

## REQUEST FOR INFORMATION

1. Please provide a written response for Section A below, which addresses general science, technology and innovation policies, and for those topics identified in Sections B through G in which significant shifts in policy have been made or new initiatives launched in 2004 or 2005. Information on anticipated changes in 2006 (or beyond) should also be included, where possible.

### **Section A: General framework and trends in science, technology, and innovation policy**

**1. Please provide a brief overview of the main directions, objectives and elements of national policies for science, technology, and innovation, highlighting the following topics:**

- Main features of recent science, technology, and innovation policy developments (*e.g.*, including new innovation strategies) and the rationale behind them:

Response:

The Austrian government perceives science, technology and innovation as central to the challenge of raising productivity and improving welfare. It is committed to ensuring that science plays its full role in supporting innovation, and it also supports the European Lisbon and Barcelona agendas.

A systems perspective on research, technology and innovation has become a core element of policy discourse. As a consequence, structural issues have been very much at the attention of RTD policy, aiming to improve science-industry relations, to upgrade the research promotion landscape or – more recently – to promote “excellence” in research.

- Lisbon and Barcelona goals - successful catching up process in R&D spending

In Austria a successful catching up process has been taking place since the mid-90ies. R&D spending increased by 129% from 1993 to 2003. Austria is one of the few European countries that is well on track towards the Barcelona targets, both in terms of the 3% target and in terms of the 2/3 share of private sector R&D funding. On the road to Barcelona the Austrian government has fixed an intermediate goal of 2% of GDP in 2003. This goal was attained successfully with 2,2 % of GDP spent for R&D. The latest provisional estimate by Statistics Austria on gross domestic expenditure on R&D as a percentage of GDP indicates - in spite of low economic growth in Austria – that the annual growth rate on R&D expenditure rises continually and will achieve in 2005 a total amount of € 5.773, 86 million, or 2,35 % of GDP . In comparison with 2004 that is an increase by 8%. As main intermediate goal Austrian RTD policy intends to achieve an R&D expenditure of 2.5 percent of GDP by the year 2006.

- Major changes in the legislative, administrative, organisational, institutional, or budgetary framework for the formulation and implementation of science, technology, and innovation policies (*e.g.*, new Ministerial structures, better inter-Ministerial coordination, increased involvement of non-governmental stakeholders):

Response:

The government appropriated 508 Mio. € for the 2000-03 period and 600 Mio. € for the 2004-06 period. Furthermore, for 2006-2010 the government has appropriated 1 billion EURO to strengthen the RTI-area effectively also in the future. The allocation of the funds results from by the **Council for Research and Technology Development(RFT)**

The research promotion system for industrial innovation was streamlined: In 2003/2004, RTD policy debates were marked by the preparations for major reforms in research, technology and innovation (at strategic as well as operative level). The recent reform efforts were chiefly aimed at upgrading and simplifying the promotion agency landscape of Austria, which – previously – had been criticised in policy debates and evaluations for being too fragmented. By establishing the **FFG** (Austrian Research Promotion Agency - Österreichische Forschungsförderungsgesellschaft) particular emphasis was given to the much-faulted intricacies, rifts and splinters in promoting applied research. FFG is now responsible for much of the research and technology policy programmes financed by BMVIT and BMWA, which are both half-owners of the organisation (Federal Law Gazette no. I 73/2004). The general bottom-up research programme of the FFG is the most important source of public finance for research and development projects carried out by industry. Structural programmes aim at improving the structural conditions for research and innovation. Thematic programmes follow selected national priorities to encourage research on future key topics. Main objective is to build up critical mass for these topics having a strategic impact on the economy by developing new technologies. Other activities of FFG aim at supporting the international cooperation of Austrian RTD actors.

Further funding agencies for promotion of innovation are:

**AWS** (Austria Wirtschaftsservice GmbH) – after the establishment in 2002, the AWS brings together all forms of business-related support to economic operators.

**FWF**-Austrian Science Fund (Fonds zur Förderung der wissenschaftlichen Forschung) - the FWF is Austria's central body for the promotion of basic research. It is open to all scientific fields. Project selection is based on research excellence.

- In 2004 the government set up a **‘National Foundation for Research, Technology and Development’**, focusing on middle- and long-term goals and distributing additional funds amounting to 125 Mio. € annually.
- In May 2005 government announced another increase in public spending for R&D of 1 billion € for the period 2005 until 2010. Out of this, 50 million € have been added to the 2005 budget and additional 75 million € will be spent on R&D in 2006.
- The set of fiscal and other indirect measures to promote R&D investment was extended. Not only companies carrying out R&D but also companies contracting out R&D are eligible to an allowance/premium of 25 % of R&D expenditure up to 100.000 Euros a year.
- Thanks to the financial means of the Offensivprogramm (and fresh money from the National Foundation), the aggregate research funds paid by the three ministries involved (BMVIT; BMBWK and BMWA) to domestic beneficiaries (and their organisations) could be raised to more than 1.3 billion € in 2002–04. With these funds, several new programmes and initiatives were launched as well as current programmes supported to accelerate their implementation. Nevertheless, despite of high growth rates in R&D spending in recent years, additional efforts will be needed to further push up gross domestic R&D expenditure.

- New policy measures to foster increased innovation and productivity growth in the service sector (both services in general and specific service-sector, finance, etc.).

Response:

- 2. Please describe major shifts or changes in the priority given to different areas of science, technology, and innovation policy listed below or the policy instruments used to achieve them: i) strengthening the science system; ii) supporting business innovation; iii) linking science to innovation; iv) developing human resources for S&T; and v) establishing framework conditions that are conducive to innovation (e.g., IPR regimes).**

Response:

The following publications highlight the majority of such policy shifts:

RFT (2005): Strategie 2010 - Perspektiven für Forschung, Technologie und Innovation in Österreich. Rat für Forschungs- und Technologieentwicklung, Vienna : "Strategie 2010" covers each of the above mentioned aspects (bullet points i to v) with proposals for STI-policy makers.

"Strategie 2010" gives examples of the emphasis laid on the linkages between actors in the innovation systems. One of the three pillars of the latest strategy paper is the improvement of networking and cooperation between science and industry. To bridge identified gaps in the innovation process, the RTD Council suggests to further increase cooperative research, and to further develop the competence centre programme and other related programmes. The other pillars are the improvement of quality in all areas of RTD and developing excellence, and the improvement of efficiency and effectiveness of the system of funding.

"Strategie 2010" compiles the following ten "Fields of Action":

- Universities
  - Enterprises
  - Cooperative Sector
  - Excellence Strategy
  - Internationalisation
  - Regional dimension
  - Human resources
  - Impulses from the State (Public Impulses)
  - Public Financing Portfolio
  - Public Financing
- Nationaler Aktionsplan Innovation (9/2005), BMWA, Vienna: The Platform Innovation defined priorities for the Austrian Innovation Strategy which formed "cornerstones" of "Nationaler Aktionsplan Innovation". Through measures proposed in the National Actionplan Austria tries to meet the goals of the Lisbon Strategy, thus forming a building block for the National Reform Process. The measures proposed in "Nationaler Aktionsplan Innovation" mainly refer to ii (supporting business innovation), iv (human resources) and v (framework conditions conducive to innovation). The Actionplan distinguishes between four main "Fields of Action".

- Framework conditions for markets and innovation
- Public infrastructure in support for enterprises/ SME
- Financing of Innovations
- Human Resources and Innovation
- support for mobility of scientists
- Austrian University Report

The **University Report 2005** is the first report on basis of § 11 University Act 2002. This report refers mostly to items (1) and (iv). The **Universities Act 2002** turned universities and art colleges into legal entities in law which may independently avail of their respective budgets. The universities shall perform their duties within the limits of the law and the orders, without restriction by ministerial directions and shall adopt statutes within the limits of the law. The supervision of the Federal Ministry mainly takes place in form of a strategic controlling. The available report puts account over the relevant measures and their implication since 2002.

**3. Please describe the primary challenges that are expected to be addressed in future science technology and innovation policy initiatives and/or that have been identified in forward-looking exercises, such as foresight and technology road mapping (*i.e.*, in the 2007-08 timeframe).**

Response:

The major future challenges for Austrian STI-policy are described in the aforementioned policy documents. They are based on a critical assessment of the current situation of Austria's research and innovation systems rather than on a systematic forward-looking assessment. The last broad and encompassing foresight-type activity was conducted in 1996-1998; recently only a small number of rather narrowly defined foresight or road mapping activities have been conducted.

It is a widely recognised challenge to raise additional research funding required to reach the 3% Barcelona goal. The EU is unlikely to meet its target of boosting research spending to 3% of GDP by 2010 (of which two thirds is by the private sector and one third by the public sector). In Austria, there is considerable scope for improving the quality of public expenditure and the effectiveness of public sector support for R&D. But to achieve the 3 % Barcelona goal, it remains imperative to get industry to invest more in R&D. In terms of human resources, increasing input would require several thousand new researchers spending only the public monies and even more R&D personnel to spend private R&D money.

Coordination between ministries with STI competences and ministries with related sectoral competences is likely to become an issue of growing importance over the next years. The Austrian Council for Research and Technology Development, in its latest position paper "Strategie 2010", recommended to clearly define the coordination competences and the inter-ministerial interfaces.

Improving coordination between the national and the provincial level (Bundesländer) is also expected to turn into a policy concern in the near future, not the least because many Austrian provinces have actively reinforced their portfolio of science, technology and – in particular – innovation policy initiatives. To efficiently use the national resources, the provincial resources and the European funding mechanisms, new efforts will have to be made.

In the second half of 2006 the first steps of implementation of the concept for a new university of excellence, the "Austrian Institute for Advanced Science and Technology" are furthermore expected. Research at the highest level (excellence) is the determined element. At the beginning ten small research groups, a senior scientist with international reputation and few strongly evaluated Post Docs and PHD students, should work in sciences and mathematics to develop emerging research fields. But the new university is open for all science fields. At the full developed level (in 10 years) 25 /30 research groups should be established. The financing sectors will be the industry/business sector, the government and subsidies from successful research projects and income from contract research. The great challenges in the next years will be the gaining of the demanding objectives, so that the excellence university will hold an eminent place in the EU-research area.

## Section B: Public sector research and public research organisations

### 1. Please describe major policy changes related to the financing of public R&D, to include the following:

- Changes in overall levels of R&D funding for public research organisations during last few years.

Response:

If funding data is available, please provide it below:

Year	2003	2004	2005	2006(forecast)	2007(forecast)
R&D funding (Unit: )					

- Shifts in the allocation of funding across the following areas (please provide quantitative information if available):

1) different types of public research organisations (*e.g.* universities vs. government research institutions)

Response:

Comprehensive data on research and development expenditure in higher education and public research is only available for 1998 and 2002 (see below).

Funding of R&D performed in the higher education and the state sector, Austria, 1998 and 2002

Higher  
Education R&D  
expenditure

	Funding sector					
	Industry	Government	funds abroad	other sources	nat.	Sum
1998	12,822	698,180	19,551	3,240		733,793
2002	51,327	1,156,949	49,640	8,188		1,266,104
Shares	2%	95%	3%		0%	
Shares	4%	91%	4%		1%	

State R&D expenditure	Funding sector					Sum
	Industry	Government	funds abroad	other sources	nat.	
1998	4,868	146,863	4,434	2,953		159,118
2002	16,007	236,813	11,608	2,000		266,428
Shares	3%	92%	3%		2%	
Shares	6%	89%	4%		1%	

Source: national research and development surveys, statistics Austria. In 1,000. €

- Public funding for universities vs. research institutions

With regard to the shift in allocation of funding across different types of public research organisations (e.g. universities vs. government research institutions): Public funding for universities as well as for public research grew almost proportionally between 1998 and 2002.

2) different socio-economic objectives (e.g. general advancement of knowledge, health, national security, environment, energy)

Response:

- Shifts in financing for public R&D across different economic objectives:

Research on:	1993	1995	1998	1999	2000	2001	2002	2003	2004
Land, sea, space	5%	5%	7%	7%	7%	7%	6%	7%	6%
Agriculture	5%	4%	6%	6%	6%	6%	6%	6%	5%
Trade and industry	15%	15%	14%	15%	15%	18%	17%	15%	18%
Energy	2%	2%	2%	2%	2%	2%	2%	2%	2%
Transport and communication	3%	3%	3%	3%	2%	3%	3%	3%	4%
Education	1%	1%	1%	1%	1%	1%	1%	1%	1%
Health	25%	24%	22%	22%	23%	22%	22%	23%	21%
Socio-Economic development	7%	7%	7%	7%	7%	7%	7%	7%	6%
Environmental protection	5%	4%	4%	3%	3%	3%	3%	4%	3%
Urban planning	1%	1%	1%	1%	1%	1%	1%	1%	1%
Defence	5%	5%	7%	7%	7%	7%	6%	7%	6%
Other	5%	4%	6%	6%	6%	6%	6%	6%	5%
general advancement of knowledge	15%	15%	14%	15%	15%	18%	17%	15%	18%

Source: Statistics Austria

3) different fields of science and technology (e.g. information and communications technology, biotechnology, and nanotechnology.)

Response:

- Shifts in financing for public R&D across different fields of science and technology

At present there are no data available on total public funding according to different fields of science and technology. However, given the government's efforts to set priorities in certain technologies, it is very likely that public funding in ICT, biotech and nanotechnologies has increased faster than in other fields of science and technology.

- Changes in the use of different types of funding instruments for financing R&D or the balance among them, *e.g.* institutional funding (block grants) and project funding (contracts and grants), or public funding vs. private funding. To what extent have funding mechanisms become more competitive?

Response:

Austria has started some fundamental reforms in the university sector which also affected university funding. The University Act of 2002 has, as mentioned above, implied significant changes for universities (see *Universitätsbericht 2005* p. 34ff):

- The size of the university and the number of students play a decisive role in the budget of the individual universities. However, since January 2004, universities are now given a global amount (Globalbetrag) and allocation is left to the universities themselves.
- Moreover, university revenue now goes directly to the university budgets and is not a part of general federal revenues. This also includes general tuition fees (currently 363 € per term for students from Austria and other EU and EEA countries).
- Universities are encouraged to raise more funds from contract research, from EU funding or the Austrian Science Fund (FWF), a fund to promote basic research. The total income from these areas amounts to approx. 187 Mio. € per year, which is about 7% of total federal university funding.
- Following the recommendation of the Austrian Council for Research and Technology Development, 170 Mio. € have been allocated from the special funding "Offensivprogramme I and II" to universities between 2001 and 2006. These funds are mainly assigned to improvements of the infrastructure.
- In 2005 and 2006, 0.4% and 0.8% of the global amount to universities are used to promote organisational change and specialisation at universities. This amounts to 20.5 Mio. € for the two years. The funds have been allocated on a competitive basis.
- Since 2004, Austrian universities are required to publish financial statements.
- Starting in 2007, financial means each university will be tied to 3-year performance contracts (Leistungsvereinbarung) between the Federal Ministry for Education, Science and Culture and the universities. The performance contracts contain the services to be provided by the university, including teaching, research, mobility of researchers and students, co-operation, strategy, specialisation, etc.

From 2007 on, general university funding will include a budget based on performance contracts for a 3-year period, topped by a flexible component which is linked to performance and quality indicators. This flexible component amounts to 20% of the general university funds.

University funding has become more competitive, as well as more targeted towards specific technologies or functions within the innovation system (for example science-industry-collaborations).

Moreover, public funding is now targeted to commit the organisations to certain goals and strategic orientations. So since 2004 the publicly funded "Non university R&D organisations" (Austrian Academy of Sciences, Ludwig Boltzmann Society, Christian Doppler Society and many other institutions with

specific research focus ) have to orientate their institutional development and R&D objectives along the R&D framework of public funding.

**2. Please describe major initiatives to reform the organisation and governance of universities and other public research organisations to improve the quality of their R&D or their ability to contribute to economic growth and other social objectives. Please consider reforms such as:**

- Initiatives to increase the flexibility and/or accountability of universities and other public research organisations (*e.g.* granting more autonomy, performance measurement systems or stronger evaluation, new funding structures).

Response:

a) Universities

In 2002 in Austria the new University law “Universities Act 2002” was (as already mentioned) issued which has to be implemented step-wise until 2007. The reorganisation of Austrian universities is based on the principles of New Public Management with its premises of increased autonomy, output orientation and performance-based funding. The new university law specifies the organisational framework of all public Austrian universities with respect to funding, governance (incl. a new university council), management structures, evaluation, accreditation and employment law.

Funding is based on performance contracts (criteria needs, demands, performance, social goals) in the future with up to 20% funded based on performance criteria (formula-based budget component).

Regularly evaluations and quality management are part of the reform of the university system and should improve efficiency and effectiveness. With respect to accountability and transparency Austrian Universities will have to publish Intellectual Capital Reports which disclose a set of indicators about their human capital, structural capital and relational capital as well as outputs in the fields of research and education.

b) Public research organisations

There has been a merger of the two largest public research organisations Forschungszentrum Seibersdorf and Arsenal Research into one big research organisation, Austrian Research Centres in 2002. In the future the funding shall be based on performance contracts there, too.

Two important research societies which consist of research institutes associated mainly to university institutes have been subject to recent evaluations: the Ludwig-Boltzmann-Society and the Christian-Doppler-Society, resulting in some restructuring and bundling of activities in the former and increased communication with the public and explorations on internationalisation within the latter.

- New organisational structures for performing R&D, such as larger-scale research teams, centres of excellence, multi-disciplinary research centres, research networks, etc.:

Response:

Three Competence Centre programmes (Kplus, Kind, Knet) have been established in the last five years where universities, research organisations and industrial firms run thematic competence centres with the aim to carry out pre-competitive research. After an evaluation of the running competence centre programme recently a new programme for Competence Centres including the evaluation results is designed. The programme will start in the half of 2006.

- Revised procedures for setting research priorities at the institutional level in universities and public research organisations (*e.g.* involvement of outside stakeholders):

Response:

**ad Universities:** According to the new university reform and legislation (Universities Act 2002) all universities have to provide a Development Plan until April 2006. The development plan serves as strategic plan and should facilitate the identification of strengths and academic priorities. The aim is to strengthen the existing research base and bundle research capacities. Moreover the co-ordination of activities between universities should be improved. These development plans have been prepared within a bottom-up/top-down process by the 21 state universities and define strategic goals and priorities in the field of research, education and administration. The university council consisting of representatives of academia, industry and politics has to approve the development plans. Even though external stakeholders are not involved directly within the planning process the universities clearly approach to meet various demands and needs from industry, citizens, etc.

**ad Public research organisations:** These organisations regularly adapt their strategies to the needs of the industry and society. New established Competence Centres are concentrated on new promising themes such as new materials research, electronic commerce, etc. which have been founded after a call where ideas have been brought up bottom-up.

- Reformed rules governing ownership and licensing of publicly-funded research results, support for technology licensing, etc., whether or not these measures are focused on a specific type of IPR (patents, copyright, *etc.*) or certain technological fields:

Response:

Within the universities internal support teams, departments, organisational units, etc. have been established which support the commercialisation of research findings, spin-off development and provide consultation with respect to IPR issues.

According to the Universities Act 2002 and the Austrian Patent Law inventions made at a university by an employee belong to the employer, the university. All inventions have to be reported to the rector, who decides about a patent application. With the aim to increase the commercialisation of inventions universities will foster the exploitation of new inventions by licensing, etc. in the future.

- Other

Response:

**3. Please identify major shifts or changes in priority among the approaches for strengthening public sector research, including efforts to: *i*) increase levels of funding; *ii*) alter the structure of funding (*e.g.*, institutional vs. project-based funding; public vs. private-sector funding); *iii*) reform the governance of public research organisations; *iv*) implement new structures for performing research (*e.g.*, centres of excellence, multi-disciplinary centres); *v*) changing guidelines for ownership and management of IPR; and *vi*) implementing new evaluation procedures).**

Response:

- i. i) Levels of funding: The levels of funding have been increased slightly for universities, universities of applied sciences (Fachhochschulen) and public research organisations.
- ii. ii) Structure of funding: There is a trend towards stronger project- and programme-based funding, public funding has been increased with the aim to leverage also the private R&D investments.
- iii. iii) Governance: New University law implies new governance structures with stronger decisions power of the rector, internal goal agreements and the establishments of university councils. Minor changes within the public research organisations such as Austrian Research Centres, Academy of Sciences, etc. with respect to governance up until now.
- iv. iv) New structures: More than 20 Competence Centers and 9 Fachhochschulen (FH) have been established in the last 7 years.
- v. v) IPR: The commercialisation of inventions gets great priority in the management of public research institutions and the universities. The establishing a sustainable “utilisation culture” of patents and licensing is in progress. Especially the universities pay attention more strongly to their almost neglected economic potentials to open up new sources of revenue. To support this progress the bm:bwk has launched the programme uni:invent. It aims to develop the patenting and licensing potential available at Austrian universities and prepare it for efficient economic exploitation.
- vi. vi) Evaluation: Public research organisations have been evaluated (institutional evaluations) in the past. At the university level regularly evaluations are obligatory according to the new university law. The Austrian Agency of Quality Assurance (AQA) has been founded to support universities with respect to quality assurance, accreditations and evaluations.

**4. Please describe any new or recent changes in policies adopted by government, public research funding bodies or public research institutions to improve access to data resulting from publicly funded research.<sup>1</sup>**

Response:

Universities will have to publish output indicators within the annually published Intellectual Capital Reports which provides new information about research outputs in the future (*e.g.* number of publications). Some public research organisations also provide such data voluntarily.

Universities aim to increase the number of patents and their commercialisation and have to set incentives since the publication of scientific papers is still the prime motivation of universities’ scientists.

The Federal Ministry for Education, Science and Culture (bm:bwk) is currently developing a database where publicly funded research projects will be filed. This Database will cover all research projects that are funded by institutions on federal level (ministries).

Every research project will be recorded with 150 data items such as

- Researcher (First Name, Family Name, Sex, Qualification....)
- Research Project (Title, Discipline, Duration, Number of Researchers working in the project.....)
- Final Report, Abstract, publications, patents...

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<sup>1</sup> Delegates may wish to consult with experts participating in the electronic discussion group to develop OECD guidelines for access to research data.

A wide range of search and query functions will be available, e.g. a query for all projects of a certain discipline or a query for all researchers working in certain field.

Access to the database takes place via internet connection and internet browser, no additional software is required.

**5. Looking to the future, what are the main challenges that the science system is expected to face and the main issues that policy makers will need to address? What future actions are anticipated?**

- 4) Balancing basic research and applied research, especially within the university system, actually the pressure to increase third-party funding might favour applied research.
- 2) Balancing the tendency towards focusing and bundling research activities (critical masses and priority setting) and the tendency towards the differentiation and diversification of research
- 3) Support the cultural change within the universities towards a more flexible and interdisciplinary research style which enables the co-operation between various research teams.
- 4) Foster career development for researchers and attract human resources from abroad.
- 5) Find effective ways to implement science and research policies in a system consisting of “autonomous agents” where important instruments are performance contracts and research funding based on project and programme funding.

**Section C: Government support for private-sector R&D and innovation**

**1. Please describe major policy changes in the instruments used to support private sector R&D and innovation, including:**

- Tax treatment of business R&D (e.g. tax credits for R&D expenditure, changes in corporate tax regimes that could affect business R&D activities):

Response:

Allowance for development of inventions:

A significant R&D tax allowance has been granted since 1998. It has been revised since and now provides a tax allowance of 25% of expenditures excl. fixed investment and administrative costs (35% for the increase of past 3 years) deductible from income to all companies, irrespective of the size of the company.

Allowance/premium for Frascati R&D expenditures:

In 2002 another allowance of 25% of expenditures according to Frascati definitions has been introduced, deductible from income with an option for a premium, payable tax credit. The allowance was subsequently raised from 10 to 25 % in 2004, and the premium was changed from 3 % to 8% correspondingly.

The tax revenues lost by this measure have been increasing from 130 Mio. € in 2000 to 230 Mio. € in 2003.

In 2005 the set of fiscal and other indirect measures to promote R&D investment was extended once more. Not only companies carrying out R&D but also companies contracting out R&D are eligible to an allowance/premium of 25 % of R&D expenditure up to 100.000 Euro a year.

- Direct public funding of business R&D and innovation (*e.g.* grants, contracts, loans, etc.):

Response:

No major policy changes. ERP-loans for R&D with an emphasis on “technologies for the future”:

*e.g.* Biotech, environment and energy, aerospace (components);

- Public procurement policies, new contractual guidelines, more competitive selection processes, etc:

Response:

Continuous development of the project scoreboard for the funding of industrial research projects by the FFG

- Changes in IPR regimes to create additional incentives for business investments in innovation, such as via new or revised guidelines for specific types of inventions (*e.g.* genetic, software, business methods), or new or strengthened mechanisms for enforcement of IPR (*e.g.* specialised courts):

Response:

No major policy changes

- Other forms of public support for innovation (*e.g.* consulting services and extension programmes):

Response:

No major policy changes

**2. Please describe policy changes in programmes to support R&D and innovation in SMEs and new technology-based firms, *e.g.*, via efforts to:**

Responses:

Generally spoken, the current programmes and initiatives are under evaluation. Once the recommendations are ready, the programmes will be adapted accordingly.

- Establish and develop venture capital funds and/or second-stage financing for the support of new technology-based firms or spin-offs from public research organisations:

Response:

No major policy changes. The BMVIT is supporting new technology-based firms by the programme “Seed Financing” (operated by AWS) and spin-offs by the programme “AplusB- Academy plus Business” (operated by FFG). The programme “Seedfinancing” promotes high tech start-ups before and during the phase of establishment. The criteria of allocations are newness and technology intensity, potential of development and willingness for risk. A plus B helps university researchers by founding a new firm. AWS provides Seed Financing Programmes: mezzanine capital for High Growth Technology based SME and guarantees for Venture Capital.

- Provide additional R&D funding targeted to SMEs and new technology-based firms

Response:

No major policy changes. The Austrian Research Promotion Agency (FFG), as the central organisation for promotion of applied research and innovation, is conducting a Start-up programme for improved support and financing mode for young (not older than 3 years) and high tech oriented SMEs. The “Austria Wirtschaftsservice “(AWS) provides special funding programmes “High Tech Double Equity”: Private Equity or Venture Capital is doubled by a 100% guarantee for a bank loan

- Encourage entrepreneurship through training, information services, or other means:

Response:

No major policy changes. The “Austria Wirtschaftsservice “(AWS), an institutions for subsidies and services for the enterprise business sector is conducting such programmes, e.g.it provides “Business Angels Börse” as a service for technology based SME.

- Financing and Funding instruments apart from direct R&D subsidies

As a sponsoring bank the AWS - which brings together all forms of business-related support to economic operators - provides several programmes in this context by subsidies, favourable interest credits from of AWS administered agency fund ERP, assumption of liability, backings and advice (like *Eigenkapitalförderung*, Protec 2002+, etc.). AWS provides especially for SME soft aid programmes to support inward technology transfer (protec TRANS and innovation management (protec INNO).

**3. Please identify major shifts or changes in the mix of instruments used to provide public support for private sector R&D and innovation, to include: i) direct financing of R&D, ii) R&D tax incentives, iii) support to entrepreneurship and SMEs and iv) IPR protection and other framework conditions. What shifts in the policy mix are anticipated in coming years?**

Response:

i) Direct financing:

There has been a trend to create specific top down programmes, either with functional goal. ie.to support collaborative research, to improve science-industry relationships or with objectives in a certain thematic area. Meanwhile the scope of unspecific bottom-up research programmes has been also extended.

ii) R&D Tax incentives

The set of fiscal and other indirect measures to promote private R&D investment has been further extended.

**4. Looking to the future, what are the main issues that policy makers will need to address regarding support to the business innovation system? Please describe any efforts that have been taken to identify or address them.**

The financial flows between financing and performing sectors show that the Austrian innovation system consists, at least in financial terms, of two mutually rather independent sectors: the corporate sector on the one side, and the public sector plus universities at the other. Funds provided by the public sector mostly flow into research at universities and in the public sector itself, while corporate R&D is financed almost exclusively by the companies through their own capital resources and capital obtained from abroad.

From a financial point of view, the public sector thus has clearly a greater scope of action at universities than in the corporate sector, where research and innovation policies will operate chiefly through the definition of a beneficiary framework.

Better balance direct financing and R&D tax-incentives improve the policy-mix to increase business R&D

#### **Section D: Enhancing collaboration and networking among innovating and research organisations**

**1. Please describe major initiatives to promote collaboration and networking among innovating firms, e.g. via joint R&D programmes, regional innovative clusters, international co-operation (attracting research labs of foreign firms or supporting access of domestic firms to foreign programmes).**

Response:

- CIR-CE ("Co-operation in Innovation and Research with Central and Eastern Europe")

CIR-CE is an RTDI funding programme developed and implemented by FFG /Structural Programmes on behalf of the BMWA. CIR-CE promotes cooperation between innovative Austrian companies and innovative companies from Central- and Eastern Europe. The objectives are to strengthen joint endeavours in the global environment (e.g. the implementation of transnational networks - organised by intermediary organisations (Competence Centres, Technology centres, clusters) and the encouraging transnational projects covering R&D, technology transfer, benchmarking, quality assurance )

Public funding is between 45% and 75%, project duration ranging from 1,5 up to 3 years.

**2. Please describe major policy initiatives to promote stronger industry-science relationships, such as efforts to:**

- Enhance collaborative research (e.g., through changes in regulations governing the types of agreements negotiated between public research organisations and businesses and their implications for access to and exploitation of research results);

Response:

- Increase the mobility of human resources between public and private sectors (e.g. by revising employment and financial rules governing public-sector researchers to allow them to more easily collaborate with industry, move between the public and private sectors, participate in the creation of spin-offs, take equity positions in technology-based firms emerging out of public research, etc.);

Response:

There are programmes run by the Austrian Science Fund (FWF) to finance the employment of young researchers by industry for one or two years.

- Set up new modes of public/private partnerships for research and innovation:

Response: No major policy changes

- Others:

Response:

**3. How has policy shifted in recent years in its support for different channels of industry-science linkages (e.g., collaboration, licensing, spin-outs, public/private partnerships). Please describe any anticipated shifts or changes in policy for strengthening industry-science linkages.**

In order to close the "promotion gap" between basic research and industrial research FWF and FFG have coordinated the programmes "Translational Research" (FWF) and "Bridging Programme" (FFG) under the common roof "BRIDGE". The goal is to refine jointly on the potentials of the basic research and industrial research. Projects are to be submitted due to the requested guidelines of FWF or FFG. Promotion recommendations to the responsible fund committees are based on international appraisals by a council which was established jointly by FWF and FFG.

Initiatives like the Structural Programmes managed by FFG make great contributions to industry-science collaboration in all fields mentioned above.

The Christian Doppler Gesellschaft (CDG) enables in its application-orientated fundamental research projects member companies to have a direct access to new knowledge.

A few programmes administered by ministries, like the Austrian GENome Research Programme (GEN-Au) are also promoting science-industry collaboration.

## **Section E: Globalisation<sup>2</sup>**

**1. Please describe the most important policy issues and objectives with respect to the process of internationalisation of R&D:**

Response:

Austria has succeeded in recent years to attract R&D activities of foreign enterprises. Regarding science and technology, the country is among the most internationalized in the OECD, measured by the share of foreign sources on R&D financing or the foreign ownership of patent inventions. Despite the positive situation, there are also concerns of increased competition from Eastern Europe and Asia which may lead companies to relocate R&D to these countries. Policy issues regarding internationalisation mainly deal with the question of how to keep Austria an attractive location for foreign R&D.

Although being industry-led, Austrian R&D policy is also getting increasingly interested in the European Technology Platforms (TPs), which are supposed to define strategic research agendas in key technology areas. Currently, Austrian representatives are involved in more than 30 TPs. In order to better coordinate and bundle activities of different Austrian industrial, research and policy actors, the RTD Council has suggested developing a national strategy in respect to FP7, cooperation of research funds and intermediaries and a focus on strategic cooperation.

Austria is willing to participate actively within the newly planned European Institute of technology (EIT) via its new to be established Austrian Institute for Advanced Science and Technology.

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<sup>2</sup> Many of these questions on globalisation were asked in a questionnaire circulated in November 2004 in the context of the CSTP/TIP project on globalisation of R&D. 13 countries (Australia, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, Netherlands, New Zealand, Norway, and Poland) replied. These countries are invited report only significant changes since November 2004.

**2. Please identify and describe changes in policies to attract R&D through foreign direct investment. This may concern:**

- Direct financial support
- Fiscal incentives (tax breaks, R&D tax credits ...)
- Administrative support
- Provision of infrastructure
- Public procurement
- Active recruitment of foreign firms
- Advertising
- Other measures:

Please check the boxes above to indicate the types of policies used and provide more detail information here:

Austria is providing administrative support to enterprises willing to locate in the country at the national as well as the local level. Austria's federal inward investment agency (ABA) is actively recruiting RDI and advertising Austria as an investment location.

The Austrian government provides financial support to multinational enterprises for locating R&D facilities and centres of competence in Austria ("headquarter strategy" programme). However, the scheme is open to Austrian-owned enterprises with international activities as well as foreign-owned enterprises and therefore not only a measure to attract RDI, but also to retain domestic multinational enterprises. Criteria for eligibility are (amongst others) supranational R&D mandates and co-ordination competence, a link to local production activities of the company in Austria, a significant demand for research personnel, and linkages to the national science base.

In some cases, there may be also direct financial support from federal or provincial government for specific projects in accordance with EU competition law.

**3. Please describe any changes in the principles concerning the treatment of foreign firms (both non-domiciled firms and foreign-owned subsidiaries) or foreign research institutions in national R&D programmes (e.g., access to national R&D funding programmes, rules for co-operation with domestic public research institutions, rules for co-operation in public private partnerships, public procurement, etc.)**

Response:

There is no positive or negative discrimination against foreign-owned enterprises located in Austria with respect to access to funding or fiscal incentives. Non-domiciled firms are usually excluded from national R&D funding programmes, but are in some cases eligible to funding when they enter into co-operative R&D programmes with Austrian organisations.

**4. Please describe specific measures to support the internationalisation of domestic public research institutions (e.g., such as additional funding for projects with international partners, co-funding for project partners not located in-country, support for setting-up affiliates abroad).**

Response:

Domestic public research organisations are encouraged to expand their operations abroad, but there is no promotional scheme for such activities. However, there is additional funding for Austrian participants in international research programmes like the EU's framework programmes. There are also national programmes with co-funding for project partners not located in-country, ie. to promote co-operation in Innovation and Research with Central and Eastern Europe.

- 5. Please describe measures to link domestic firms, in particular SMEs, to foreign sources of research and innovation, including international co-operation in R&D** (*e.g.*, additional/preferential funding for projects with international partners; co-funding for project partners not located in the country; and support to find international partners, *etc.*).

Response:

There are some measures to promote exports and the internationalisation of production of SMEs, but no specific measures to promote the internationalisation of SMEs in R&D. However, Austrian SMEs have full access to the EU's promotional activities in R&D, which also include the promotion of cross-border technology development, like the Framework Programmes, EUREKA or COST or CIR-CE. To rise the share of Austrian SMEs in EU- R&D projects the Research Promotion Agency (FFG) gives active support (*e.g.* consulting services, additional funding, finding R&D partners) for preparation R&D projects and for participation in such projects (*e.g.* SMEs for life sciences, SMEs for food).

#### **Section F: Human resources<sup>3</sup>**

- 1. Please identify and describe recent efforts to improve supplies of university graduates with science and engineering degrees (both quantity and quality), in particular as relate to the following areas:**

- Raising interest in and awareness of science among youth;
- Revising academic curricula to make science and technology more attractive to students, such as by expanding interdisciplinary training in S&E education;
- Improving teaching in mathematics and science, including through the use of ICT in teaching content and delivery;
- Reducing gender and ethnic minority gaps in science and technology education
- Enhancing financing opportunities for PhD study and post-doctorate training (such as through fellowships, funded research opportunities, *etc.*)
- Improving the quality of secondary university research laboratories/infrastructure
- Demand-side policies to increase the attractiveness of employment in public research organisations, make public sector employment more flexible, or improve provision of information to students regarding job opportunities in the public and private sectors.
- Others:

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<sup>3</sup> These questions are broader than those included in the OECD Questionnaire on the Working Conditions and Attractiveness of Research Careers in the Higher Education and Public Research Sectors (April 2005). Delegates may wish to consult their SFRI delegates in responding to these questions.

Please check the boxes above to indicate the types of policies used and provide more detail information here:

- Raising interest in and awareness of science among youth:

Austria has launched a programme “Lange Nacht der Forschung” in 2005 to improve and promote a better public understanding of the contribution of researchers to society:

<http://www.langenachtderforschung.at/Indf/content/>.

In June/July 2006 a local exhibition “wahr/falsch Inc.” of visions and versions of European research is planned: [http://www.xperimenta.at/call/content/page.jsp?page\\_id=300](http://www.xperimenta.at/call/content/page.jsp?page_id=300)

- Reducing gender gaps in science and technology education:

fFORTE is an inter ministerial initiative recommended by the Austrian Council for Research and Technology Development (RFT) for the advancement of women in research and technology. fFORTE was launched in 2001 by the BMBWK and BMVIT, with the BMWA joining in 2004. fFORTE aims to promote equal opportunities for women in research and technology, and each ministry has undertaken specific tasks that address target groups in line with the respective ministry’s portfolio of responsibilities.

Whereas ongoing measures taken by the BMBWK primarily concern schools and universities as well as scientific research (choice of professional career and study course, scientific careers of women, cross-disciplinary research), FEMtech-fFORTE addresses industrial and extra-university research as well as senior technical colleges and technology policy programmes run by BMVIT. w-fFORTE aims at new target groups such as (potential) female founders, inventors and re-entrants after parental leave, i.e. highly qualified women who are to be supported in their efforts to acquire a professional position that corresponds to their qualification regardless of their age and current employment situation. The strategic focus of fFORTE is co-ordinated by an inter ministerial co-ordination group.

In 2004, many new activities were spawned with regard to women in research and technology. The Austrian Council for Research and Technology Development RFT recommended to allocate funds for new measures within fFORTE-academic and FEMtech-fFORTE and for six measures within the new w-fFORTE scheme. A programme known as Professorinnen x2, a new measure within fFORTE-academic, aims to double the number of women professors at Austrian universities. The new measures of FEMtech-fFORTE span networking, a database for women experts and an increase in the proportion of women at Fachhochschulen (senior technical colleges), extra-university research facilities and enterprises. In 2004, w-fFORTE concentrated on the development of these new measures. Another activity was the establishment of an interministerial working group on gender mainstreaming (GM) made up of members from the three ministries and the RTF office.

- Enhancing financing opportunities for PhD study and post-doctorate training (such as through fellowships, funded research opportunities)

The new mobility and research grants database contains grant options for students and researchers in Austria, for the incoming (to Austria) and the outgoing (from Austria to ...): [www.grants.at](http://www.grants.at).

Information on fellowships and grants as well as job opportunities for researchers (listings from the European Research Opportunity Database, vacancy listings on institutions' and companies' own websites, links to job search engines offering research vacancies in Austria are available at the “Researchers Mobility Portal Austria”): [//www.researchinaustria.info/](http://www.researchinaustria.info/)

There are ongoing discussions in context with the Bologna process and the implementation of PhD studies at Austrian Universities.

- Improving the quality of secondary (?) university research laboratories/infrastructure

To strengthen co-operation between science and business and to improve the universities' international competitive standing the bm:bwk has invested since 2001 for the quality of the infrastructure on universities 176,5 Mi €.

- .....improve provision of information to students regarding job opportunities in the public and private sectors

Information on Austrian job opportunities for researchers are available at the "Researchers Mobility Portal Austria" (listings from the European Research Opportunity Database, vacancy listings on institutions' and companies' own websites, links to job search engines offering research vacancies in Austria): //www.researchinaustria.info

**2. Please describe recent policy changes to enhance the international mobility of scientific and high-skilled personnel, including programmes to attract foreign (and expatriate) talent and encourage students/workers to gain international experience. Consider such policies as:**

- X Changes in immigration legislation;
- Funding of scholarships, grants for international mobility of students/scholars;
- Creation of special positions at universities or public research centres;
- X Fiscal incentives (*e.g.*, income tax breaks) for foreign workers
- X Programmes to promote return migration of expatriate students, scientists and engineers
- Other measures:

Please check the boxes above to indicate the types of policies used and provide more detail information here:

- Changes in immigration legislation:

Two legal amendments regarding admission procedures and work permits for foreign researchers were implemented in 2005:

- Formally only stipulated by regulation the exemption from work permits or quotas for foreigners active in teaching and research has now been included in the "Employment Act for Foreigners" ("Ausländerbeschäftigungsgesetz")
- The implementation of the act on the right of remain and the right of residence ("Bundesgesetz über die Niederlassung und den Aufenthalt in Österreich 2005") provides for facilitated admission and residence issues for third country researchers. Within this act the certification of research institutions is foreseen. Researchers who are employed by such institutions obtain the residence (and work-) permits without additional examination through the legal authority.
- Programmes to promote return migration of expatriate students, scientists and engineers:

One instrument here is BrainPower Austria, which provides both financial and facility support (e.g. internet platform for Austrian researchers to connect with each other across the world, job advertisement, etc...)

Another important programme is the Erwin-Schrödinger Auslandsstipendium, which was made available for foreign and Austrian researchers abroad to return to Austria and establish a research group. Scientists who wish to return to Austria following a period of research abroad may now apply for financial support through the 'Independent Scientist' (Selbstantragstellung) programme, a more flexible mechanism which replaced the previous 'Follow-up Programme' in the Erwin-Schrödinger family of programmes.

- Fiscal incentives (e.g., income tax breaks) for foreign workers :

Two legal amendments regarding taxation were implemented in 2005:

- - A new regulation ("Zuzugsbegünstigungsverordnung") enables in addition to universities also institutions active in research in the non-university and private sector (enterprises) the facilitated employment of foreign researchers through fiscal measures.
- - The regulation "Doppelbesteuerungs-Entlastungsverordnung" concerns restricted tax obligations and regulates the national implementation of provisions of the double tax agreements through a simplified administration.

In addition, there is also now a tax allowance ("Zuzugsbegünstigung") for foreign researchers/highly skilled workers through which they can ensure that their taxation level in Austria will not be higher than their previous country of residence. The **Zuzugsbegünstigung** is a tax privilege for foreign researchers and scientists who move to Austria. It is regulated at § 103 of the income tax act (Einkommenssteuergesetz, EStG). The person has to live and work as researcher or scientist in Austria and his work is of public concern (e.g. his work is serves for the advancement of research and science in Austria).

If the person moves to Austria the foreign worker becomes subject to taxation, with all his income from both at home and abroad, in Austria (§ 1(2) EStG). If the worker's main residence is not in Austria only the income in Austria will be subject to taxation. It might be that the taxes for the income from abroad is higher in Austria than in country of origin, in that case the law says that this additional amount of taxes does not have to be paid. In order to get this tax privilege the person has to prove that the tax burden in Austria is higher than before by preparing a calculation (Mehrbelastungsrechnung). The finance minister can then correct his tax burden.

**3. Please describe recent policy efforts to foster development of specific skills other than S&T skills needed to foster innovation in a knowledge-based economy (e.g., management, communication, legal), notably as relates to the service sector.**

**Response:**

"Doctoral Programs" (Austrian Science Fund) The education and training of PhD candidates includes "soft skills": <http://www.fwf.ac.at/en/projects/dk.html>

A programme run by BMVIT called "*Scientists for the Economy*" is set up to train scientists on business and commercial skills and make them adept to working in the business sector.

**4. Please describe any major shifts or changes in the priorities and mix of instruments used for developing human resources for innovation, e.g., between development of domestic talent versus attraction of foreign talent; between development of S&T skills and non-S&T skills; between stimulation of demand and development of supplies; between support for teaching and support for research; etc.**

Response:

Tax allowance for highly skilled foreign workers is a major change in this context.

A light shift to non S&T skills can be observed ( see Point 3 )

**5. Looking to the future, what are the main changes anticipated in the supply and demand for human resources, and what are the main policy challenges that policy makers will need to address? Please describe any efforts being made to identify future challenges or develop future policy directions.**

The main challenges in the future are:

- - Creation of career prospects and the increase of attractiveness of research careers
- - Gender balance
- - Increased competition for research personnel and a shortage of human resources for R&D activities, particularly in the industrial and business sector. This anticipation is supported by two main trends, continued growth in R&D activities and expenditures worldwide, and the shrinking proportion of young people saying that they would choose a career in science and technology.

**Section G: Policy evaluation**

**1. Please describe recent changes in policies regarding ex-ante or ex-post evaluation of innovation policies and programmes, including new legislation or regulations, methodologies employed, criteria considered and the organisations/institutions that perform the evaluations.**

Response:

Programme orientation together with the increasing propensity of ministries to outsource the management part have accelerated the creation of dedicated programme management capabilities at the agency level. The pressure to adopt good practices and quality standards in program management has increased. Evaluation has been increasingly used to assess performance and impacts of launched measures. The establishment of the Platform Research & Technology Policy Evaluation in 1996 underlines the progress made in anchoring evaluation as learning instrument within the policy making process. Among the members of the platform one finds the three ministries involved in innovation policy, the major funding agencies as well as a group of policy consulting and research firms. As for the state of affairs, the platform has launched evaluation standards and runs a workshop program which aims at improving the spread of good practices in evaluation. The Austrian council has supported the systematic use of evaluation by introducing evaluation requirements in its assessment scheme for new programs. Furthermore it has put forth an evaluation strategy for evaluating programs financed by additional financial resources invested by the government in recent years ("Sondermittel").

**2. Please describe recent changes in policies regarding the evaluation of public research organisations, including legislation or regulations requiring evaluation, methodologies employed, criteria considered and the organisations/institutions that perform the evaluations.**

Response:

Since the beginning of 2004 the Austrian Agency for Quality Assurance (AQA) gives advices and support to the tertiary education sector in all matters of quality assurance and evaluation.

**3. Please outline any significant changes in the priority given to evaluation in innovation policy, including the motivations for such changes and anticipated effects. Please include information**

**about additional resources being invested in evaluation and approaches used to ensure that results of evaluation feed-back into policy making.**

Response:

Evaluation provides a better basis both for the development of new promotion programmes and laws, and for the assessment of existing ones. Since its founding the Austrian Council for Research and Technology Development has urged the evaluation of the institutional structure of the national innovation system and the most important programmes. Since the beginning of 2004 the findings have been available for Austria's two most important promotion instruments: The first was the evaluation of the Austrian Science Fund (FWF) and of the Fund for the Promotion of Industrial Research (FFF). The results showed that both organizations work well and efficiently. To draw more benefit from the existing potential and create a modern funding structure, the report suggested to tighten the governance structures and reduce the influence, of recipients and ministries on the funding guidelines. The second important evaluation was the assessment of the Competence Centre-program. The objective of the assessment was the support for the strategic decision-making of the two responsible ministries regarding the future of the K-programs and centres/networks.

**4. Please provide information or web-links, if available, about the outcomes of recent major evaluations of R&D or innovation policies.**

Response:

Platform Research & Technology Policy Evaluation <http://www.fteval.at/home.php?lang=en>

Researcher's Mobility Portal Austria [www.researchinaustria.info](http://www.researchinaustria.info)

AQA - Austrian Agency for Quality Assurance [www.aqa.ac.at](http://www.aqa.ac.at)