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contents

4 __ **foreword**

5 __ **editorial**

7 __ **outlook**

How Good is Austria's RTI System _____ 8

11 __ **the austrian council recommends**

Recommendations 2012 _____ 12

31 __ **creating knowledge**

What Has Been Accomplished _____ 32

Reports and Studies 2012 _____ 37

International Activities _____ 43

45 __ **events**

51 __ **the austrian council**

Review and Outlook: 2012 and 2013 _____ 52

Members of the Austrian Council _____ 54

Secretariat _____ 55

56 __ **contact**

foreword

Austria's catch-up process in research, technology and innovation (RTI) since the turn of the millennium is a remarkable example of practical, and at the same time proactive, policymaking. Thus despite the global financial and economic crisis, the Federal Government has further increased the budget for research and development and at the same time carried out a large number of structural reforms, which have led to significant improvements in the Austrian RTI system.

The goal formulated in the Federal Government's RTI strategy is that Austria should move up into the group of European innovation leaders in terms of its research and development intensity. For strengthening research,

technological development and innovation is the most effective way to safeguard high-quality jobs, generate sustainable economic growth and employment as well as to overcome the key challenges facing our society – from climate change to the energy system to the effects of demographic changes.

The Austrian Council for Research and Technology Development has made a significant contribution to the success achieved in recent years in its active role as an advisory body to the Federal Government. We would therefore like to thank the members of the Austrian Council, who with their sound advice, provide such valuable support to the government's strategies and measures for research and innovation policy.



Doris Bures

Minister of Transport,
Innovation and Technology



Maria Fekter

Minister
of Finance



Reinhold Mitterlehner

Minister of Science
and Research



Karlheinz Töchterle

Minister of Economic Affairs,
Family and Youth

“Moving in the right direction, but with the handbrake on!”

In the fifth year of crisis-driven financial and economic policies, we and many other countries are still firmly in the grip of the sovereign debt crisis. It is undisputed that strained public budgets are imposing significant constraints and in many cases also painful cutbacks. However, the “where?” and the “how much?” are often highly controversial, as no one wants to have to make cutbacks and savings that affect themselves or their own areas.

In political and human terms this is understandable. It is therefore all the more important to overcome short-term patterns of thought and action and to look beyond the next election date to recognise what has to be done to secure our future. The Austrian Council for Research and Technology Development has there-

fore made serious efforts in the last year to ensure that the urgent need for action in the area of education, research and innovation policy has not been neglected in the vital debates surrounding cutbacks in public budgets. In particular, the Austrian Council has called for reforms in the educational system, adequate financing for universities, investments in research infrastructure and more private-sector financing for R&D as matters of priority. The course that has been pursued in Austrian research and technology policy over the last 15 years or so has indeed been the right one and must now be continued with even greater determination and without the “handbrake” that has been applied since 2009.

editorial



Hannes Androsch
Chairman
of the Austrian Council

From a “Performance Report” to “Austria 2050” – A Survey of the Status Quo and the Outlook Ahead

The milestone in 2012 was the Report on Austria’s Scientific and Technological Capability that was presented by the Austrian Council for the first time. Based on more than 40 indicators, the report provides a comprehensive picture of the strengths and potential as well as the problems of the Austrian research and innovation system. The result is a new type of report, which in future should serve as an instrument for monitoring and supporting the implementation of the government’s RTI strategy.

In addition, a series of events on topics ranging from energy to science to taxes was held under the general heading “Austria 2050”. The aim of this series was to encourage us to look at the bigger picture and to embed education and research in a broader context. The event series will

be continued in 2013 and will eventually lead to the publication of a book that will be presented at the Alpbach Technology Forum. It is hoped that this publication will show means and ways of overcoming existing and future challenges and that by taking the right steps we will even be able to emerge from the crisis in a stronger position. For a small, open economy like Austria, it is essential to optimise the overall system in order to free up blocked resources that can then be invested in education, research and innovation. This is the only way that our country will be able to embark on the path to becoming an internationally well-connected and innovative knowledge-based society that responds flexibly to domestic and international challenges.



Peter Skalicky
Stv. Deputy Chairman
of the Austrian Council

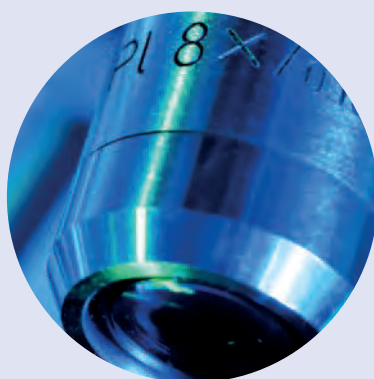
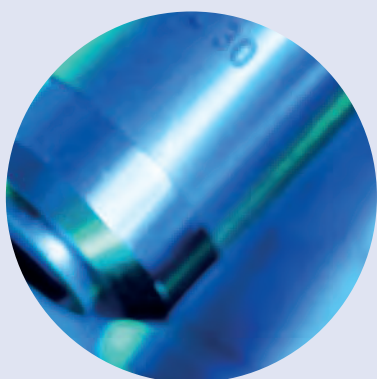
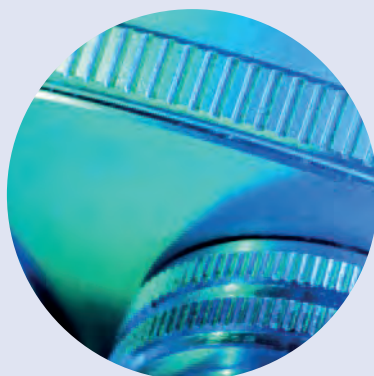
editorial

Finally, we would like to thank all those who have supported us and our work in 2012 and hope for continued suc-

cessful collaboration in the future. We must lay the foundations for a successful future by our joint efforts.

The members of the Austrian Council (from left to right):
Markus Hengstschläger,
Karin Schaupp,
Gi-Eun Kim,
Renée Schroeder,
Marianne Hilf,
Peter Skalicky,
Gabriele Ambros,
Hannes Androsch





How Good is Austria's RTI System?

The Austrian Government has commissioned the Austrian Council to carry out a regular strategic monitoring of the implementation of the government's RTI strategy. The results of this monitoring process are incorporated into the yearly report on Austria's scientific and technological capability, which is also compiled by the Austrian Council at the behest of the cabinet. This report was prepared and presented for the first time in 2012 and will in future be submitted to Parliament on 1 June. On the basis of specific indicators, the report paints a sweeping picture of the strengths and potential as well as the problems of the Austrian research and innovation system

Strengths and Weaknesses of the Austrian RTI System

The chapter "General Assessment of the Performance of the Austrian RTI System in an International Comparison" examines the strengths and weaknesses of the domestic RTI system as seen by the Austrian Council. It is based upon national analyses and studies, as well as global ranking tables and international comparative data. The evaluation of more than 40 indicators revealed the following picture:

- The strengths of the Austrian RTI system include
- Above average growth in GERD as a percentage of GDP
 - Several university and non-university institutes with a high scientific reputation and excellent output
 - Above average increase in output in terms of scientific publications and international co-publications
 - Austrian research has a high degree of internationalisation
 - Top scores for inventions, trademarks and utility models
 - Strong cooperation between science and business.

The weaknesses of the Austrian system include:

- In the educational system: Low university access and graduation figures, high drop-out rate, low proportion of graduates and too few graduates in STEM subjects
- In the university system: Insufficient coordination and planning in the tertiary education sector, Austria is not an attractive destination country for researchers, poor performance in international university league tables and potential to improve research infrastructure
- In the business sector: Innovation performance and inter-sectoral structural change needs to be brought up to speed and there is a lack of risk capital
- In governance: Complex governance structures, limited flexibility, coherence and steering capability of the funding system, inadequately coordinated internationalisation strategy and an inadequate dialogue between science/research and society and finally
- In financing: The funding quota has not been achieved, and there is too little private funding, below average financing of education and universities as well as inadequate financing of basic research.

Evaluation of the Federal Government's RTI Strategy

In the chapter "Evaluation of the Objectives and Measures from the RTI Strategy", the Austrian Council assesses whether the implemented measures are suitable for achieving the objectives of the RTI strategy and the Vision for Austria 2020. In addition, options for improving the individual strategy elements are recommended. Finally, there is a summative evaluation of the degree to which the measures have been implemented. The third chapter in the RTI performance report evaluates elements that are not contained in the RTI strategy, but which in the opinion of the Austrian Council are important for improving the performance of the Austrian RTI strategy, such as

- Coordination between the Federal Government and the provinces
 - Aligning the RTI Strategy with the University Plan
 - Developing an innovation-orientated STRAT.AT plan for 2014 to 2020
 - Humanities, social and cultural sciences and
 - Risk in research funding.
- Here too, specific possibilities for optimisation are identified and recommended.

Recommendations Concerning the Further Development of the RTI Strategy and the RTI System

The final chapter summarises what the Austrian Council considers to be the most urgent findings of the implementation monitoring and contains

recommendations for the further development of the RTI strategy and the Austrian RTI system.

On the basis of its analysis of Austria's RTI system as well as of the initial results of its implementation monitoring, the Austrian Council reaches the judgement that, subsequent to an impressive process of catching up, Austria's innovation performance has in the last three years stagnated. In international comparisons, Austria's RTI system has a good mid-range ranking. Austria thus finds itself in a position from which its prospects of joining the leading group and achieving the objectives of the RTI strategy remain good. Yet delays in optimising the framework conditions to increase innovation performance are having a very strong impact. European and international competitors are also active-

outlook

Press Conference
Alpbach Technology Forum
(from left to right)

Hannes Androsch
(Austrian Council),
Doris Bures (BMVIT),
Karl Heinz Töchterle
(BMWf),
Georg Kapsch
(Federation of Austrian Industries)





outlook

ly working towards increasing their innovation performance. The implementation of the RTI strategy measures must therefore be accorded high priority.

In view of the fact that the RTI strategy was only agreed on 8 March 2011 and that the implementation understandably requires time, the Austrian Council's recommendations focused on two core areas, which in the opinion of the Austrian Council are especially essential for the future development of the RTI strategy and the RTI system:

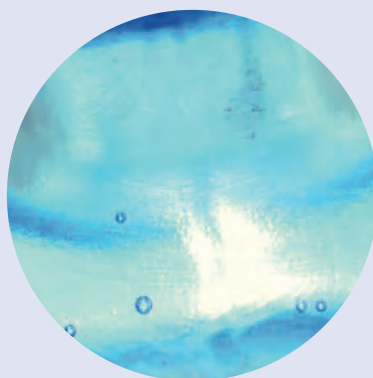
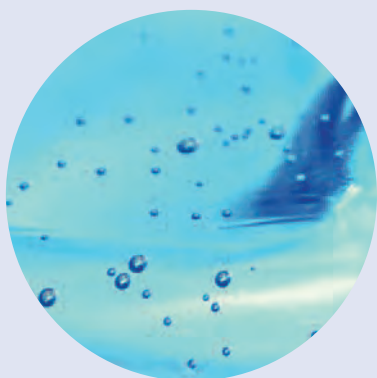
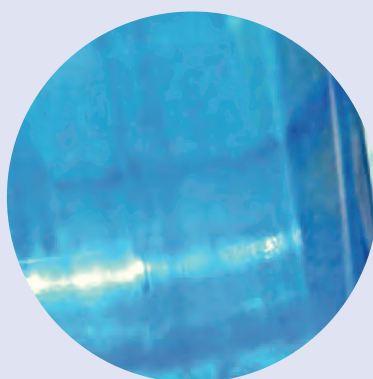
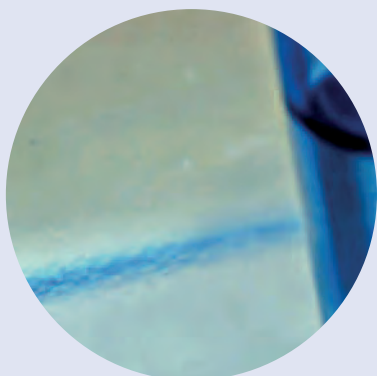
1. Modernising the education system
 2. Increasing the private share of R&D funding
- The Austrian Council's implementation monitoring clearly shows that major efforts are necessary above all in the area of education. The education system remains the bottleneck of Austria's RTI system. The high degree of social selectivity means that existing potential is not being sufficiently realised. Here, it is necessary to vigorously pursue the implementation of the relevant measures in the RTI strategy.

According to the findings of the implementation monitoring, the second crucial substantive area is to be found in broadening the sources of funding for R&D activities. When it comes to research and innovation, the Austrian economy has mastered the crisis years better than many other countries, yet compared to leading innovation nations

there is still some catching up to do. It is above all necessary to significantly raise the proportion of private R&D financing. Yet there is a lack of new concepts as to how this should be done. In addition, however, the degree to which the measures contained in the RTI strategy have been implemented is still inadequate.

The Austrian Council recommends that particular importance be attached to implementation activities in these two areas. In this regard, it is on the one hand essential to modernise the structures of the education system. This can be done by strengthening school autonomy, as well as by streamlining the division of competences between central government and the provinces. To overcome early selection in the education system, the Austrian Council recommends a commitment to and appropriate implementation of comprehensive all-day secondary schooling, alongside performance differentiation and talent development.

On the other hand, an increase in the private share of R&D funding is central. The Austrian Council thus recommends greater examination of international models for increasing the R&D expenditure of the private sector. Parallel to that, the Austrian Council regards the statutory anchoring of research funding to be an important signal for research organisations, but also for companies. The prompt implementation of this intention is of great relevance for planning and funding security.



Recommendations for 2012

Recommendation regarding key areas for the allocation of funding from the National Foundation for Research, Technology and Development (NSFTE) for 2013 – recommendation dated 14 June 2012

In the light of the Research Strategy 2020, the Board of Trustees of the National Foundation for RTD invited the Austrian Council for Research and Technology Development to define potential key areas for the allocation of funding in 2013.

Following a detailed discussion and in line with the National Foundation's criteria of long term planning and continuity, the Austrian Council recommends the following substantive focus for 2013.

Priorities for 2013

Basic principles for the 30th meeting of the Board of Trustees on 26 June 2012)

- Strengthen national human potential base
- Strengthen research infrastructure by focusing on initiatives with a suitable critical mass and risk potential
- Coordination and alignment of regional and federal RTI activities
- Increase venture capital
- Excellence in basic research
- Measures to make Austria more attractive as a location for research-intensive companies

Factors to be taken into consideration:

- Topic management FFG
- Status quo VC initiative

Statement of the Austrian Council for Research and Technology Development regarding the white paper STRAT.AT 2020 – recommendation dated 4 September 2012

The European Fund for Regional Development and Competition (ERDF) is one of the EU Structural Funds. The forthcoming funding period that runs from 2014 to 2020 requires a new partnership agreement, for which a new white paper was published in mid July 2012.

This document was the first written description of what should or must be the subject of the partnership agreement. In the public consultation process, the Austrian Council set out its position on the document in the form of the following statement.

The Austrian Council for Research and Technology Development welcomes the document formulated by METIS and WIFO and considers that it accurately depicts the domestic innovation system in the context of the Structural Funds' overall goals and priorities. Furthermore, this document should be seen as an excellent starting point for the future formulation of a partnership agreement.

The Austrian Council considers it important that all key actors in the innovation system are involved in the next stages of the process for programming the funding period from 2014 to 2020. An opening to national funding instruments must be guaranteed, as must a complementary alignment of national framework conditions with other EU funding programmes – in the context of innovation this in particular refers to Horizon 2020.

The Austrian Council points out that the Structural Funds in Austria, which are based on the strategy documents of the European Commission (the Europe 2020 Strategy, the Innovation Union and the joint strategic framework) can make an important contribution to achieving the

goals formulated in the RTI strategy. The white paper highlights this importance and also draws attention to the challenges which will have to be tackled in the coming months in partnership with all those actors concerned.

recommendations

Recommendation regarding long-term financing of the Austrian education and RTI system – recommendation dated 11 September 2012

Background

An excellent education system and adequate financial support for science and research are factors that have a crucial influence on shaping and securing the future. In recent years, Austria has significantly increased investments in research and development. Supported by a vigorous expansion of the funding system, the business sector in particular has generally reported very positive development. However, at the same time, the economic crisis has resulted in a sustained stagnation in the level of research expenditure since 2008. In view of the ambitious goal to increase R&D expenditure to 3.76 percent of GDP by 2020, there is an urgent need to increase private-sector research funding in order to achieve the target ratio of 70 percent private and 30 percent public spending.

Research has long lead-times. In comparison, the planning horizon in industry is considerably shorter. Thus adequate public funding is essential to create the necessary pull effect in private-sector research and to motivate the sector to make anti-cyclical investments in R&D. Furthermore, national funding schemes also provide an important basis for obtaining EU funding.

In economic terms, an anti-cyclical approach should be adopted. The role models in this regard are Germany, Switzerland and the Netherlands, where despite spending cuts in other areas, anti-cyclical investments are being made in education and research. In Germany, for example, public and private-sector spending on research and development rose to a record level of almost EUR

70 billion in 2010, the equivalent of 2.82 percent of gross domestic product. Industry contributed EUR 46.9 billion to this total and the Federal Government EUR 12.8 billion. No other large member state of the European Union has increased its national R&D budget as significantly.

Research requires long-term secure financial planning. The long-term securing of IST Austria is therefore exemplary. However, the same must be guaranteed for all other Austrian research institutions. Provisions should therefore be made in the current budget negotiations or in the negotiations concerning the future performance agreements.

In this context it is essential that calculations are based on realistic figures. It is unacceptable that after adjusting the nominal increase in the university budget for inflation, there is no budget increase in real terms, yet at the same time, the universities are expected to cover steadily rising general costs as well as sharp increases in student numbers. When implementing the planned funding measures, the performance agreements should be structured in such a way that they offer greater incentives to carry out structural reforms than in the past.

Analysis of the Trajectory of R&D Expenditure in Austria Until 2020

The following calculations show the development of R&D expenditure in Austria until 2020 and the foreseeable funding shortfall to the 3.76 percent GERD-to-GDP target. The figures for the period up to 2012 are based on the Statistik

recommendations

Austria global estimate, those for the period 2013 to 2020 on the WIFO figures for the study “GERD-to-GDP Targets 2020”.

The table entitled **Foreseeable Budget Trajectory** shows the growth of private and public-sector spending on R&D, taking into account the Budgetary Framework Act (2011–2015) and assuming that the status quo is retained

(2016–2020). The table entitled **Trajectories Calculated Using a Deterministic Model** calculates the trajectories that are hypothetically necessary to achieve the GERD-to-GDP target of 3.76 percent by 2020. In the deterministic scenario, the ratio of public and private-sector contributions to total R&D spending in the period 2011–2020 will evolve from approximately 40:60 to roughly 30:60.

Budget Trajectories and Financing Shortfalls Until 2020

	Development from current perspective (bn. €)		Deterministic calculation (bn. €)		Shortfall (€ mn.)		
	Public	Private	Public	Private	Public	Private	Total
2012	3.28	5.48	3.38	5.50	-98.9	-27.6	-126.6
2013	3.40	5.95	3.57	5.97	-171.3	-16.2	-187.5
2014	3.45	6.37	3.78	6.48	-328.5	-103.5	-432.0
2015	3.50	6.83	3.99	7.03	-491.5	-199.2	-690.7
2016	3.58	7.14	4.14	7.48	-562.6	-338.5	-901.1
2017	3.66	7.47	4.29	7.96	-635.1	-489.7	-1,124.8
2018	3.72	7.78	4.45	8.47	-729.5	-682.7	-1,412.2
2019	3.79	8.11	4.62	9.00	-827.8	-893.8	-1,721.6
2020	3.85	8.45	4.79	9.57	-933.4	-1,128.8	-2,062.2

The table shows the absolute nominal amounts of public and private-sector R&D spending up until 2020. The difference between the deterministic trajectory (to the 3.76 percent target) and the continuation of the status quo (taking into account the Budgetary Framework Act) is the hypothetical shortfall. The figures show that the shortfall in public funding will rise to almost one billion euros by 2020. As a result, the private sector will be required to provide additional funding of more than one billion euro in 2020.

The figures show that by 2020 there will be a substantial financing shortfall in respect of both private and public R&D spending; in 2020 this will total some two billion euros.

Recommendation

In view of the continuing stagnation of research spending in the private sector, the Austrian Council recommends increasing the public R&D spend in order to ensure the necessary anti-cyclical pull effect. If the 3.76 percent GERD-to-GDP target is to be reached by 2020 an accumulated additional financing requirement of more than EUR 900 million must be expected. This requirement must be taken into account in the current budget negotiations.

In the opinion of the Austrian Council there is an urgent need to improve the predictability of research financing. The current basis of financial planning and appropriate safeguarding of the

central institutions of Austria's science and research system thus need to be anchored in the federal budget. This concerns the tertiary education and research sector (e.g. universities), non-university research (e.g. the Academy of Sciences) as well as direct research funding (e.g. FFG). Furthermore, the recommendation made by the EU Commission to spend two percent of GDP on the tertiary education sector should be implemented as quickly as possible.

The Austrian Parliament and the Federal Government have committed themselves to achieving a GERD-to-GDP target of 3.76 percent by 2020. This necessitates the introduction of the research finance law announced in the RTI Strategy, which must establish a corridor for research and development investments, so that the GERD-to-GDP target of 3.76 percent by 2020 can be reached. This does, however, require the successful implementation of the current planning and reform processes.

Regular and objective quality controls which are carried out independently are a key element for implementing all planned financing measures in the research sector.

Tertiary Sector

A central element is the further development of the tertiary education sector by means of a thorough reform of the Austrian higher education landscape and the consistent implementation of the University Plan, within the framework of which sufficient scope and appropriate financial resources must be provided for research. Performance agreements must be structured in such a way that they provide a greater incentive for structural reforms. In particular, this applies to the current negotiations with the universities regarding the performance agreements for the period 2013 to 2015, as well as with the Academy of Sciences (ÖAW).

The university sector is characterised by a problematic combination of an absence of access management and tight budgets. The system of unrestricted university access has not brought about the desired progress toward equal opportunities. The most important measure to improve planning security for the university sector is therefore the autonomous regulation of access by the individual universities.

recommendations

Recommendation of the Austrian Council for Research and Technology Development regarding ERDF (Structural Funds) – recommendation dated 19 September 2012

General

In discussions with representatives from a variety of institutions from the RTI system (including federal ministries, provincial governments and agencies) the Austrian Council for Research and Technology Development has become aware of systemic hindrances in the area of European Regional Development Funds¹. At its meeting on 19 September 2012, the Austrian Council therefore decided to make a recommendation regarding the challenges described below.

Background

The Structural Funds (ERDF and ESF²) as elements of European cohesion policy are important instruments for financing regional projects in particular, although only roughly one third of total ERDF resources are budgeted for the innovation system. In the current financing period, Austria has achieved positive implementation rates in the area of bilateral projects and the multinational European Territorial Cooperation (ETC) programmes. Ambitions in terms of tech-

¹ European Regional Development Fund

² European Social Fund

recommendations

nology transfer and knowledge sharing – especially across borders – have been very successfully fulfilled in the ETC projects. However, it is a subject of ongoing discussion that the views of the funding applicants and the second level control by the Federal Chancellery diverge with regard to the eligibility of costs for funding in projects with ERDF co-financing. Extremely high rates of error have been detected among projects that have been audited and these can be extrapolated to the system as a whole. Overall, the return flow from this funding instrument has so far remained below expectations. For the remainder of the programme until the end of 2013, it is expected that under the prevailing administrative conditions the funds budgeted for Austria can only be used with restrictions, resulting in a correspondingly low return flow. In the forthcoming period, national participation should be prepared together with the EU framework programme for research and innovation Horizon 2020. The ERDF should in particular provide funding for RTI-relevant infrastructures and investments (Stairways to Excellen-

ce), while Horizon 2020 aims to promote excellence and to close the gap between research and innovation up until market maturity. The foundations for this key research, technology and innovation priority are the Federal Government's commitment to achieving a GERD-to-GDP ratio of 3.76 percent by 2020, the measures presented each year by the Federal Government and provinces within the framework of the National Reform Programme for the Europe 2020 strategy and the implementation of the Federal Government's RTI strategy for the period up to 2020.

Planning for the future funding period (from 1 January 2014 to 31 December 12 2020) has already begun. Responsibility for coordinating the process in Austria has been given to the Austrian Conference on Spatial Planning (ÖROK). Various preparatory activities and expert groups are – with the agreement of the task force that was appointed to implement the Austrian RTI strategy – based at the ministries with the relevant specialist responsibility.



Selected RTI-Relevant Strategy Documents of the European Commission

On 17 July 2012 the European Commission published a document on the “ERA – European Research Area” with the reference number COM (2012) 392. Making reference to the Europe 2020 strategy, the Innovation Union (IU) and the drafts for the framework programme for research Horizon 2020 and the Structural Funds, this document underlines the importance of a strong and well-positioned European research community.

The key demand made in this document for achieving the completion of the European Research Area is the harmonisation of national funding rules and selection processes to remove barriers to scientific work. The document also highlights the need to apply high standards of quality when selecting projects (for example peer review processes) to ensure greater excellence in research.

The document COM (2012) 392 refers several times to the Structural Funds and the smart specialisation strategies. By setting out this political objective the European Commission is encouraging the regions to establish individual profiles. In particular, the document addresses leading regional companies and entrepreneurs, representatives of the regional knowledge, technology and creative sector as well as regional policymakers and planners. The success of the regions measured by the return flows from the Structural Funds will depend to a large extent on the ability of the actors to define joint priorities.

Austrian Council Findings

The Structural Funds constitute an important instrument of European cohesion policy for the RTI system in the forthcoming funding period (2014–2020). However, current national eligibility rules, governance structures and prevailing practices in programme management generate real barriers, which have a negative impact on

scientific work. Continuing with current practices would lead to tension between the political objectives of the European Commission and practical implementation in Austria. The fundamentally good chances for the domestic innovation system to generate new impetus in the regions with resources from the Structural Funds must be effected by means of comprehensive changes to the processes and structures. Merging the regional operational programmes (OP) into a joint Austrian OP would be an important first step, and one that is welcomed by the Austrian Council.

Recommendation

Based on its findings, the Austrian Council makes the following recommendations regarding the Structural Funds (ERDF) in Austria:

- The European Commission accords great importance to innovation in its strategic documents and in the prioritisation of the objectives in the Structural Funds. The Austrian Council recommends that the same level of importance should be accorded at the national level and that framework conditions and structures that are conducive to innovation should be created.
- The governance of the administration of structural funds in Austria must be critically questioned. The Austrian Council recommends that alternative models should be developed in consultation with all involved institutions and is of the opinion that a functional separation of the areas of responsibility, in particular in the necessary agency structures (certifying authorities, managing authority and audit authority), is necessary.
- The processes during the administration of projects currently focus strongly on auditing and are less than satisfactory. The Austrian Council recommends a service orientation and complementarity³ with other European and

recommendations

³ Austrian negotiating position; cabinet presentation on 14 February 2012; Item #41.

recommendations

national funding instruments as a central element of a reorientation of governance by the Federal Government and provinces. This requires a clear joint commitment on the part of the Federal Government and the provincial governments.

- An absence of uniform advisory structures in the Structural Funds has been identified in the current programme period. The most significant obstacles in terms of project implementation were the lack of adequate advice from European and national funding programmes to help applicants select the optimal funding instrument during the application process as well as ambiguously formulated framework conditions. The Austrian Council recommends that information geared to the requirements of RTI institutions and based on the model of the EU framework programmes should be provided for ERDF co-financed programmes by the start of the next funding period at the latest. In future, uniform Austria-wide rules (funding eligibility directive) must be introduced to simplify the advisory and management processes for the different programmes. In the interests of the innovation system, it would be desirable to align these processes with those of complementary funding instruments – in particular Horizon 2020. The formulation of an easy-to-understand guideline for funding applications with the active involvement of the audit authority is considered to be a key support measure.
- The expertise of the unit based at the BMWF that coordinates the topic of smart specialisation in consultation with the actors from the Austrian research community, makes an important contribution to preparing the framework conditions for the next funding period. With a view to promoting science, research and innovation-driven structural change by means of intelligent specialisation on the part



of the regions, policymakers, business, universities and research centres as leading regional institutions should be actively involved in the formulation of regional development priorities and the development of the operational programmes. The Austrian Council recommends that the RTI community should be involved to a greater extent in the preparation of the partnership agreements to ensure optimal networking between central government, the provinces and other actors. In this context, the Austrian Council draws attention to the important role played by the task force that was appointed to implement the RTI strategy.

- Austria performs well in the current bilateral and multinational programme lines and targets have been exceeded, not least of all due to severe structural weaknesses in other states. The Austrian Council recommends bringing in Austrian expertise as a contribution to the bilateral programmes to support other regions as well as the adoption of the lead principle for administrative issues in the operational programmes. This will enable Austria to obtain a strong mandate in the programmes and also to build up partnerships with cross-border regional development – for example the Danube region strategy.
- The at present barely coordinated interfaces between the individual instruments at the European, national and regional levels as well as

differing eligibility rules act as hindrances in collaborative projects and larger project families. With regard to the planning of the national operational programmes and for negotiations with the EU, the Austrian Council recommends adopting an Austrian position which will make it possible to open up structures for goal-orientated funding from a variety of European, national and regional initiatives – for example ESFRI or the KICs of the EIT.

- At present, the processes in the Structural Funds for selecting and evaluating project applications as well as for the monitoring of the results are not explicitly optimised for projects with a scientific focus, as the Structural Funds are geared to regional development. It is not always possible to foresee the specific results of innovative projects in detail, quality in science and research is not a region-specific characteristic. The Austrian Council recommends generating measures in accordance with the ERA objectives, which will support the selection of high-calibre research projects in the application process while taking into account the requirements in a region with a view to smart specialisation. Appropriate modifications to the guidelines should be made to enable a more flexible approach to be taken when implementing scientific projects.

recommendations

Statement regarding the research premium regulation – recommendation dated 24 September 2012

Background

Research activities at Austrian companies have risen sharply in recent years, not least of all because of the research premium, the total volume of which rose, parallel to research spending, from EUR 121 million in 2005 to EUR 330 million in 2010 (although this development also reflects the shift away from a system of research tax allowances to the research premium). During this period the precision of the measure became the

subject of repeated discussion, particularly as regards whether the research premium should be seen as a form of research support or business location support. Under the terms of the Stability law that was adopted in March 2012, stricter conditions for obtaining the research premium were introduced for companies, which will come into force at the beginning of 2013. Stricter vetting of eligibility for the premium is expected to generate annual savings of EUR 40 million for the

recommendations

Ministry of Finance. In return, the premium for contract research was raised from a maximum amount of EUR 100,000 for contract research expenses to one million euros. This should make the research premium more accessible also to smaller companies, which make greater use of contract research. From the beginning of 2013, and in the interests of greater planning security, tax-payers applying for a research premium for in-house research must submit an expertise from the FFG evaluating whether the relevant conditions are met.

Statement

The Austrian Council for Research and Technology Development draws attention to the following points, which are essential for a successful implementation of the Research Premium Regulation⁴:

- It is not a priori clear what impact the new control system will have on the research activities of Austrian companies. It is essential that the

vetting of applications by the FFG does not act as a brake on corporate innovation and research activities. Furthermore, on no account should it lead to excessive red tape at the FFG when processing the applications so that applications can be dealt with swiftly.

The following aspects of the regulation are hard to judge at present and should therefore be evaluated once again after a year and if they are inadequate should be put up for discussion again:

- No consequences are specified for non-compliance with the deadlines set out in the Regulation. This offers an incentive to ignore obligations or to prevent rapid processing.
- Several quarters have expressed scepticism about the data which have to be provided with the application (§ 13: use of data, which were generated from the direct project funding; Appendix III / A / Point 2: Comprehensive data [Details of a company's total R&D spend] to verify plausibility). To avoid problems with data protection, clear rules should be laid down for handling confidential data.

Statement of the Austrian Council for Research and Technology Development regarding the current performance agreement negotiations at universities with STEM subjects – recommendation dated 18 October 2012

Third-party funding via competitive applications is an important component of the budget for universities, especially those in the technical and science sectors. Third-party funding is money that is obtained by universities through partnerships with the business sector and national

funding agencies and which in the past was additionally rewarded with appropriate incentives from central government. Changing the basis upon which the global budget is calculated creates disadvantages, which were dealt with in the following Austrian Council statement.

Preamble

In this statement the Austrian Council for Research and Technology Development examines current developments in the financing of uni-

versities with STEM subjects. In particular, this concerns the current performance agreements for the funding period 2013 to 2015 with universities with a technical and medical focus.

⁴ In detail: Regulation of the Ministry of Finance concerning the criteria for premium-assisted research and development expenditures, research confirmation and the preparation of expert opinions by the Österreichische Forschungsförderungsgesellschaft mbH.

Background

In recent decades, the STEM subjects have had disproportionally few students and due to sometimes extremely resource-intensive courses and expensive research activities, are highly dependent on third-party funding obtained via competitive applications. Measures taken in response to this state of affairs included special STEM initiatives and campaigns as well as measures in the RTI strategy.

The budget available to the universities in the current period consists of a core budget component (80 percent) and a formula-based component (20 percent). However, in future the formula-based component will be replaced by the Higher Education Area Structural Funding Regulation (HRSMV – 292 Regulation of 3 September 2012). The indicators this contains differ significantly from those used in the past in the formula-based budget.

A comparison of the respective indicators used to calculate the formula-based budget and the structural funding can be found in the appendix.

An examination of the indicators shows that the percentage of the budgeting indicators that refer to students and graduates (including doctoral students) has risen from 60 percent in the past to 70 percent. The indicators based on societal objectives have increased from 10 to 16 percent. The area of research (income from projects) has been reduced from 30 to 14 percent and the assessment base has been further narrowed by dropping indicator 7 (formula-based budget).

Impacts on STEM Subjects

The reduction of the assessment base in relation to the formula-based budget has had a perceptible impact on the global budget, in particular for universities with a high proportion of third-party funding (predominantly technical and medical universities) and is putting them at a disadvantage in terms of core funding.

The minimum budgets of the technical/medical universities underwent a retroactive cutback to the initial base, which in the current performance agreement period from 2010 to 2012 consists of a core budget and a formula-based budget.

Due to the changes to the indicators during the transition from the formula-based budget to Higher Education Area Structural Funding, projects obtained from industry, the FFG (and the CDG, LBG ...), but also direct funding and contracts from the public sector (in particular ministries) do not affect the assessment base. In addition, it must also be noted that other categories of sponsors have not been taken into account in the Intellectual Capital Balance Regulation.

Performance incentives or compensation obtained for activities between 2008 and 2012 are thus rendered obsolete and the calculation base from the perspective of third-party funded projects refers to the status in 2008.

Furthermore, as in the past, the participation of the technical universities in the COMET centres is not included in the assessment base of the indicator “third-party funding”. This might result in participation in such centres becoming economically unsustainable in the medium term.

Given that for many years universities have not been reimbursed for the full overhead rates⁵ and are obliged to make a contribution of their own to national research programmes, currently successful partnerships with industry are likely to be severely adversely affected for economic reasons.

Universities with a technical orientation will therefore be massively affected twice over – on the one hand, by the retroactive cuts to the initial budget, and on the other, by the Higher Education Area Structural Funding, which will come into force on 1 January 2013, and which will result in the disappearance of key providers of contracts/funding as indicators.

recommendations

⁵ In real terms no more than 20 percent, in some cases 0 percent, for example at CD Laboratories.

recommendations

Conclusions

The evident turning away from the STEM-orientated fields of study on the part of the BMWF is incomprehensible – not least of all because of the focus in recent years⁶.

The Austrian Council for Research and Techno-

logy Development would greatly welcome a clear commitment from the responsible ministries to support universities with STEM subjects – both in the field of teaching and research. The Austrian Council proposes that suitable measures should be put in place to compensate the universities for the budget shortfalls resulting from the changes.

Appendix – Comparison Formula-Based Budget and Higher Education Area Structural Funding

Indicators		
1. Number of students taking examinations within the normal timeframe specified in the curriculum plus an additional permissible semester in bachelor, master and diploma programmes, applying a weighting for different groups of study programmes: 15%		1. Component for students taking examinations in degree programmes: 60%
2. Number of students graduating from bachelor, master and diploma programmes, applying a weighting for the different types of programmes completed: 10%		2. Component for graduates of degree programmes: 10%
3. Number of students graduating from bachelor, master and diploma programmes within the timeframe specified in the curriculum plus an additional permissible semester as a percentage of all students graduating from courses of the same kind: 10%		3. Component for knowledge transfer: 14% Definition: Indicator 1.C.2 "Revenues from R&D projects / projects from the advancement and appreciation of the arts in euros" pursuant to the Intellectual Capital Balance Regulation 2010 provided that only income obtained from the following contracting and/or funding organisations is taken into account: EU, provinces (incl. their foundations and institutions), municipalities and associations of municipal corporations (without Vienna), FWF, the Anniversary Fund of the Austrian National Bank, companies and private sources (foundations, associations etc.)
4. Success rate of students in bachelor, master and diploma programmes of study: 10%		4. Component for private donations: 2%
5. Number of graduates in doctoral programmes, applying a weighting for different types of doctoral programmes: 15%		5. Component for partnerships: 14% Note: The component allocated to the individual universities pursuant to § 2 (5) for partnerships is awarded in a call taking into account indicators.
6. Revenue from research and development projects and from the advancement and appreciation of the arts pursuant to § 26 (1) and § 27 (1) 2 and 3 of the Universities Act 2002, which are financed by the Austrian Science Fund (FWF) or by the European Union, in euros: 15%		
7. Other revenues from research and development projects and from the advancement and appreciation of the arts pursuant to § 26 (1) and § 27 (1) 2 and 3 of the Universities Act 2002 in euros: 15%		
8. Percentage of women among full professors: 6%		
9. Number of women graduating from doctoral programmes applying a weighting for different types of doctoral programme: 1%		
10. Number of students participating in international mobility programmes (outgoing): 2.5%		
11. Number of students enrolled in masters or doctoral programme who do not hold an Austrian bachelors, masters or diploma degree: 0.5%		

⁶ STEM: <http://www.mint.at/content/>

**Recommendation regarding RTI-related start-up activities – recommendation dated
19 November 2012**

recommendations

The recommendation regarding RTI-related start-up activities addresses eight areas of action.

1. Education

While entrepreneurial thinking has already been anchored as a teaching principle at colleges for (higher) vocational education, there is an absence of such a focus in consistent quality at academic secondary schools. In particular, greater emphasis needs to be placed on conveying a knowledge of economics.

In the higher education sector, entrepreneurial content has already been integrated into the syllabus at a number of universities and Fachhochschulen. Yet in addition to this content, a greater openness for inter-departmental, inter-faculty and inter-university learning, teaching and research needs to be created to facilitate the bringing together of different educational and research backgrounds, in particular, economics, technology and science.

The Austrian Council therefore recommends,

- introducing entrepreneurial thinking in a consistent quality as a tuition principle at academic secondary schools
- involving entrepreneurs as role models in secondary and tertiary education
- enabling different educational and research backgrounds, in particular of a technical-scientific and economic nature, to be brought together and facilitating flexible and innovative forms of education which promote independence and personal responsibility.

2. Start-up Consultancy

The chambers of commerce offer training programmes for all kinds of start-ups in the regions. These services are wide-ranging and of very good quality, but chiefly address start-ups in general. They do not, however, go into further detail regarding the special needs of new businesses with

a research and technology orientation.

Consultancy services for RTI-orientated start-ups are sometimes offered by the aws and FFG within the framework of various funding measures. But generally speaking these have room for improvement as the main emphasis in the area of budgeting is usually on the subsidy and less on providing advice. The institutions should be placed in a financial situation that will enable them to expand these services to meet the need.

The Austrian Council therefore recommends

- expanding the range of training programmes offered by the chambers of commerce to include modules for RTI start-ups in cooperation and close contact with the AplusB centres
- expanding consultancy services for RTI-related new entrepreneurs at the aws, if necessary by introducing a joint consultancy package from the FFG, WKO and Federation of Austrian Industries.

3. Interface Science – Industry

University Spin-Offs

There has been considerable movement on the political front as regards the value attached to university spin-offs. The picture at the universities, however, is rather mixed. The attitude to spin-offs is positive where a great deal is being done in terms of commercialisation. Thus universities that have a strong record of commercialising their research results have professional property rights and commercialisation strategies. Basically, the IPR should be given to the companies to take with them.

However, in the long-term it is essential to have an adequate pool of people who can be motivated to start a business. In Austria there is an absence of the necessary start-up culture in

recommendations

which one can fail without endangering one's scientific career. Furthermore, the universities should also communicate a positive image of entrepreneurship as a career alternative.

The Austrian Council therefore recommends,

- promoting a culture in which failure is allowed and safeguards are provided (e.g. the possibility to return to the institution)
- communicating a positive image of entrepreneurship as a possible career alternative for graduates from all disciplines
- establishing clear rules for dealing with patents when start-ups are founded at universities.

Patent Exploitation

To strengthen patenting and commercialisation structures at universities, the BMWF has included the formulation of intellectual property rights and commercialisation strategies in the performance agreements. Merely proliferating and holding patents does not in itself constitute a form of added value. The number of patents should not be the sole decisive criterion for assessing a university's commercialisation performance. Priority should instead be given to the quality of the patents and the professionalism with which they are managed. The university system itself should also provide incentives for commercialisation – for example, within the framework of funding allocations.

The Austrian Council therefore recommends

- creating (economic) incentives for commercialisation in the university system
- that the universities formulate clear and carefully considered exploitation strategies which should then be communicated to the business community
- introducing indicators, e.g. within the framework of the Intellectual Capital Balance Regulation, which go beyond the mere number of patents and which enable an appropriate

monitoring of university property rights and commercialisation strategies over a specific period of time.

Start-up Teams

Team start-ups are a key factor for the success of research-driven start-ups. Yet despite this, there is little in the way of support to actively bring together inter-disciplinary start-up teams. The aim must be to create more platforms and interfaces where interested founders from different disciplines can meet. Use should be made of existing experience in this area, for example, the experience of the AplusB centres with the gate2business portal.

The faculties are also urged to seek contact with other institutions and to give their students and researchers the opportunity to interact with colleagues from other faculties and universities as a normal part of university life.

The Austrian Council therefore recommends

- providing services such as platforms and interfaces to bring together inter-disciplinary start-up teams, where founders from different disciplines can meet
- setting up a contact exchange for founders who are looking for partners, for example, at the aws
- creating opportunities for students and researchers to interact with one another as a normal part of university life.

AplusB centres in the context of the IPR and commercialisation strategies

With regards to the cooperation with AplusB, it is critically important to ensure that the centres are involved in future activities to formulate property rights and commercialisation strategies, which should be coordinated with them. In view of the establishment and expansion of regional knowledge transfer centres at the universities, cooperation should be sought with the AplusB centres as key transfer agencies.

The Austrian Council therefore recommends

- involving and consulting the AplusB centres when developing university strategies for property rights and commercialisation
- involving the AplusB centres as key transfer agencies in the establishment and expansion of regional knowledge transfer centres.

4. Direct Support

Central points of contact for knowledge and technology-intensive entrepreneurs

There are many different points of contact in the regions for knowledge and technology-intensive entrepreneurs. Establishing a one-face-to-the-customer in the form of regional points of contact, which should systematically refer entrepreneurs seeking advice and funding to the proper support systems should remain the goal. The AplusB centres, which in some regions are already very well established, would be a logical, although not mandatory choice to take on this role. Should it not be possible for the centres to take on this role, suitable one-stop-shop alternatives, for example at the chambers of commerce or the provincial business promotion agencies should be considered. In this case, steps must be taken to ensure that services which meet the specific requirements of research-based start-ups are provided. The central point, however, must be appropriate communication on the part of the contact points in the regions.

The Austrian Council therefore recommends

- establishing regional one-stop-shops for entrepreneurs seeking advice and funding in the knowledge and technology-intensive sector and communicating them.

Broadening Pre-Seed and Seed Funding

Pre-seed and seed funding address limited target groups in the area of high-end research. As experience from the pilot project of the pre-seed

calls for innovative service providers shows, there is a need to broaden access to such funding. Restricting it to certain branches might indeed be expedient for budgetary reasons, but is not productive in terms of the impact on the innovation system. Pre-seed and seed financing should be open to all knowledge and technology-intensive start-ups.

The Austrian Council therefore recommends,

- opening up access to pre-seed and seed financing for all knowledge and technology-intensive start-up sectors.

5. Indirect Funding

In Austria the New Business Support Act (NeuFöG) provides for tax concessions for start-ups. These concessions are granted to all companies, irrespective of their innovation focus. There are no additional tax concessions that are based on the innovation content and research output of the young business.

International examples of tax concessions for young science and technology-based companies should be examined with a view to the feasibility of implementing them in the Austrian system. Models from France and the Netherlands in particular can serve as models in this regard. A model which allows a differentiated research premium with percentages in excess of ten percent for new and small companies should be hammered out and implemented.

The Austrian Council therefore recommends

- examining international examples of tax concessions for young knowledge and technology-based companies (for example in France and the Netherlands) to see whether they are suitable for implementation in the Austrian system
- a differentiated research premium with higher percentages in excess of ten percent for young and small enterprises.

recommendations

recommendations

6. Follow-up Financing

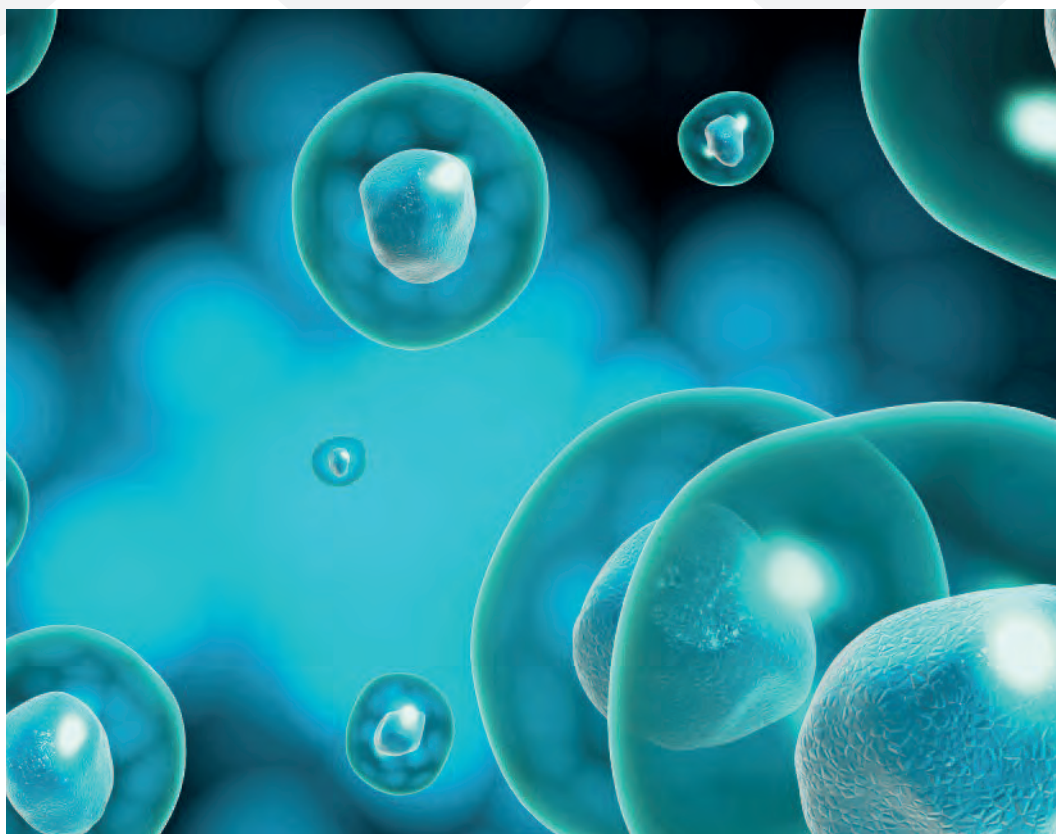
There is still a financing gap at the interface to commercialisation. Soft loans, the assumption of liabilities and guarantees in particular are an important form of support. The aws must be put in a position where it can better fulfil its role as a business development bank for enterprises. Revolving funds of the kind used in other EU countries, could also be of interest to Austria. This type of fund could be set up at the aws.

There are currently a host of initiatives at the EU level which seek to support the commercialisation of innovations and which provide for suitable forms of financing. Horizon 2020, for example, refers to what it calls innovative financial instruments. These include all interventions

with the exception of pure subsidies. Financial instruments offer an important means of follow-up financing. Banks and other institutions in Austria, such as the aws, should be appropriately prepared for this.

The Austrian Council therefore recommends,

- providing all suitable research and technology-intensive companies with support services for commercialisation (e.g. by expanding Markt Start)
- providing greater support to the aws in its role as a business development bank
- examining the use of revolving funds as a funding instrument (also at the aws)
- preparing banks and other suitable institutions for financial instruments as a possible form of follow-up financing.



7. Social Perception

Individual initiatives that are designed to raise awareness have been launched by a number of institutions or within the framework of existing funding programmes. While these initiatives are very welcome, their impact is patchy. However, achieving the necessary change in attitude in society requires a broad-ranging and comprehensive approach that encompasses all key actors and measures and which must be implemented in every area of life. In particular, the process of raising awareness must be started early on – i.e. in the upbringing and education of children and those who care for them.

Prejudices against entrepreneurship must be broken down. It is especially problematic that entrepreneurial values, such as a willingness to take risk, are discredited in Austria by society at large and often even by politics. The system of incentives in our society is structured so that failure is punished and not regarded as a learning experience.

The Austrian Council therefore recommends

- a broad-ranging and comprehensive approach to changing attitudes in society that encompasses all key actors and measures and which must be implemented in every area of life and which starts early in the process of raising awareness, i.e. in the upbringing and education of children and those who care for them.
- using targeted information and the presentation of good practice examples, and involving entrepreneurs as role models, to break down prejudices against entrepreneurship.
- promoting entrepreneurial values such as a willingness to take risks and creating appropriate incentive systems in the different sectors of society that can be politically influenced.

8. Database

The RTI strategy xx7 has, among other things, set itself the goal of accelerating the growth of innovative companies and increasing the number of knowledge and research intensive start-ups by an annual average of three percent by 2020. However, the question remains as to how the number of knowledge and research-intensive start-ups should be ascertained, as there are no comprehensive statistical records of start-up activities in the knowledge and technology-intensive sector. There is therefore an urgent need to keep regular, consistent, statistical records of all Austrian start-ups in the knowledge and technology-intensive sector. This should be done in consultation with Statistik Austria. When defining an RTI start-up, the exclusive use of sectoral taxonomies such as NACE codes should be avoided, as a start-up in a research-intensive sector does not necessarily also have to be research-intensive and sectors that are not typically research-intensive can also produce start-ups with a strong propensity to innovate. Instead, other criteria such as data concerning research intensity and the number of patents should be applied. Besides the number of start-ups, information should also be collected about their background, business purpose, growth and composition. The details should be hammered out in consultation with external experts. The BMWFJ could, for example, assume overall responsibility for this.

The Austrian Council therefore recommends

- keeping regular, consistent, statistical records of Austrian start-up activities in the knowledge and technology-intensive sector based on a precise definition of an RTI start-up drawn up in consultation with suitable external experts.

recommendations

⁷ STEM: <http://www.mint.at/content/>

recommendations

Regarding the use of funding from the National Foundation for Research, Technology and Development for 2013 – recommendation dated 19 November 2012

Preamble

Based on the resolution adopted by the Board of Trustees on 25 September 2012, the Austrian Council for Research and Technology Development has been invited by the head of the National Foundation for RTD (in accordance with § 11 para. 1 subpara 1 of the Austrian act governing the National Foundation for RTD) to put forward a recommendation regarding the use of foundation funding for the year 2013 based on the applications submitted by the beneficiaries. In times of tight public-sector budgets, the National Foundation acquires special significance, which finds expression in the provision of support for long-term, interdisciplinary research (cf § 2 National Foundation for Research, Technology and Development Act). The Austrian Council thus reiterates the need for a funding volume of EUR 125 million, the sum that was originally intended when the foundation was set up. The allocation of funding was carried out according to the strategic significance and socio-political relevance of the projects submitted and their categorisation in the global context of Austrian research promotion. The Austrian Council additionally laid down the following key areas for 2013:

- strengthening of the national human potential basis
- strengthening the research infrastructure by focusing on initiatives with relevant critical mass and risk potential
- co-ordination and alignment of regional and federal RTI activities
- strengthening venture capital
- excellence in basic research
- measures to strengthen Austria as a location for companies actively engaged in research

Given the considerable disparity between the total funding volume applied for and foundation resources likely to be available, the beneficiaries were asked to prioritise the projects and programmes submitted.

Recommendation regarding the National Foundation for RTD for 2013

The Austrian Council for Research and Technology Development has discussed the pending applications at length and taking into account the list of the priorities drawn up by the beneficiaries and the defined priorities, has allocated the funds for 2013 as follows:

Institution	Amount in EUR mn.	Programme or Initiative
FFG	24	BRIDGE and Competence Headquarters
FWF	18.19	Priority Research Programmes (SFB, DK)
CDG	4.5	CD Laboratories
LBG	5.62	LB Institute for Health Technology Assessment LB Institute for Clinical Forensic Imaging
ÖAW	8	Frontier Groups
aws	10	Venture Capital Initiative
Total	70.31	

This Austrian Council recommendation is explained in further detail below:

In the Council's view one central, long-term strategic concern of Austrian research policy is to improve the interface between science and industry in order to translate research results into marketable products with an economic and socio-political significance. For this reason, it recommends supporting the **FFG's** BRIDGE programme with the full EUR 20 million requested. In view of the BVMIT's regrettable decision to discontinue the partner programme Translational Research, the Austrian Council urgently suggests retaining the advisory board with the FWF to ensure the interface function. To safeguard Austria's future through research, technological development and innovation the programme line Competence Headquarters should receive funding amounting to EUR 4 million. In view of the strategic processes now getting underway, the biotech initiative, for which an application was also submitted, was deferred and therefore not recommended, although the Austrian Council considers that it addresses an important topic.

With the aim of supporting the development of areas of excellence for research and teaching at Austria's universities and non-university-based research institutes, the priority programmes of the **FWF** are making a special contribution to ensuring excellence in the field of basic research and to strengthening the national human potential base. To safeguard this function, the Austrian Council thus recommends endowing the FWF with EUR 18.19 million. This should finance two new SFBs to the tune of EUR 7.32 million and two new doctoral programmes to the tune of EUR 8.36 million as well as prolong the current doctoral programmes. The Austrian Council would like to take this opportunity to state its opi-

nion that the FWF should be provided with more additional funding in concert with the core funding for universities as with its international evaluation standards and procedures it is particularly well-suited for ensuring competitive third-party financing for the universities.

The Austrian Council attaches great importance to initiatives and programmes which reinforce the link between higher education, non-university-based research and private enterprise. For this reason, the prioritised funding requirements for seven Christian Doppler Laboratories⁸ is set to receive funding of EUR 4.5 million within the framework of the **CDG**.

Life Sciences is a field of research with great social significance and major potential for development. The Austrian Council therefore recommends allocating EUR 5.62 million to **LBG** to fund the LB Institute for Health Technology Assessment and the Institute for Clinical Forensic Imaging for four of the seven years of the contractual term originally applied for. If the evaluation is positive, the objective will be to provide full funding for the remaining period.

Qualitative and quantitative expansion of the human capital base is an essential prerequisite for ensuring excellence in research and innovation in Austria on a long-term basis. The development and availability of well-trained research staff has thus always been a concern of the Council. The New Frontier Groups initiative applied for by the Austrian Academy of Sciences (**ÖAW**) is particularly aimed at ensuring long-term funding for junior researchers in Austria and excellence in basic research. The Austrian Council therefore recommends providing financing of EUR 8 million for a period of five years for the establishment of several New Frontiers Groups.

recommendations

⁸ CD Laboratory for Optimisation and Biomass Utilisation in Heavy Metal Recycling, CD Laboratory for Cardio-Metabolic Immunotherapy, CD Laboratory for Application-Oriented Coating Development, CD Laboratory for Mycotoxin Metabolism, CD Laboratory for Advanced Process Simulation of Solidification and Melting, CD Laboratory for Bioactive Aroma Compounds, CD Laboratory for Restoration of Extremity Function

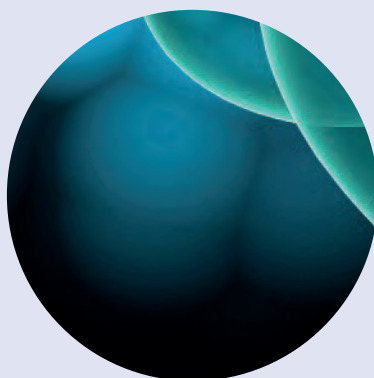
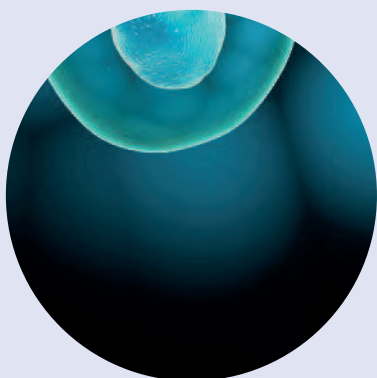
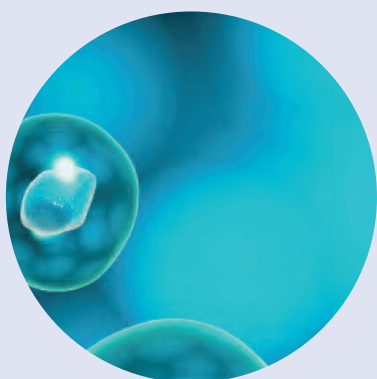
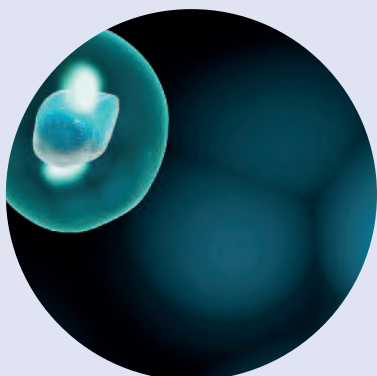


recommendations

Compared with other countries, Austria's below-average availability of venture capital for new, innovative companies is one of the main reasons that Austria remains in the position of an innovation follower. The Austrian Council has therefore already spoken out several times in the past for the national venture capital (VC) structures to be strengthened and supported the VC initiative of **aws** for 2010 and 2012. In view of Austria's known structural weakness in this regard, it

should be made clear that in future even greater support must be given to this initiative. The Austrian Council therefore recommends financing a VC fund of EUR 10 million.

Should the National Foundation have more or less than the forecast EUR 70 million available for 2013, a request has been made for a renewed referral to the Austrian Council as a changed financing situation will make it necessary to carry out another overall evaluation of all projects.



Update: What Has Been Accomplished

Research infrastructure

In June 2012 the leading figures of the science and technology councils from Switzerland, Germany and Austria came together in Cologne. One of the topics covered here was a detailed discussion of the question of research infrastructure. Since this date there have also been two other meetings at secretariat level in Bern and Vienna.

The objective of these discussions was to talk about the experiences gleaned from the various phases of roadmap processes and to further develop guidelines for an efficient and objective assessment procedure. Given the differing conditions in the three countries concerned, the talks revolved around national requirements in terms of future-orientated research infrastructure planning. The projects discussed – for example, the pilot project of the

German Science Council “Science-driven Evaluation of Large Research Infrastructure Projects for the National Roadmap” or the roadmap process carried out in Switzerland – provide valuable information for the roadmap process in Austria, which is currently only at the planning stage. Other meetings are planned. They will deal with questions such as “Decision-making criteria for the funding of research infrastructures” and the “Relationship between research infrastructures and innovation” – issues of ever-increasing importance, due to the budget required for the establishment of such infrastructures, in particular where policy advice is concerned. Initial results will be debated at the meeting to be held between the three countries in the summer/autumn of 2013.

Work Group 4 of the RTI Task Force: Infrastructure as a basis for research

It is the role of the RTI Task Force to implement the objectives set forth in the strategy of the Austrian Government. Work groups have been set up within the Task Force itself, responsible for drawing up relevant measures. Work Group 4 is in charge of research infrastructure. The item “Research Infrastructure” of the RTI strategy observes that research infrastructures in Austria should be developed in a coordinated manner as a basis for ensuring outstanding research and the positioning of Austrian research at an international level. It is planned here to raise the profile of the universities and non university-based research facilities to support research infrastructures and so guarantee optimum coverage in terms of strengths and synergy effects in practical application.

Work Group 4 is managed by representatives of Austria’s Ministry of Science and Research and the Ministry of Transport, Innovation and Technolo-

gy. Other permanent members of the work group include representatives from the Ministries of Finance and of Economic Affairs, Family and Youth and the Austrian Council for Research and Technology Development. Experts are also invited to attend where special issues are involved.

The work programme of WG 4 includes the following topics:

- Incentives for the networking of infrastructures to attain critical mass
- Development of cooperation between universities, research facilities and industry based on shared usage of infrastructure

Financing models

- Austria’s involvement in projects in the framework of ESFRI (European Strategy Forum on Research Infrastructure)
- National roadmap for research infrastructure

- Any adjustments to the statutory framework conditions for the use of research infrastructures

It is the aim of the work group to put forward

proposals for improved development of the national research infrastructure and its linkage to European research infrastructure.

creating knowledge

Strengths and problems of the humanities, social and cultural sciences

The humanities, social and cultural sciences make a key contribution to preserving our intellectual and cultural heritage and to shaping our future. They reflect social development, sometimes act as a go-between for different cultures and offer guidance in relation to current values. Moreover – something that is of special significance for the future – it will not be possible to master the so-called grand challenges we face (e.g. ageing, migration, demographics, the environment, etc.) by merely developing new technologies. We also need the humanities, social and cultural sciences, particularly when trying to find solutions to such problems.

In addition, certain fields of the humanities, social and cultural sciences contribute to the strengths of Austria's science and research landscape. This is how the University of Vienna managed to come in at No. 46 in the latest "Times Higher Education Ranking" for the category of "Arts and Humanities" (corresponds to No. 15 within the EU). It holds a similar position in the "QS World University Rankings by Subject", where both philosophy and linguistics were rated 46th.

The strengths of Austria's humanities, social and cultural sciences are also demonstrated by its successful participation in the framework programmes of the EU. Until May 2012 Austrian institutions of the humanities, social and cultural sciences were involved in 27.4 percent of all projects receiving funding under the key area of "Socio-Economic Sciences and Humanities (SSH)" (with an average participation level of 10.2 percent for Austria in the entire framework programme). They were also responsible for coordinating 6.3 percent of the SSH projects

(compared with an average of 3.4 percent for Austria in the entire framework programme).

Recognising the importance of and need for the humanities, social and cultural sciences in the development of society, the Austrian Council has in the past put forward a number of recommendations to try and help improve the structural framework conditions of the humanities, social and cultural sciences in Austria. In 2012 a work group attempted to diagnose what are currently the most serious problems of the humanities, social and cultural sciences at the universities. The following results will form the basis of a recommendation to be submitted by the Council:

Problem area 1: Oversubscribed subjects of study

The number of students has greatly increased in recent years, and in certain subjects it has more than doubled. This rise has however not been followed by a corresponding augmentation in teaching staff, meanwhile resulting in untenable student to staff ratios in certain disciplines of the humanities, social and cultural sciences. The findings of the Swiss Science and Technology Council regarding the situation in Switzerland are equally applicable to Austria: *This [the poor student to staff ratios] does not merely have an adverse effect on the quality of teaching (...), but also makes it by and large impossible for faculty members to carry out research due to a lack of time. Nor can the aim of acquainting students with research work during teaching in the academic environment be desired to the desired extent.*

Problem area 2: Regulated careers with greater long-term perspectives for researchers

In addition to the problematic teaching and research conditions prevailing in certain disciplines,



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another major difficulty involves the situation of the next generation of researchers, an issue which cannot be disregarded any longer. Insufficient aid is offered to junior scientists, who face growing uncertainty due to current short-term contracts of just a few years and the trend towards project-based research funding. Highly gifted young researchers are thus increasingly either finding themselves in a precarious work situation, are obliged to leave Austria to improve their career prospects or give up the plan of a scientific career altogether and drop out before doctorate level – particularly in the case of the humanities and cultural sciences.

Problem area 3: Employability of graduates from the humanities, social and cultural sciences

The issue of employability is anchored in the Bologna Declaration as a key objective of the European reform of higher education. The cycle-based degrees of “Bachelor’s” and “Master’s” are the

result of a new understanding of qualification: Ideally Bachelor’s courses are intended to lay the basis for both lifelong learning and the ability to work through the provision of central theoretical and methodological tools, while courses at Master’s level allow students to specialise in their chosen field.

Graduates of the humanities, social and cultural sciences are particularly characterised by having acquired a broad-based, generalised education rather than specific professional qualifications. Such an education revolves around analytical skills in dealing with complex relationships (between structures, principles and rules) and involves networked, non-linear and systemic thinking. The broad base of a qualification, which also ensures greater versatility, is seen as offering a good foundation for subsequent career success. At the same time, however, a lack of specialisation is frequently cited as a hindrance when these graduates try to step onto the first rung of the career ladder.

New set of indicators for measuring Austrian performance under the performance report

On 11 October 2012 the Austrian Council met up with Work Group 8 “International Rankings” of the RTI Task Force to take part in a joint workshop. The outcome of the workshop was to firstly refine in terms of content the indicators used to measure the scientific and technological performance of Austria (in the framework of the report evaluating its scientific and technological performance, which is drawn up by the Austrian Council once a year) and secondly, to reduce their number from originally well over 70 indicators to 65. This number thus falls within the range of indicators examined in the report of the German Commission of Experts for Research and Innovation (EFI) for the performance of Germany and lies significantly below, for example, the 90 indicators adopted by the Finnish Techbarometer.

In terms of content the indicators now used he-

re are justified and defensible on the following grounds:

- The data are within the public domain and are regularly collected at a national and international level.
- They are based on classifications of the OECD or Eurostat used throughout the world.
- They result from the over 60 specific objectives set forth by the RTI strategy.

The revised set of indicators, which was discussed with all ministries, was approved at the meeting of the RTI Task Force on 5 December 2012 and will form the basis of the Council’s future reports regarding the scientific and technological performance of Austria.

The workshop was attended by a total of some 25 experts from the Austrian Institute of Technology (AIT), Joanneum Research, the Austrian Institute of Economic Research (WIFO), Statistik

Austria, the Federal Chancellery (BKA), the Federal Ministry of Education, the Arts and Culture, (BMUKK), the Federal Ministry of Transport, Innovation and Technology (BMVIT), the

Federal Ministry of Science and Research (BMWf) and the Federal Ministry of Economic Affairs, Family and Youth (BMWfJ).

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What women want: Careers for women in science and research

In Austria women are still clearly under-represented in some areas of science and research, particularly in the case of certain natural and engineering sciences.

The GENDERA⁹ project has shown that one of the biggest obstacles for women in the field of science and research is the persistence of male-dominated work cultures and ways of thinking (for example, the availability of scientists round the clock, etc.). In addition, the constant demand for excellence is anchored to criteria such as “mobility”, despite actually being of no relevance at all to the quality of research.

The results of the Gendera project prompted the Austrian Council to stage two workshops which looked at the different perspectives in relation to the needs, objectives, problems, obstacles and other questions confronting women employed in science and research. Debate focused on the following issues:

Variation in the understanding of the term ‘career’

The term “career” is generally understood to refer to an upward progression associated with the attainment of certain rungs of the career ladder. Such advancement, which is frequently linear in nature, is oriented towards the “normal” career

path consequently experienced by the male working population. At the same time, however, such career development is understood to be gender-neutral because it is solely based on supposedly objective performance.

In contrast, the life and the career path of women are characterised by interruptions (mainly due to pregnancy and maternity leave), part-time employment and frequent changes in employer. When compared with a linear career, such “irregularity” makes the path taken through life by women look “flawed”.

In overall terms, it can be seen that people with successful careers signal to others that work has top priority and everything else is of lesser importance. As men (are able to) comply with the requirements of such a work culture more readily, they also advance in their careers far more frequently than women.¹⁰

Indicators/methods of performance measurement

Various studies indicate that the assessment procedures and methods of evaluation established in the fields of science and research (generally peer reviews and scientometric methods) cannot be considered to be as objective and value-free as has been assumed until now.¹¹ Only recently a stu-

⁹ GENDERA (Gender Debate in the European Research Area) was a project in the 7th EU Framework Programme, the aim of which was to discuss and further develop existing approaches toward analyses and recommendations with a view to improving the situation in respect of the under-representation of women in certain scientific disciplines and in positions of leadership in academia, in decision-making bodies and in interest groups in this field, and to then implement these approaches through national GENDERA task forces. The Austrian project partner and thus the coordinator of the national GENDERA task force was Joanneum Research.

¹⁰ 10 See also : Schiffbänker, Helene / Reidl, Sybille (2009): Frauenkarrieren in F&E. Erfahrungen von aktiven und ausgestiegenen (Drop-outs) Forscherinnen und Technikerinnen in der industriellen und außeruniversitären Forschung. Study by Joanneum Research, Vienna, p. 7.

¹¹ European Commission (2004): Gender and Excellence in the Making. Brussels, p. 13.



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dy from North America demonstrated that, despite being identical, the curricula vitae and references of male and female applicants (university professors) were assessed differently on a gender-specific basis.¹²

This raises the question of whether the indicators and methods used for performance measurement are actually as objective as they are claimed to be, or rather are characterised by a gender bias. It is also necessary here to analyse the impact (if any) of existing framework conditions, implicitly influencing the measurement of performance and so undermining its objectivity

Women in STEM subjects (Mathematics, Information Sciences, Natural Sciences, and Technology)

The circumstance that the proportion of women in the so-called STEM disciplines is not very high can be interpreted as female students “voting with their feet”. In other words, women avoid these subjects as the framework conditions in higher education are felt to be unattractive (form of teaching, etc.). At the same time it should be borne in mind that the STEM disciplines are generally also less popular with men than the humanities, social and cultural sciences. We can thus conclude that improvements in the framework conditions would boost the appeal of the STEM disciplines among both men and women.

Structural framework conditions contributing to diversity

In the past measures for the advancement of women primarily aimed to do away with unjustness and inequality. Many women consequently felt compelled to adopt the ideas, objectives and thinking patterns characterising men.

As the next step it will be necessary to determine the structural conditions required to provide for diversity in every aspect. The fact that existing structures are simply taken over when new institutions are founded (e.g. IST-A), so offering little room for “divergence” as experience has shown, makes these questions all the more pressing.

Research funding as a means of changing awareness

Gender mainstreaming, the advancement of women and the raising of awareness for gender-specific role concepts and associated expectations should not remain the task of a person appointed for this purpose (on the lines of “our gender/women’s/equality representative”) as is currently the case, but must be understood as a key element of management quality overall. To ensure people take this on board, it is up to policy makers to link public research funding to relevant demands. If, as in the past, public money is allocated under theme-based programmes to fields dominated by men, this will not only sideline major areas of importance to society (for example, the humanities, social and cultural sciences), but also above all fields in which women are strongly represented.

Transfer of knowledge and start-ups – Report of work group

Within the framework of the work performed by the Task Force to implement Austrian RTI strategy an interdepartmental steering group for knowledge transfer and start-ups was set up in January 2012. Under its aegis the plan is to deve-

lop, define and agree strategic objectives and uniform standards in conjunction with knowledge transfer and start-ups. The Austrian Council for Research and Technology Development has also been invited to participate, together with repre-

¹² See also: Mervis, Jeffrey (2012): U.S. Study Shows Unconscious Gender Bias in Academic Science. In: Science, Vol. 337 from 28 Sept. 2012, p. 1592; and: Yurkiewicz, Iliana (2012): Study shows gender bias in science is real. Here’s why it matters.

sentatives from Austria's Ministry of Science and Research, the Ministry of Transport, Innovation and Technology, the Ministry of Economic Affairs, Family and Youth and the Ministry of Finance as well as the AWS and the Austrian Research Promotion Agency. The main objective of the work group is to support implementation of the measures laid down in the RTI strategy to improve RTI-related start-up activities and the transfer of knowledge within Austria and to ensure optimum coordination of these activities.

The priorities of the Austrian Council in this field are described in the 2012+ work programme. The section dealing with the implementation of research results makes specific reference to knowledge transfer and start-ups. For 2012 the Austrian Council set itself the task of supporting RTI-related start-up activities in Austria and of making recommendations regarding suitable framework conditions. As far back as 2008 the Austrian Council for Research and Technology published a recommendation relating to Austrian start-up activities based on an assessment of the status quo. This was used to draw up a comprehensive report about the current situation for the founders of RTI-related companies and their public support in Austria (cf. section dealing with status monitoring of RTI-related start-up activities).

This report was prepared with the help of members from the work group and provided the basis for the Council's subsequent recommendation for RTI-related start-up activities dated 19.11.2012 (cf. section Recommendation regarding RTI-related start-up activities).

This recommendation was itself presented and discussed in the work group. The most pressing problem is seen to be the lack of information on start-ups involving high levels of knowledge and research, an issue which is addressed by the report and the recommendation. Although there currently exist a large number of different institutions which compile data on new companies from various different aspects, a uniform, centralised acquisition system is however lacking. It is essential here to understand the starting position of such businesses if continuous monitoring of start-up activities is to be ensured in this field. Not least because it will otherwise be impossible to determine whether the annual increase of three per cent for new RTI-relevant start-ups by 2020 targeted in the RTI strategy is actually achieved.

In 2013 the results of the monitoring report and the content of the recommendation are scheduled for incorporation in a joint business start-up strategy being drawn up by the work group for knowledge transfer and start-ups.

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Basic Expertise: Reports and Studies in 2012

Private money for research – Study “Strategies for increasing private R&D expenditure”

The aim of the study was to demonstrate ways of using available funds to support science, research, education, innovation, company start-ups and radical innovation strategies. This can be attempted for example by a policy mix which improves the conditions for such activities (i.e. by modifying incentives) while at the same time also working towards a change in culture.

The starting points for specific measures include the laws governing foundations, the fiscal framework conditions for investment in new firms and start-ups, the framework conditions for risk capital providers and tax arrangements for innovative new businesses.

Initiatives should thus be set up to increase the level of philanthropic donations, as for example



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make up a significant share of private R&D funding in the USA. In Austria there is no strong culture of philanthropy. In countries where philanthropy is well established, the key players include large and small-scale donors, charitable foundations and private firms, while in Austria none of these segments is developed to any great extent. Although the country's inhabitants show a

significant willingness to donate, the volume/level of donations is low. Encouraging a culture of philanthropy in Austria could be forced forward in various ways, for example by changing the legislative basis (discrepancies in the tax system regarding the fiscal deductibility of donations) or by ensuring greater loyalty among graduates to their alma mater in line with the North American model.

Preparation of a study “Third-party funding of university research in Austria”

In recent years the funding structure of the universities has undergone a twofold change in the majority of OECD countries: Firstly, financial resources are being increasingly raised externally, and secondly, this trend is accompanied by a growing orientation to performance, both in terms of basic and outside funding. In this context an increasingly important role is being played by competitive project-related research funding, contract research projects with industry and revenues from sponsoring.

Against this background the study carried out by P-IC looked at the development of externally funded research at Austrian universities and placed a special emphasis on the structural and organisational framework conditions. The following five universities were specifically considered as regards research performed with outside funding and the associated framework conditions:

- Paris Lodron University Salzburg
 - Graz University of Technology
 - University of Natural Resources and Life Sciences, Vienna
 - Medical University of Vienna
 - Vienna University of Economics and Business
- The study considered factors such as insufficient indemnification for general costs, differences between funded projects and contract research, and the impact of administration and externally funded research on teaching. The analysis

showed that, depending on the specialism of each university, projects involve outside funding to a greater or lesser degree. Here technology and the natural sciences have a significantly larger share of such funding (external resources accounting for 20 to 35 percent of the overall budget) compared with a university specialising in economics and business administration (less than 10 percent) and universities devoted to the arts (well under 5 percent). This difference is even more marked where externally funded research staff are concerned: 30 to 48 percent for the natural sciences, in particular medicine and technology, as against 2 to 3.5 percent for universities specialising in arts subjects.

The analysis made in the study identified certain factors as exerting an inhibiting or a stimulating effect in terms of the framework conditions. Structural factors include for example administration, consulting, incentive systems and the creation of a distinctive profile by the individual universities. Other factors involve general costs, the balance between teaching and research, IPR and their exploitation, infrastructure and the length of time taken to complete a project.

The last section of the study contains proposals as to how third-party funding can be strengthened at Austrian universities and how realistic fundamental expectations can be generated in relation to objectives. A full version of the study is available on the Austrian Council's website.



Study “Unique features and profiles in the Austrian higher education system” (AUSTIN Pock + Partners))

The question of the unique features and profiles existing in Austria’s higher education system, a subject which has been under discussion in Austria for some time, has acquired new importance thanks to the so-called University Plan, a higher education strategy for the country, and its elaboration in Austria’s University Conference. Debate repeatedly revolves around clear-cut delineation between the different higher education sectors. Many Austrian universities are addressing – not least with regard for performance agreements – the question of how to create their own distinctive profile and unique features. It has therefore been especially important to actively embrace this issue, particularly in the early phases of the Austrian University Conference established in 2012.

Both the individual scientific disciplines and the institutions need clear-cut unique features and profiles if the system overall is to be best positioned to master the challenges of the future. The Austrian higher education system has seen dynamic development in recent years and has thus undergone radical change. It has witnessed differentiation processes as well as experiencing a loss of differentiation. New sectors of higher education have been established, while others are splitting off. Universities are placing an increasing emphasis on teaching – not lastly as a consequence of the Bologna Process – while the Fachhochschulen have in some cases adopted a stronger scientific focus and stepped up levels of research. The newest higher education sector, the teacher training universities, are currently endeavouring to attain equal footing with the universities.

The boundaries between the different sectors have thus become somewhat blurred, and the effects of processes which sometimes run counter to each other have given rise to a higher education system where the dividing lines no longer seem clear-cut. This circumstance makes it increasingly difficult to speak of uniform sectors which are cleanly delineated. The main objective of the study was to offer an

overview of the unique features and profiles to be found in Austria’s higher education system and to demonstrate associated problems. As this addresses a broad-based issue, the study commissioned here focused on three specific aspects:

On the one hand, it investigated fundamental and theoretical aspects of the issue, considering the implications of the call for unique features and profiles in the higher education system, both for the different sectors and the individual institutions.

On the other hand, the study paid special attention to the profiles currently presented by the higher education sectors. On this basis, it considered where there is a need for action and where the boundaries between the sectors should be tightened up. The study concludes with reflections about the options available to the individual institutions for creating their own distinctive profile. The processes involved here and their boundaries are discussed and specific measures put forward.

The study is rounded off with a number of recommendations for the Austrian universities regarding the creation of their own profiles and unique features:

- The creation process must pursue a higher objective and should not be seen as an end in itself;
- Delineation of the sectors is sufficiently regulated by the existing legislation. There should however be greater flexibility within the different sectors and in relation to their boundaries;
- Creation of institutional clarity regarding the issues of “PädagogInnenbildung NEU” (new system of teacher training) and research undertaken by the Fachhochschulen;
- The creation of distinctive profiles should be implemented by the sectors at an institutional level, with this process being actively driven forward by the universities;
- The creation of an effective profile depends on the accomplishment of self-governance and policy incentives; it would be helpful here to put across a “big picture” of the Higher Education Area.

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The non university-based sector – Status and challenges

In many countries non university-based research organisations (NUR) are a cornerstone of the RTI system along with the universities and industry, a fact that is also noted by the OECD in its report about public research institutions.

A multifaceted, differentiated NUR sector has developed in Austria, with its importance growing steadily over the years. This is underlined by the fact that in 2009, the sector accounted for some 14 percent (around one billion euros) of all R&D expenditure effected by Austria in this field. 22 percent of public spending on R&D goes to research facilities which are not based at the universities. With a workforce of some 14,000 people, the NUR sector represents around 14 percent of all researchers in Austria. The wide variety and regional spread of non university-based research organisations offers flexibility, creativity and a spirit of competition, but also results in a predominantly fragmented structure with high overheads and inefficient duplication. There is frequently also a shortage of financial resources for the development of skills on a long-term basis.

This means that many of the institutions making up the non university-based research sector lack a clear idea of their role. Nor have there been many basic empirical studies investigating NUR's role for the innovation system and its impact on this system. From the perspective of the Austrian Council it is thus only logical for the RTI strategy of the Austrian Government to specifically address the issue of non university-based research. The objectives listed in the section with the same name are fundamentally highly positive: the development of clear-cut roles for the various NUR institutions, reform of the internal structures of NUR and coordination of the overall structure of the NUR sector. It must however be noted that in the case of the measures currently underway, the focus falls on reform of the internal structures of the research facilities, so thus

in fact only addressing one of the three objectives set forth in this section of the strategy.

The question remains as to how these measures will help to attain the two other objectives. It is not currently possible to discern any comprehensive strategic approach involving research outside higher education that directly addresses the relevant objectives of the RTI strategy. The Austrian Council is particularly unhappy at the absence of measures designed to improve coordination within the overall structure of the non university-based research sector and the development of corresponding roles.

In its work programme the Austrian Council has therefore set itself the objective of ensuring further development of the research landscape outside the field of higher education in terms of its interaction with the universities and industry. The plan here is to define success factors for the sustainable establishment of structures, expertise and the impact of non university-based research facilities and to draw up proposals for their further development.

As the first step the Austrian Council has therefore asked FAS.research to carry out a participative impact analysis, which can then be used as the basis for any further action and the submission of recommendations to the politicians.

Key results of the impact analysis

The results of the impact analysis suggest that it would be advisable to centralise the management of research outside the universities to a greater extent – despite all the difficulties known to exist here (for example, the obstacles to administrative reform due to the diverging interests of the central government and the provinces). This would help to improve the allocation of tasks and roles for NUR through the vehicle of research policy (the most important lever in the initial phase). NUR would then be able to position itself to better effect and define its role more precisely vis-à-vis other sectors such as higher education,

industry, etc. (recognition of functional complementarity, dependence and differentiation, the key factor of the critical phase).

It should also be discussed whether the existing interdepartmental RTI Task Force could provide the framework for such harmonisation, in particular also with regard to the NUR sector. For example, a separate work group for non university-based research could be set up within the RTI Task Force.

Detailed analysis of the overall system (evaluation and network analysis of the different RTI sectors and their links) would be helpful as input for

objective discussion of common goals for this work group. The Task Force could take on the role of client here, with the study being jointly funded by all bodies currently responsible at a governmental and provincial level: an approach that could already be seen as an initial step towards improved coordination in this field.

It would also be necessary to discuss which objectives are expedient for non university-based research in view of the options and resources available in Austria and in the framework of the European Research Area.

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The role of the patent offices in the innovation system

Background

If Austria is to move from the position of an innovation follower to that of an innovation leader, it will be necessary to satisfy the framework conditions for a knowledge-based economy. They should then ensure a smooth, and above all, swift transition from outstanding research results to the launch of innovative products and services on the market. The transfer of codified, clearly defined knowledge via intellectual property is of special importance here.

In this context, the patent offices play a central role in the innovation system. They must embrace this role accordingly: they are able to smooth the path of innovation. It is however necessary to evaluate strategic goals and clearly define operational practices.

Project Objective

The analysis aimed to identify the role a patent office can play in terms of economic growth and innovation-based affluence.

Practical recommendations should help provide new momentum in the case of Austria. To this end a European Best-Practice comparison has been carried out to understand how patent offices should deal with innovation-based entrepreneurship, knowledge transfer, patent-related measures

designed to raise awareness and the role of intellectual property, in particular for small and medium-sized enterprises in various European countries

The study conceptualises the patent office as a key institution in the innovation ecosystem and argues that its role consists of more than merely affording patent protection. It investigates the practical steps that need to be taken by a patent office to ensure innovation-based growth and what relevant measures should be introduced by other countries in this regard.

Key findings

Austria lacks a national strategy for intellectual property as the cornerstone of a functioning innovation system. The issue of intellectual property (IP) is given little consideration in the RTI strategy of the Austrian Government. The absence of a strategic top-down approach to IP prevents the Austrian Patent Office (ÖPA) from fully developing its role for the Austrian economy. This would be of special importance as, in Austria, competence in relation to intellectual property is distributed between various ministries. In addition, there is insufficient networking between the ÖPA and other institutions responsible for encouraging innovation.



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In its current structure the ÖPA fails to fully satisfy the objectives it has set itself. The analysis made by the study documents that it is not involved in many European IP-related initiatives, has not undergone international benchmarking and has to date failed to analyse the needs of its customers. Moreover, the innovative economy sees no points of contact with the ÖPA in many respects.

PR work, measures designed to raise awareness and analyses of IP and growth form an integral part of the work of a patent office. This is the only way to ensure that use will actually be made of the IP system. This system paves the way for a highly abstract form of market economy – namely, the opportunity of fully extending market economy mechanisms to include intangible goods – so representing a key tool of the knowledge society. Such mechanisms are however barely understood by the players of the Austrian economy. The ÖPA has realised this and is trying to counteract the problem with a series of measures. The-

se measures could nevertheless be stepped up so they can be put to use by all eligible market operators.

Markets are becoming increasingly globalised – the EU patent will soon be introduced – and the costs of national examination are high. The question thus arises, in particular where small countries are concerned, for how much longer national examination will remain practical. The current system of national examination involving national searches is one of the most costly in Europe. Many national patent offices dispense with examination in their own country. Restructuring of the existing examination procedure could minimise the divergence between the expenditure (cost structure) and revenue (price) side. It should also be considered whether it would not be better to leave examination up to the European Patent Office (EPO) and to instead concentrate fully on PR work for intellectual property and IP-based growth.

Failure may also have a positive side – Status monitoring of RTI-related start-up activities

In its recommendation dated 9 December 2008 the Austrian Council already addressed the issue of RTI-related start-up activities in Austria and their funding. This recommendation underwent close analysis in relation to its implementation in 2012, and the results now form the basis for the present further recommendation.

As the survey has shown, the majority of the recommendations have already been put into practice or are in progress. Outstanding items in particular include the continuous acquisition of statistics for RTI-related start-ups, in addition to the simplification and coordination of interaction between governmental and provincial funding in this field. Well-publicised and clearly defined central points of contact in the regions would help to offer more guidance to researchers interested in starting up a business and point the way towards public and private funding. Where finan-

ce for innovative start-ups is concerned, there should not be any restriction to individual branches or a specific clientele in the long term to ensure the full exploitation of existing potential and to avoid any distortion here.

However, the basis for funding initially depends on the availability of a sufficient number of potential entrepreneurs to guarantee the existence of real competition and qualitative selection. Further training and development can be combined with information and image campaigns to cultivate a suitable mind-set within society. This calls for a culture of failure together with an appreciation of the lessons learned thereby. In Austria the fear of failure however remains one of the biggest obstacles to new start-ups. People who did not initially succeed in setting up a business but are willing to try again must be given a second chance more readily than before. A contribution can be

made here for example with the legislation governing insolvencies.

Only someone who trusts the business environment will dare start up a company. This implies a reduction in the costs and paperwork involved in setting up a new business. But here it is not just a question of boosting the number of start-ups. The framework conditions must be satisfied at the same time to ensure the long-term survival of new companies along with the associated effects

in terms of prosperity and growth. In this context these conditions could not only take the form of suitable tax breaks for new research-based businesses, but also ensuring an attractive environment for private equity capital from venturers, business angels and strategic investors to guarantee funding on a long-term basis. Austria lags behind other countries here.

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International Affairs

Think Big, Invest Local – A comparison between the innovation strategy of Austria and Sweden

Sweden is one of the frontrunners in a number of international rankings such as the Global Competitiveness Report of the World Economic Forum, the World Bank's Doing Business Report, the IMD's World Competitiveness Yearbook or the Global Innovation Index drawn up by INSEAD. In terms of size and structure, the Swedish system is comparable with that of Austria.

For this reason, the Austrian Council has a strong interest in subjecting to Sweden to close analysis as a centre of research, technology and innovation – and also to comply with its task of monitoring and evaluating international trends and developments according to the presentation made to the Council of Ministers on 9 September 2010. As regards the differences between Austria and Sweden it was especially striking that overall, the players enjoy greater autonomy (for example in relation to decisions about funding, subject matter) as well as greater independence at the level of policy. It was also noticeable in all discussions that there seems to be national/social consensus regarding existing topics (including at a corporate level). The politicians do not generally get involved here or try and interfere with the decision-making process.

Sweden and the individual institutes undertake highly detailed planning where projects are concerned. The institutes tend to concentrate on their own work and less on delineation in relation to other institutions. Swedish culture is based on an open society, with this openness being firstly reflected in a culture of discussion, and secondly, in the orientation of industry.

Although the governance system is basically extremely complex in terms of ownership structures, there nevertheless exists a clear-cut principle of subsidiarity: programme responsibility of the agencies, and programmes are handled at the agencies. Despite the complicated situation regarding ownership there are surprisingly few problems due to the willingness of the Swedes to engage in discussion.

Access to higher education is planned in line with current capacity, with financial resources being determined according to the number of graduates. Higher education is a grant-based system, with its costs finding expression not as tuition fees but as living expenses. It is however frequently emphasised that the entry level is very poor; particularly when it comes to the natural sciences (above all, subjects involving mathematics). Venture capital on the other hand is readily available



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(prevalence of sponsorship, i.e. affluent families investing in research), something that can first and foremost be attributed to Sweden's highly developed risk culture and the existence of sufficient capital in the country.

It should be fundamentally noted here that the successful positioning of the Swedish innovation

system is the result of a vision and strategy that came into being 20 years ago. At this time Sweden realised the importance of ICT and invested accordingly. The motto adopted here is frequently "Think Big", i.e. a clear orientation towards big players such as China (and not European markets). A certain "mental distance" from the European continent was unmistakable here.

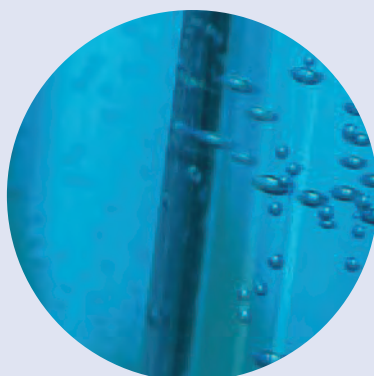
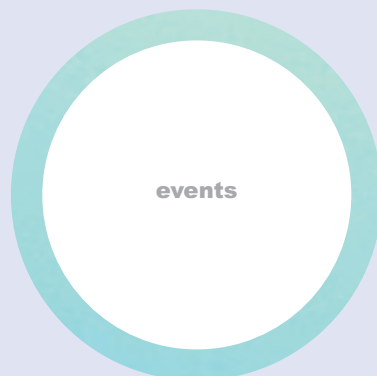
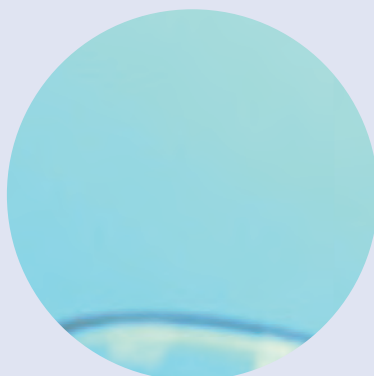
India: A subcontinent with many options – October 2012

With a population of some 1.2 billion the Republic of India is not only the world's largest democracy, but also an interesting growth market for many branches. Research and innovation is primarily perceived by the Indian government as a means for improving the country's weak infrastructure. Here the biggest opportunities for international partners lie in cooperation with Indian organisations. The government plans to invest a total of 1,000 billion dollars in infrastructure by 2017. The issues of urban development and mobility that predominate have played a key role in Austria's technology policy for many years.

It is thus logical to take advantage of the climate of change prevailing on the subcontinent and to establish long-lasting cooperative relationships in the fields of research and development, both at the outset and in the course of subsequent implementation. The conditions for collaboration are

good: India's culture of cooperation differs significantly from that of many other Asian nations, in particular that of the Chinese. In India it is possible, with careful preparation, to quickly develop a cooperative relationship based on trust, which is characterised by mutual respect and oriented to achieving a win-win situation.

While accompanying politicians on a trip to India in October 2012, the Austrian Council was able to establish such a cooperative relationship for the research institutions and firms also forming part of the contingent, so finding a strong cooperation partner in the Indian Institute of Technology. It is only by cultivating such contacts on a long-term basis and keeping them alive with specific projects that Austrian companies will be able to operate successfully in the attractive Indian market.



Electricity from the Desert

Panel Discussion: How can we create a sustainable energy supply – 17 January 2012

On 17 January 2012 the Austrian Council invited guests to a panel discussion entitled “Electricity from the Desert – how can we create a sustainable energy supply?” Discussion focused on whether a sustainable energy revolution can succeed and what role research, technology and innovation play.

According to the International Energy Agency (IEA) global energy demand is set to rise by one third between 2010 and 2035, fuelled largely by rising demand in India and China. This is set against the ambitious goals of the international community and individual countries to work toward a sustainable energy supply. Thus at the end of 2011, the European Commission presented a new roadmap which aims to reduce greenhouse gas emissions from fossil energy sources to 80 to 95 percent below 1990 levels by 2050. Solving the energy question is thus one of the central challenges facing society today.

In light of these figures and targets, how can we usher in the energy revolution? In his talk Dr. Thimo Gropp, one of the founders of the DESERTEC Foundation, outlined the basic feasibility of providing Europe with a clean and adequate supply of energy with an efficient network of renewable energy sources in Europe and North Africa. The solution proposed by DESERTEC: the deserts of the world receive more energy from the sun in six hours than humankind consumes within a year. Solar-thermal power plants in deserts could generate sufficient clean electricity to provide humankind with a sustainable supply of energy. High-voltage direct transmission (HVDC) makes it possible to access these sites. In contrast to conven-

tional AC transmission, HVDC can carry electricity generated from renewables over long distances with losses of just three percent per 1,000 kilometres.

In the follow up discussion there was consensus that in the long term a safe, environmentally-friendly and cost-efficient energy system will have to be developed that also does justice to social needs. There was also agreement that measures in the area of research, technology and innovation with a long-term focus are essential prerequisites for successfully meeting this challenge. A reliable and affordable supply of energy and the rapid switch to an efficient and environmentally-friendly energy system with low CO₂ emissions is contingent upon the development of completely new or vastly improved energy technologies. There was a general consensus that the prerequisites for this are successful and interdisciplinary research as well as new and optimised technologies.

The panellists in alphabetical order:

- Brigitte Bach (Head of the Energy Department at the AIT Austrian Institute of Technology GmbH)
- Thimo Gropp (founding member of the Desertec Foundation)
- Gi-Eun Kim (Professor at the Department for Biotechnology at Seokyeong University in Seoul, Member of the Austrian Council for Research and Technology Development)
- Ingolf Schädler (Head of Innovation at the Ministry of Transport, Innovation and Technology)
- Peter Traupmann (Head of the Austrian Energy Agency)

Science and Research

Event within the Framework of “Austria 2050” – 16 April 2012

Under the title “Science and Research – Luxury or Vital Necessity?” the third event for the project “Austria 2050” dealt with the question of whether the purpose of research is to satisfy human curiosity or merely to develop more marketable products.

The panellists (in alphabetical order) Konrad Osterwalder (Rector of the United Nations University), Alwin Schönberger (profil wissen), Peter Skalicky (Deputy Chairman of the Austrian Council), Karlheinz Töchterle (Minister of Science and Research) and Gabriele Zuna-Kratky

(Director of the Technisches Museum Vienna) presented their views on the lack of awareness about, or frequently negative public attitudes towards, science and research.

This event, which was held in the run-up to the Long Night of Research, was organised in co-operation with the magazine “profil wissen” in the Dome Hall of the Vienna University of Technology. A video documentation and a summary of quotes by panellists is available at <http://www.youtube.com/watch?v=NfAoZHI1Vh7k>.

events

Event: Science and Research

Photo Right:

**Konrad Osterwalder –
Keynote Speaker**



Photo Left (from left to right)

**Gabriele Zuna-Kratky,
Karlheinz Töchterle,
Konrad Osterwalder,
Albin Schönberger,
Peter Skalicky,
Matthias Strolz**

The Long Night of Research – 27 April 2012

Following the success of the Long Night of Research in 2010 the Austrian Council was able to support the participating provinces by coordinating preparations for the event to be held on 27 April 2012. The joint preparations with eight provinces

– Tyrol carried out its own event on 28 April 2012

– culminated in the biggest science event to date in Austria. With a total of 1,382 stations and approximately 100,000 visitors, this event was three times as large as previous events and bears witness to the enthusiasm of the scientific community for this format.

Thanks to the dedication of scientific institutions,

events

more than 250 stations were organised in Vienna alone. The Long Night of Research 2012 was opened by the Minister of Science Karlheinz Töchterle at an event at the Museum of Natural History which was organised by the Austrian Council together with LW Media, the event's co-ordinator in Vienna. Members of the Austrian Council were

able to gain a personal impression of the enthusiasm among visitors in the different provinces. The support provided by the Austrian Council for the Long Night of Research in Vienna was also the subject of a presentation at the end of September at ScienceComm'12, a yearly congress for science communication in Rapperswil in Switzerland.

Opening event for the
Long Night of Research at the
Museum of Natural History
(from left to right)

Oliver Lehmann,
Hannes Androsch,
Renée Schroeder,
Karlheinz Töchterle,
Sabine Ladstätter,
Christian Köberl



FameLab 2012

Science Communication Event – 14 May 2012

Didac Carmona, a biochemist working at the University of Graz, not only impressed the Austrian jury with his presentation on programmed cell death on 14 May 2012; a few weeks later he also thrilled the audience and panel at the international finals at the Times Cheltenham Science Festival. He beat off the challenge from participants from 18 other states to win the competition. His presentation dealt with suicidal cells, which “shoot”, “stab” and “explode” themselves all for the good of the organism.

The Famelab competition was initiated for the first time in 2005 by the British Council with the aim of finding young, talented science communicators and giving them an opportunity to improve their skills. The challenge for the competitors is to present their scientific work in a way that is both exciting and also scientifically accurate without using much in the way of accessories. The Austrian Council has supported the science communication competition since 2006.



Demography as a Chance for Innovation

Alpbach Work Group – 24 August 2012

A decline in the working-age population and an ageing society are two of the most important trends in the demographic development of Austria and large parts of Europe. Due to consistently low birth rates in recent decades, it will be impossible to completely replace the generations which are leaving the labour market.

This presents a challenge not only for social security systems and public-sector budgets, but also and in particular for industry, whose human capital is the driving competitive factor in our globalised knowledge-based society. A smaller workforce can also hinder economic growth – something that is already demonstrated by the increasingly intense debates on the imminent – or even existing shortages of labour with certain qualifications.

To discuss these challenges and outline solutions, the Austrian Council for Research and Technology Development organised a work group at the Alpbach Technology Forum 2012 on 24 August 2012 on the subject of “Demography and Human Capital as a Chance for Innovation”.

The discussions showed that it is imperative that all players take action if the looming loss of prosperity arising from lost growth is to be limited. Demographic change must be seen as an opportunity and driver of societal innovation. The Work Group also identified and evaluated innovative ways of overcoming the demographic challenges to preserving innovative ability and competitiveness.

These issues were discussed by a high-calibre panel, which included the Director of the Vienna Institute of Demography and Professor of Statistics, Wolfgang Lutz, the Senior Economist at the OECD, Mario Cervantes, the Senior Project Manager of the Bertelsmann Foundation, Thieß Petersen, the President of the German Academic Exchange Service and Professor of Social Psychology at Saarland University, Margret Wintermantel, the President of the Sociological Research Institute in Göttingen and Professor of Sociology, Martin Baethge, and the Scientific Director of Eco Austria, Ulrich Schuh.

More Innovation Through Taxes

Event Within the Framework of “Austria 2050” – 4 October 2012

To examine the research and technology-specific components of our tax system more thoroughly, the Austrian Council for Research and Technology Development invited guests to a discussion of experts on 4 October 2012. It took place within the framework of a two-day conference on the “Design and Impact of Tax Reform” organised by the Institute for Advanced Studies (IHS).

Discussions focused on how an optimum tax and transfer system might look and the conclusions that can be drawn from this for existing systems.

Tax systems are in fact solutions that have evolved organically and which often lag behind current economic and social developments.

A team of researchers led by the economist Sir James Mirrlees from the University of Cambridge freed themselves from these constraints and identified the basic principles of an optimum fiscal and transfer system, which was summed up in the Mirrlees Report. One of its main theories: In the state tax and transfer system, efficiency and distributive justice are always in a conflict. Thus, for

events

example, greater redistribution distorts incentives to work for both the tax-payer and for the recipient of the transfer. An optimum system therefore applies low marginal rates of taxation where the labour supply is highly responsive and high rates where economic behaviour is not very responsive.

Integration with other types of taxation is also conceivable. Thus the head of the Institute of Advanced Studies, Christian Keuschnigg, suggested making Austria more attractive for international businesses by granting higher tax credits for R&D expenditures. Keuschnigg during the discussion: "A tax system is efficient when the harm-

ful side effects on investments, savings, innovation, labour participation, education etc. remain low. In a globalised world economy the attractiveness of a business location is outstandingly important."

Furthermore, Austria suffers above all from a lack of private-sector investment in the R&D system. It is precisely here that a reorientation of the tax system can be helpful. And one conclusion is certain: If an economy is geared toward future-orientated sectors and thus increases its growth potential via investments in research, technology and human capital, the overall growth prospects of this economy rise. This in turn generates higher tax revenues.

Does it Depend on the Location? Club Research – 24 October 2012

Club Research
Panel Discussion
(from left to right)

Claus Schultze,
Georg Schadt,
Martha Mühlburger,
Johannes Steiner,
Hans Schönegger,
Armin Mahr,
Walter Schneider

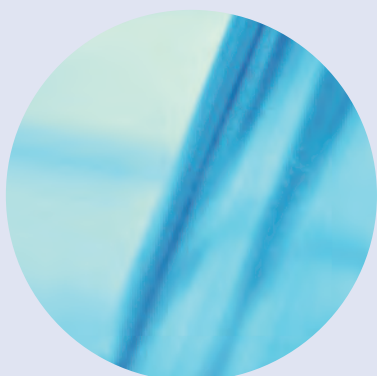
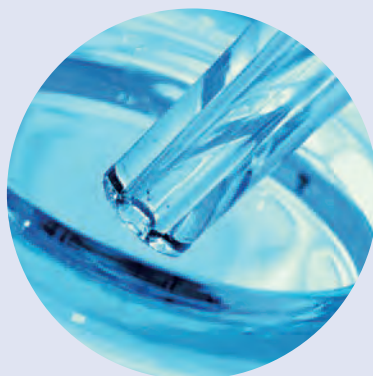
The Club Research "Smart Regions in the Knowledge-Based Society: Does it Depend on the Location?" organised by the Austrian Council together with the BMWF highlighted the promotion of innovation in regional policy from a number of different angles. The key focus of discussion was the creation of innovation-friendly framework conditions in Austria to make it easier for the regions to take part in programmes that sharpen their profile. Following the keyno-

te address by Claus Schultze, Armin Mahr (BMWF), Martha Mühlburger (University of Leoben), Georg Schadt (Federal Chancellery), Walter Schneider (RFTE), Hans Schönegger (KWF) and Claus Schultze (European Commission) discussed the opportunities and problems in the forthcoming financing period of the EU from the perspective of the innovation system.

The questions contained in the title of the event were quickly answered by the panellists with a resounding, "yes". The frequently expressed criticism of project audits within the framework of the allocation of ERDF funds was explained by the conflicting goals that arise from the requirements of the EU regarding the documentation of the use of public funding. In this context, attention was drawn to deficits in the advisory services regarding the optimum use of ERDF funds and to the recommendation of the Austrian Council on this topic.

Finally, the concept of the "region" was critically questioned, although the panellists agreed that a region is more than just a political administrative unit and that greater flexibility is required in the delineation of regions.





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Review and Outlook: 2012 and 2013

The work of the Austrian Council in 2012 was largely dominated by the preparation, presentation and discussion of the first so-called performance report, or to give it its proper title according to the presentation to the cabinet: Report on Austria's Scientific and Technological Capability. What can easily be overlooked at first is the role played by and the importance of this report in the RTI system, due not least of all to its origins.

It is a bold piece of politics and one that demonstrates the kind of courage, which the report often criticises as being missing. For the Government has placed the monitoring of the implementation of its own strategy in the hands of the Austrian Council, which now has the task of also bringing unpleasant interpretations of the situation into the public debate.

The responsibility of the Austrian Council in terms of formulating its interpretations, and thus also the implicit tenor of the report, is thus all the greater. If one examines the document from this perspective, it becomes clear that the positive developments and implementation steps are described right at the very beginning of the report. This was a deliberate decision, for it is not the intention of the Austrian Council to "badmouth" everything, all the more so as the-

re has been a very positive development in the area of RTI in the last ten years. But this is where the congratulations end, for the overall picture shows that certain measures that are necessary to optimise the RTI system have either not been implemented at all or only too slowly. In this manner, the report fulfils its most important role. It can and should serve those in positions of political and administrative responsibility as a basis for their work – not least of all to enable them to carry out the necessary prioritisation of the reform steps.

The Austrian Council has gleaned a great deal of experience compiling this first performance report. And that brings us to the outlook for 2013: In autumn 2012 a set of indicators were defined in a wide-ranging process coordinated with the ministries, with the aim of processing the large quantities of data in a way that will permit comparability of the yearly reports. A positive side-effect is the stronger quantitative anchoring of those interpretations, which shape the substantive statements of the report. Contrary to the impression usually created by the tabloid press, not "everything is bad" in Austria, although there is a need to live a permanent process of reform, which cannot be allowed to falter. The performance report of the Austrian Council can, and will, make an important contribution to this.



Ludovit Garzik
Head of the Secretariat



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The Austrian Council

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Maria Fekter Minister of Finance

Reinhold Mitterlehner Minister of Economic Affairs, Family and Youth

Karlheinz Töchterle Minister of Science and Research



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Hannes Androsch

Chairman of the Austrian Council is an industrialist and former minister of finance and vice chancellor who also served as a consultant to the World Bank. He is a member of the Senate of the Austrian Academy of Sciences (ÖAW) and head of the Supervisory Board of the Austrian Institute of Technology (AIT)



Peter Skalicky

Deputy Chairman of the Austrian Council From 1991 to 2011 Rector of the Vienna University of Technology, Professor of Applied Physics and President of the Austrian Rectors' Conference (1995–1999), Deputy Chairman of the University Council of the University of Leoben.



Gabriele Ambros

Owner of the Bohmann and Holzhausen publishing houses, member of the Supervisory Board of the FFG (since 2009) and President of Forschung Austria (also since 2009)



Markus Hengstschläger

Head of the Institute of Medical Genetics at the Medical University in Vienna, Vice Chairman of the Bioethics Commission at the Federal Chancellery (since 2009)



Marianne Johanna Hilf

Professor at the University of Bern in Switzerland, lecturer in criminal law, law of criminal procedure and criminology



Gi-Eun Kim

Professor at the Department for Biotechnology at the Seokyeong University in Seoul and Secretary General for Biotechnology in the Committee for Industrial Cooperation between Korea and Germany



Karin Schaupp

Independent management consultant (international innovation and business consulting) with a focus on innovation transfer



Renée Schroeder

Professor at the Department for Biochemistry of the Max. F. Perutz Laboratories, formerly a member of the Bioethics Commission of the Federal Chancellery (2001–2005) and Vice President of the Austrian Science Fund (FWF, 2005–2010)

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 of Transport, Innovation and Technology. The head of the secretariat, deputy head of the secretariat and members of staff (in alphabetical order):



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The Austrian Council has lost a valuable member of staff, Ms. Selina Morrison-Brandauer, who has left to go to the USA. We wish her all the best for the future.



Bettina Rutensteiner-Poller

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