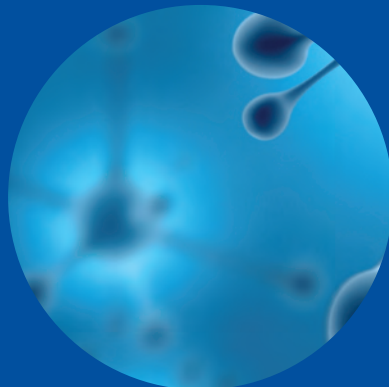
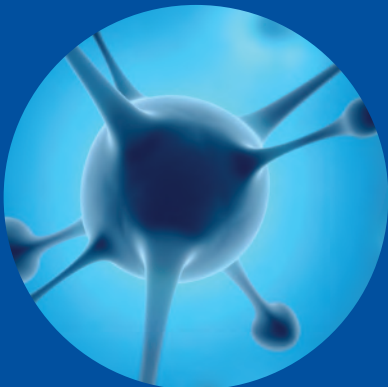
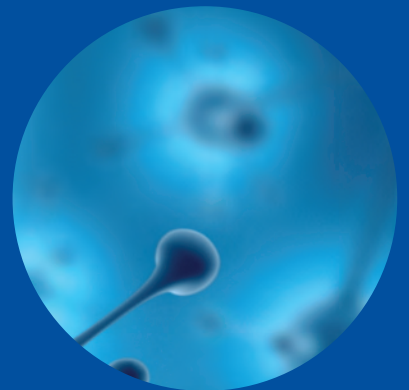
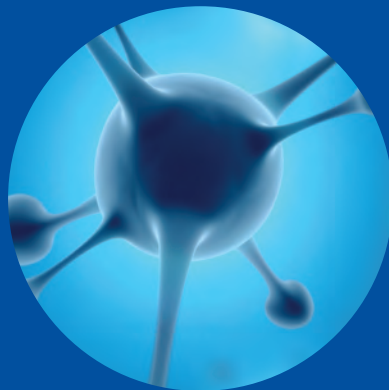
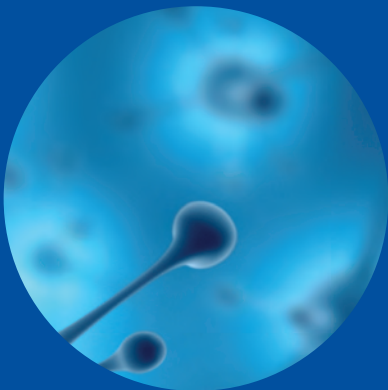
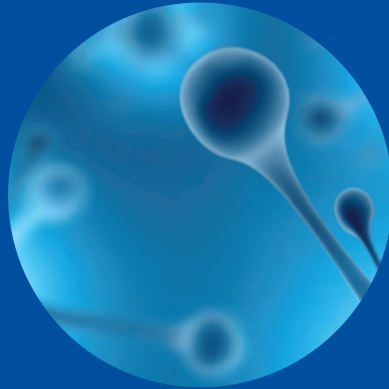
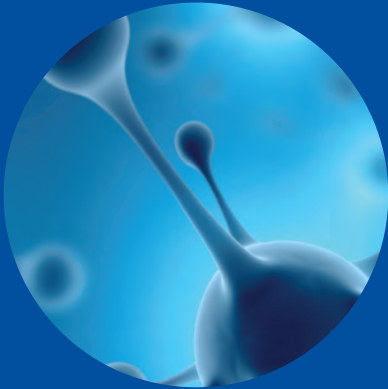






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foreword

The Austrian Council for Research and Technology Development has carefully considered the question of how Austria should or might look in the year 2050. With the Austria 2050 project, the Austrian Council has attempted to look beyond Austrian research and innovation policy and deal with the political, social and economic trends and global developments already discernible today, as well as their impact on the life of Austria's inhabitants.

It is only with a solid foundation that we will be able to identify which opportunities will open up for Austria in the world of tomorrow and what challenges this might entail. One important result of this project is not lastly the realisation that it is the sectors of research, technology and innovation (RTI) oriented towards the future which will increasingly help us to successfully master what are known as the Grand Challenges. With the aim of advancing to become a leading innovation nation in Europe by 2020, the Austrian Government stated in its programme

“Successful. Austria”, which was adopted in December 2013, that the RTI strategy passed in 2011 would remain the basic framework for its RTI policy. However, achieving this goal requires the speedy and determined implementation of the measures contained in the strategy. Austria is in a good position to catch up with the frontrunners in this sector and achieve the objectives of the strategy.

The Federal Government is therefore looking to maintaining its constructive dialogue with the Austrian Council, which will continue to carry out the monitoring task entrusted to it by the government and keep under continuous review the challenges that have to be overcome if Austria is to join the ranks of the leading innovation nations. We would therefore like to express our warmest thanks to all members of the Austrian Council in this regard. In the light of past achievements, we are optimistic that our concerted efforts will in future keep Austria on track towards its goal of becoming an innovation leader.



Doris Bures
Minister of Transport,
Innovation and Technology



Dr. Reinhold Mitterlehner
Minister of Science, Research
and Economic Affairs



Dr. Michael Spindelegger
Vice-Chancellor and
Minister of Finance

Austria is among the countries which have to date managed to successfully cope with the financial crisis. It has been gratifying to see how well our exports and our tourist industry have held up, so ensuring a positive balance of payments, accompanied by an increase in overall employment levels.

We cannot however overlook the fact that Austria only shows weak growth, unemployment is rising and public finances are in a sorry state. A sustainable restructuring of public budgets is all the more urgent given that our accumulated debt does not derive from investment but consumer spending.

This situation is made more acute by the fact that our world is currently undergoing a rapid and radical change due to globalisation, demographic trends, climate change, the digital revolution and problems with the cyber world. The Austrian Council for Research and Technology Development therefore turned its eyes to the future and invited some thirty leading experts to look at a wide range of issues relevant to the future – from education and demographic trends through possible constitutional and fiscal reform, to global development and, of course, science and research. These experts were asked to not only assess the current situation, but above all, to outline the path Austria should be pursuing and describe the steps required to successfully shape the future of the country. The outcome of their analysis was presented at the Alpbach Technology Forum in August 2013 in the publication “Austria 2050 – FIT for the future”. The focus here falls on the following questions: How could or should Austria look in the year 2050? What will be the impact of the global political trends and developments emerging at the present time? What possibilities and opportunities do they open up, and what risks and problems might result? How could political structures specific to Austria be brought into line with the changes underway in Europe

and the world at large, how should this be accomplished? What framework conditions need to be created by Austrian politicians to ensure a sustainable social system? And finally: What roles do education, science, research and innovation each play here?

The Report on Austria’s Scientific and Technological Capability, which was published in June 2013 for the second time, specifically dealt with the Austrian innovation system. It not only offered a general assessment of the performance of the Austrian RTI system, but above all provided a comprehensive view as regards implementation of the Austrian Government’s RTI strategy.

By adopting this strategy in March 2011 the Federal Government had opted for a strategic roadmap set to run until 2020 while however departing from the necessary funding pathway. In consequence there has been no improvement in Austria’s competitive position since the crisis year of 2009. Not surprisingly, comparison of the different country rankings in the Report on Austria’s Scientific and Technological Capability revealed that Austria’s development in the individual policy areas that are a driving force behind its ability to compete, e.g. education or administrative reform, has been stagnating for a number of years.

At the end of September 2013 the Austrian Council finally presented its white paper on the governance of research, technology and innovation (RTI) in Austria, in which it emphasised the growing importance of efficient organisation and goal-oriented management of RTI policy and thus also the flow of funds to aid research (RTI governance). The white paper does not merely see itself here as a position paper, but also as a compilation of practical courses of ac-

editorial



Hannes Androsch
Chairman
of the Austrian Council



Peter Skalicky
Deputy Chairman
of the Austrian Council

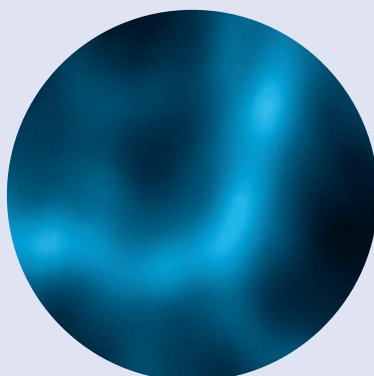
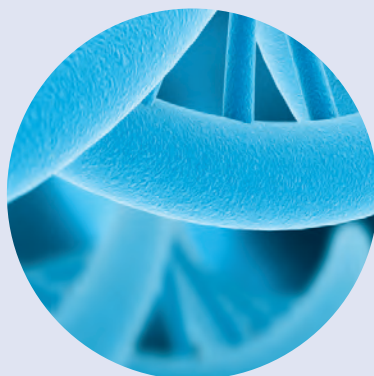
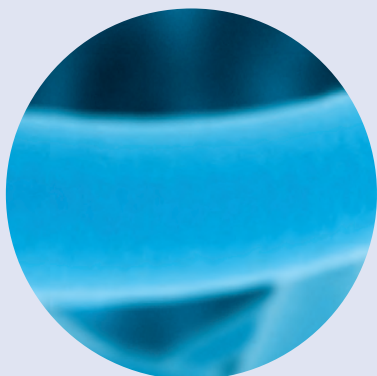
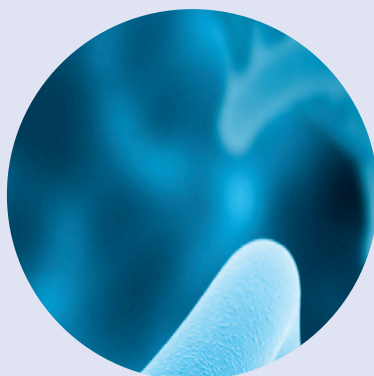
editorial

tion available to decision-makers. It contains suggestions and positions for the improvement of RTI governance in Austria and outlines a raft of measures necessary for reform as well as specific fields of action.

We hope you will enjoy reading about these projects and the further recommendations of the Austrian Council in the present Annual Report 2013. We should also like to thank everyone who has helped us complete our task and contributed critical input and we look forward to continuing our cooperation in future.

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





outlook

Austria 2050: From future diagnosis to shaping the future

“Austria 2050” – what has to be done to make Austria ‘fit for the future’? A large number of experts have given thought to this issue at the invitation of the Austrian Council. The result was presented by the Austrian Council in the framework of the Alpbach Technology Forum on 21 August 2013 in the form of a publication entitled: Austria 2050 – Fit for the future.

The position is plain from the bare facts: By 2050 the Earth will be home to almost ten billion people, with two thirds living in cities. The number of persons 60 years of age and over is set to triple in the next 35 years to more than two billion, with life expectancy rising from a current 70 years to almost 80 years. Competition to procure raw materials and energy will become fiercer, while hunger and poverty become more widespread: This is the global prognosis.

But what position will Austria find itself in by 2050 and how should it develop over the coming years? What will be the impact of the global political trends and developments emerging at the present time? What possibilities and opportunities do they open up, and what risks and problems might result? And lastly: What role will education, science and research play in the future of our country?

The Austrian Council has devoted this compendium of forecasts to the examination of these questions. Leading experts from various fields were invited to put forward prognoses in their specialist field and to suggest how Austria could or should look in future. In the eight chapters of this work, they analyse issues relevant to the future of the country: the challenges for education and research policy, migration and demographics, energy supply and environmental problems, struc-



from left to right:

Peter Skalicky

Deputy Chairman
of the Austrian Council

Hannes Androsch

Chairman
of the Austrian Council

Ludovit Garzik

Head of the Austrian
Council Secretariat



tural reform, global developments and the future in general terms.

The majority of the experts concluded that Austria will not be able to evade the Grand Challenges facing us – from climate change through demographic trends to developments affecting the global balance of power. On the contrary: the main fu-

ture-oriented sectors are in urgent need of reform if they are to cope with these challenges. For a small, open economy such as Austria's it will therefore no longer be sufficient to merely join the global race between knowledge-based economies. For a country such as Austria with few natural resources, education, research, technology and innovation are key to remaining competitive in future and progressing in the fields of business, technology, society, ecology and culture.

And even if no single policy approach can provide answers to all the burning questions of our age, there is nonetheless a general consensus that education, research and innovation are important factors for facing up to future challenges. This publication also aims to offer guidance and encourage politicians to act here. To this end, some thirty leading experts have assessed the current situation and in particular, outlined the path Austria should pursue, describing the steps required to successfully shape the future of the country.

outlook

from left to right:

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Former Executive President of the
Regional Education Board of Styria

Peter Schwab Voest



outlook

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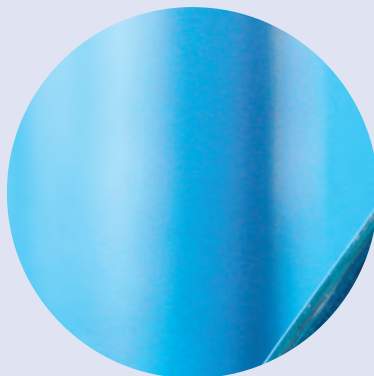
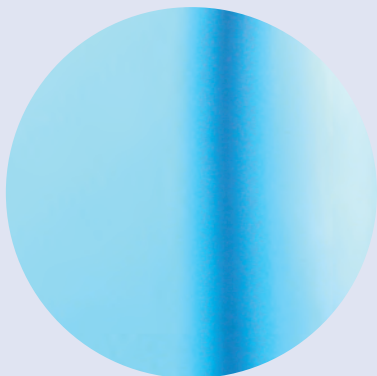
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Recommendation Regarding Selected Areas of the Humanities, Social and Cultural Sciences – Recommendation dated 27 February 2013

Background

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

Furthermore, certain disciplines and research institutions/teams from the humanities, social and cultural sciences contribute to the strengths of the Austrian science and research landscape. This is how the University of Vienna managed to come in at No. 46 in the latest Times Higher Education Ranking¹ in 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 Subject², where both philosophy and linguistics were rated 46th.

The strengths of the humanities, social and cultural sciences in Austria are also demonstrated by its successful participation in the framework programmes of the EU:

- As regards the thematic priority “Citizens and governance in a knowledge-based society” of the 6th EU Framework Programme, Austrian research institutions engaged in the field of the humanities, social and cultural sciences participated in 37.2 percent of all funded projects and were responsible for coordinating 6.9 percent of these projects (in comparison: in the 6th Framework Programme as a whole Austria was involved in 13.5 percent of the projects funded, with 3.3 percent being coordinated by Austria).³

- The 7th EU Framework Programme paints a similar picture. By May 2012 Austrian institutions engaged in the field of humanities, social and cultural sciences took part in 27.4 percent of all projects funded under the priority “Socio-Economic Sciences and Humanities (SSH)” (with Austrian participation averaging 10.2 percent for the Framework Programme as a whole) and also coordinated 6.3 percent of SSH projects (in comparison to an Austrian average of 3.4 percent in the Framework Programme as a whole).⁴

The humanities in particular are also extremely successful at securing funding on a competitive basis following international peer-review. Compared with other organisations for financing scientific research (e.g. German Research Foundation – DFG, or the European Research Council – ERC), the Austrian Science Fund (FWF) reports that hu-

¹ <http://www.timeshighereducation.co.uk/world-university-rankings/2012-13/subject-ranking/subject/arts-and-humanities/institution/university-of-vienna>

² <http://www.topuniversities.com/university-rankings/world-university-rankings/2012/subject-rankings/arts-humanities>

³ Proviso (2009); 6. EU-Rahmenprogramm für Forschung, technologische Entwicklung und Demonstration (2002-2006). PROVISIO-Bericht, November 2009. Vienna, pp. 122, 124.

⁴ Proviso (2012); 7. EU-Rahmenprogramm für Forschung, technologische Entwicklung und Demonstration (2007-2013). PROVISIO-Überblicksbericht, May 2012. Vienna, pp. 92, 94.

manities-related projects account for a significantly higher share of the overall budget. The rates of approval for the majority of humanities-related disciplines are also well above the FWF average.⁵ In acknowledgement of the importance and need for the humanities, social and cultural sciences to ensure the development of society, the Austrian Council for Research and Technology Development has in the past made a number of recommendations⁶ in an attempt to help improve the structural framework conditions for the humanities, social and cultural sciences in Austria. The recommendation given below reinforces these efforts by addressing selected challenges in this field, particularly at the universities.

Subject 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 in numbers has however not been followed by a corresponding augmentation in teaching staff and has meanwhile resulted 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 no less true of Austria: *“This [i.e. the poor student-to-staff ratios] does not merely have an adverse effect on the quality of teaching (...), but also*

*make it largely impossible for faculty members to carry out appropriate research through a lack of time. As a result, the goal of acquainting students with research work in the course of teaching in the academic environment cannot be realised to the desired extent.”*⁷

The repeatedly debated call to manage this situation by restricting admission to the most popular subjects of study entails the risk that prospective students then opt for closely related subjects, and the problem is merely shifted elsewhere. It is also above all in the field of the humanities and cultural sciences that the question arises as to which selection methods and criteria are suited to differentiating at the outset between the “right” and the “wrong” students for each degree. A more precise understanding of the motives involved in the selection of a course of study is required if students are to be *“successfully steered away from oversubscribed subjects and diverted towards others, for which greater popularity among students would be desirable in terms of the national economy and science policy (...)”*⁸. However, there is in fact a lack of systematic studies to indicate how a preference for or dislike of certain degree courses comes about when students are selecting a subject for study. It thus appears more expedient to bring about corresponding reform of the education system in order to capture the interests of school-age children and to nurture their

recommendations

⁵ http://www.fwf.ac.at/de/downloads/pdf/FWF-Erfolgswahrscheinlichkeit_P-99-08_15-12-2010.pdf

⁶ Previous Austrian Council recommendations regarding the humanities, social and cultural sciences:

- 15 January 2001: Recommendation Regarding the Further Development of the Humanities, Social and Cultural Sciences in Austria.
- 3/4 July 2002: Measures to Strengthen the Humanities, Social and Cultural Sciences.
- 16 September 2003: Recommendation Regarding the Humanities, Social and Cultural Sciences
- 30 March 2006: Recommendation Regarding the Austrian Academy of Sciences
- 2 April 2008: Recommendation Regarding the Further Development of the Humanities, Social and Cultural Sciences in Austria.

The FWF provided a commentary to the recommendation made in 2008: http://www.fwf.ac.at/de/downloads/pdf/FWF-RFTE-Empfehlungen_2008.pdf

⁷ Swiss Science and Technology Council (2006); Perspektiven für die Geistes- und Sozialwissenschaften in der Schweiz. Lehre, Forschung, Nachwuchs. SWTR Schrift 3/2006. Bern. p. 49.

⁸ Swiss Science and Technology Council (2006), p. 55.

recommendations

talents across the entire breadth. In addition, a comprehensive, high-quality advisory system should be set up to cover the wide selection of subjects available for study and the associated possibilities.

If we also assume that it is relatively easy with demographic trends to forecast the numbers of youngsters graduating successfully from school and consequently the number entering higher education⁹, it is likewise possible to calculate the financial resources that will in future be required by the universities.

Subject area 2: Structured careers with greater long-term perspectives for researchers

In addition to the problematic conditions for teaching and research found in certain disciplines, another major difficulty involves the position of the next generation of academic staff, an issue which cannot be disregarded any longer. Junior scientists are confronted with factors such as the scarcity of financial resources, uncertainty of employment due to short-term contracts and the trend towards project-based research funding. As a result, highly gifted young scientists are thus increasingly either finding themselves in precarious employment, (are obliged to) leave Austria to improve their career prospects or give up the plan of a scientific career altogether, often dropping out before taking their doctorate – particularly in the case of the humanities, social and cultural sciences.

The 2002 Austrian Universities Act has brought about far-reaching changes in the contracts of employment held by academics and has altered the status of all mid-level academic staff. The most significant change was abolition of the status of civil servant for newly recruited academic staff, so that all mid-level university recruits are now only offered fixed-term employment contracts. Under the provisions governing “consecutive fixed term

contracts”¹⁰ these contracts can no longer be extended after a maximum of six years in the case of full-time employment (eight years for part-time staff), regardless of how well employees have performed during this time!

Although there exists a theoretical possibility of offering non-time-limited contracts of employment, the universities vary widely in the way they take advantage of this course of action, and overall very little use is made of the option.

The collective bargaining agreement which came into force on 1 October 2009, should improve the situation here in as much as it provides for a performance-related career model based on qualification agreements. This ultimately leads to an unlimited contract of employment in the fullness of time, i.e. once the qualification agreement is satisfied. However, very few of the “tenure-track positions” required here have in fact been created to date, with the result that there has been little improvement in the situation of academic staff at the universities.

In this context it will not come as a surprise that the number of doctoral students is relatively low, with this being even more true for the numbers of graduates in the humanities, social and cultural sciences. The cost and effort involved in earning a doctorate thus appear to many as not really worthwhile where there is a lack of financial support during such a course of study, slim prospects of a scientific career, and a growing risk of failure to find employment due to ever-increasing specialisation, “overqualification” and competition from younger applicants.

Subject 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 Eu-

⁹ There is a certain degree of uncertainty arising from the difficulty of predicting the number of new students arriving from abroad.

¹⁰ See also: § 109 (“Term of Employment Contracts”), Universities Act 2002, Status: Federal Law Gazette I No. 134/2008; as amended on 1 January 2009.

European reform of the higher education system. Even if this was initially only mentioned in conjunction with the comprehensibility and comparability of university degrees, improving the employability of Europe's students is meanwhile seen as one of the key drivers behind the Bologna process.¹¹ The cycle-based "Bachelor's" and "Master's" degrees are the outcome of a new understanding of qualification. Ideally, BA courses should lay the basis for both lifelong learning and employability by offering key theoretical and methodological tools, while MA courses allow students to increasingly specialise in their chosen field.¹²

Even if there is huge variation between the individual courses on offer for the humanities, social and cultural sciences, graduates of most of these courses are however particularly characterised by having acquired a broad-based, generalised education rather than specific professional qualifications. Degrees in the humanities, social and cultural sciences revolve around analytical skills in dealing with complex relationships (between structures, principles and rules) and involve networked, non-linear and systematic thinking. The broad base of a qualification, which also ensures greater versatility, is

seen as offering a solid foundation for a successful career. 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.

The Swiss Science and Technology Council has thus called for more part-time degree courses in the field of the humanities, social and cultural sciences in order to offer students the opportunity of acquiring professional experience while still a student – including (increasingly) at an international level.¹³

In Austria the rate and average extent of employment is already very high, particularly where students of the humanities, social and cultural sciences are concerned.¹⁴ This double burden of study and employment generally has an adverse effect on the amount of time available for study – with the result that students are rarely able to graduate within the period envisaged for completion of their degree.

This situation is further aggravated by the circumstance that, contrary to the original intention of creating a professional university qualification with the Bachelor's degree, a BA is frequently not recognised as being a 'proper' academic qualifica-

recommendations

¹¹ Pasternack, Peer, et al. (2006); Die Trends der Hochschulbildung und ihre Konsequenzen. Wissenschaftlicher Bericht für das Bundesministerium für Bildung, Wissenschaft und Kultur der Republik Österreich. HoF Wittenberg – Institut für Hochschulforschung an der Martin-Luther-Universität Halle-Wittenberg, Wittenberg, p. 64.

¹² Swiss Science and Technology Council (2006), p. 64.

¹³ Swiss Science and Technology Council (2006), pp. 65, 68.

¹⁴ In the humanities, social and cultural sciences the proportion of students who undertook work during term time amounted to 66.2 percent, working an average of 19.2 hours per week. In the social and economic sciences, 65.4 percent of students were in employment, working an average of 21.1 hours per week. More than three quarters of working students (76 percent) cited the need to earn their living as their main motive for taking up employment; just over half (51 percent) of working students cited "vocational orientation" as their motive. See also: Unger, Martin, et al. (2010); Studierenden-Sozialerhebung 2009. Bericht zur sozialen Lage der Studierenden. Study by the Institute of Advanced Studies (IHS) on behalf of the Ministry for Science and Research. Vienna, pp. 141, 151, 158

¹⁵ It is not just the private sector that has reservations about Bachelor's degrees. It was not until December 2011 that the public sector was able to bring itself to recognise the B.A. in civil service salary law, by creating a new salary grade to take effect on 1.1.2012 for BA graduates who had already been employed in the public sector prior to obtaining their degree. For further information see: <https://www.help.gv.at/Portal.Node/hlpd/public/content/340/Seite.34060717.html#Bachelor>

recommendations

tion¹⁵ and students are therefore obliged or opt to undertake a Master's degree as well.

Subject area 4: Access to research data and publication infrastructure

Like all other fields of science and research, the humanities, social and cultural sciences require suitable infrastructure, in particular access to research materials / data, which are available from publicly financed institutions such as museums, libraries or statistical offices. Scientists however often only have limited access to such information¹⁶, or it is only available for purchase at high cost from these institutions in the form of publications¹⁷ using their research funding. This means that data and materials which are publicly financed then have to be paid for with public resources if reliable scientific information is to be made accessible to the general public.

In addition, it has been shown that the internationalisation of science also makes greater demands on scientific publications. This above all includes quality standards such as the peer review procedure or specialist / foreign-language proofreading for publications in the form of books but also involves taking advantage of the potential offered by open access, i.e. free access to scientific literature and other materials available on the Internet. The international assessment procedures of the FWF and other funding agencies (such as the ERC) show that ever-greater importance is being attached to such factors in the evaluation of scientific publications by scientific communities in the field of humanities, social and cultural sciences.

Recommendation

The Austrian Council for Research and Technology Development recommends the following measures to deal with the above challenges facing the Austrian universities, and the humanities, social and cultural sciences in particular:

- **Funding for the universities:** Austria's universities are the backbone of its tertiary education system and a major part of its research and innovation system. Ensuring financial security for higher education is thus of vital importance to the future of the country and must be anchored in the federal budget in the interest of secure long-term planning. Here the natural sciences and engineering must not be played off against the humanities, social and cultural sciences or vice versa, as society requires both for further development. The Austrian Council therefore recommends that following detailed examination of international models for research funding, tax incentives should be stepped up for industry-funded research in the humanities, social and cultural sciences, in addition to explicitly supporting the setting-up of foundations dedicated to this field. However, such a measure should not belie the fact that *"under no circumstances is it possible to compensate for a lack of basic facilities with funding acquired through a competitive process, i.e. resources which are only ever available on a temporary basis."*¹⁸ The Austrian Council therefore also recommends that the statutory provision of "two percent of GDP for the tertiary sector" is enshrined in legislation governing research funding.
- **Relieving the pressure on oversubscribed subjects of study:** The pressure on these subjects could be relieved by improving the system of credits for other courses beyond the individual

¹⁶ See also the very limited access to micro-data in Austria:

http://www.noeg.ac.at/index.php?option=com_content&view=article&id=11&Itemid=12&lang=de

¹⁷ See for example, the prices of the Austrian National Library, which are still comparatively moderate but increase exponentially as a result of online use: http://www.onb.ac.at/ben/gebuehren_verwendungsentgelte.htm#a14932

¹⁸ Swiss Science and Technology Council (2006); p. 37.

boundaries of each subject or by relaxing the criteria for acceptance of such credits. This might additionally offer greater scope for cooperation within the humanities, social and cultural sciences by including the so-called “minor” disciplines. The Austrian Council therefore recommends introducing corresponding measures at the universities.

- **Doctoral programmes:** As regards funding levels for doctoral programmes, the humanities, social and cultural sciences in particular still have a long way to go if they are to catch up with other disciplines. This is key to ensuring young scientists are supported and encouraged to good effect. The Austrian Council therefore once again recommends stepping up systematic, structured and fully funded doctoral programmes, not only by offering additional courses at this level, but also by increasing the availability of doctoral fellowships (including at leading institutions based abroad) in conjunction with performance-related rules for admission and international standards for professional doctoral programmes.

- **Outlook for young academics:** It is not only science and research that require continuity: young academics also need realistic prospects which are based on transparent selection procedures and allow them to carry out independent research at an early stage and plan for their future life and career. The current situation is characterised by a growing lack of job security, unsatisfactory regulations as regards consecutive fixed term contracts and a scarcity of career positions in higher education. And this is not just a problem for the individual scientist, but also for Austria's science and research landscape overall, as a huge amount of talent is currently lost to the system. This is not a difficulty solely affecting the humanities, social and cultural sci-

ences, although it has been shown to be particularly acute in this field. One of the consequences here is that young scientists fear they will be faced with even fewer opportunities following a temporary absence and then become highly immobile, so making little use of fellowship formats such as the FWF's Schrödinger Fellowship programme.¹⁹ As it is both important and desirable for highly qualified scientists to remain at the universities in the framework of stable employment, this once again calls for an improvement, i.e. an increase, in the basic funding available to the Austrian higher education system if there is to be any significant rise in the number of tenure-track positions on offer. In the view of the Austrian Council, it is also necessary for the Federal Ministry for Science and Research and the universities to jointly analyse the application in practice of the current provisions governing consecutive fixed term contracts and the collective bargaining agreement and to come up with improvements that would offer a balanced solution going beyond the issue of “full-tenure vs. consecutive fixed term contracts”. Where this concerns third-party funding for individual scientists, the Austrian Council also recommends the involvement of the FWF here.

- **Greater scope for research:** Time is the most important requirement for people employed in science and research. At the same time, it is in the oversubscribed fields of study that the resource of “time for research” is often in very short supply – if available at all – due to the extensive obligations of the teaching staff vis-à-vis their students. In the medium to long term, this involves the risk that key scientific disciplines will miss out on international developments. The Austrian Council therefore recommends the creation of framework conditions conducive

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¹⁹ http://www.fwf.ac.at/de/public_relations/printprodukte/info/info76-11-01.pdf

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to the development and funding of an initiative which would offer greater scope for research in the humanities, social and cultural sciences through a new form of support and broad-based exemption from university obligations for a specific period of time. This initiative should be developed and implemented by the FWF to subsequently award funding on a competitive basis to individuals who excel in the humanities, social and cultural sciences.

The Austrian Council furthermore recommends reducing the level of bureaucracy at the universities. If red tape were scaled down and, above all, scientific staff relieved of their administrative duties, this would create more time for high-quality teaching and research, so significantly reducing the need for programmes designed to free up such staff for research. If the separation between research and teaching is too great, this also entails the risk of losing the connection between the two that Humboldt deemed necessary for academic instruction in his ideal of education. For this reason, the Austrian Council additionally advises against the creation of professorships solely devoted to research and those to teaching, as is sometimes envisaged.

- Measures for the structuring and improvement of options relating to income from “external sources”: In the past, national priority programmes were an important precondition for the further development of scientific skills and quality assurance. However, despite their posi-

tive evaluation, the two successful programmes “NODE”²⁰ and “TRAFO”²¹ have been discontinued and not replaced by new measures. While in the last ten or so years, a relatively large amount of money has flowed into ICT and the Life Sciences and thus into the development of outstanding research centres and institutions²², there have been no remotely comparable initiatives in the humanities, social and cultural sciences or any influx of funds into this field. The Austrian Council therefore first of all recommends implementation of the “NIKE – Network Initiative Cultural Heritage” programme²³ devised by the FWF in 2008 and secondly, the development of incentives designed to bring about structural improvement for the humanities, social and cultural sciences.

One option here would be to extend COMET, Austria’s centre of excellence programme, in terms of the eligibility of applicants modelled on the example of Australia’s “Cooperative Research Centres Programme (CRC)”. Here the CRC specifically provides for participation “*from all industry and community sectors and all research disciplines including humanities, arts and social sciences*” and thus stipulates that project participants must be involved in co-operation with an “end-user (either from the private, public or community sector)” and “*higher education institution (or a research institute affiliated with a university)*”²⁴. In the COMET programme, however, it is currently only consortia consisting of one scientific partner and at least three / five partners from industry that are eligible to apply, so au-

²⁰ The research programme NODE – New Orientations for Democracy in Europe of the Ministry for Science and Research had a term of five years (with three calls between 2002 and 2006) and a total budget of 5.8 million euros for some 30 research projects.

²¹ The research programme TRAFO – Transdisciplinary Forms of Research in the Humanities, Social and Cultural Sciences of the Ministry for Science and Research was carried out between 2004 and 2007.

²² For example, the founding of IMBA (Institute of Molecular Biotechnology), the GMI (Gregor Mendel Institute), CeMM (Centre for Molecular Medicine of the Austrian Academy of Sciences), and IST-Austria.

²³ http://www.fwf.ac.at/de/downloads/pdf/NIKE_Programmkurztext.pdf

²⁴ Commonwealth of Australia (2012); Cooperative Research Centres Program – Program Guidelines, Canberra 2012, pp. 1, 2.

tomatically restricting cooperation within the framework of the centres of excellence to research allied to business or industry. The Austrian Council thus recommends extending the COMET programme, both in terms of areas of science and research and also as regards the eligibility of applicants in line with Australia's Cooperative Research Centres Programme.

● **Improvement in employability of graduates in humanities, social and cultural sciences:** The Bachelor's (BA) degree is frequently not recognised as being a 'proper' academic qualification, and for this reason it is necessary to facilitate the transition to Master's (MA) courses for students. The Austrian Council therefore recommends suitable measures should be introduced to avoid delays in enrolment on Master's degrees. In addition, the number of places on MA courses should not be restricted either – indeed, the universities should ensure that they do not just offer MA degrees which follow on from a BA, but also that students are increasingly allowed to transfer from a programme which is not consecutive. Furthermore, those graduates of the humanities, social and cultural sciences who are not interested in pursuing a scientific career should be increasingly able to acquire qualifications (e.g. by means of additional university courses) which will ease their entry into the world of work.

This includes for example dealing with information and communications technology as well as obtaining an understanding of law and business administration (e.g. project management and project work, budgeting and cost structures, as well as the different types of business organisation). This way the flexibility offered by graduates from the humanities, social and cultural sciences can be supplemented to good effect by specific industrial skills and knowledge.

● **Access to research materials / data:** To facilitate and/or guarantee access to research data and materials which have been financed with public resources, the Austrian Council recommends coordination of existing statutory provisions and – where necessary – creation of the relevant legal framework conditions.

● **Investment in an internationally visible publication infrastructure incorporating quality assurance:** To satisfy the more exacting demands made on scientific publications as a result of the internationalisation of science, the Austrian Council recommends the creation of appropriate framework conditions. The aim here is to establish an internationally visible publishing sector in Austria and to brand it the "Austrian University Press" or "Austrian Academic Press" to target the premium market for scientific publications.²⁵

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Recommendation Regarding ERDF (Structural Funds – European Regional Development Fund) – Recommendation dated 27 February 2013

Preamble

In its recommendation dated 19.9.2012 the Austrian Council for Research and Technology Development dealt with the question of structural funds. In 2013, the formal framework conditions were defined at a national level for the funding period from 2014 to 2020, with con-

firmed by the European Commission then being required. In addition to the recommendation already issued in this regard, a number of structural issues will now be highlighted and examined separately in this document.

²⁵ http://www.fwf.ac.at/de/public_relations/oai/pdf/info83_austrian-univ-academic-press.pdf



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Starting position

During the current funding period from 2007 to 2013 the certifying and the audit authority are attached to the Federal Chancellery and the managing authorities to the individual provinces. The operational programmes forming the basis here were drawn up separately for each province. This gives rise to very small-scale programmes, which, depending on the budget, offer only limited scope for the implementation of projects with a long-term effect. And this is not the only disadvantage here. For example, structures for the managing authority need to be established in every province, and coordination with the other partners involved in implementing the structural funds involves liaising with a large number of individuals, especially at a federal level. A uniform state of knowledge and harmonised approach to handling is thus only possible to a limited extent. The implementation of projects and programmes in more than one province involves a huge amount of administrative effort and almost never takes place. The existing guidelines governing eligibility for funding are highly specific to the individual structural funds and offer leeway for their interpretation. In current standard practice there is no legal certainty as regards their implementation and application, with this aspect coming in for a good deal of criticism as a result. No harmonisation of the guidelines with other programmes has taken place.

Objectives

As matters currently stand regarding the preparations underway for the funding period from 2014 to 2020, a general reduction in available resources is to be expected. It is therefore advisable to ensure administration of the resources is kept as simple as possible and to create a high level of synergy.

The guidelines forming the basis for financing

projects with resources from structural funds must be clearly defined and modelled on the customary approaches of other programmes. There must be legal certainty for the recipients of such funds. It must be possible for any differing interpretations to be settled by neutral arbitration bodies, and the effort involved in managing resources from structural funds needs to be reduced to the required level. This applies not only to the structure of the programmes – including the structure of the authorities – but also to handling of the projects.

Recommendation

The Austrian Council recommends that the provinces come to an understanding as regards a joint operational programme and thus to the setting-up of a joint managing authority. The Austrian Council however recommends taking account of the regional requirements and needs of the individual provinces and giving expression to them in the operational programme in the interest of an overarching solution for Austria. To this end, province-specific sub-items should be introduced to ensure organisational leeway for the individual provinces in terms of content and budget.

The Austrian Council recommends that the tasks of a joint administrative authority be allocated to a technically competent but neutral body. Where a high level of technical expertise and the necessary acceptance as a neutral body are concerned, the business office of the Austrian Conference on Spatial Planning (ÖROK) would be an ideal choice as the managing authority in both regards.

The Austrian Council recommends the drafting of suitable guidelines to deal with problems which come about through application of the general framework guidelines.



Recommendation Concerning the Development of Profiles in the Higher Education Area – Recommendation dated 27 February 2013

The Austrian Higher Education Area has seen dynamic development in recent years and has thus also undergone radical change. The specific missions, profiles and unique features of the different tertiary education sectors are no longer so clear-cut, so also resulting in redundancy and subcritical mass which is no longer sufficient to fully compete with others. Examples here are a stronger focus on teaching by the universities (to the detriment of research) or the development of research infrastructure at universities of applied sciences with their own funds, which then remain subcritical.

The effect of this process is to erode the unique characteristics of the different sectors, which after all were motivating factors in their establishment and which must form the basis for sharpening their profiles. The institutions thus lose some of their distinctive character, so impeding strategic further development. There is also the problem that the institutions of the Austrian Higher Education Area are still suffering from insufficient funding, in particular the universities, notwithstanding the positive trend seen over the last few years (one recent example being the cash injection of a billion euros for Austria's higher education system).

If the universities are to face up better to the international competition and the associated challenges, they will however need to stand out from the rest and raise their profile. The creation of a more distinctive profile and contemplation of their unique features will boost efficiency in terms of teaching and research and so improve their ability to compete at an international level. Scarce resources cannot however provide the sole impetus here.

Any university that wishes to successfully sharpen its profile will have to consider and reinforce the unique features of the individual institution (and thus also of the sectors). This can be illustrated by the example of the univer-

sities, referred to below as the traditional universities, and the universities of applied sciences.

Research-led teaching at the traditional universities is the most important unique feature they have to offer. This also includes training young scientists in the field of research. Universities are not first and foremost educational establishments which also carry out research: research and participation in this process as part of a university education is the key constituting element of a traditional university. And this also depends on the existence of an appropriate research infrastructure at the relevant university. Universities of applied sciences on the other hand offer teaching which is more practical and vocational in nature and generally have better staff-to-student ratios than the traditional universities. These universities of applied sciences are appealing successfully to target groups who do not traditionally opt for higher education and so fulfil important regional tasks in relation to training and applied research.

Reflecting on the unique features offered by the different types of higher education institution will secure them a competitive advantage and boost efficiency – this is not solely dictated by the need for economic efficiency. However, if all institutions then develop an ambition to resemble each other as closely as possible, this will undermine all the efforts to sharpen their distinctive profiles and dilute the available resources to the point where they become unusable.

In the public debate the same misunderstandings such as “monopolisation” of research or “prohibition of research” constantly crop up. It therefore seems important to emphasise that, where a university manages to reflect on its unique features and achieve a more distinctive profile, this does not constitute monopolisation or prohibition.

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The Austrian Council for Research and Technology Development thus makes the following recommendations in the interest of encouraging the development of profiles in the Austrian Higher Education Area:

- **The development of distinctive profiles is a strategic objective, not an end in itself.**

The creation of distinctive profiles is not a quick fix that can be achieved without careful planning, but should be pursued with the necessary tact and sensitivity over a lengthy period of time. The objective here is not to save money but to make efficient use of infrastructure and human resources and so ensure that investments meet their targets more accurately.

- **The statutory provisions are perfectly adequate.**

The Austrian Council considers the type-based distinctions made between universities, universities of applied sciences, private universities and teacher-training universities in the Higher Education Area to be meaningful and recommends that they are maintained. There seems to be no apparent need for tighter regulations, standardised individualisation of these profiles or the introduction of new types of higher education establishments. Greater and more exacting restriction of the activities of the different types of university is also not advisable here given that there is now major differentiation within the sectors. One exception here involves the teacher-training universities, which are striving to reposition themselves in the university landscape. What is true of other sectors, applies here too: Autonomy reinforces the development of profiles and makes this process easier. It should not be accomplished through intervention in the teaching syllabus, content of research and orientation of the institution but by determining the qualification profiles of graduates.

- **Greater flexibility within sectors and cooperation beyond their boundaries.**

Differentiation within the sectors should be seen in a positive light. The Austrian Council recom-

mends permitting greater variety within these sectors in the interest of self-governance by the institutions. The core identity in terms of affiliation to a specific university sector should however always be maintained. Hybrid formats and opportunities for cooperation between sectors should increasingly appear on the agenda, as this enables every institution to develop its own special profile.

- **Creation of institutional clarity regarding the issues of “PädagogInnenbildung NEU” (new system of teacher training) and research by the universities of applied sciences.**

In the Austrian Higher Education Area research activities at the universities of applied sciences and the positioning of the teacher-training universities have at present not been solved in a satisfactory manner.

The universities of applied sciences should – where expedient at the individual locations – be placed in a position where they can intensify their research work by taking full advantage of proven sources of finance on a competitive basis. Furthermore, they should work in close cooperation with industry and the traditional universities (above all in relation to doctorates) to develop additional capacity. The Austrian Council recommends concentrating on collaboration here. The development of costly research infrastructure from the core budget of a university of applied sciences is not consistent with the mission of this type of university.

In the case of the teacher-training universities the Austrian Council recommends the bold continuation of the reforms underway in this sector in the interest of improving quality, in addition to the development of a clear-cut institutional solution for “PädagogInnenbildung NEU”, so bringing together the strengths of both the teacher-training universities and the universities.

- **Communication of a “big picture” of the Higher Education Area.**

There is sometimes confusion about the positioning of the individual types of university, a factor that makes debate about this issue more dif-

ficult. The Austrian Council therefore recommends communicating more forcefully and consistently the positioning of the different types of university as they are envisaged under the legislation. This would thus amount to a sort of “commentary” on the relevant laws and outline the framework for the Austrian Higher Education Area with its general and more specialised objectives and responsibilities in the form of a big picture.

The coordination necessary in this regard could most likely be best accomplished at the present time via Universities Austria. This overview could then also provide the basis for further consideration (for example, as to whether individual specialist areas would not be better served in other university sectors).

- **The creation of distinctive sector profiles should be achieved by sharpening profiles at the institutional level.**

A big picture of the Higher Education Area should provide the framework for this process to take place at the individual autonomous university institutions. Implementation of the individualisation process must – in keeping with the principle of autonomy – be carried out at the level of the individual institutions and cannot be prescribed ‘top-down’. The Austrian Council therefore recommends that all means necessary should be used to support the autonomous institutions in developing their own distinctive profiles and setting priorities.

The universities are already paying greater attention to creating more individualised profiles and should be consciously striking out on innovative paths in terms of their positioning. This involves reinforcing their strengths in the field of research and the range of subjects they offer. The universities should remain functionally broad-based centres of research and education with key focal areas. Care must be taken that the development of distinctive profiles and other strategy papers are closely coordinated. The development plans for the universities deserve greater attention. The process of developing distinctive profiles at Aus-

trian universities, if conceived as a strategic management process, offers significant potential for a more differentiated Higher Education Area.

In accordance with their statutory remit, traditional universities in particular should sharpen their academic-scientific profile in this manner and accentuate the link between research, teaching and the transfer of knowledge. They must focus their efforts on attaining an international standing as centres of research in the key areas.

In this context, the universities of applied sciences should focus more on offering high-quality Bachelor’s courses and emphasise their more vocational nature, backed up by cooperative applied research, including at Master’s level. Collaboration with the traditional universities is particularly appropriate at doctoral level and these universities should retain their well-founded exclusive right to award doctorates.

- **Effective development of distinctive profiles depends on the attainment of full autonomy and political support.**

The development of profiles is accomplished with the help of university-based strategies, stimulus from competitors and appropriate financing flows. University policy is challenged insofar as it is really only self-governing universities that can effectively develop distinctive profiles. This process likewise depends on the ability of a university to select its own students. The introduction of autonomous admission management is therefore indispensable for meaningful profile development.

Profile development processes require support, stimulus and incentives, naturally without additional red tape and without eroding self-governance. The Austrian Council recommends that the path of mission-based funding is pursued further in a consistent manner and that clear incentives in respect of profile development are offered in the performance agreements.

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Recommendation Regarding the Use of the Supplementary Funding

Provided by the National Foundation for RTD for 2013 – Recommendation dated 8 March 2013

In a letter to the beneficiaries of the National Foundation dated 6 February 2013, the Foundation's Board of Trustees announced that it would release an extra 20 million euros in 2013 to fund suitable projects. This was possible because of an additional endowment from the Austrian National Bank. In accordance with Section 11 Subsection 1 Item 1 of the law on the Austrian National Foundation for RTD, the Austrian Council for Research and Technology Development was requested to make a recommendation. The applications for supplemental funding submitted by recipients are basically consistent with the Austrian Council's recommendation regarding key areas for the allocation of funding from the National Foundation dated 14

June 2012 and are therefore eligible for support. The Austrian Council sees the additional endowment as an opportunity to provide greater support to initiatives which in the past have only been partly funded by the National Foundation due to a shortage of funds.

In addition, the Austrian Council also considers that the additional funding provides an opportunity to recommend initiatives that again have a greater emphasis on the National Foundation's guiding principles of quality, risk and sustainability.

Recommendation

After discussing the applications at length, the Austrian Council recommended that the additional funding be allocated as follows:²⁶

Institution	Contribution 2013	Programme or Initiative	Additional Funding 2013
FFG	24	BRIDGE and Competence Headquarters	3.0
FWF	18.19	Priority Research Programmes (SFB, DK)	2.0
CDG	4.5	CD Labs	2.5
LBG	5.62	LB Institute for Lung Vascular Research	2.0
ÖAW	8	New Frontiers Research Infrastructure Programme	1.5 reallocated
AWS	10	Licence.IP	3.0
Total	70.31		14.0

The 3 million euros recommended for the **FFG** should benefit the BRIDGE programme and should be used for joint infrastructure projects. The Austrian Council also recommends that a further 2 million euros be made available to the FWF to continue the doctoral colleges. The **CDG** should receive 2.5 million euros to finance a further two laboratories, the CD Laboratory for Medical Radiation Research for Radi-

ation Oncology and the CD Laboratory for Functional and Polymer Based Ink-jet Inks.

The Academy of Sciences (**ÖAW**) has submitted the New Frontiers Research Infrastructure Programme, which supplements and in some areas expands upon the New Frontiers Groups Programme, with which it shares the same basic aim. This should receive a total of 3 million euros from the National Foundation, 1.5 million of

²⁶ Amount in millions of euros

which should be diverted from the original application for the NFG and a further 1.5 million which will be provided from the additional endowment.

It is also recommended that 3 million euros be provided for the initiative “licence.IP”: Technology Transfer from Universities to SMEs by means of “Inlicensing” as requested by the **aws**.

In addition, the Austrian Council proposes inviting funding recipients to a special round of applications where they can put forward sugges-

tions for a system change that should lead to “long-term and high-risk” initiatives of the kind envisaged in the National Foundation law. The beneficiaries should also make clear in their suggestions how they could contribute to bringing about such a system change. A funding framework of up to 3 million euros per initiative could be provided, which would allow two initiatives from the beneficiary institutions to receive funding awarded in a competitive procedure.

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Recommendation Regarding a National Strategy for Intellectual Property –

Recommendation dated 6 June 2013

Background

All forms of intellectual property (IP) rights are pillars of a new, knowledge-based economy. The potential for revenue from commercial property rights (patents, trademarks, utility models, design, copyright law) is just as important today as access to goods. Commercial property rights, i.e. intangible assets, are also increasingly used today for evaluating companies, especially in the biotechnology and pharmaceutical fields, and in the digital economy and in consumer goods sectors, where business models are determined to a large extent by intellectual property.

Active markets for technology and innovation are driven by market players who have a solid understanding of intellectual property. Making better use of intellectual property through licensing and commercial exploitation is a central factor in a successful business model in today's economy. However, the discussion on intellectual property and its economic utility has been

delayed in Austria and is still not sufficiently developed.

The feebly developed IP culture has an effect on Austria's position in an international comparison of innovation systems. As a result, Austria has a lower score in the Innovation Union Scoreboard for international²⁷ patent applications than the Innovation Leaders.²⁸

The Austrian Council for Research and Technology Development therefore already referred to the necessary improvement in the Austrian IP system in its Recommendation of 24 November 2011 on the Efficient Implementation of Research Results in Innovations. Establishing a central contact point for patent enquiries was in particular identified as a priority. As this role is assumed mostly by patent offices in comparison countries, the Austrian Council subsequently commissioned a study²⁹ to better understand the role of the Austrian Patent Office (APO).³⁰

²⁷ Patent Cooperation Treaty (PCT)

²⁸ Innovation Union Scoreboard 2013

²⁹ Oxfirst Ltd. (2012): Analyse des Österreichischen Patentamtes (ÖPA) im europäischen Vergleich

³⁰ The Austrian Patent Office is a subordinate office of the central government. Some of the services it offers have been spun off in an organisation that is managed as a private entity (serv.ip).

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Recommendation

● National Strategic Orientation

In contrast to many other knowledge-based³¹ economies, Austria has no national strategy on intellectual property. The Federal Government's research, technology and innovation strategy only makes a slight reference to commercial property rights and contains no specific or comprehensive strategy for the protection, use, enforcement or creation of awareness, and competence for intellectual property. IP competencies are fragmented in Austria. IP services are rendered by public and private service providers alike. However, they are not always optimally integrated with one another.

The Austrian Council therefore recommends:

- Preparing a national IP strategy which covers all commercial property rights with regard to their role in the innovation process.³²
- Introducing a reform of the structures, organisation, division of powers and content of the Austrian IP system based on the national IP strategy.

● Access to IP-relevant information, increasing awareness and public relations

Public relations and measures to increase awareness on intellectual property are integral components of the functions of a national IP system. Yet Austrian market players are still often lacking awareness about the importance of commercial property rights. Building on a recommendation from the European Commission³³, the BMWF in conjunction with the BMWFJ and the BMVIT, and with the operational support of the Austria Wirtschaftsservice, established a National Contact Point for Intellectual Property (ncp-ip), which supports pub-

lic research institutions and universities via events and the preparation of IP guidelines.

Many organisations currently provide general information on commercial property rights, e.g. the Austrian Patent Office (APO), aws, the Austrian Research Promotion Agency (FFG), the Austrian Federal Economic Chamber (WKO), Technology Transfer Offices (TTOs) of universities and practising patent lawyers.

It can be assumed that important IP-relevant information is available in the system. However, due to the fragmentation of these services, it is not always guaranteed that potential customers can find the best access to the information they need. Companies, universities and research institutions often only find the correct information after several attempts, or the information is only rarely tailored to the customer. Due to lack of size or number of cases, the development of organisations' own competences or networks is frequently inadequate.

The Austrian Council therefore recommends:

- Performing a comprehensive analysis of customer needs by the IP-relevant institutions.
- Providing a customer-friendly information portal for IP, for example by improving and better integrating the online services available from various IP-relevant institutions such as the APO and aws.
- Focusing on public relations in order to make a broader public aware of the importance of the legal protection of commercial property.
- Strengthening IP presence at trade fairs, conferences and seminars on intellectual property and innovation.
- Additionally providing important information in English as part of the development of inter-

³¹ Singapore has recently published a strategy to turn Singapore into a global hub for IP services (Intellectual Property Hub Master Plan: Developing Singapore as a Global IP Hub in Asia). In 2011 the United Kingdom began a thorough overhaul of its own IP system with the national strategy Digital Opportunity, A Review of Intellectual Property and Growth.

³² Consideration should be given as to whether the IP strategy should be directly linked with, or ideally, how it can be integrated into the RTI strategy. Practically speaking, coordination of the IP strategy process should best be undertaken by the BMVIT, the ministry responsible for both the Patent Office and for innovation and technology policy.

³³ Commission Recommendation on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and public research organisations, 10 April 2008.

national markets for IP services as well as the general globalisation of innovation-related activities.

● **Networking and customer presence in the IP system.**

The APO currently focuses most of its efforts on the investigation procedure for industrial and commercial property rights. The APO's service centre, serv.ip, which is managed as a private entity, also provides business-related services and information services. These services partially overlap with what the aws provides, with which the sovereign part of the APO otherwise cooperates successfully in the "discover.ip"³⁴ programme. The size of serv.ip is subcritical in relation to the tasks to be covered. Topics such as commercialisation, licensing markets and the economic importance of patents, trademarks and designs are not adequately covered.

The Ministry of Justice is responsible for copyright law, while competency for counterfeiting and product piracy is located at customs. However, there is a gap in the specific support for these areas of the legal protection of industrial and commercial property.

The aws on the other hand, has offered technology transfer services for 15 years and as part of these activities is active in the fields of consulting, financing and exploitation. For example, it conducts market research on intellectual property which should help SMEs to assess the economic value of a potential patent application, it supports universities in evaluating invention applications and it supports the patent brokerage business.

The aws IP department focuses on patents in particular. Economic aspects of copyright law, design protection and trademark protection are not a focal point. Similarly to serv.ip, the size of the aws IP department is also subcritical and cannot do justice to the broad range of tasks.

Furthermore, the chamber of commerce as well

as federal and provincial funding agencies offer consultation on intellectual property.

The Austrian Council therefore recommends:

- Bundling both consulting and concrete activities for the commercial exploitation of intellectual property and establishing active markets for industrial and commercial property rights.
- Setting up online platforms (e.g. an "IP Marketplace"³⁵ as in Denmark).
- Setting up technology exchanges to stimulate the licensing market (e.g. a national patent fund such as in France) or supporting the participation of Austrian players across Europe or on international exchanges.

● **International Orientation and Development**

The increase in international trade and the international integration of technology markets has brought the international dimension of IP protection into focus. Globalisation opens up opportunities for trade with IP-based products, processes, services and expertise. However, it also changes the commercial foundation of national IP systems.

For example, national patent applications are no longer economically interesting for many companies in Austria due to internationalisation. An application via the European Patent Office (EPO), the World Intellectual Property Organization (WIPO) or the German Patent and Trade Mark Office (DPMA) is often preferred. It can be assumed that this trend will continue to strengthen with the creation of the unitary patent and a unified patent jurisdiction within the EU. In addition to the targeted reduction in costs for companies to protect their inventions, the EU patent will also have a structural effect on national patent systems.

The national contact point in the Austrian Fed-

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³⁴ Over the past five years, some 250 companies have received coaching or been subjected to a property rights audit carried out by aws together with the sovereign part of the Austrian Patent Office within the framework of "discover.ip".

³⁵ <http://www.ip-marketplace.dk/>

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eral Ministry for Science and Research represents Austria on the topic of “IP in knowledge transfer activities” in European committees and principally serves to network with other countries.

The Austrian Council therefore recommends:

- Stepping up cooperation in international fora as part of European integration and in the context of regional bilateral contacts.
- Using bilateral relations in the IP sector for a comparison in order to understand how the efficiency of one’s own activities can be improved in light of the experience of other countries.
- Using international relationships to provide one’s own services worldwide.

• IP Analyses

Analyses on intellectual property and economic growth should also be covered by a national IP system. There are currently no economists in public service in Austria who exclusively deal with intellectual property and who help to better understand the economic contexts of the trends in this sector. There is a lack of both critical reflection on the national patent system and research activities on IP and IP policy.

The Austrian Council therefore recommends:

- Introducing a chief economist for intellectual property (such as in the United Kingdom, France, the EPO, the WIPO, in Australia and in the USA).
- Investments in research on intellectual property as an important basis for political decisions.
- Presenting practical and politically relevant research activities on the IP portal that is to be set up.

The tasks of the Austrian Patent Office as a potential hub of the IP system

In contrast to other countries, the Austrian Patent Office with its current remit and its current structure does not have the role of a true IP hub in the Austrian innovation system.

The granting of patents, trademarks and design rights and providing services and information in the area of legal protection of commercial property is one of the core tasks of the Austrian Patent Office (APO). Furthermore, awareness-raising measures are also implemented in the IP system to a certain extent.

However, the national audit office³⁶ and the study carried out on behalf of the Austrian Council³⁷ document the lack of networking between the APO and the other institutions of the innovation system and the APO’s lack of visibility among potential customers. It is predicted that the introduction of EU patents and other international trends will lead to a massive change to the basis of the APO’s business in the future. Nor is the APO subject to any independent external benchmarks to date, and is still not involved in many European initiatives on industrial and commercial property rights.

The Austrian Council therefore recommends:

- Evaluating the APO’s fields of activity on the basis of the national IP strategy that is to be drawn up at a future date.
- For the evaluation, considering the impact of the introduction of the EU patent on core business as well as using the best practice examples of comparable organisations in other countries (e.g. with regard to awareness-raising measures, building competence, international networking, training and integration into innovation consulting).
- Re-aligning the evaluation results in accordance with the organisational and financial structure of the APO and the division of labour with other IP-relevant institutions (e.g. the tasks that are carried out by the aws on the one hand or by serv.ip in the APO on the other).
- Regularly subjecting the Austrian Patent Office to external quality assurance procedures.

³⁶ Bericht des Rechnungshofes, Österreichisches Patentamt, Bund 2012/7.

³⁷ Oxfirst Ltd. (2012): Analyse des Österreichischen Patentamtes (ÖPA) im europäischen Vergleich

Recommendation Regarding the Use of the Final Tranche of the Funding Provided by the National Foundation for RTD for 2013 – Recommendation dated 6 June 2013

recommendations

Preamble

In its recommendation dated 8 March 2013 the Austrian Council for Research and Technology Development proposed inviting the recipients of National Foundation funding to take part in a special round of applications where they can put forward suggestions for a system change that should lead to “long-term and high-risk” initiatives of the kind envisaged in the National Foundation law.

The Board of Trustees complied with this recommendation in a letter to the beneficiaries of the National Foundation on 20 March 2013 and invited funding recipients to submit applications for suitable projects. Funding recipients were asked to make it clear in their suggestions how they could contribute to bringing about such a system change. A funding framework of up to 3 million euros per initiative can be provided. The original 6 million euros in funding made available by the National Foundation for this round of applications has now been increased to approximately 13 million euros due to an increased endowment from the European Recovery Programme (ERP). This will allow the best initiatives from the beneficiary institutions to

receive funding awarded in a competitive procedure.

In accordance with Section 11 Subsection 1 Item 1 of the law on the Austrian National Foundation for RTD, the Austrian Council for Research and Technology Development was requested on 23 May 2013 to make a recommendation to this effect.

The applications for supplemental funding submitted by recipients are basically consistent with the Austrian Council’s recommendation regarding key areas for the allocation of funding from the National Foundation dated 14 June 2012 and are therefore in principle eligible for support. In addition, the Austrian Council has analysed the applications in particular with regard to their focus in terms of the framework conditions formulated in the recommendation dated 8 March 2013.

Recommendation

After discussing the applications at length, the Austrian Council recommended that the final tranche of funding be allocated as follows:

Institution	First Tranche 2013 (in EUR mn.)	Second tranche 2013 (in EUR mn.)	Programme or Initiative	Final Tranche 2013 Ranked according to Priority
FFG	24	3.0	Research partnerships	P2
FWF	18.19	2.0	Matching Funds	P1
CDG	4.5	2.5	CD Laboratory for Neurodegeneration	not recommended
LBG	5.62	2.0	International Post-Doc Programme	not recommended
ÖAW	8	0.5 2.5 reallocated	ÖAW Imaging	not recommended
aws	10	3.0	FIRST	P3
Total	70.31	13.0		

recommendations

The Austrian Council ranked the **FWF's** Matching Funds initiative first among the projects to receive funding. Matching Funds supports a project of outstanding strategic importance, namely the inclusion of funding from the provinces in the FWF's evaluation guidelines, which are committed to upholding the principles of excellence. By doubling the amount of money provided by the provinces, the initiative also multiplies the impact of the funding from the National Foundation for RTD. However, the Austrian Council also recommends placing a stronger focus on quality and making a slight modification as regards the target group. The exclusive focus on "young researchers" and "internationalisation" should be dropped. The programme to promote public-private partnerships for PhD measures and endowed chairs is also recommended. The application tackles a weakness in the tertiary education system identified a long time ago by the Austrian Council and which

was addressed most recently inter alia in the Austrian Council Recommendation regarding Barriers to Innovation dated 24 November 2011. It is also recommended that funding be awarded to the initiative FIRST as requested by the **aws**. This initiative addresses the underdeveloped entrepreneurial spirit in Austria and targets young people. The proposed modules are expected to contribute to bringing about the change in culture that is needed for more dynamic start-up activities. The applications from the **CDG**, **ÖAW** and **LBG** are in principle eligible for funding, but comply to a far lesser extent with the general conditions set out in the recommendation made on 8 March, namely to make suggestions to bring about a change in the system which will in particular lead to "long-term and high-risk" initiatives. The Austrian Council therefore recommends that these applications be resubmitted during applications for funding from the National Foundation for RTD in 2014.

Recommendation Regarding the Use of the Final Tranche of the Funding Provided by the National Foundation for RTD for 2014 – Recommendation dated 6 June 2013

The Board of Trustees of the National Foundation for RTD has requested the Austrian Council for Research and Technology Development to define potential key areas for the allocation of funding in 2014 that are consistent with the Research Strategie

gy 2020. Following a detailed discussion and with a view to ensuring the long-term planning and continuity underlying the National Foundation's activities, the Austrian Council recommends the following substantive focus for 2014.

Priorities for 2014

(Basic Principles for the 43 Meeting of the Board of Trustees of the National Foundation, 26 June 2013)

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

On 26 September 2013, the Austrian Council presented its white paper on steering research, technology and innovation in Austria in which the Council submitted its recommendations on key aspects of RTI governance to the Federal Government and provided substantive input for coalition negotiations for the forthcoming legislative period.

The white paper was conceived as a position paper and collection of implementation-oriented options for decision makers. It sets out suggestions and positions for the improvement of RTI governance in Austria and outlines a raft of measures necessary for reform as well as specific fields of action. The purpose of the white paper is to initiate a broad-based and wide-ranging discussion.

The white paper describes three “levers” each of which covers 17 fields of action to improve political governance of the system. The levers together with their central fields of action are outlined below.

Lever 1:
Simplification of the Funding Landscape,
Strengthen the Core Activities of the
Funding Agencies

It is necessary to streamline the funding agencies as well as the requirements they must fulfil, their criteria for success, tasks and profiles.

- *Strengthen, streamline and expand the core activities of the FFG and aws:* The Austrian Research Promotion Agency (FFG) should be upgraded to become a full technology and innovation agency. This will involve broadening its remit: from research promotion up to and including launching new products and services on the market. To this end, technology funding activities will be reorganised between the Austria Wirtschaftsservice (aws) and the FFG. This will strengthen the aws’ profile as a development bank for business and clearly position it as an agency that

supports a dynamic, innovative SME sector. A special aws fund for start-ups and venture capital will be established for this purpose. In the long term, this should be endowed with 500 million euros for a period of 5 to 10 years.

- *Examining a suitable form for merging the Christian Doppler-Gesellschaft (CDG) and the Ludwig Boltzmann Gesellschaft (LBG):* This merger will create a powerful agency to promote cooperation geared to strengthening universities by means of fixed term research centres. This will provide a stronger basis for transferring science to industry.

- *End the RTI activities of the Climate and Energy Fund (KLIEN):* These agendas are to be integrated into the agencies or ministries. At the same time, the usefulness and effectiveness of continuing further tasks should be examined.

This leaves the Austrian Science Fund (FWF) as the main funding agency for basic research. An agency to promote cooperation (CDG/LBG) will be positioned at the interface of basic research and applied research: This will strengthen the transfer of knowledge from universities and research institutes to industry. The Austrian Research Promotion Agency (FFG) remains the funding agency for applied research and will at the same time support the development of new products and their market launch. The reorganised Austria Wirtschaftsservice (aws) rounds off the portfolio. As a development bank for business, it supports dynamic and innovative SMEs and start-ups, for which it will be given a separate fund.

Lever 2:
Transfer of Responsibility, Greater
Overview of RTI Governance and Greater
Freedom for Research

Planning and coordination processes in the area of research funding must in future consider the

recommendations

RTI system in Austria as a whole. At the same time, greater account must be given to the principles of deregulation and the reallocation of responsibilities by the ministries to the agencies.

- *Establishment of an Overall Schedule of Measures Between the Ministries and Funding Agencies:* In future, coordination with the funding agencies should be carried out on the basis of consolidated agency portfolios along an overall schedule of planning measures. Together with the relevant agency, the ministries will draw up a multi-year plan which will be agreed once with the Ministry of Finance. Within the framework of the multi-year plan, the owner ministries will then adopt a specific annual plan for each agency in which the agency's portfolio is defined. This includes tasks, topics and funding programmes. If several ministries are responsible for an agency, they must agree upon a joint annual programme. This will replace the current processes undertaken between the ministries, the Ministry of Finance (BMF) and the agencies, which are based on stand-alone programmes.
- *Greater budgetary freedom for the ministries and agencies:* Based on the annual budgets and the clear performance agreements they contain, the ministries and the funding agencies will in future have greater resources at their disposal. These resources may be used by the actors autonomously to achieve targets. This is the only way that actors will be able to react flexibly to short-term opportunities and take up new developments. This requires a basic trust in those in positions of responsibility and a focus on outputs and long-term impacts.

Lever 3:

Positioning of RTI as a Priority for the Entire Government

The Federal Government's RTI strategy is ambitious but does not set out binding goals – it is more of a position paper. To advance the implementation of the strategy more decisively, an active reform process will have to be initiated. This must receive support at the highest political level.

- *Initiation of an "RTI Reform Agenda" led by the Federal Chancellery and in cooperation with all ministries with responsibility for RTI.* This is set out in the Government Programme and must contain binding political targets and clear mandates for the RTI Task Force.
- *This agenda should be negotiated and updated at a yearly event of the "RTI Task Force at the ministerial level":* The RTI reform agenda should be negotiated once a year – under the direction of the Federal Chancellor and with the participation of all relevant ministers as well as experts.

Once the white paper had been presented, the Austrian Council took first steps to bring its content into the political discussion. Thus the responsible ministers and leaders of all parliamentary parties received copies of the white paper shortly after the general election. The Chairman of the Austrian Council also outlined the most important topics in the white paper in a letter to those negotiating the coalition agreement. Lastly, the Austrian Council initiated talks with representatives of the agencies concerned and funding bodies. The Austrian Council will continue to support the implementation of the recommendations from the white paper and will continue to monitor them in accordance with its remit.

Recommendations Regarding the Development of the Tertiary Education and Science System – Recommendation dated 5 November 2013

recommendations

Education, science and research are crucially important for Austria's future, its prosperity and its competitiveness. It must therefore be an urgent concern of any Austrian government to both create optimal framework conditions for these areas and to provide appropriate financial resources.

University Funding

For several years now there has been an imbalance in the structure of university funding, which hinders the positive development of the universities. Thus Austrian universities have been suffering from inadequate funding for years already.

The Austrian Council for Research and Technology Development therefore considers that there is an urgent need to substantially increase the General University Fund (GUF) with a view to improving university financing.

At the same time, it is necessary to significantly increase the proportion of resources that are allocated to research on a competitive basis. Research funding obtained via competitive applications to the Austrian Science Fund (FWF) plays a key role for the development of the universities in an international context. However, the provision of adequate funding for the FWF is an essential precondition for this. At the same time, financing for collaborative and applied research funding in the Austrian Research Promotion Agency (FFG) should also be increased. Furthermore, the fact that Austrian university buildings are not owned by the universities but by the Bundes-Immobilien-Gesellschaft (BIG) is a massive burden on the universities. This federal property management company is responsible for providing the premises, including the infrastructure, needed for regular university activities "according to market-oriented principles." However, a consequence of this is that the universities currently have to pay roughly 240

million euros to BIG in rent.

The Austrian Council recommends as an expression of a sustainable budget structure:

- raising the **General University Fund (GUF)** by at least **260 million euros per year**,
- increasing the **budget for basic research (FWF, ÖAW, CDG)** by **200 million euros per year**,
- increasing the **budget for applied research (FFG)** by **200 million euros per year**
- transferring to the universities ownership of the shares in the properties used by them and which are managed by BIG, so that **the rental payments made in the past (approx. 240 million euros) can be used in the university budgets**.

Even if these measures were implemented, the 900 million of additional funding that it is envisaged the federal budget will provide, would still leave the university system trailing far behind comparable leading international universities such as the ETH Zurich and while it would fail to meet the both the 2020 target of spending 2 percent of GDP on the tertiary sector and 3.76 percent of GDP on research, the opportunities for development would be vastly improved.

University Research and Teaching

The allocation of the agendas of the Ministry for Science and Research (BMWF) to other ministries envisaged during the current coalition negotiations would be a grave setback for Austria in its efforts to join the group of leading innovation nations in Europe. Separating universities from their research would not only result in a marginalisation of these areas, it would also mean that in future universities would have to conclude performance agreements with several ministries with the risk of falling between two stools.

The Austrian Council therefore recommends:

recommendations

- the **option of dropping the idea of dividing the ministerial competences of the BMWF**, and instead according the areas of science and research the importance they deserve given their significance for Austria's future. Building on the Austrian Government's RTI Strategy from 2011, what is needed is not just a clear commitment but genuine engagement on the part of the entire government and new momentum for reform – irrespective of any party politics.

Study-Place Financing

The number of students has fortunately greatly increased in recent years. While in the 2001/02 academic year the number of first-time students enrolling for a degree programme totalled 26,850, the figure in the 2006/07 academic year had already risen to 33,515, and in the 2011/12 academic year totalled 44,452. At the same time, however, spending per student fell well short of the levels in other countries and it has not been possible so far to find any clear solution for financing study places.

In addition, the current structure of admission restrictions and the introductory periods of study are also problematic. A number of univer-

sities are already using these instruments very successfully. It should therefore be left to the discretion of the universities as to which instruments are applied at which point in time. Introductory periods of study are intended to give new students an overview of the content of their chosen course of study so they can choose the course that is best suited to their individual requirements. However, the current situation is characterised by opaque requirements on the part of the Ministry for Science and Research (BMWF) and consequently by a variety of implementation measures at the universities.

The Austrian Council therefore recommends:

- the swift development of a sustainable system of study-place financing on the basis of a **socially balanced mix of tuition fees and student grants**, as well as
- the development of **fair admission restrictions**, which will support “active” students and will in future help prevent “nominal” students.

The Austrian Council addresses this recommendation in particular to those members who currently bear responsibility for the future of Austria's science and research system within the framework of the negotiations to form a coalition government.

Recommendation Regarding the Simplification of Research Funding – in Particular Structural Funds (European Regional Development Fund) –

Recommendation dated 3 December 2013

Preamble

In recommendations made on 24 March 2011, 19 September 2012 and 27 March 2013, the Austrian Council for RTD dealt with the area of structural funds. In addition to the recommendations already issued, a number of points regarding the simplification of accounting will be highlighted and examined separately in this document.

In its recommendation dated 27 March 2013,

the Austrian Council recommended the drafting of suitable guidelines to deal with problems which come about through application of the general framework guidelines. In addition to this, a number of specific examples are cited in the present recommendation.

The content of the recommendation addresses the European Fund for Regional Development (EFRD) but should also be applied to other national funding instruments.

Starting Position and Objectives

As things stand in November 2013 it is clear that nothing like all the available funding will have been allocated by the end of the current period. This can be explained first and foremost by the large amount of administrative work involved and by a lack of legal certainty with regard to the eligibility of costs after projects have been completed.

Mindful of the demands of the European Commission,³⁸ eleven funding priorities were defined for the period 2014-2020. Funding priority 1, Research, Technological Development and Innovation (R&D&I) should, together with the funding priorities ICT, SMEs and CO2, receive 80 percent of the available funds. To prevent a similar situation in which funding cannot be called up in the forthcoming period, the Austrian Council for Research and Technology Development has made the following recommendation.

Recommendation

To simplify jurisdictions and with a view to building up solid competency the Austrian Council recommends merging the many First Level Control (FLC) units currently in existence. This will alleviate the current situation in which a comprehensive knowledge of the many different guidelines has to be permanently maintained at more than 90 FLC units throughout Austria. Centralisation would allow members of staff to specialise and would support the greater build up of expertise. In combination with improved coordination of First and Second Level Control this must subsequently lead to a more transparent administration. The right to legal certainty for funding recipients must in future be noticeably improved, and in particular in respect of audits by Second Level Control.

As far as the drawing-up of eligibility guidelines is concerned, the Austrian Council recommends that the rules are appropriate to the implementation of Funding priority 1, R&D&I. As research projects usually involve a high proportion of personnel costs and individual invoices, a basis for a simple and manageable procedure must be created here. In particular, this includes:

- Simplifying the documentation of ancillary wage costs. Keeping personal records on a monthly basis requires a disproportionate amount of extra effort and expense. The need to blank out other posting lines when making collective bank transfers could be eliminated if confirmations from the tax office and regional health insurance funds are available.
- Recognition of electronic invoices. Keeping both electronic and original paper bills would on the other hand not simplify the procedure, but would merely constitute an additional administrative burden.
- Low-value consumables should be billed based on the quantities used during the project. Action must be taken to ensure that stock withdrawals of equivalent value are clearly documented, however, a clear attribution of the materials used to the relevant documentation is not appropriate.
- Transactions processed by the Federal Computing Centre (BRZ), in particular salary remittances, do not require further documentation. The Federal Computing Centre is a recognised clearing centre and therefore need not be questioned unless there are justified grounds for suspicion.

The Austrian Council reiterates its recommendation that the problems created by the application of the general framework guidelines should be countered by the drafting of suitable guidelines.

recommendations

³⁸ Europe 2020 Strategy

Recommendation Regarding the Use of Funding from the National Foundation for RTD for 2014 – Recommendation dated 3 December 2013

Preamble

Based on the resolution adopted by the Board of Trustees of the National Foundation for RTD on 17 September 2013, the Austrian Council was invited by the head of the National Foundation for RTD in accordance with Section 11 Subsection 1 Item 1 of the law on the National Foundation for RTD to put forward a recommendation regarding the use of Foundation funding for the year 2014. The total volume of applications for 2014 amounts to 148.8 million euros. The Board of Trustees requested the Austrian Council to make a statement based on three possible scenarios with regard to the amount of Foundation funds available for 2014:

Scenario 1) 60 million euros

Scenario 2) 70 million euros

Scenario 3) 80 million euros

In times of tight public-sector budgets, the National Foundation plays an especially important role, which is manifested in the provision of support for long-term, interdisciplinary research (cf. Section 2 of the National Foundation for Research, Technology and Development Act). The allocation of funding was carried out according to the strategic significance and socio-political relevance of the projects submitted and how they fit into the overall context of Austrian research funding. In its recommendation from 6 June 2013, the Austrian

Institution	Programme	Amount requested in EUR mn.	Scenario 1 Recommendation EUR 60 mn.	Scenario 2 Recommendation EUR 70 mn.	Scenario 3 Recommendation EUR 80 mn.
FFG	Headquarters – New	25	4	5	6
FFG	Services Initiative – DLI	10	4	4	4
FFG	Research partnerships	12.6	7.5	7.5	7.5
FFG	Bridge	30	5.9	9.4	9.9
FWF / FFG	Translational Research		3.9	3.9	3.9
FWF	SFBs and DK	19.1	12	15	19

Council additionally defined the following priorities for the allocation of funding for 2014:

- Strengthening research infrastructure by focusing on initiatives with a relevant critical mass and risk potential
- Strengthening the national human potential base
- Strengthening venture capital
- Strengthening the contribution of intellectual property rights to growth and innovation
- Strengthening innovation potential by means of Open Innovation
- Coordination and alignment of regional and federal RTI activities
- Excellence in basic research
- Measures to strengthen Austria as a location for companies engaged in research

Recommendation

The applications for funding from the National Foundation submitted by recipients are basically consistent with the Austrian Council's recommendation regarding key areas dated 6 June 2013 and are therefore, in principle, eligible for support.

Against the background of the Austrian Council's recently published white paper on the RTI system, the LBG should be merged with the CDG. This information will be communicated with the recommendation for the year 2014 and should be taken into account when making applications for 2015. Following an extensive consultation process and bearing in mind the financing scenarios communicated by the National Foundation, the Austrian Council for RTD recommends that funds be allocated as follows:

recommendations

Reasons – Comment

An appropriate financial input is required if the Headquarter Strategy is to be properly implemented and it can be plausibly argued that this is provided with the 25 million euros requested. The FFG has made improvements to the restructured Competence Headquarter programme on the basis of the evaluation. The Austrian Council recommends the allocation of funding for a pilot programme.

As the Services Initiative (DLI) addresses a relatively young area of research promotion, experience with it is limited. An evaluation of the activities to date should be carried out by 2015. The Austrian Council therefore recommends that funding should be granted in order to generate a suitable basis for the evaluation.

Strengthening human capital and the linkage with training programmes in accordance with the needs of industry is an important objective, and one which is also called for by the various national and European strategy documents. As the application for the research partnerships fulfils this goal, the Austrian Council recommends that an appropriate amount of funding should be provided.

Bridge is an important instrument for collaboration between science and business. The Austrian Council therefore recommends a long-term allocation of funding as in previous years.

Translational Research is the second pillar of the successful bridging programme. The Austrian Council has already expressed its regret in previous statements that the FWF has had to withdraw from the bridging programme for budgetary reasons. The FWF and FFG are called upon to submit a proposal for the joint management of this part of the bridging programme by March 2014. If the Board of Trustees is unable to allocate funding to this programme due to technicalities, the Austrian Council proposes that half the funding proposed here should be allocated to the FFG's Bridge programme and the other half to the special research areas (SFBs) and doctoral colleges of the FWF.

The special research areas are an excellent interdisciplinary research approach with a very high quality that makes exacting demands on research and teaching. The doctoral colleges are instruments to train young highly-qualified academic researchers. However, given the total amount of money that is available, the amount of funding will have to be reduced under the first two scenarios.

recommendations

Institution	Programme	Amount requested in EUR mn.	Scenario 1 Recommendation EUR 60 mn.	Scenario 2 Recommendation EUR 70 mn.	Scenario 3 Recommendation EUR 80 mn.
FWF	Matching Funds	2.87	2.9	2.9	2.9
ÖAW	New Frontiers Groups	8	4	4	4
ÖAW	Imaging	3.5	0	0	0
ÖAW	Digital Humanities	4.44	1	1	4
LBG	Neo-Latin Studies	1.91	0	0	0
LBG	Open Innovation Competence	2.14	2.1	2.1	2.1
LBG	Postdocs Health Sciences	2.69	0.8	0.8	0.8
CDG	9 CD Laboratories	10.4	4.5	7	7
aws	Venture Capital Initiative	5.39	5.4	5.4	5.4
aws	Service Innovation	3.45	2	2	3.5
aws	SME Internationalisation	7.3	0	0	0
Total	in EUR mn.	148.8	60.0	70.0	80.0

Reasons – Comment

Matching Funds is an innovative governance model to promote an efficient integration of federal and provincial funding and in particular follows the priorities and recommendations of the Austrian Council. Funding in the full amount is recommended.

The ÖAW programme New Frontiers Groups is a high-risk approach to establish new research topics and offers young scientists the opportunity to work on cutting-edge topics independently. In the spirit of the Austrian Council's recommendation to enable a greater amount of risk in research funding, a corresponding funding allocation is recommended.

Imaging is another ÖAW research infrastructure project and should strengthen cooperation in this area. Imaging is a very fast developing field of research which is hugely important in a great many disciplines. However, given the amount of funding that is available and the comparatively low impact on the RTI structure as a whole, the Austrian Council does not recommend that funding be awarded.

The programme supports the development of state-of-the-art research infrastructure in the humanities, social and cultural sciences in combination with state-of-the-art information technologies. The research infrastructure for the humanities, social and cultural sciences in particular is under pressure in a number of forms and this programme therefore provides a good opportunity to raise the visibility of data and results from these areas of research. Due to its design, Digital Humanities is a suitable instrument for networking scientific data. However, given the amount of funding that is available and the relatively low impact on the RTI structure and the prioritisation of the New Frontiers Groups, only a limited amount of funding as a pilot project is recommended.

The continuation of the Institute for Neo-Latin Studies makes sense, but should be reconsidered in 2014 against the background of the evaluation which will then be available. A new application is recommended.

The planned build-up of open innovation competence is consistent with the Austrian Council's priority recommendation made in 2014.

The planned development of an international post-doc programme in health sciences is consistent above all with the goal of strengthening the human potential base. To be recommended as a pilot project. The pilot project should be evaluated after three years.

Regarding the applications to continue the proven CD Lab characteristics. As CD Labs play an important role in the knowledge transfer system, several of the CD Labs for which applications were submitted should be granted funding depending on the money that is available. The laboratories should be chosen in a bilateral consultation process by the Austrian Council and the governing bodies of the CDG.

The venture capital initiative addresses the absolute weak point of the Austrian RTI landscape. With the planned inclusion of the ERDF funds it is also very innovative in programme terms. Funding in the full amount should be available in all 3 scenarios.

A new idea that picks up on the very important trend of innovative services and links it with the necessary increase in venture capital for start-up teams in this sector.

In the context of the BMVIT initiative "Haus der Zukunft" an innovative funding concept that addresses the topic of intellectual property as well as the aspect of internationalisation. The project deserves to be funded depending on the availability of resources. However, as other applications for 2014 have been given priority, it is not possible to recommend the allocation of funding.

Recommendation on Optimised Proof of Concept Support in the Transfer of Knowledge – Recommendation dated 3 December 2013

Background

Austria's gap to the EU's innovation leaders is primarily based on weaknesses in the marketisation of research results. The importance of the transfer of knowledge to companies as well as a stronger use of the scientific research base is emphasised in the EU strategy Europe 2020 and in Austria's National Reform Programme for the implementation of the European strategy as well as in the Federal Government's RTI Strategy (Becoming an Innovation Leader).

The transfer of new knowledge and new business models into marketable products and services is a complex process however, and sometimes has its origins in cultural specificities such as a low appetite for risk and often in structural weaknesses as well as inadequate framework conditions. An improvement in the performance of Austrian knowledge transfer can thus only be achieved through long-term and sustainable efforts by all participating players.

The Austrian Council has considered the topics of knowledge transfer and start-ups on several occasions in recent years, inter alia in its Recommendation Regarding the Efficient Translation of Research Results into Innovations dated 24 November 2011 or in a further recommendation regarding RTI-related start-up activities dated 19 November 2012.

Most of these recommendations are already being implemented by the actors in the RTI system, in particular the ministries and the funding agencies. The Austrian Research Promotion Agency (FFG), for example, has now started to set up an industrial PhD programme.

Knowledge transfer has many facets though and the ministries' promotional instruments such as the Christian Doppler Laboratories, COMET competence centres, Research Studios Austria and Laura Bassi support the transfer of technology between universities and the business com-

munity in accordance with relevant departmental priorities. As a result, potential prototypes are also funded until the results are implemented at the cooperating companies.

Another approach is to use research results by founding innovative companies. In this case, programmes such as AplusB, support the first steps of building an enterprise that lie between research, prototype and business creation.

The new programme of the BMWFJ and the BMWF, "Knowledge Transfer Centres and Exploitation of IPR" represents an additional instrument. Key questions in the transfer of knowledge and technology are addressed with this programme line that builds on the previous uni:invent and PRIZE initiatives. Module 1 supports the establishment of regional knowledge transfer centres, a thematic knowledge transfer centre for the life sciences and in particular promotes the transfer of knowledge from the humanities, social and cultural sciences.³⁹ Module 2 assists universities with patent applications. Module 3, "prototype development", specifically targets the proof-of-concept phase, a particularly important and sensitive phase of marketisation.

Proof of Concept Definition

Proof of concept, also known as proof of principle, is a milestone on which the basic feasibility of a project is proven. In many cases, the positive or negative proof of concept is the result of a feasibility study. In general, the development of a prototype which has the core functionality required is associated with proof of concept.

Risks can be minimised in decision-making by means of a proof of concept. As a rule, the focus is on the following arguments:

- Risk minimisation for decision-making principles and budget

- Validation of critical requirements for the application
- Application acceptance test in cooperation with manufacturers and partners

International Examples of Proof-of-Concept Programmes

With the “proof-of-concept” funding programme, the ERC⁴⁰ aims to bridge the gap between basic research and the early stages of a marketable innovation. As part of this initiative funded under the 7th EU Framework Programme, researchers who are already supported by the ERC can receive up to 150,000 euros (100 percent of the cost plus 7 percent of general costs) to bring their research closer to the market. However, this is contingent on the award of an ERC grant. Researchers can use the additional funds to finance market research, technical validation and analysis of economic and operational possibilities for example. Approximately 15 percent of the projects funded so far are established in the humanities, social and cultural sciences.

Proof-of-concept projects for public research institutions in Denmark are financed with funding from the Danish Council for Technology and Innovation. The aim is to facilitate the commercial exploitation of inventions by developing detailed documentation of technical and commercial potential. For this purpose, researchers receive up to 100,000 euros for 18 months in the first round. A top-up of an additional 100,000 euros is possible for promising projects. The programme has been running since 2007 with approximately 50 percent of the evaluated projects having led to the creation of spin-offs.

The TULI programme developed by the Finnish government agency TEKES serves to evaluate the commercialisation potential of re-

search results with its target groups being universities, research institutions and universities of applied sciences. The starting point for TULI is the evaluation of research results for their commercialisation potential, and the financial support of this process. Different funding levels are provided here. The first stage is supported with up to 5,000 euros and takes several weeks. The next stages (“evaluation phase” – up to 20,000 euros, “refinement phase” – up to 30,000 euros) last longer, namely one to three months, or one to six months. The detailed definition of a commercialisation model is presented at the end. The overarching objective also lies in providing new research-based companies with support in terms of licensing agreements and the transfer of knowledge.

Recommendation

1 Expanding the Circle of those Benefiting from Proof-of-Concept Support

The aws PreSeed programme is essentially high-tech oriented and as start-up funding for the pre-seed phase is geared to future entrepreneurs. As the positive experiences from the former PreSeed pilot call for innovative service providers showed in 2010, there was a need for an expansion of the circle of beneficiaries.

The feasibility studies of the FFG’s General Programmes, which are commissioned as external studies at third-party research institutions, are also only provided for SMEs and start-ups. The technical feasibility of innovative ideas and concepts can be verified within the framework of the exploratory procedures in the FFG’s Thematic Programmes. Companies and universities, universities of applied sciences and non-university research institutions are eligible to apply to exploratory procedures.

recommendations

⁴⁰ European Research Council

recommendations

The PRIZE competition focuses entirely on prototype development at universities. While universities can now work together in PRIZE's successor (module 3 of the programme on knowledge transfer centres), as part of what are known as collaborative projects with other universities and non-university partners such as the Austrian Academy of Sciences, in practice there has been little take-up.⁴¹ Focusing on patentable or patented inventions also results in a restriction to high-tech industries. Even if some restrictions to advanced technology and some types of beneficiaries are understandable for budgetary reasons, this does not seem satisfactory in view of the effect in the innovation system since it represents an artificial constriction of the competition of ideas. Comprehensive proof-of-concept support must not necessarily take place within an individual programme. However, the existing funding lines will have to be adapted or extended.

The Austrian Council therefore recommends:

- Analysing and evaluating the available funding lines relevant to proof of concept for their target accuracy and overall innovation policy effect.
- Promoting all knowledge and technology intensive sectors as well as creative and social sectors including the humanities, social and cultural sciences and the innovative services sector within the framework of comprehensive proof-of-concept support.
- Providing proof-of-concept funding for all potential beneficiaries. In addition to companies, it is first and foremost the academic sector that must be well integrated. Alongside

universities, this specifically includes non-university research as well as universities of applied sciences and independent researchers

2. Design and Development of Proof-of-Concept Funding Instruments

The provisions of state aid law often hinder the transfer of knowledge and expertise to the market. Market-ready developments may not be funded. On the other hand, there are very low funding rates for close-to-market developments, which is often an obstacle, especially for academic project partners. Proof-of-concept support can therefore be most effectively provided by exhausting non-state-aid relevant possibilities and by working with de minimis subsidies. Currently, the PreSeed programme provides up to 200,000 euros in funding for the scientific execution, review and preparation of the proof of concept, for study and concept costs, market analysis and consulting and training measures of a legal and organisational nature with a typical project duration of 12 to 18 months.

In the FFG feasibility studies, a maximum of amount of 30,000 euros is available explicitly for external studies, but certainly not for costs incurred by the applicant (e.g. for a prototype). For exploratory procedures in the Austrian Research Promotion Agency Thematic Programmes, all of the attributable costs for technical feasibility and concept development are recognised. The funding requested for exploratory procedures is up to 200,000 euros for a maximum term of 12 months.

The PRIZE successor, module 3 for prototype production, funds up to 70 percent of project-specific prototype costs up to an amount of

⁴¹ According to information from the aws, only one of the 29 applications submitted for the first call in autumn 2013 had a non-university cooperation partner.

100,000 euros for simple projects and 150,000 euros for cooperative projects for a maximum term of 18 months.

In terms of the practical implementation of proof-of-concept projects, especially with technical prototypes, questions of an organisational nature are often asked, about the availability of special experimental laboratories, equipment and other technical infrastructure for example. The Austrian Council therefore recommends:

- Further exhausting the de minimis regulations of EU state aid law in respect of company funding for proof-of-concept support with adequate funding rates.
- Covering economic, social, legal and organisational questions with proof-of-concept funding instruments in addition to technical feasibility and validation, if necessary.
- Following the Finnish model, establishing available proof-of-concept funding in several phases with incorporated Go/No Go decisions to increase the efficiency of the commercialisation process.
- Making greater use of the incubator function and coaching programmes from existing institutions such as the AplusB and technology transfer centres for the implementation of proof-of-concept projects – as announced for the “Living Labs” initiative – and promoting the early and systematic involvement of user perspectives to accelerate the innovation process.

3. Optimisation of Governance in Connection with Proof-of-Concept Support

Funding with proof-of-concept-relevant elements in Austria is currently focused primarily

on business and is handled by either the Austrian Research Promotion Agency or the aws that serve as agencies, mainly for corporate funding.

In the Austrian funding landscape, a proof-of-concept programme would be positioned somewhere between the BRIDGE-programme and the AplusB programme for start-ups. Both these programmes are currently managed by the FFG.

The aws, on the other hand, has a great deal of experience in assessing the commercialisation potential of scientific results with its start-up programmes and growth programmes. Building on this, the aws supervises the new “knowledge transfer centres and IPR exploitation” programme and thus module 3 prototype funding (formerly PRIZE). Due to its connection with the start-up topic, the PreSeed programme is also based at the aws.

Similarly to the ERC, a proof-of-concept programme could also be positioned as a follow-up to the customary FWF programme lines. In the first place it would be especially important to give the FWF a real role in transferring knowledge, particularly with a view to resuming the Translational Research Programme. This means that the connection to the Austrian Research Promotion Agency’s BRIDGE Initiative could be resumed in the spirit of the previous bridging programme.

In this connection, an Austrian Council white paper⁴² recently recommended fundamentally and systematically reorganising the division of competencies between the RTI players.

The Austrian Council therefore recommends:

- Using the organisation and completion of the available proof-of-concept support as a

recommendations

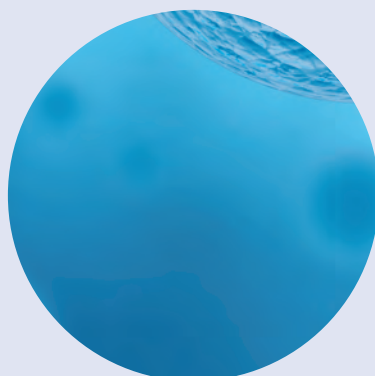
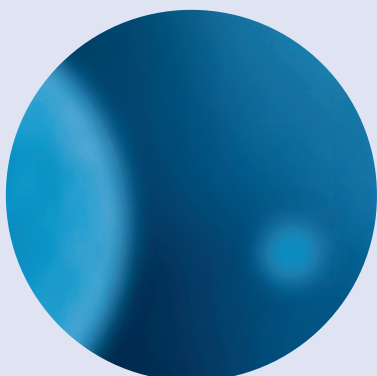
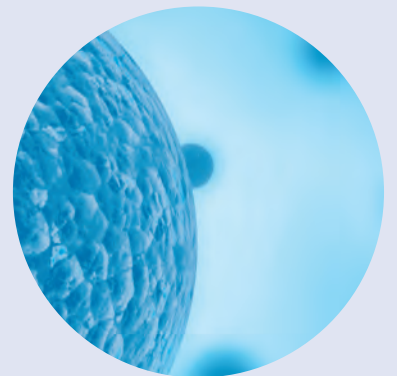
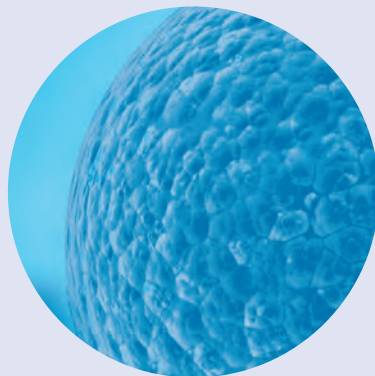
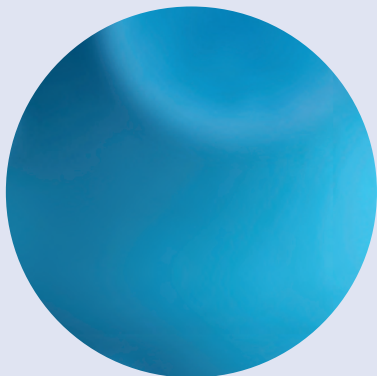
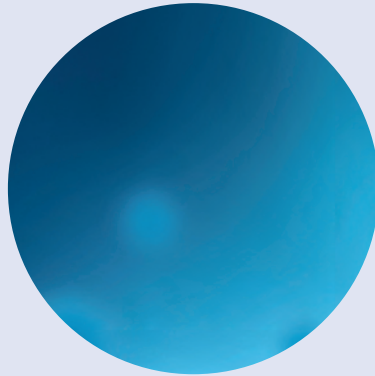
⁴² White paper of the Austrian Council for Research and Technology Development from 26 September 2013 on steering research, technology and innovation in Austria



recommendations

benchmark case for the implementation of the white paper on RTI governance.

- Following the lines of action suggested by the Austrian Council in its white paper during any reorganisation of agency competencies made as part of proof-of-concept support.
- Closing any gaps in existing proof-of-concept programme lines regardless of historic programme or departmental responsibilities and consequently establishing additional programmes and new programmes at the agency that is best suited to managing the content.



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Update: What Has Been Accomplished

Compact Brochure Published on Austria as a Location for RTI

Public awareness is a key element of any successful RTI policy. Under the heading *New Forms of Dialogue / New Formats* of its working programme, the Austrian Council therefore set itself the goal of preparing an image brochure on Austria as a location for RTI in co-operation with the relevant stakeholders. The brochure, which is available in English as

well as German, was presented at the Alpbach Technology Forum and offers a comprehensive yet compact overview of Austria as a centre for research, technology and innovation. It is used by a variety of institutions, such as the *Office for Science and Technology* (OST) in Beijing, to present the Austrian innovation system and has been very well received.



RTI Governance: The Best System for Success Stories

How can the framework conditions for research, technology and innovation be organised to generate maximum success. The Austrian Council developed answers to this question under the heading RTI Governance, which it had already defined as a key area of work in its Working Programme 2012+. As the governance of the RTI system is also an important issue for the Federal Government, the Austrian Council has increased its focus on this topic within the framework of its monitoring activities.

In its Report on Austria's Scientific and Technological Capability 2013, the Austrian Council reached the following judgement: The RTI system in Austria still shows the weaknesses in the governance structures identified previously. The resulting framework conditions prevent performance from being improved as was clearly addressed and noted in the analysis of the RTI Strategy.

The goals and measures set out in the Strategy directly address the problems raised and in the opinion of the Austrian Council are for the most part to be viewed positively. Thus for example an RTI Task Force was set up to coordinate the implementation of the measures. The

Austrian Council welcomed the increased coordination of inter-ministerial activities as well as the new approaches to steer funding agencies by means of performance agreements.

However, the governance system remains highly fragmented and extremely complex. The earlier findings in respect of the distribution of competences and departmental responsibilities remain valid. Upon closer inspection, the formal structures still indicate ambiguities in the distribution of roles. Ministries for example are active both as owners of programmes and as the party commissioning the evaluations of these programmes. Furthermore, decision-making processes take place in parallel and without comparing information, which can lead to duplication and inconsistencies in the downstream institutions. These parallel processes hinder consistent, strategic governance. The measures in the RTI Strategy make only a limited contribution to eliminating the resulting inefficiencies.

Spe-consulting gmbh was therefore commissioned to carry out a project to develop implementation-oriented approaches to overcoming the challenges in the area of RTI governance.

Intellectual Property – Part of the National Strategy

Intellectual property (IP) rights are pillars of a new, knowledge-based economy. The potential for revenue from commercial property rights (patents, trademarks, utility models, design, copyright law) is just as important today as access to goods. Markets for technology and innovation are driven by market players who have a solid understanding of intellectual property. Making better use of intellectual property through licensing and commercial exploitation is a central factor in a successful business model in today's economy. However, the discussion on intellectual property and its economic utility has been delayed in Austria and is still not sufficiently developed.

In the past, establishing a central contact point for patent enquiries was identified as a priority by the Austrian Council. In comparison countries, this function is carried out first and foremost by the patent offices. The study⁴³ conducted on behalf of the Austrian Council on the role of the Austrian Patent Office (ÖPA), the results of which were presented in the Annual Report 2012, highlighted the need for a substantive and structural reform of the Austrian IP system. In addition, a study carried out on behalf of the Austrian Council by WIFO in

2013 on Patent Indicators for the Evaluation of Inventive Activity in Austria emphasised that while Austria had caught up in terms of quality and technological breadth, it still trails behind the innovation leaders.

Based on the aforementioned inputs and the discussions with the actors in the IP system, the Austrian Council issued a recommendation on the IP system on 6 June 2013. In addition to the necessary streamlining of competencies, increased efforts in the area of public relations and awareness raising, greater networking and internationalisation, the recommendation also called for better scientific handling of IP protection. The Austrian Council therefore included the need for scientific support for intellectual property as a priority for the year 2014 in its recommendation regarding the National Foundation for RTD (also dated 6 June 2013).

As the main point in its recommendation, the Austrian Council urged that IP protection should be given a strategic focus similar to that in other innovation nations.

The development of an overall Austrian IP strategy was included in the Working Programme 2013-2018 of the new Austrian Government.

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Humanities, Social and Cultural Sciences

The Austrian Council believes that the humanities, social and cultural sciences make a key contribution to preserving our intellectual and cultural heritage and shaping our future. They reflect social development, can build bridges between different cultures and also offer orientation. Moreover – a factor that is of special significance for our future – it will not be possi-

ble to master the *grand challenges* we face by merely developing new technologies. We need the humanities, social and cultural sciences, particularly when trying to find solutions to such problems.

Furthermore, certain disciplines and research institutions/teams from the humanities, social and cultural sciences contribute to the strengths

⁴³ Oxfirst Ltd. (2012): Analyse des Österreichischen Patentamtes (ÖPA) im europäischen Vergleich



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of the Austrian science and research landscape – a fact that is demonstrated, inter alia, by their successful participation in the framework programmes of the EU.

Recognising the importance of, and the need for, the humanities, social and cultural sciences to ensure the development of society, the Austrian Council for Research and Technology Development has in the past made a number of recommendations⁴⁴ in an attempt to help im-

prove the structural framework conditions for these disciplines in Austria. A further recommendation was made on 27 February 2013 (see also the chapter “Recommendations”), which addressed a number of selected topics, such as oversubscribed subjects of study, structured careers and employability. This recommendation was drawn up on the basis of a series of working discussions with several stakeholders from the humanities, social and cultural sciences.

Better Framework Conditions for Industry: EU R&D Task Force of the Federation of Austrian Industries

In the course of coordinating issues of regional development between the Federation of Austrian Industries, a number of research institutions, the BMWF and the secretariat of the Austrian Council, a task force under the leadership of Dr. Herlitschka was set up at the beginning of 2013.

The task force is a temporary platform established in view of the 2014-2020 funding period with the aim of supporting domestic stakeholders, in particular industry, with exchanges of information and suitable framework condi-

tions for increased participation in European projects. The task now is to address the problem areas of the European programmes and draw up suitable measures together. Conditions for Austrian industry should be framed in a way that enables optimum use to be made of European research and innovation funding.

Due to its activities in relation to the structural funds (ERDF), the Austrian Council had already provided input when the group was founded and had shared new information on the topic during Working Group meetings.

Long Night of Research – 4 April 2014

The Long Night of Research is the biggest Austrian research event and most recently took place on a nationwide basis on Friday, 4 April 2014. During the planning phase in 2013, the

Austrian Council for Research and Technology Development in cooperation with AKZENT-PR played an active role in coordinating the content of the event as well as the communica-

⁴⁴ Previous Austrian Council recommendations regarding the humanities, social and cultural sciences:

15 January 2001: Recommendation Regarding the Further Development of the Humanities, Social and Cultural Sciences in Austria.

3/4 July 2002: Measures to Strengthen the Social, Humanities and Cultural Sciences.

16 September 2003: Recommendation Regarding the Humanities, Social and Cultural Sciences

30 March 2006: Recommendation Regarding the Austrian Academy of Sciences

2 April 2008: Recommendation Regarding the Further Development of the Humanities, Social and Cultural Sciences in Austria.

tion between the ministries and the provinces. Representatives of the provinces were responsible for the operational implementation in the regions. The Austrian Council serves on the one hand as the interface to the advisory board comprising representatives of the ministries and on the other, coordinates all nationwide measures with the provinces. In 2014, all nine provinces were able to participate in the event for the first time on the same date and offered a very wide-ranging programme. In the opinion of the Austrian Council, the Long Night of Research makes a key contribution to presenting

the achievements of the domestic research and innovation community to a wider audience.

The nationwide activities organised for the Long Night of Research 2014 were financed by the then ministries for Science and Research (BMWF), for Economic Affairs, Family and Youth (BMWFJ) and for Transport, Innovation and Technology (BMVIT) and supported by the Ministry for Education, Arts and Culture (BMUKK). The Austrian Research Promotion Agency (FFG) was responsible for the legal and financial management.

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Austria's Future in the World of Tomorrow: Open Online Discussion on www.oesterreich2050.at

Background

The Austrian Council for Research and Technology Development defined the project Austria 2050 in its working programme 2012+. The project asked what does the future hold for Austria giving particular consideration to the education system and the research and innovation location.

The project ran until the Alpbach Technology Forum 2013. The purpose of the project was to visualise the future of Austria in terms of education, research and innovation, taking into account global trends, societal developments and structural changes in the innovation system as well as general education, innovation and economic policy issues.

Alongside a sound analysis and evaluation of Austria's development in a global context, a large part of the project was dedicated to developing a future scenario, including a description of fields of action for different policy areas.

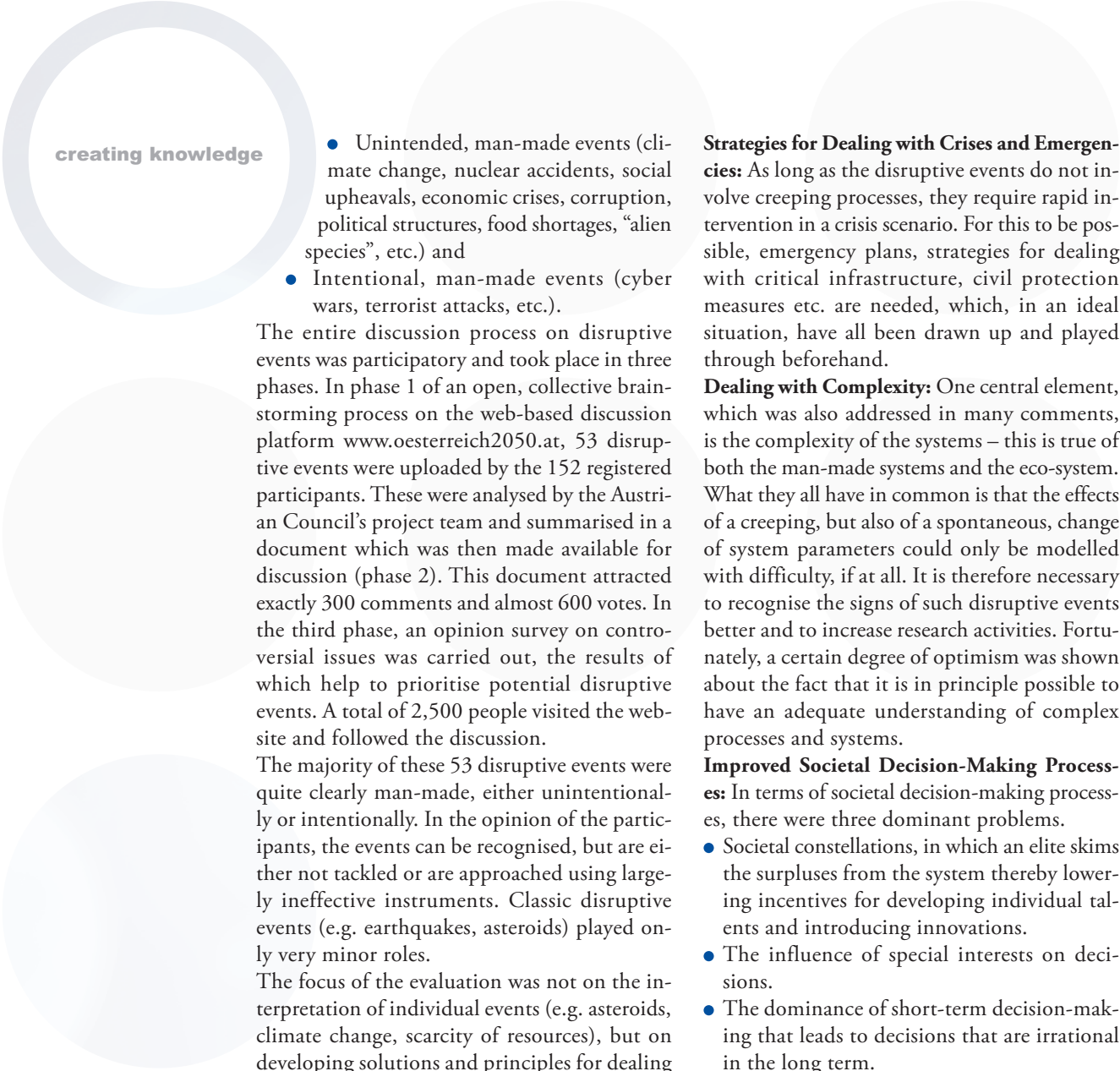
www.oesterreich2050.at

On 15 January 2013, the website www.oesterreich2050.at went online for all those who are considering Austria's future in a globalised world. It served as a platform for the discussion

of issues ranging from energy and the environment, to Austria as a location for education and innovation, federalism and state reform. Particular attention was paid to "disruptive events", i.e. larger or smaller occurrences that can change the way things are, but which are rarely included in discussion, planning and political processes because they occur either completely at random or were classified beforehand as highly unlikely.

Disruptive events permanently change our lives. The term disruptive means to break apart, to throw into disorder, to destroy. Events in this context are isolated events as well as ones that develop over a longer period of time. Disruptive events, then, are those that destroy or disintegrate existing things and replace them with something new. This can have negative as well as positive consequences. But what is significant is that they are difficult to predict and can thus only be partly influenced by ex ante measures. Disruptive events can be divided into four categories:

- Natural disasters (epidemics, volcanic eruptions, meteorite impact, etc.)
- Scientific accidents or laboratory accidents (e.g. release of bacteria)



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- Unintended, man-made events (climate change, nuclear accidents, social upheavals, economic crises, corruption, political structures, food shortages, “alien species”, etc.) and
- Intentional, man-made events (cyber wars, terrorist attacks, etc.).

The entire discussion process on disruptive events was participatory and took place in three phases. In phase 1 of an open, collective brainstorming process on the web-based discussion platform www.oesterreich2050.at, 53 disruptive events were uploaded by the 152 registered participants. These were analysed by the Austrian Council's project team and summarised in a document which was then made available for discussion (phase 2). This document attracted exactly 300 comments and almost 600 votes. In the third phase, an opinion survey on controversial issues was carried out, the results of which help to prioritise potential disruptive events. A total of 2,500 people visited the web-site and followed the discussion.

The majority of these 53 disruptive events were quite clearly man-made, either unintentionally or intentionally. In the opinion of the participants, the events can be recognised, but are either not tackled or are approached using largely ineffective instruments. Classic disruptive events (e.g. earthquakes, asteroids) played only very minor roles.

The focus of the evaluation was not on the interpretation of individual events (e.g. asteroids, climate change, scarcity of resources), but on developing solutions and principles for dealing with disruptive events in general. As part of the evaluation, an attempt was made to define disruptive events and to highlight the most important problems when dealing with them, to analyse the results of the collective brainstorming from a meta perspective and to draw conclusions from them. Based on this process, four approaches for dealing with disruptive events were identified.

Strategies for Dealing with Crises and Emergencies:

As long as the disruptive events do not involve creeping processes, they require rapid intervention in a crisis scenario. For this to be possible, emergency plans, strategies for dealing with critical infrastructure, civil protection measures etc. are needed, which, in an ideal situation, have all been drawn up and played through beforehand.

Dealing with Complexity: One central element, which was also addressed in many comments, is the complexity of the systems – this is true of both the man-made systems and the eco-system. What they all have in common is that the effects of a creeping, but also of a spontaneous, change of system parameters could only be modelled with difficulty, if at all. It is therefore necessary to recognise the signs of such disruptive events better and to increase research activities. Fortunately, a certain degree of optimism was shown about the fact that it is in principle possible to have an adequate understanding of complex processes and systems.

Improved Societal Decision-Making Processes:

In terms of societal decision-making processes, there were three dominant problems.

- Societal constellations, in which an elite skims the surpluses from the system thereby lowering incentives for developing individual talents and introducing innovations.
- The influence of special interests on decisions.
- The dominance of short-term decision-making that leads to decisions that are irrational in the long term.

The fundamental decision-making capability of policymakers was not questioned. The only thing that helps against these developments are decision-making processes that are more transparent, more participatory and thus more open, and which allow participation for all. Although this is obvious, it is not necessarily easy in practice. Societal innovations are needed here to change decision-making processes and to provide a broader base.



Taking System Limitations into Account: One point that resonated in the discussion but was not always clearly addressed was the limitations of our ecosystem. It is well known that the earth is a closed system and that all resources are therefore limited. In addition, the question of distribution clearly manifests itself at this level: Who consumes how much of the limited resources? Far too little consideration is given to either of these dimensions in political decision-making. It is precisely the attempts to create an internationally binding set of regulations

(Copenhagen 2009, Rio +20) that demonstrate the influence of vested interests. The most recent political U-turn in Europe – lower energy prices to increase competitiveness – shows that this particular aspect has not yet been understood. The likelihood of disruptive events has thus risen significantly.

More detailed information about the process and results of the evaluation can be found in chapter 7 of the publication *Austria 2050 – Fit for the Future*.

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Basic Expertise: Reports and Studies 2013

RTI Governance: Review and Perspectives

Within the scope of its work in the area of RTI Governance, the Austrian Council has drawn up suggestions to improve the steering of the Austrian RTI system. This topic was explicitly defined as a field of action in the Federal Government's RTI Strategy and specific goals have been defined and a number of measures taken. Thus for example, an inter-ministerial task force was set up for the purposes of coordination between the ministries. The Austrian Council has made several recommendations concerning RTI governance and within the framework of its monitoring remit commissioned a large-scale RTI governance project to analyse the status quo and answer fundamental questions about RTI governance in Austria.

Together with the project partner spe-consulting gmbh, a review was carried out of the developments that have taken place since the RTI strategy was adopted. In numerous orientation meetings, interviews and workshops, a common understanding between the key actors at the ministries, funding agencies and research institutes was reached with regard to the state of progress, options for modifying and correcting processes and also their impacts. This formed the basis for defining areas in which guidance and action are needed for the future process, which in turn formed the basis for the recommendations made by the Austrian Council in its white paper on steering research, technology and innovation in Austria.

Interim Report on the Study “Options for Cooperation Between the Medical Universities and University Clinics in Austria”

The financing of university medicine in Austria and collaboration between the medical universities (which were set up in Austria in 2004), and hospital operators within the framework of

the university clinics, have repeatedly been the subject of discussions, reform efforts and (legal) disputes in recent years. This is largely due to differences of opinion on the responsibilities



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of central government and the provinces in the area of university medicine and with regard to financing flows within the framework of “Additional Clinical Expenditure”⁴⁵.

As several of the current agreements with the provinces (e.g. about the amount of the Additional Clinical Expenditure, which is agreed periodically) are due to expire in the next few years, this issue has now become hugely important. Furthermore, Austrian university medicine has been enriched by the decision to establish a new medical faculty in Upper Austria and by the plans made by several provinces with regard to private medical universities. For this reason, it would be useful to consider university medicine in Austria in its entirety.

As part of the ongoing project “Findings and Approaches for the Further Development of University Medicine in Austria”, an analysis was carried out of the preliminary work that is already available in the form of recommendations, analyses, studies, expert opinions, etc. The results formed the basis for interviews with more than 20 representatives from all relevant stakeholders (government ministries, provinces, medical universities, hospitals and university clinics).

It should be noted – in keeping with the demands of the Science Council and National Audit Office – that efforts to overcome the challenges at hand, must centre on improving the performance of university medicine in Austria. It is also important to deal with problem areas and locational questions in their overall context and not to treat them in isolation, as was the case during the many reform efforts in the past.

The trends in recent years, paint a mixed picture of Austrian university medicine: On the one hand, there are well established medical universities of international standing and a high quality of university medicine and health care. On the other hand, there are long-standing significant operational and strategic challenges:

(i) There is an absence of an overall strategy and vision for university medicine which covers all locations and stakeholders.

(ii) The legal framework conditions are in some cases inconsistent and unclear.

(iii) Closer cooperation and the joint management of the university clinics have proved useful but require trust and a genuine willingness to cooperate.

(iv) The financing of university clinics is too complex and intransparent and does not reflect the true cost of financing.

A glance beyond Austria's borders shows that other countries also face similar challenges both in terms of the organisational structures and the financial flows to university clinics. As the political, legal and organisational starting positions in other countries are usually very different, they cannot provide clear role models in terms of best practice for the operation and financing of university clinics, although Germany and Switzerland for example can provide some valuable ideas.

Basically, there are at least three organisational models for university clinics or models of cooperation between medical universities and hospital operators: Fusion, joint management and cooperation. At Hannover Medical School for example, the medical university and the university clinic were merged. At most institutions in Germany, but also in Switzerland (e.g. at the

⁴⁵ Additional clinical expenditure equates to those costs in excess of the costs of normal health care that are incurred by the university hospitals in Vienna, Graz and Innsbruck as a result of research and teaching activities. In the past, central government reimbursed the hospital operators for these costs. (see §55 KAKuG).

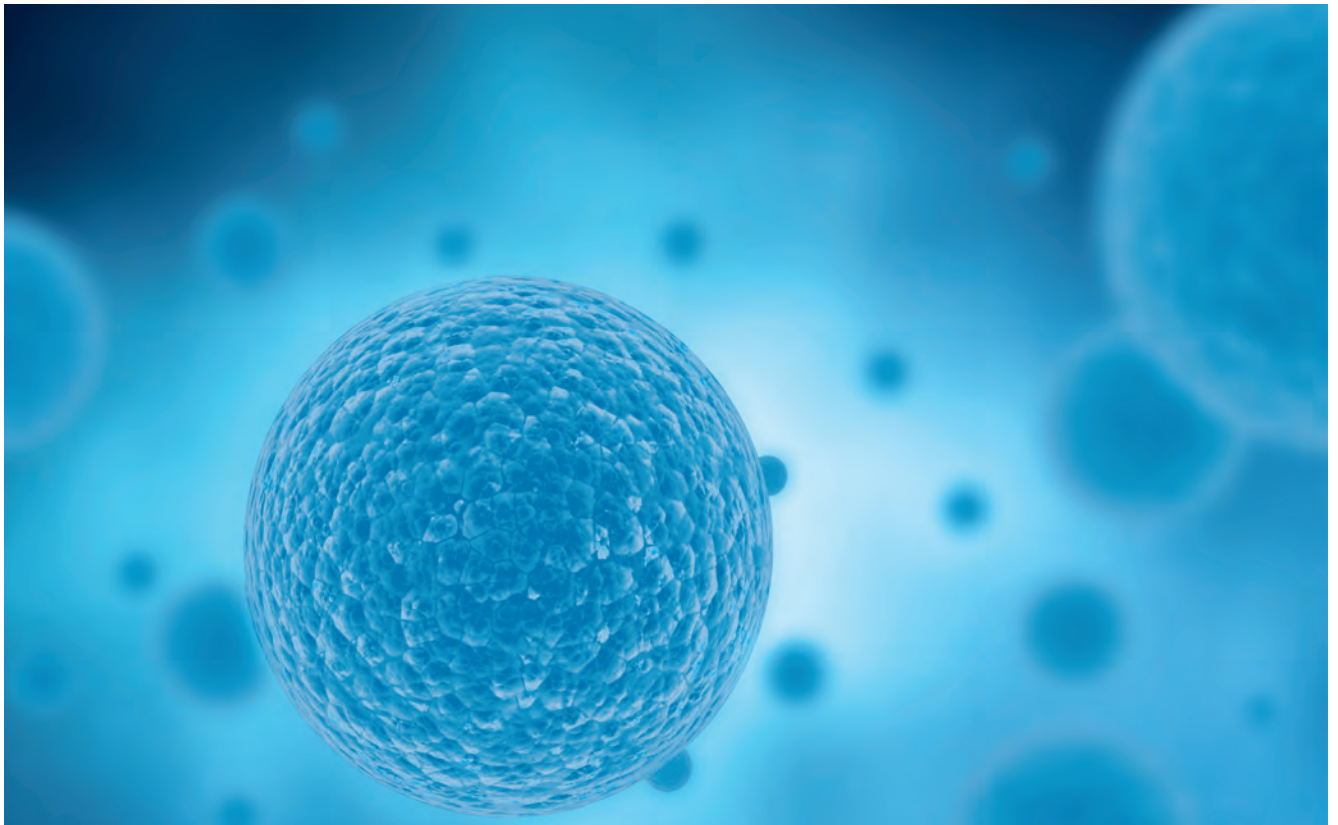
university hospitals in Zurich and Bern) and in Scandinavia (e.g. Karolinska University Hospital), cooperation between the medical universities and hospital operators is defined and regulated by contract (e.g. performance agreements). The joint management model is of interest above all where competency overlaps between central and local government occur in university medicine, as is the case in Austria. In Germany, the question of financing, in particular additional clinical expenditure, is as controversial as it is in Austria. No standard solution for remuneration has been found to date and each clinic tries to set the amount individually. University clinics in Germany have long complained that the compensation they receive reflects neither their costs nor their performance.

Based on the analyses and interviews there are several conclusions that can be drawn regarding the status of medical universities and university clinics.

- There is no overall strategy and vision for university medicine in Austria.
- The legal framework conditions are in some cases inconsistent and unclear.
- Partnerships between the medical universities and university hospitals have either not been created at all or only to a limited extent.
- The financing situation is too complex and intransparent.

The results of the study that will be completed in 2014 should contribute to developing a uniform structure for cooperation between medical universities and university hospitals and for its financing.

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IHS Study Austria 2050:

The answers to the grand challenges in a radically changing world are adaptability and innovation. Eliminating deficits and securing a position among the leaders in the world of 2050 requires more investment in the future and not less. This is the main conclusion of the study carried out by the Institute for Advanced Studies (IHS) on behalf of the Austrian Council, in which the authors of the study analysed long-term strategic directions for Austria for the year 2050.

The study is based both on a detailed analysis of the most important elements of the Austrian innovation system (with a view to economic growth) and on a study of those trends which have to be correctly anticipated now, such as demographic change, shifts in the balance of economic power and globalisation, climate change and technological progress. Austria's future will depend on these exogenous trends and at this point in time Austria could still help shape them by adopting forward-looking policies.

According to the authors of the study, education, innovation and structural change are the key preconditions for Austria to be a global leader in 2050. The ability to innovate but also to imitate, in the sense of successfully adopting existing technologies, is closely linked to the

education and human capital of the population, the study says.

According to the IHS, Austria must set itself the goal of becoming an innovation leader in 2050. However, due to the rapid pace of change, this can only be achieved with a culture of change. Innovation requires education and in turn brings about change, which is why the impact of R&D spending in a country increases with the effectiveness of the education system and in accordance with how well the resulting change is mastered. According to the IHS, the diverse nature of the preconditions for Austria's long-term success means it is essential to adopt a systematic approach instead of pursuing R&D policy in isolation.

The study also stresses the necessity to devise a policy for the long term. Success in education and innovation as pillars of a systematic growth policy requires long-term investments. Yet such investments are often postponed as in many cases it takes several years for the benefits to become apparent. Furthermore, there needs to be a turn toward more radical innovations, as Austria has by now reached the global technological frontier in many industries. The task for policymakers is therefore to create a suitable framework that supports joint experimentation by companies and research institutions.

Internationalisation: Learning from the Best

In 2013 the Austrian Council for Research and Technology Development commissioned a study entitled "Coordination and Cooperation Structures for the Internationalisation of Austrian Research, Science and Technology (EU third states)" to analyse the "Internationalisation of Austrian Research". In the first phase of this project, think tank structures in comparable countries which can be regarded as best practices in a number of respects, were surveyed and analysed. The second phase was devoted to those

criteria which are used in comparable countries to identify regions with future potential.

The results are to be used to develop a think tank model for Austria with existing capacities being constructively embedded in new concepts.

A further focus of the study is upon preparing opportunities for cooperation and coordinating existing structures. To this end, a workshop was held during the first phase of the study. The questions under discussion were firstly, which structures for cooperation and coordination or

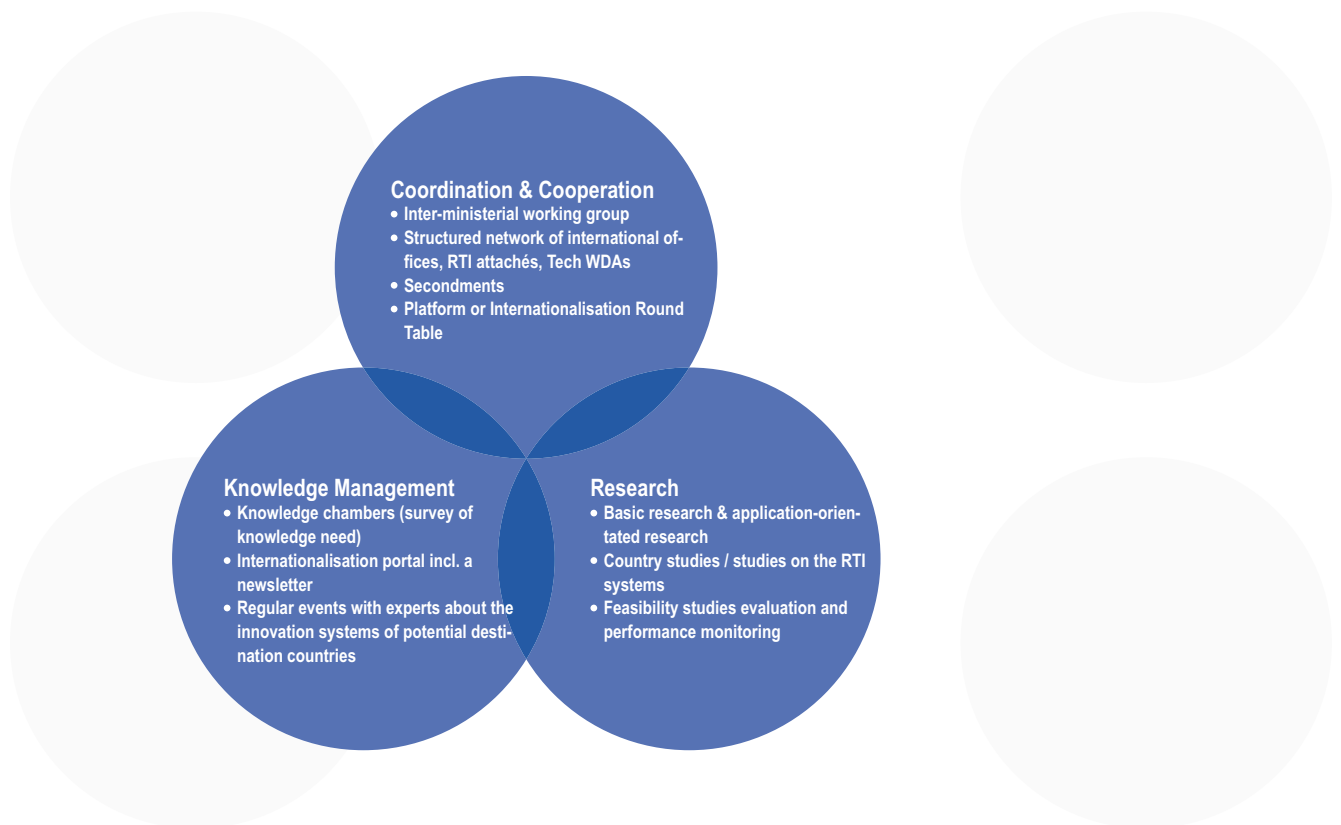
informal exchange already exist, where is there an (additional) need for cooperation/coordination, knowledge management and research, and thirdly, which specific think tank structures would be desirable for Austria.

Based on the presentation of the project's interim results, the "think tank" was understood in

the general discussion as the sum of a variety of functions and not as a single, physical institution. The diagram below depicts a number of substantive areas and functions:

The concrete structural proposals drawn up in the working groups each covered these three

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functions – albeit in different models. All three working groups advocated the continuation of Working Group 7a “Internationalisation and RTI Foreign Policy” (usually with an emphasis on the second level: ministries, stakeholders) – in variable combinations with a clearing house, a round table and/or other opportunities to form flexible ad hoc coordination groups (for specif-

ic themes or countries). There was also consensus in the working groups on the formation of structures for information management as well as research and strategy development for RTI internationalisation.

The study will be concluded in the first quarter of 2014.

Report on Austria's Scientific and Technological Capability 2013

Background

In the cabinet presentation of 9 September 2010, the Federal Government tasked the Austrian Council for Research and Technology Development with drawing up a yearly report on Austria's scientific and technological capability, which is submitted to Parliament together with the Research and Technology Report. The first report was presented in June 2012. The second report was published in June 2013.

To prepare the report the Austrian Council keeps under continuous review the goal set by the Federal Government of rising to join the

ranks of the leading innovation nations. The Austrian Council sees its task as being to monitor developments in these areas and to assess their importance for the RTI system.

The report focuses on the extent to which the goals of the RTI strategy have been achieved. In this connection, the Austrian Council strategically monitors the implementation of the Government's RTI strategy and evaluates the measures that have been put in place, as well as their goal orientation. The results provide key data for evaluating the performance of the Austrian RTI system. For this purpose, a set of indicators was developed in cooperation with the WIFO,



from left to right:

Hannes Androsch

Chairman Austrian Council,

Markus Hengstschläger

Member Austrian Council

the Austrian Institute of Economic Research, to illustrate goal achievement.

Indicators to Measure Performance

To measure Austria's performance in an international comparison and the progress that has been made toward achieving the objectives set out in the RTI strategy, the Austrian Council uses a comprehensive set of indicators. This contains 73 indicators that depict the aspects of performance and the objectives contained in the RTI Strategy. They are based on international classifications used by the OECD and Eurostat etc. and relevant data.

To define a widely accepted, consistent set of indicators, the Austrian Council participated in a feedback discussion with experts as well as a discussion process with the responsible ministries in cooperation with Working Group 8 (RTI Rankings) from the RTI Task Force. The result is a set of indicators against which the Austrian Council measured the performance of the Austrian RTI system for the first time in 2013.

Structure of the Report

The report has an independent structure of its own, but takes account of the structure of the RTI strategy in order to facilitate a comparison between the challenges and the fields of action. The chapter General Assessment of the Performance of the Austrian RTI System in an International Comparison examines those areas of the Austrian RTI system that have been accorded priority as seen by the Austrian Council.

The chapter Evaluation of Austria's Performance Relative to the Goals and Measures of the RTI Strategy analyses the RTI strategy in detail. In this chapter, the Austrian Council assesses how far Austria has progressed toward achieving the goals defined in each chapter of the strategy and whether it is still even possible to achieve them. In individual cases, the Austrian Council also makes an assessment as to whether the measures that have been implemented are ap-

propriate to achieve the goals of the RTI strategy and Vision 2020. Additionally, possible improvements are recommended with regard to individual strategy elements.

The final chapter summarises what the Austrian Council considers to be the most urgent fields of action and contains recommendations for the further development of the RTI system.

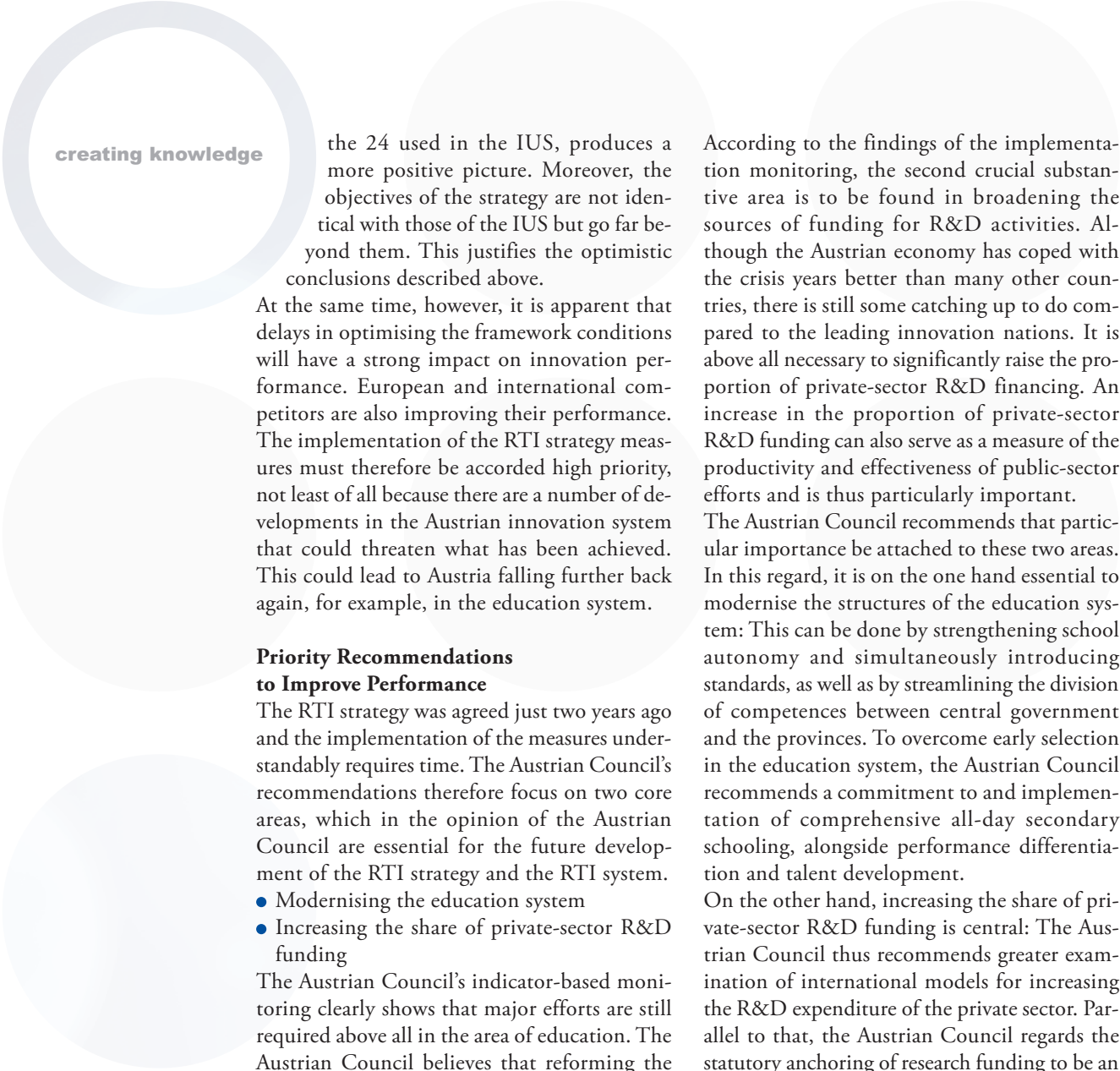
Summary Assessment of Austrian Performance

On the basis of its indicator-based analysis of the Austrian RTI system, the Austrian Council has reached the judgement that Austria's catch-up process in terms of innovation performance has become less dynamic over the last three years. In an international comparison, the Austrian RTI system has a good mid-range ranking. Although it is still possible to catch up with the leading group of nations and to achieve the goals of the RTI strategy, increased efforts are urgently needed if Austria is not to fall back in global competition.

This assessment is corroborated by the recently published results of the Innovation Union Scoreboard 2013. According to the IUS 2013, Austria has fallen back one position since last year to ninth place. Although this is the third drop in its ranking in succession, in the opinion of the Austrian Council this is far less dramatic than it appears at first sight. The reason for this is that a number of IUS indicators distort Austria's ranking relatively strongly. These are mainly the indicators concerning university graduates, venture capital, knowledge-intensive services exports, the net technological performance balance and patents. Several indicators based on a survey of companies (Community Innovation Survey, CIS) also show negative results for Austria. Internationally diverging subjective assessments of innovation could play a role here.

A more differentiated consideration of the kind undertaken in this report (especially in Chapter 2), with a total of 73 indicators instead of

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the 24 used in the IUS, produces a more positive picture. Moreover, the objectives of the strategy are not identical with those of the IUS but go far beyond them. This justifies the optimistic conclusions described above.

At the same time, however, it is apparent that delays in optimising the framework conditions will have a strong impact on innovation performance. European and international competitors are also improving their performance. The implementation of the RTI strategy measures must therefore be accorded high priority, not least of all because there are a number of developments in the Austrian innovation system that could threaten what has been achieved. This could lead to Austria falling further back again, for example, in the education system.

Priority Recommendations to Improve Performance

The RTI strategy was agreed just two years ago and the implementation of the measures understandably requires time. The Austrian Council's recommendations therefore focus on two core areas, which in the opinion of the Austrian Council are essential for the future development of the RTI strategy and the RTI system.

- Modernising the education system
- Increasing the share of private-sector R&D funding

The Austrian Council's indicator-based monitoring clearly shows that major efforts are still required above all in the area of education. The Austrian Council believes that reforming the education system remains the top priority. The background to this is the fact that education is an essential precondition for research and innovation. For this reason, the framework conditions of the education system have a strong influence on RTI. 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. Although the Austrian economy has coped with the crisis years better than many other countries, there is still some catching up to do compared to the leading innovation nations. It is above all necessary to significantly raise the proportion of private-sector R&D financing. An increase in the proportion of private-sector R&D funding can also serve as a measure of the productivity and effectiveness of public-sector efforts and is thus particularly important.

The Austrian Council recommends that particular importance be attached to 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 and simultaneously introducing standards, 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 implementation of comprehensive all-day secondary schooling, alongside performance differentiation and talent development.

On the other hand, increasing the share of private-sector 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 ambition is of great relevance for planning and funding security. On the other hand, an increase in the share of privately funded R&D will also result from the successful implementation of reforms in many areas of the innovation system, which were mentioned above (for example, in governance, and in the educational system etc.).

Patent Indicators to Evaluate Inventive Performance in Austria (WIFO)

To understand the impact of research and innovation efforts at the level of patented inventions, the WIFO was commissioned to carry out a detailed analysis of patent registrations at the European Patent Office (EPO). The study entitled Patent Indicators to Evaluate Inventive Performance in Austria focused mainly on technological characteristics such as quality and the technological breadth of innovation efforts. The aim was to compare technological inventions in Austria with those of the leading innovation nations in order to obtain information about Austria's technological capability. At the same time, the frequency of inventions in certain fields of technology also highlighted Austria's specialisation in a number of areas.

The results of the study show a consistent picture: Although Austrian patents are characterised by lower quality and technological breadth than those of the leading innovation nations, they have caught up in numerous respects. This confirms previous analyses according to which Austria's technological performance is based largely on incremental advances in clearly defined fields of technology, a niche-

quality strategy that has proved extremely successful in the past.

However, in the last ten years this picture has begun to change and Austria is catching up in terms of the quality and technological breadth of its inventions. From this, it can be concluded that although Austria still trails behind the leading innovation nations, there is a clear trend towards catch-up. Provided that RTI policy efforts are continued, the relevant targets of the RTI strategy could be met in 2020.

With regard to Austria's technological specialisation, the study came to the following conclusion: Measured by patent registration activities in the areas of environmental technology, advanced manufacturing and materials technologies and photonics, Austria is specialised compared to the leading nations. In certain areas of technology (e.g. materials technologies, photonics, ICT, as well as micro and nano-technology,) a catch up process can be observed. In the field of environmental technology, however, the degree of specialisation has declined in relative terms.

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WIFO Study GERD-to-GDP Targets

The implementation of the Federal Government's strategy for research, technology and innovation in 2011, which laid down a 3.76 percent target for R&D spending as a percentage of GDP by 2020, marked an important step toward improving framework conditions for Austrian science and research. In its programme for 2013-2018, the Government once more defined science and research as a primary pillar of Austria's overall development and potential. The government programme announced that specific budgetary measures would be taken to reach the 2 percent of GDP target for spending on tertiary education institutions by 2020.

Even before the Government had been formed in October 2013, the WIFO calculated the budget trajectories required to achieve the GERD-to-GDP targets by 2020. The study shows that although the trajectory of GERD-to-GDP is moving toward increased spending on science and research, the increases that are necessary to reach the 3.76 percent target are not being achieved. Specifically, the WIFO study shows that spending would have to rise by an annual average of some 200 million euros between 2013 and 2020 (see Fig. 1) to achieve the target. The cumulative gap between the 3.76 percent target and current levels of public-sec-

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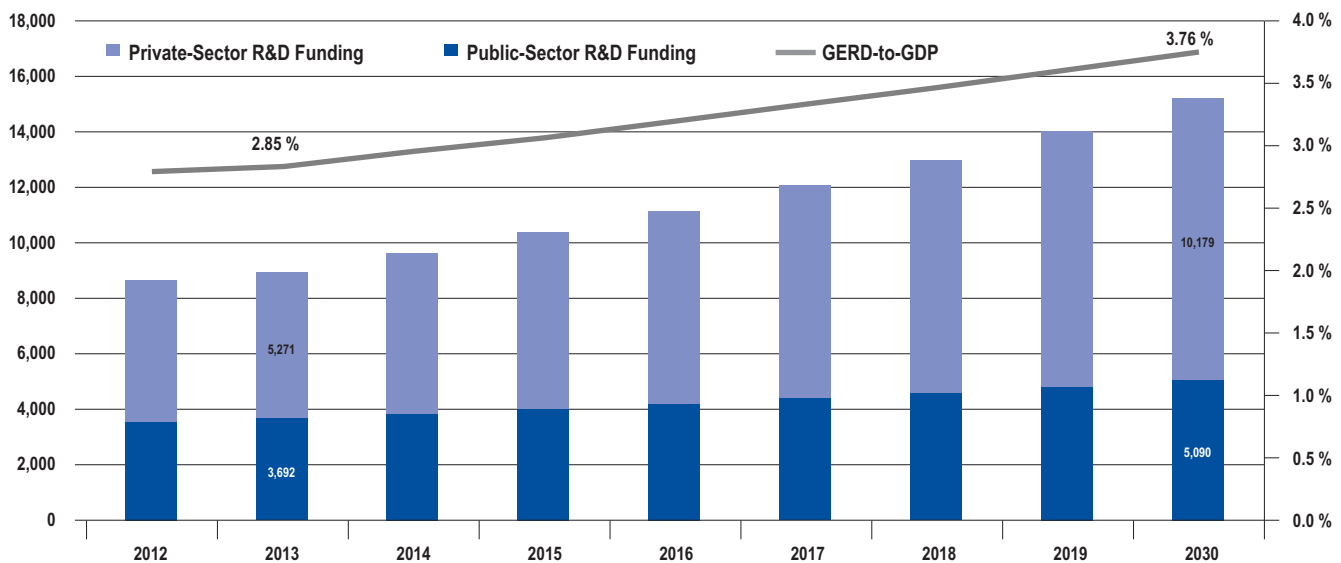
tor R&D spending based on the current government spending programme for 2013-2018 amounts to approximately two billion.

If the goal of spending 2 percent of GDP on tertiary education by 2020 is to be achieved, the budget for science and research in the tertiary sector for universities, basic research and applied research will have to be increased significantly.

To achieve the 2 percent target, spending would have to rise from 1.51 percent of GDP or 4.3

billion euros per year in 2010 to 8.3 billion euros in 2020. As the share of public-sector financing in the tertiary education sector is greater than that of the private sector, the necessary increases will largely have to be borne by the public-sector. Additional spending averaging some 400 million euros over the remaining period would be required to reach the 2 percent target. As the current government spending programme does not envision increases on this scale, it appears unlikely that the target can be met. Action is urgently needed.

Fig. 1: Financing Path to Achieve the Target GERD-to-GDP Ratio of 3.76 Percent in 2020 (in EUR mn.)



Source: WIFO GERD-to-GDP Targets 2020

Cooperation with Lower Austria

Since 2011 the Austrian Council has met twice a year with representatives of the province of Lower Austria. At the spring meeting held in Krems in 2013, the province presented an overview of the scientific institutions currently based in the region and those that will be established in future.

The province representatives also reflected on the current status of Lower Austria's RTI strategy. The autumn meeting in Wieselburg was dominated by biotechnology, the K1 centre Bioenergy 2020+ and the various education and higher education courses that are available in the region.

International Affairs

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Innovation Leader Denmark: Role Model with Limitations

On 8 and 9 August 2013, the Austrian Council had the opportunity to gain a deeper knowledge of the Danish innovation system on a fact finding mission. The bilateral discussions conducted with Axel Nielsen (DTU – Technical University of Denmark), Karin Madsen (Danish Research Council), Allan Helgelund (Ministry of Science, Innovation and Higher Education – Division for Sciences) and Thomas Sinkjaer (Danish National Research Foundation) focused in particular on the 2007 university reform.

The first university reform was carried out in 2003 and the main objective at the time was to strengthen autonomy. At the same time, though, the structures of employee and student representative bodies were streamlined (consistently, in Austria: the senates). The consequence is an unusually strong hierarchical structure, with a chain of command extending from the president to the dean down to the heads of department.

In 2007 – triggered by the Globalisation Strategy (2006) – responsibilities for all research agendas were transferred to a single ministry. As a result, responsibility for research is now held by one ministry – a fact that was initially viewed critically by some, as political responsibility for implementation in many areas (e.g. agriculture) was left at the original departments where thematic commitment is sometimes lacking. The ministry awards long-term contracts to the universities (e.g. food safety to the DTU) to obtain sound scientific analyses more quickly.

At the same time, the Globalisation Strategy re-defined the future viability of the universities in a competitive environment. As the realisation of the strategy envisaged fewer, but internationally more competitive universities, a process of merging institutions began in 2007 and is still underway. During this process, the 25 research

institutions and universities that existed prior to 2007 will be merged to create eight universities (University of Copenhagen, Aarhus University, Technical University of Denmark, University of Southern Denmark, Aalborg University, IT University of Copenhagen, Copenhagen Business School and Roskilde University) and three research institutions.

As a supplemental measure, financing for the sector was increased by 30 percent (2007-2010); however, since 2010, there have been practically no budget increases. One element of this funding increase included a specific infrastructure programme amounting to 600 million Danish krone (approx. 80 million euros) which was distributed to the institutions on a competitive basis.

At present, universities receive approximately 54 percent of their financing in the form of core funding and 46 percent through competitive processes. The budget of the science fund per inhabitant (34 euros) is thus twice as high as in Austria (17 euros). In addition to the formula-based component (which as in Austria has remained unchanged for years) core funding also includes a per student component (approx. 100,000 Danish krone), which at the DTU accounts for some 15 percent of the university budget. Other fields, such as the humanities for example, receive less money per student (approx. 40,000 krone). In addition, the universities receive a fixed overhead component of 44 percent.

Significant amounts of funding are also made available to the research system using foundations. Privately-owned companies receive tax relief if they invest money for charitable purposes. These range from opera houses to research (e.g. the Nordic Foundation will receive approx. 1 billion euros over the next five years).

Official Visit to Japan and Korea

From 13 to 19 November 2013, a delegation from the Austrian Council visited Japan and the Republic of South Korea. In both countries, the relevant individuals at the political level and from the research institutes and agencies were able to build closer ties and personal contacts through direct discussions of research policy strategies in each country. In Japan/Tokyo, the delegation was led by Gi-Eun Kim, a member of Seokyeong University in Seoul and of the Austrian Council for Research and Technology Development. In Korea/Seoul, the Chairman of the Austrian Council, Hannes Androsch, headed the delegation. Other members of the delegation were Ingolf Schädler (BMVIT, Deputy Head of Section), Stefan Riegler (BMWFI, Head of Department), Ingrid Sauer (Assistant General Manager at AIC), Markus Leeb (News, journalist), Andreas Koller (Salzburger Nachrichten, journalist), Ludovit Garzik (Austrian Council, Head of Secretariat) and Anton Graschopf (Austrian Council, Scientific Advisor).

Key scientific and economic data from both countries show that research and development is accorded high priority. The Japanese government is currently working on a new innovation strategy with a global orientation. This Innovation 25 Strategy initiative for the next 20 years is to be flanked by a new, more open science and technology foreign policy. In the many discussions with representatives of Japanese organisations, it became clear that scientific and technological cooperation between Austria and Japan is relatively underdeveloped and that it should, in the opinion of the participants, be stepped up.

Japan traditionally spends a very high proportion of its GDP on research. In the last 10 years, the figure has remained stable at an average of 3.4 percent. Japan is one of the world's biggest economies (ranking third in 2010 with a 5.6 percent share of the global economy) and a per

capita GDP of approx. 47,100 US dollars. The sustained, mild recession in Japan, however, is still having an effect. In 2013, national debt rose to more than 240 percent of gross domestic product, and despite rising export receipts, the Japanese economy has again come under severe pressure with a negative trade balance due to the need for energy imports (oil and gas).

South Korea has had a remarkable rise. Still one of the poorest countries in the world in the 1960s, the Republic of Korea is now the fourth largest economy in Asia. In terms of gross domestic product, South Korea currently boasts the 15th biggest economy in the world and ranks 9th among exporting nations.

The balance of trade in the last ten years has been consistently positive and in 2012 Korea recorded a debt-to-GDP ratio of approx. 33.5 percent. Per capita GDP in 2013 was roughly 24,500 US dollars.

Spending on R&D as a proportion of GDP is currently just above 4 percent and is to be increased to 5 percent by 2018. The goal is to transform Korea from a "fast follower" into a "first mover" over the next decade. There will be a strong emphasis on basic research with the intention being to allocate between 25 and 30 percent of total public-sector spending to basic research.

Structurally, private-sector research in Korea is in the hands of a few large companies, with the four largest corporations (Samsung, LG, Hyundai, SK) accounting for approximately 60 percent of research spending.

In terms of historic development, Korea is in a "sandwich position" between Japan and China. In the 1960s, the country began the process of industrialisation with the textile industry, which in the 1970s was followed by the chemicals and steel industries, and the development of the transport system (motorway construction). Since the 1960's – after the armistice agreement between North and South Korea – the

Korean economy has been strongly export oriented as the domestic market soon became too small. In the 1980s and '90s, the economic focus shifted to the automotive industry and then to the IT, telecommunications, construction and pharmaceuticals industries (Samsung, LG, Hyundai and SK). Korea was a very early investor in semi-conductor technology and was able to take a leading role in this sector with what then was a high-risk investment. On fact-finding visits in Japan on 14 and 15 November 2013, the members of the delegation had the opportunity to view the Super KEKB accelerator in Tsukuba among other things. A research team from Austria under Dr. Schwanda is leading a major international project at the installation with the Austrian scientists playing a key role in the field of high energy physics. The Japan Science and Technology Agency (JST), where the delegation met Dr. Ohtake

(Senior Executive Director) is a body that administers top-down research support. JST activities focus on the areas Development Infrastructure of Knowledge, Foster Next Generation and Science Communication.

The Council for Science and Technology Policy (CSTP), where the delegation met Dr. Yuko Harayama (General Director of the CSTP), is essentially responsible for coordinating the roughly ten government ministries that are involved with research.

The Japan Renewable Energy Foundation (JREF) was founded by the philanthropist Dr. Son after Fukushima (2011) with a start-up capital of approximately ten million euros. The JREF endeavours to raise the profile of "renewable energies" and in particular to enhance their social acceptance so that they can offer an alternative to nuclear energy.

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Representatives of the Austrian Council, BMWFW, BMVIT, the Austrian Embassy and the foreign trade centre of the WKO at the Science and Technology Policy Institute in Seoul, South Korea





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In the special zones (Tokku) of the Kanagawa Prefecture, clusters for the robotics industry and life science industry are being developed (Yokohama, Kawasaki Area). Start-ups in particular, receive support.

The New Energy and Industrial Technology Development Organisation (NEDO), where the delegation met Mirei Isaka, Kazuo Kaneko and Kenji Matsuoka, is an agency that supports corporate projects which are carried out at least to some extent in cooperation with universities or research institutes. The NEDO has a budget of approximately 1 billion euros and 800 employees.

The appointments in South Korea on 18 and 19 November included a meeting with representatives of the Seoul Metropolitan Government – Mr. KIM, Jong-Geun – Director of Smart City Innovations.

The focus of “smart city innovation” in Seoul is on BIG Data. A total of 490 parallel information systems will be incorporated and 1,500 free WIFI zones created in Seoul by 2015. The concept of a “smart city” is primarily understood as an “IT smart city” unlike the smart cities in Europe, which have a stronger focus on green energy, intelligent buildings, efficient mobility, zero emissions etc.

The Science and Technology Policy Institute (STEPI), where the delegation met the institute’s president Mr. SONG Jong-Guk, is, as the name indicates, a research policy institute.

There are a total of 23 institutes, which offer policy advice for a wide range of areas and levels. The STEPI, which is publicly funded, was set up in the 1960s and since then has played a key role in drawing up the five-year plans. It is mainly involved in developing economic strategies (foresight research). The prime minister is the chairman of the institute.

The Korean Academy of Science and Technology (KAST) – meeting with the President Sung Hyun Park – is one of two science academies in

Korea. There is the National Academy of Science (NAS) and the KAST, although due to its ageing membership the NAS appears to play only a limited political and scientific role. The academy currently has 474 members (maximum 500). KAST’s advisory function is focused above all on long-term strategies.

The Korean Institute of S&T Evaluation and Planning (KISTEP) – meeting with Ki-jong Lee (Director General, National R&D Coordination), Sang-young Lee (Director General, National R&D Coordination-Evaluation and Analysis) and Doowon CHA (Director, S&T Policy & Planning Division) – was founded in 1999.

It reports to the Ministry of Science, Innovation and Future Policy (MSIP) and is responsible for the detailed planning, and also implementation, of the national research strategy. The KISTEP also drew up a vision for 2040: “S&T Vision for the Future, Towards the Year 2040”. At the programme level, it handles 700 programmes (approx. 50,000 projects) in a 5-year period and carries out ex-ante and ex-post evaluations.

SAMSUNG Electronics was founded in 1969 and is the most important arm of the Samsung Group which has more than 370,000 employees worldwide. Samsung Electronics employs some 230,000 people, including 60,000 researchers and 5,500 PhDs. Approximately 31,000 employees work at the (main) location, Seoul. The company generates annual sales of roughly 200 billion US dollars. Samsung’s brand value is equally impressive and the company ranks 9th among the 100 top brands.

The vision for 2020: Samsung wants to move up to fifth place among the best brands and increase annual sales to 400 billion dollars. Samsung is one of the four biggest companies in South Korea (LG, Samsung, SK, Hyundai) which together account for 60 percent of private-sector research expenditure. Samsung itself invests approximately 10 percent of its turnover in research and development.

The Peoples Republic of China – an Emerging Innovation Nation

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A fact finding mission from 20-22 November 2013 enabled the Austrian Council to gain deeper insights into the Chinese innovation system.

Since 1978, when the country began to open up, and after subsequent turning points in 1994 (devaluation of the currency) and 2009 (stimulus package after the property bubble burst), China has not only emerged as a global power, it is also increasingly becoming a strong player in the international research community. Parallel to its economic growth, China is also steadily increasing its spending on R&D. Although the country currently invests less than 2 percent of its GDP on research, the trend is increasing sharply and the political goals are ambitious: China wants to achieve a GERD-to-GDP ratio of 2.5 percent by 2020.

Today, approximately 4 million students graduate each year from state universities and the number of scientific publications has tripled in the last decade. Since 2011 China has not only led international patent statistics: It is China's declared aim to build up an economy that is increasingly based on domestic innovations and less on imitations.

As a result of its rapid economic growth in recent years, China has become a direct competitor for the USA and Europe in just three decades. It has already overtaken Germany as the global export champion and superseded Japan as the second-largest economic power. Even if China's economic growth were to slow in the next few years, the Economist calculates that it will still overtake the USA as the biggest economic power by 2025. However, all forecasts say it will be some time before this is true of per-capita income.

Yet despite all these success stories, there are signs that growth in China is slackening, which could put these developments into a different perspective. Moreover, the Chinese economic growth model is leading to heightened social

tensions and is increasingly being met with resistance by burgeoning segments of the population. These tensions are exacerbated by growing environmental problems and a rapidly ageing population, which is already causing massive problems as the social and welfare systems have not been reformed to cope with them.

Facts about the Chinese RTI System

The structures of the national innovation system are in a state of constant flux. A major restructuring process was begun on the basis of the National Plan for Science and Technology Development 2006-2020 and the 12th Five Year Plan (2011-2015) for Science and Technology. The main emphasis here is on structural reforms which aim to enhance the performance of the Chinese universities and research organisations, and also improve the exploitation of scientific output.

Another focus is the further globalisation of the innovation system, an area where the expansion of international partnerships and cooperation is of huge strategic relevance. To date, foreign high-tech companies have set up 3,300 R&D facilities, creating some 300,000 research jobs. More than 300 of the Fortune 500 companies have research centres in China.

GERD as a percentage of GDP is rising quickly and at a rate that between 2000 and 2008 equalled that of Austria, albeit from a lower starting position. At present the GERD-to-GDP ratio is approximately 1.98 percent. The target for 2020 is 2.5 percent. Those investments classified here as "private sector" account for some 75 percent of the total and only a very small proportion of them are made by foreign companies. The share of basic research has remained stable at 5 percent for several years now. The number of researchers in China is rising steadily. In 2012 there were approximately three million researchers employed in the innovation

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system. By 2015 the number of researchers per 10,000 workers should rise to 43. Five percent of the population should then at least possess a basic science education.

Since 2003, publication output has more than tripled from 50,000 to 165,000. In science and engineering, Chinese researchers have already overtaken their counterparts in the USA in terms of the number of publications. If these trends continue, by 2015 China will also outpace the USA in terms of the total number of publications.

However, this development also reveals weaknesses: According to an investigation by Science, manipulations are widespread both with regard to authorship and the research work itself. Conclusion: In China, there is a great deal

of “horse dealing” surrounding scientific publications.

Since 2011 China has led the international patent statistics with more than 500,000 patent registrations per year. Equally important is that since this year, violations of Chinese patents abroad have exceeded infringements of foreign patents in China. This development is of course a direct consequence of the political goal of building an economy increasingly based on Chinese innovations and less on imitations. As a result, IPR is becoming significantly more important in China.

The government has set a quantitative goal for the development of patent figures, which in turn is then broken down to the regions. So far, the target has been achieved mostly by subsidising patent applications and awards. The

from left to right:

Hao Jiao

Beijing Normal University

Can Huang

Zhejiang University,
Hangzhou

Helmut Spitzel

OST Beijing

Ludovit Garzik

Austrian Council

Chen Jin

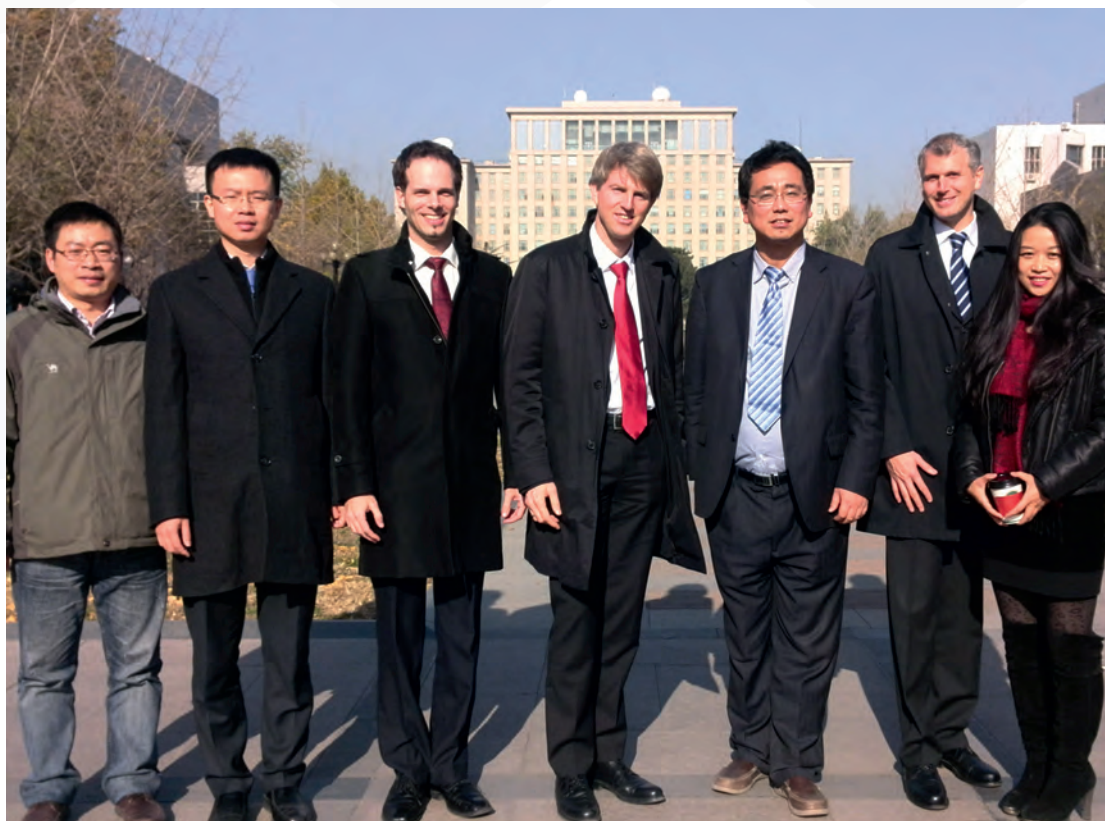
Tsinghua University, Beijing

Johannes Gadner

Austrian Council

Heidi Yan

Shanghai University



National Patent Development Strategy 2011-2020 envisages the incredible figure of two million patent registrations by 2015. Although critics consider this target to be unrealistic, it does clearly demonstrate the ambition of China's political leadership. By comparison: In the USA almost 480,000 patents were registered in 2010.

Dialogue Partners

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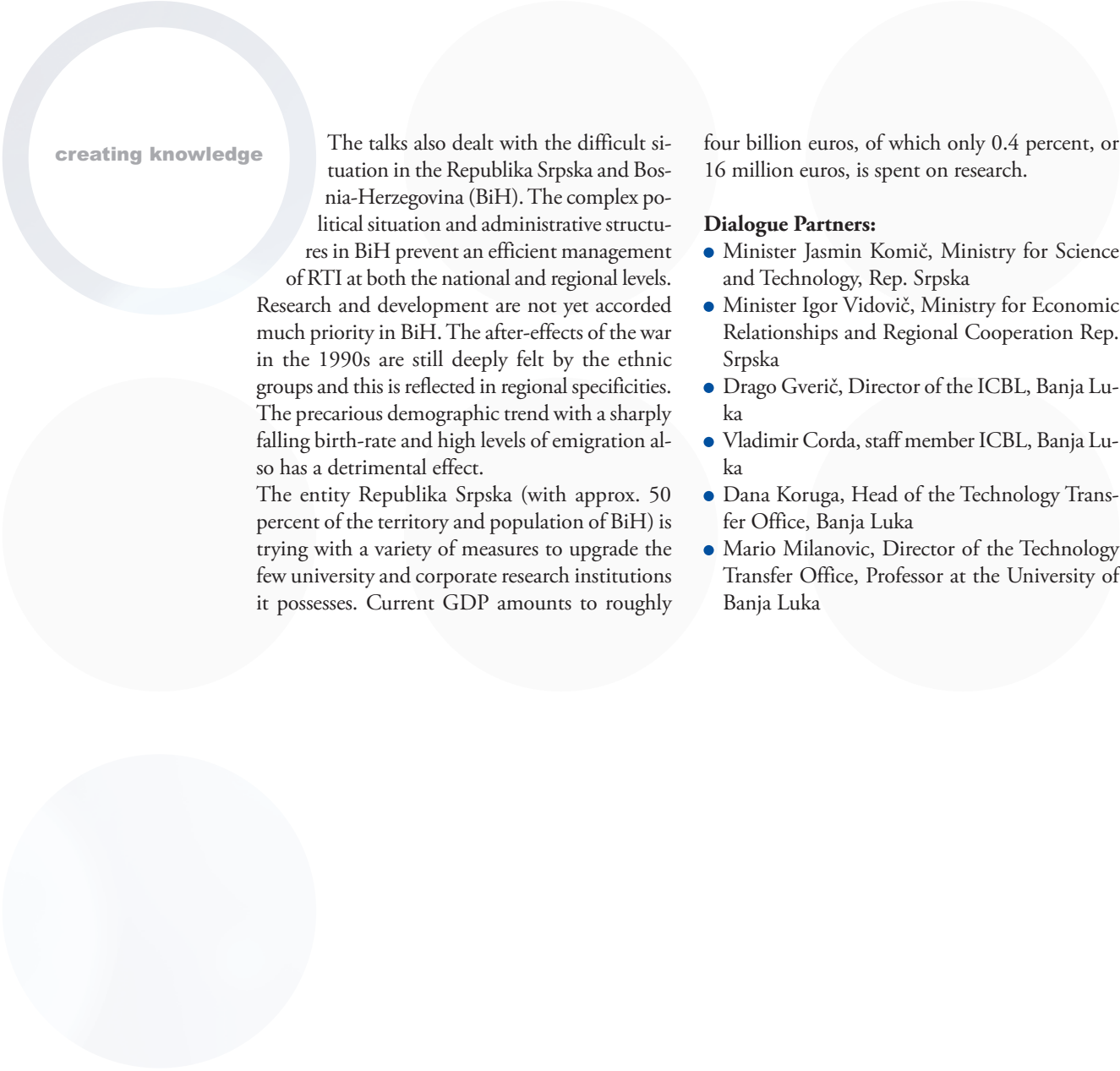
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Support for RTI in Bosnia and Herzegovina

The Austrian Council for Research and Technology Development, together with its project partners HD European Consulting Group (lead partner) and the Lithuanian Innovation Centre, is supporting the development of three innovation centres in Bosnia and Herzegovina in Banja Luka, Mostar and Zenica with a project named Institutional Capacity Development of Three Innovation Centres and the Research Sector in Bosnia and Herzegovina. The project's main activities are the development of an innovation network, supporting the measures necessary to promote research and innovation and drafting an action plan for the implementation of RTI statistical data.

As part of the project, members of the Austrian Council's staff visited the Innovation Centre in Banja Luka in the Republika Srpska (Bosnia and Herzegovina). The ICBL has been in existence

for four years and acts as an incubator for start-ups, including university spin-offs and other new businesses. One element of the Austrian Council's involvement is advising on the drafting of a strategy plan for ICBL (2014 to 2018), which will lay down the principles for the institution's medium-term development. For this purpose, talks were held with the director of the ICBL and the director of the Technology Transfer Office of the University of Banja Luka. During the visit, there was also a meeting with the Minister for Science and Technology and the Minister for Economic Relationships and Regional Cooperation. Although the minister backs the ICBL strategy plan, there is little financial scope. However, the establishment and strategy of the ICBL are viewed as a starting point for closer cooperation between the business and (university) research communities.



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The talks also dealt with the difficult situation in the Republika Srpska and Bosnia-Herzegovina (BiH). The complex political situation and administrative structures in BiH prevent an efficient management of RTI at both the national and regional levels. Research and development are not yet accorded much priority in BiH. The after-effects of the war in the 1990s are still deeply felt by the ethnic groups and this is reflected in regional specificities. The precarious demographic trend with a sharply falling birth-rate and high levels of emigration also has a detrimental effect.

The entity Republika Srpska (with approx. 50 percent of the territory and population of BiH) is trying with a variety of measures to upgrade the few university and corporate research institutions it possesses. Current GDP amounts to roughly

four billion euros, of which only 0.4 percent, or 16 million euros, is spent on research.

Dialogue Partners:

- Minister Jasmin Komič, Ministry for Science and Technology, Rep. Srpska
- Minister Igor Vidović, Ministry for Economic Relationships and Regional Cooperation Rep. Srpska
- Drago Gverič, Director of the ICBL, Banja Luka
- Vladimir Corda, staff member ICBL, Banja Luka
- Dana Koruga, Head of the Technology Transfer Office, Banja Luka
- Mario Milanovic, Director of the Technology Transfer Office, Professor at the University of Banja Luka



events

What can Foresight Contribute to Political Decision-Making Processes?

Event on Austria's Future in the World of Tomorrow – 15 January 2013

from left to right:

Marion Weissenberger-Eibl

Head of Fraunhofer Institute for Systems and Innovation Research,

Othmar Commenda

General and Chief of Defence Staff, Austrian Armed Forces,

Gerald Reischl

futurezone.at,

Hannes Androsch

Chairman Austrian Council,

Rainer Münz

Head of Research & Knowledge Center, Erste Group Bank AG and

Christian Keuschnigg

Director Institute of Advanced Studies, IHS

As part of the project Austria 2050, the Austrian Council organised an event on Austria's Future in the World of Tomorrow: What can Foresight Contribute to Political Decision-Making Processes. The Austrian Council – together with futurezone.at and the daily newspaper Kurier – invited high-calibre experts to a panel discussion to examine individual aspects of global social and demographic trends as well as the resulting demands they place on the education, innovation and pension systems. Equally important was the discussion of global strategic change processes in the years up to 2050 and their consequences for Europe and Austria, which form the backdrop for both the need for change and the means of bringing it about.

In her opening keynote speech, Marion Weissenberger-Eibl explained that there is actually no such thing as the one, inevitable future. The advantage and benefit of foresight lies above all in the fact that it opens our eyes for a variety of future scenarios. It is then possible to identify areas where action is needed and options to respond to these challenges.

The panellists all agreed that the world is experiencing a phase of accelerating change – change that is affecting almost all areas of life. The financial crisis and the recession during the last few years have cast doubt on our chosen path to economic and social development. This has exacerbated some alarming challenges for the future which were impossible to ignore even in



the past, such as the consequences of resource scarcity, climate change or overpopulation.

It has become increasingly difficult to find solutions for the future based on past experience and models of orientation. A number of countries, especially those characterised by a high level of innovation, such as Germany, Switzerland and the Scandinavian nations are increasingly relying on the support provided by foresight processes to steer their necessary transformation processes.

The panellists concluded that Austria could learn from these countries how the most robust solutions for the challenges ahead can be achieved.

After the event, the launch of the website www.oesterreich2050.at was announced – a discussion platform that was available until May 2013 to allow a wide audience to explore a full spectrum of forward-looking issues from education, to pensions to taxation.

events

Austria's Future Requires Innovation, But How Can it Be Financed?

Deputy head of the secretariat, project manager for the Report on Austria's Scientific and Technological Capability, coordination of strategic processes (Austrian Government RTI Strategy, Strategy 2020, Strategy for Excellence.

“Austria is a successful country, but this won't always be the case” was the key statement made by the former Swedish Prime Minister Hans Göran Persson in his opening address at the event. “It's a question of competition and staying at the top. This requires continuous and consistent reforms. Other countries are waiting already.” Sweden, Persson said, had implemented extensive reforms in the 1990s, not least of all to reduce its national debt, and had been extremely successful. Today, the country is at the top of many league tables, including the Innovation Union Scoreboard, a benchmark for a country's innovative strength. “The problem is not recognising what has to be done, but doing it.” It does not take a genius to reform public finances, but the political will to do so and the support of a majority of the population for a lengthy period.

The question of whether the Swedish approach is a model that Austria can, and should be guid-

ed by, was a central one in the subsequent panel discussion led by Christoph Takacs, editor-in-chief of the television channel ORF III. The discussion was dominated by an analysis of possible sources of investment in times of budgetary consolidation and the levers that will have to be applied as part of a far-reaching national reform.

Hannes Androsch, the chairman of the Austrian Council for Research and Technology Development and supervisory board chairman of AIT, confirmed that, “Sweden has not just theorised, but has shown how it can be done. Austria ought to be able to manage that too.” But as Androsch pointed out, “there are a small number of objectors who are blocking the necessary reforms.”

Others who participated in the panel discussion were, in alphabetical order:

- Georg Kapsch, President of the Federation of Austrian Industries

events

left: **Hannes Androsch**
Chairman Austrian Council,

right: **Hans Göran Persson**
former Prime Minister of Sweden

- Monika Kircher, CEO, Infineon Technologies Austria AG
- Wolfgang Knoll, Managing Director, AIT Austrian Institute of Technology GmbH
- Therese Niss, Federal Chair, Junge Industrie
- Klaus Pseiner, Managing Director, FFG Austrian Research Promotion Agency
- Gerhard Riemer, Head of Education, Innovation and Research, Federation of Austrian Industries

vation and Research, Federation of Austrian Industries

• Sabine Seidler, Rector, Vienna University of Technology

• Peter Skalicky, Deputy Chairman, Austrian Council for Research and Technology Development

• Gertrude Tumpel-Gugerell, Chair of the Supervisory Board, FFG Austrian Research Promotion Agency





Space against Youth Unemployment – 11 November 2013

Rising levels of youth unemployment, especially in the southern European countries, is one of the gravest effects of the economic and financial crisis that has been festering since 2008. Although there are signs that economic activity in the EU is beginning to pick up again, the number of young unemployed remains very high. The European Space Policy Institute (ESPI) organised a conference on 11 November 2013 to discuss how the space sector could contribute to

fighting youth unemployment as a European phenomenon. The chairman of the Austrian Council, Dr. Androsch, was invited to the event as a keynote speaker. The discussion between the high-calibre guests was moderated by the former Deputy Prime Minister and Minister of the Economy of the Netherlands, Professor Laurens Jan Brinkhorst.

Dr. Androsch, who described the horrendous youth unemployment figures in Greece, Spain,

from left to right:

Hannes Androsch
Chairman Austrian Council,

Gertrude Tumpel-Gugerell
Chair of the Supervisory Board,
FFG,

Christoph Takacs
ORF III,

Therese Niss
Federal Chair, Young Industry,

Hans Göran Persson
former Prime Minister of Sweden



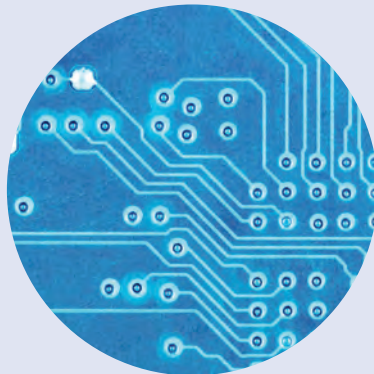
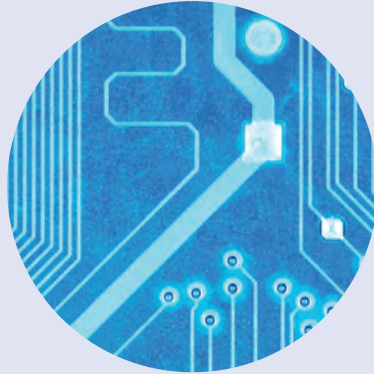
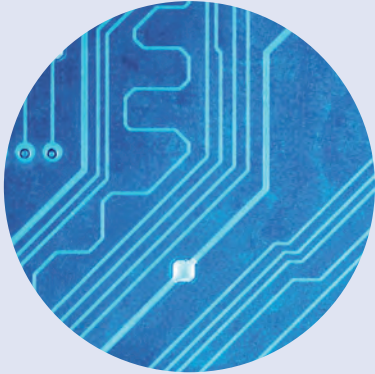
events

Portugal, Italy and other countries as a ticking political time bomb, called upon European governments and institutions to make smart investments in the future to stem this political trend. In particular, this would involve the education, research and development sectors and entail providing infrastructure that is conducive to innovation.

The Austrian Council chairman described the space sector as a small, but absolutely future-ori-

ented high-tech industry. The space industry is both the source of many innovative technologies as well as an influence on other technological sectors. At any rate, the positive effects of space activities and applications drawn from space technology can be seen everywhere in the economy.

But in addition to promoting general industrial growth, the space sector can and should also make a contribution to fighting the significant levels of youth unemployment.



Review and Outlook: 2013 and 2014

As 2013 marks the end of the first half of the third term of the Austrian Council for Research and Technology Development, it is an ideal time to look back and review the beginning of this period.

On 15 December 2010 the Austrian Council adopted its Mission Statement for the current term (2010 2015). This states:



Ludovit Garzik
Head of the Secretariat

“The Austrian Council for Research and Technology Development is the strategic advisory body to the Austrian Government on all matters regarding research, technology and innovation policy. In close dialogue with the key political players, the Council draws up recommendations for the medium and long-term strategic orientation of this policy area. As a central node of national RTI policy, the Austrian Council strengthens Austria as a location for RTI with its expertise and by providing independent and systematic advice.”

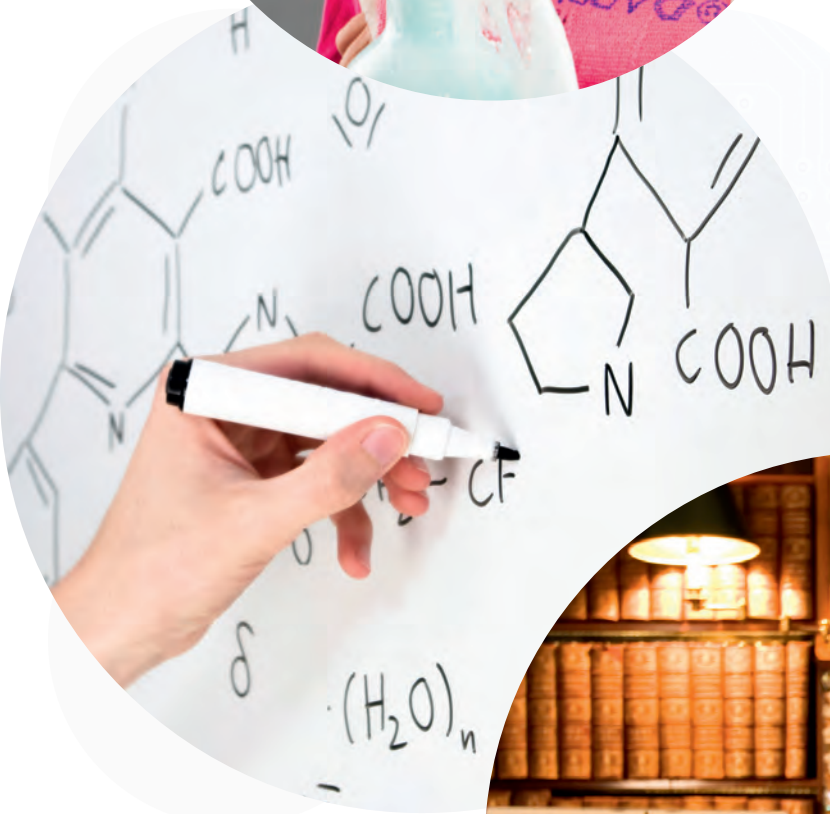
The Mission Statement was the result of an in-depth discussion process and has provided the Austrian Council with a basis for its work since its first closed-door retreat in January 2011.

With this in mind, the Austrian Council supports the Federal Government as it lays the strategic foundations that will set Austria on course to becoming an Innovation Leader. In the second half of its term, the Council will carry out the task entrusted to it by the Federal Government of keeping under continuous review the challenges that have to be overcome if Austria is to join the ranks of the leading innovation nations.

The Austrian Council sees its task as being to monitor developments in these areas and to assess their importance for the RTI system. With the strategic monitoring of the implementation of the RTI strategy and its Report on Austria's Scientific and Technological Capability and the white paper on steering research, technology and innovation in Austria, the Austrian Council seeks to support the relevant ministries in their work and in this way to contribute to achieving the goals defined by the Federal Government. This will in future, and in the context of the new government and the resulting changes at the ministerial level, continue to form the basis for cooperation.



austrian council



The Austrian Council

Advisory Members

Doris Bures Minister of Transport, Innovation and Technology

Dr. Reinhold Mitterlehner Minister of Science, Research and Economic Affairs

Dr. Michael Spindelegger Vice-Chancellor and Minister of Finance



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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