Council and Strategy 2020.

Focus on Research Infrastructures – International Meeting of the Secretariats of the National Research Councils Bonn on 13 October 2009
On 13 October 2009 the meeting of the secretariats of the European research councils met in Bonn at the invitation of the German Council of Science and Humanities. The guest speaker at the meeting of the secretariats in Bonn was Thomas Schröder from the German Ministry of Education and Research, who gave an account of his ministry's internationalisation strategy in the light of the general trend toward globalisation.
As always, the central topic at the meeting of the secretariat representatives, was the subject of and venue for the next meeting of the councils. This will take place in late spring 2010 in Belgium and, at the suggestion of Belgium and Austria, the main topic will be a transnational consideration of large-scale research infrastructures and the related national and international strategic timetables and measures. Close cooperation will be needed here if Europe is to hold its own in the global competition between large research nations. The joint financing and use of large-scale infrastructures and the coordination of the relevant national roadmaps was considered particularly worthy of discussion. Possible points



Delegation from Vietnam and members of the secretariat staff

that might be dealt with are: The development of joint financing processes, cooperation with the European Commission, the presentation of common forms of financing for acquisition and maintenance as well as the selection of best practices, and the identification of suitable rules for use including the distribution of overhead costs. This requires a close exchange of information among as many of the involved states as possible, something that makes this topic especially relevant for a meeting of international councils. It was agreed that the result of the meeting of the national councils should either be specific recommendations to the national governments or a press statement addressing them.

Long Night of Research –

7 November 2009

The third Long Night of Research, which took place on 7 November 2009, featured 570 stations (up from 375 in 2008) in Dornbirn, Graz, Innsbruck, Krems and Tulln, Linz, Salzburg and Vienna, and attracted 366,000 visitors. More than 2,000 scientists demonstrated their work and research achievements. This is a new record and makes the Long Night 2009 the biggest event for the communication of research and innovation ever held in Austria.

The initiative is sponsored by the Austrian Council for Research and Technology Development and the three ministries, BMVIT, BMWF and BMWFJ. The Chairman of the Austrian Council, Knut Consemüller, and the ministers Johannes Hahn and Doris Bures visited many of the stations at the Long Night and were both impressed and enthusiastic about what they saw. The aim of the Long Night in 2009 was once again to sharpen the awareness of the Austrian public and industry for the importance of science and research, as in today's knowledge- >

Long Night of Research from left to right: the Vice President of the Austrian Academy of Sciences Jalkotzy-Deger, the Secretary General of the Academy Suppan, Minister Hahn, the President of the Academy Denk, Chairman of the Austrian Council Consemüller

based society, research, technology and innovation are becoming ever more important. Unfortunately, however, the public perception of this importance still lags behind reality. Despite all efforts, Austrian attitudes to innovation, science and researchers are still comparatively negative. According to an international comparison carried out by the German Institute for Economic Research (DIW), Austria actually has the most negative attitudes of all the countries surveyed. This is despite the fact that a whole series of awareness-raising initiatives have been, and are being, implemented. It has become apparent that these many initiatives, sponsored by a wide range of actors, must be coordinated to achieve a focused joint approach. This was also the background to the "Innovatives Österreich" campaign, which was funded with EUR 12 million and which ran from 2004 and 2006 following an Austrian Council recommendation. "Innovatives Österreich" 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.

With more than 15,000 visitors, the Long Night of Research 2005 was the biggest, and in terms of visitor and exhibitor response, also the most successful flagship project in the "Innovatives Österreich" campaign. Against the background of this success, the Austrian Council in March 2007 recommended the continuation of the programme, and in particular, the repetition of the Long Night of Research. Unfortunately, it was not possible at that time to convince the responsible ministries to continue "Innovatives Österreich." It is therefore all the more pleasing that it has at least been possible to revive the lighthouse project Long Night of Research.

The research landscape needs continuity and consistency, also in terms of awareness measures. It is therefore essential that the continuation of the Long Night of Research in its customary quality is safeguarded, not just financially, but also structurally and organisationally. As a co-founder of this project, which has gained recognition throughout Europe, the Austrian Council will continue to provide the Long Night of Research with its full support in future. ■

austrian council

As the independent advisory body to the federal government, the Austrian Council has been tasked with defining milestones for Austrian RTI policy.

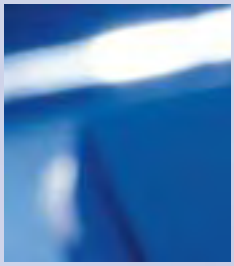
Ludovit Garzik
Head of the Secretariat

Review 2009: A Year Dominated by Strategy 2020

The year 2009 was dominated by Strategy 2020. During the first six months of the year, the initial drafts were drawn up in closed conferences and workshops, and then discussed with the stakeholders and interested members of the research community. The acute financial and economic crisis provided additional impetus for reform, making it possible to call into question some of the research sector's sacred cows – in keeping with the Greek meaning of the word crisis: "decision". Many decisions had to be taken by the Austrian Council to enable the finished strategy document to go into print in summer.
The presentation of the strategy at the end of August and its subsequent handing over to members of the government in Alpbach attracted widespread media coverage. The various chapters of Strategy 2020 were discussed in many individual discussions and their short to medium-term feasibility examined. On this basis, the cabinet started work on the development of a government strategy for RTI just one week later. This coincides with the drafting of a research financing law that should finally give the individual players in the research sector the long-term reliability they have desired for so long in terms of budget funds. This is an area that must be addressed, especially after the difficult budget preparations at the start of the year. While during the last few months of the year, the Austrian Council devoted itself to deepening Strategy 2020 in specific areas, such as indirect research funding, but also human resources, Dr. Gadner from the secretariat was seconded to the Federal Chancellery in order to contribute his expertise to the strategy process there; a high honour that also recognises the work he has carried out for the Austrian Council in this regard.
In 2009 the Austrian Council was thus able to complete the strategic groundwork, which will form the basis for further discussions over the next few years. ■

Outlook 2010: Where is the Strategic Process Leading?

"Everything will be better" – this election promise is only rarely fulfilled, but the government's strategy process holds out the promise of a number of politically binding choices. Never have we had a greater opportunity to reshape the Austrian research landscape by means of a broad discussion process. The ministries will work through the content in five working groups, discussing it with the relevant actors before finally verifying its plausibility together with international experts. The results will then have to be given a binding timeframe in order to give the institutions the planning certainty that they themselves have always called for.
There must and will be losers in this process. Conditions are changing and Austria has failed to respond adequately to this in recent years. The longer this state of affairs continues, the greater the pain will be when the necessary changes are finally made. The system does not need radical reforms, but calculable and continuous adjustment so that Austria can keep pace with its international partners and assume the desired leadership role.
The Austrian Council had and has a duty to get across unpleasant messages and communicate them to policymakers by means of recommendations. In this connection, it is of the utmost importance to preserve the Austrian Council's independence during the transition to the next term in office. In the ten years of the Austrian Council's existence, it has also become apparent that there is room for improvement in this regard, an issue which will have to be addressed when the new council takes office in September 2010. ■



Secretariat

New to the Team:
Anton Graschopf:
Anton Graschopf is standing in for Johannes Gadner during his secondment to the Federal Chancellery, especially in the areas of energy research and research for sustainable development, and as the expert for basic research, international matters, biotechnology and life sciences.
Ákos Kászoni:
Ákos Kászoni joined the secretariat team as a part time member of staff in March 2010 within the framework of a partnership with the Vienna University of Economics and Business and will provide support in the areas of impact analysis, the collection and evaluation of R&D data and macroeconomic monitoring.
Gerhard Reitschuler:
Gerhard Reitschuler symbolises the Austrian Council's increased focus on economic topics in connection with research and development in future. The earlier focus of his scientific work at the National Bank and the Federal Environment Agency as well as his teaching activities at the University of Innsbruck and the Fachhochschule Wiener Neustadt means that he will contribute broad-ranging macroeconomic expertise.
Walter Schneider:
The extensive experience Walter Schneider has gathered during his career at university and non-university research institutes enabled him to prevail against strong competition at the hearing in November 2009. He commenced work at the secretariat at the beginning of 2010.

Johannes Gadner:
Following completion of the Austrian Council's Strategy 2020 that he had coordinated, Johannes Gadner was invited to accompany the development of the federal RTI strategy at an RTI secretariat at the Federal Chancellery especially set up for this purpose. Given his experience in developing the structure and content of the Austrian Council's Strategy 2020, the steering group for the federal RTI strategy approached the Austrian Council with a request to utilise Mr. Gadner's experience for their own process. For the duration of this secondment, which will last for eight months, Mr. Gadner will not be bound by directives from the Austrian Council. ■

Public Relations Work: Press Review
In the fulfilment of its legal mandate, the Austrian Council uses a variety of public relations instruments. In the year under review, the Austrian Council published eight press releases, which can also be viewed on the Austrian Council website at www.rat-fte.at, and held three press conferences on the topics "research budget," "Strategy 2020" and "human resources."
In addition to this press relations work, there were a number of media collaborations with a variety of partners designed to reach a wider audience beyond the narrow specialist community. Members of the Austrian Council and secretariat staff also produced a host of guest articles and took part in lectures and discussions. ■

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.

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.

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' micro-electronic 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.

Advisory Members

Doris Bures
Minister of Transport, Innovation and Technology

Johannes Hahn
Minister of Science and Research (until the end of 2009)

Beatrix Karl
Minister of Science and Research (from the beginning of 2010)

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, deputy head of the secretariat and members of staff (in alphabetical order):

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

Constanze Stockhammer
Deputy head of the secretariat, business-orientated research, indirect research promotion, start-up and growth financing, SME and innovation funding, cooperation between federal government and the provinces, research infrastructure, nanotechnologies, information and communications technologies, mobility and transport
c.stockhammer@rat-fte.at

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

Anton Graschopf
Temporary replacement for Dr. Gadner and Dr. Stockhammer, who is on maternity leave
a.graschop@rat-fte.at

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

Margit Kamper
Personal assistant to the Chairman of the Austrian Council, back office
m.kamper@rat-fte.at

In 2009, Ms. **Michaela Topolnik** and **Silvo Korez** two seasoned members of staff left the secretariat. We wish them both much success as they take up their new responsibilities.
Peter Lindner carried out the duties of Ms. Topolnik from May to December 2009 and started to develop the area of macroeconomics before moving to the National Bank at the end of the year.

Ákos Kászoni
(Cooperation with the Vienna University of Economics and Business)
Impact analysis, collection and evaluation of R&D data, macroeconomic monitoring
a.kaszoni@rat-fte.at

Gerhard Reitschuler
Collection and processing of R&D data, macroeconomic development and trends, output/impact (indicators), modelling and simulation, technology flow analysis, innovative procurement
g.reitschuler@rat-fte.at

Margarete Rohrhofer
Accounting, personnel and office management
m.rohrhofer@rat-fte.at

Bettina Ruttensteiner-Poller
Science/RTI and society, human resources, humanities, social and cultural sciences, advancement of women and gender mainstreaming, ethics in research, public relations work and administrative support
b.ruttensteiner@rat-fte.at

Walter Schneider
Basic and pre-competitive research, agricultural sciences, security research, international research cooperation, EU research and innovation policy, especially EU Framework Programmes for RTD, ERA-Net
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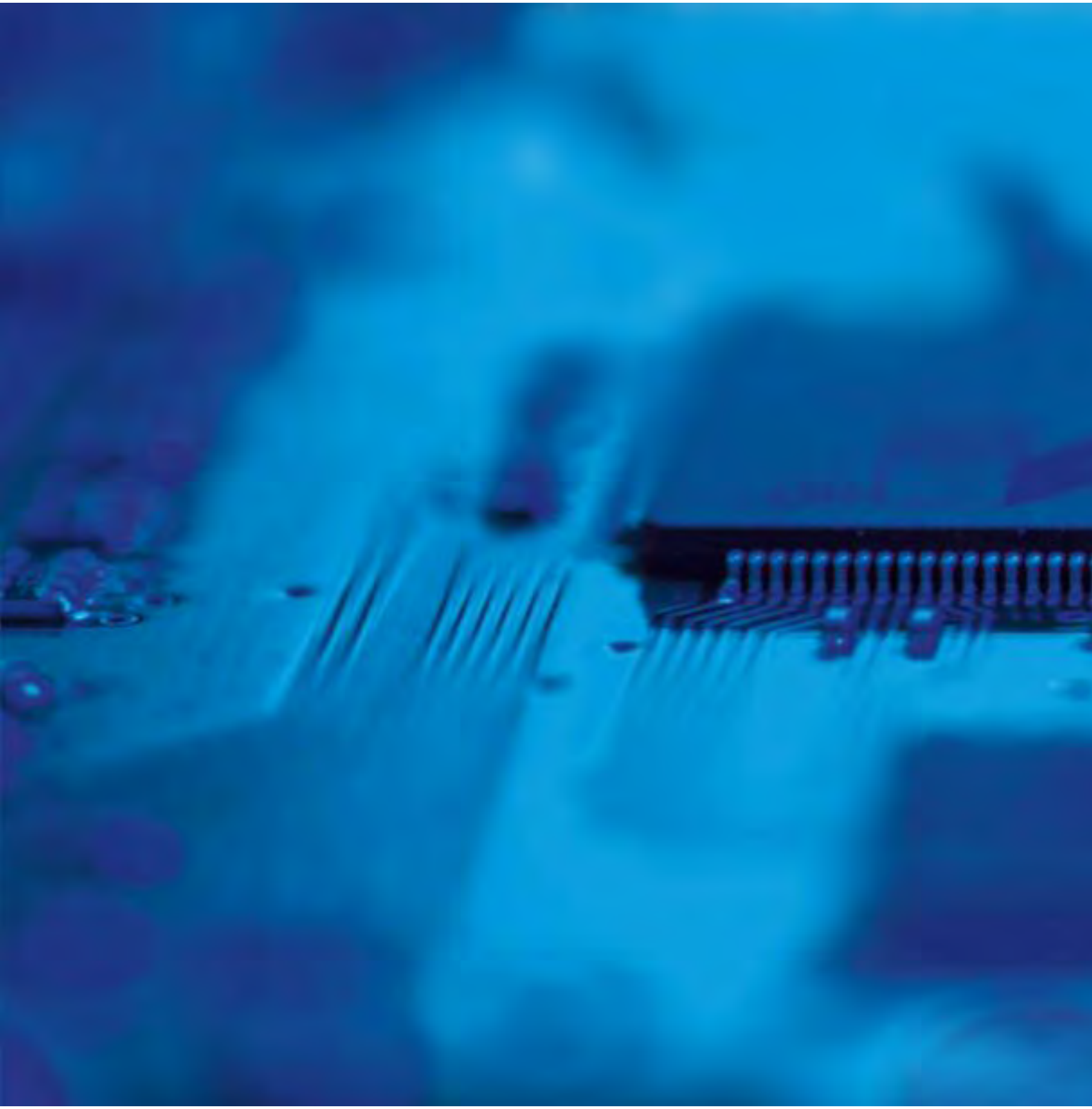
Austrian Council for Research and Technology Development

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