

Country Indicators

Population: 8,4 million (2011)

GDP per capita: 35800 (2011)

R & D intensity(GERD/GDP): 2.76 (estimate) (2010)

Share of private sector R&D: 68.09 (estimate) (2010)

Share of public sector R&D: 31.44 (estimate) (2010)

Overview

Austria is one of the smaller EU Member States accounting for less than 1.7% of the population of the EU-27. The country belongs to the richest EU Member States with a GDP per capita of €34,120 in 2011. Also the economic development of Austria in the last three years was constantly above the EU average.

At the R&D input side, Austria belongs to the EU countries with the highest GERD/GDP rate, which is 2.78% in 2010. However, the last three years did not show a new impetus but rather a conservation of achievements from the past. The financial and economic crisis and the resulting requirements for consolidation of the public budgets revealed structural deficits which were previously covered under the fire signal of growing R&D expenditures in the years before. Pressured by the need to consolidate the public household, R&D policy since 2009 focuses on increasing the efficiency of the system (or of its core elements) rather than on the expansion of input-sided measures.

In order to reduce the yearly overall public household deficit to 2.5% in 2013, a cost saving package is currently planned which should become effective as of May 2012. Presumably, education, R&D and innovation are considered priority policy fields that will be least impacted by consolidation measures.

This leads to the assumption that it will be very difficult to achieve the ambitious goals indicated in the [government's RTDI strategy](#)

Basic Characterisation of Research system

In Austria, the last 10 years were characterised by a substantial catching-up process in R&D. R&D expenditures have nearly doubled in the past decade. In 2009, the country's total investment in R&D amounted to €7.546b or 2.72% of GDP. It is estimated that GERD in % of GDP is 2.76% in 2010, significantly higher than the EU average of around 2%. Although this is below the Barcelona target of 3% in 2010, Austria experienced the fastest growth rate among all EU countries (+0.63 percent points between 2000 [1.94%] and 2007 [2.57%]) aiming to advance from an innovation follower to an innovation leader.^[1]

Within the [National Reform Programme](#)

, RTD and innovation is one of seven strategic fields. After parliamentary elections in autumn 2008 a new coalition government was formed. R&D policy was supposed to remain similarly high on the agenda as before, and two chapters of the government's programme (see section 'Current Research Policy Goals') deal with issues of science, research, technology, and innovation.

In the last two years Austria continued its efforts to transform from an innovation follower to a European forerunner in R&D and innovation. A comprehensive R&D system evaluation of Austria's R&D funding, the results of which were presented and widely discussed as of mid 2009, highlighted several of the lessons to be learnt to advance this transformation. Arguably most fundamental in this respect were the strategic recommendations

- to enlarge from a narrow innovation policy towards a broader approach including linkages towards educational policies and other social and economic framework conditions,
- to transform from fragmented to coordinated and consistent public interventions based on a shared vision and a joint strategy,
- and to advance from an imitation to a more radical innovation strategy.

Despite the fact, that Austria was hit by the financial crisis and the subsequent need to consolidate the public budget, there is still the political target to invest 3.76% of GDP for R&D in the year 2020 (with a public/private split of 1:2), 2% of GDP for the tertiary sector and 1% of GDP for basic research. The [national R&D&I strategy](#),

which was published in March 2011, reflects these long-term targets, but does not provide a multi-annual roadmap.

Besides the considerable growth in R&D investment, which was also expressed by a steep increase of GBOARD, other visible efforts are structural and organisational reforms in the Austrian research and innovation system, where several policy plans have been implemented in recent years: in 2000 the [Austrian Council for Research and Technology Development \(Austrian Council\)](#) was established as a strategic advisory body to advise the government in all matters related to R&D policies, and the [Austrian Science Board \('Wissenschaftsrat'\)](#) was established in 2004 to give advise related to universities and science policy matters.

The organisational structure of public funding for R&D and innovation has been reshaped, mainly through mergers of previously separate funding bodies and agencies. Funding for applied R&D and for innovation in Austria is now managed by two large agencies: the Austrian [Research Promotion Agency \(FFG\)](#)

and the [Austria Wirtschaftsservice \(AWS\)](#). The underlying objective is the separation of tasks between the ministries and the funding agencies, i.e. between the level of policy making and the operative level. This effort was also visible in the systematic introduction of programmes as key instruments for competitive funding of R&D in Austria.

Moreover, the Austrian university system was reformed through the [University Act of 2002](#) which grants full autonomy to universities. Performance contracts between each university and the [Ministry of Science and Research \(BMWF\)](#) with a duration of three years have been signed first in 2007. Accordingly, institutional funding is now basically provided through three-year global budgets.

Another indicator of the attention that R&D policy has gained in the general agenda of the government is the upscaling of a [tax allowance](#)

system as a fiscal incentive towards increased R&D expenditures in the private sector.

	2007	2008	2009	2010	EU average 2010
Real GDP growth rate	3.7	1.4	-3.8	2.3	2.0
GERD as % of GDP (R&D intensity)	2.51	2.67 e	2.72	2.76 e p	2.0 s
GERD per capita	829.1	907.4 e	895.2	942.1 e p	490.2 s
Total civil R&D appropriations (GBOARD) in million Euro	1,770.12	1,986.63	2,149.78	2,412.59 p	86,428 s
Total R&D appropriations in % of GDP (GBOARD as % of GDP)	0.65	0.70	0.78	0.84 p	0.76 s
BERD in million Euro	4,845.9	5,323.6 e	5,092.9	5,372.7 e p	151,125.561 s
BERD as % of GDP (Business sector R&D intensity)	1.77	1.85 e	1.85	1.88 e p	1.23 s
GERD funded by abroad as % of GERD	17.9	16.4 e	16.8	16.4 e p	8.41, S
HERD as % of GERD (R&D performed by HEIs as % of GERD)	23.8	25.0 e	26.1	26.1 e p	24.2 s
GOVERD as % of GERD (R&D performed by PROs as % of GERD)	5.3	5.3 e	5.3	5.3 e p	13.3 s
BERD as % of GERD (R&D performed by Business sector as % of GERD)	70.6	69.3 e	68.1	68.1 e p	61.5 s
Doctorate graduates (ISCED 6) per 1,000 population aged 25-34	2.0	-	2.11 IUS	-	1.51 IUS
Share of the population aged 30-34 having completed tertiary education	21.1	22.2	23.5	23.5	33.6
Employment in Knowledge-intensive service sectors as share of total employment	30.0	31.5	n.a.	n.a.	32.962
HRST as a share of total labour force (EUROSTAT)	37.6	37.8	39.0	39.2	40.5

Source: Eurostat.

Note: Data were updated end of Nov 2011 by EUROSTAT

S: Eurostat estimate

E: estimate

P: provisional value

1: 2009 average

2: 2007 average

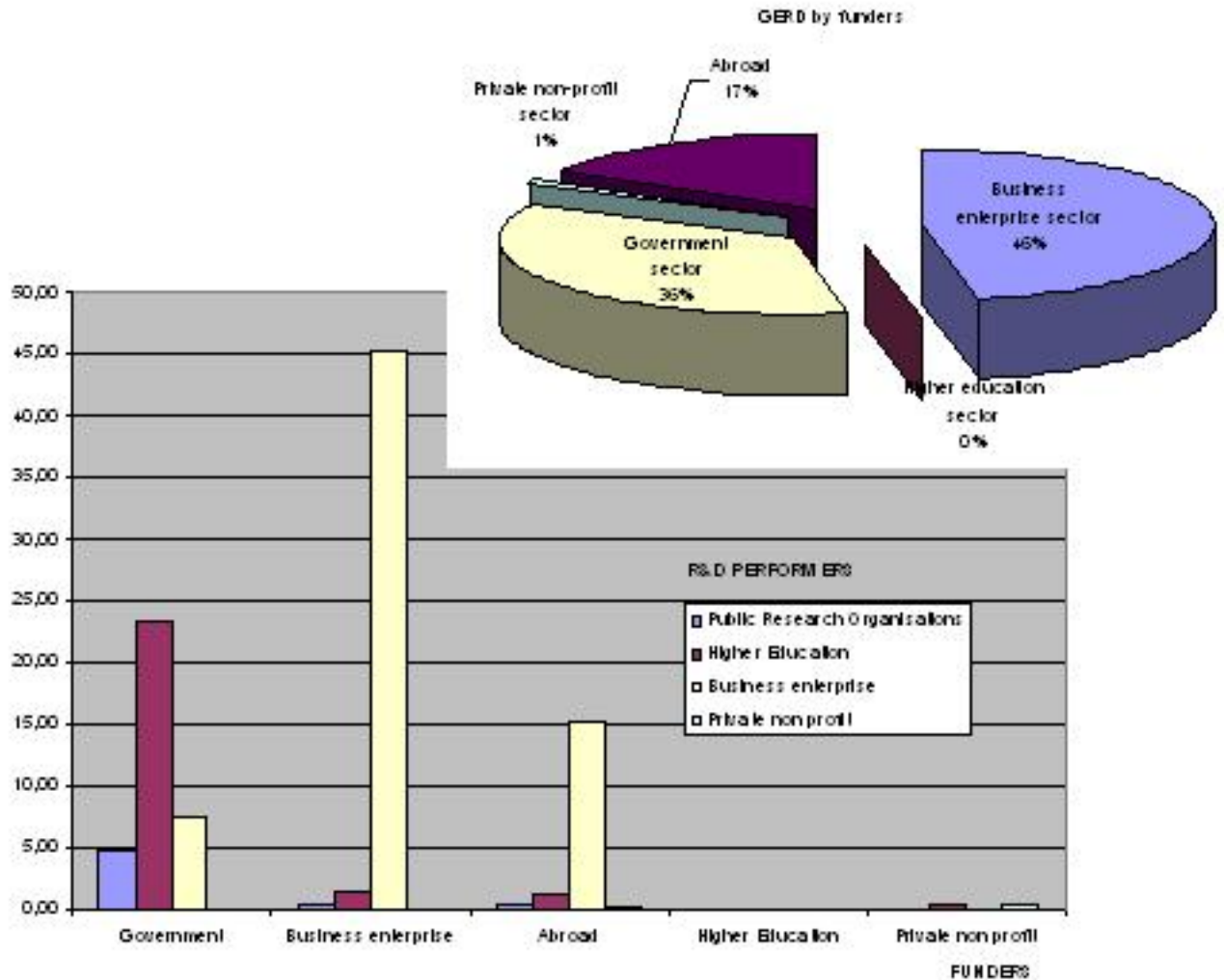
IUS: data from Innovation Union Scoreboard 2011

Although Austria has a federal system, the main actors in research and innovation governance are at the national state level. R&D policy is also implemented at the regional level, but the budget appropriations by the federal states (Bundesländer) are rather moderate.

[1]

BMWF, BMVIT and BMWFJ 2010

Funding Flows



The funding flow diagram is based on the most recent inventory census data of R&D expenditure in Austria from 2009. The total volume of R&D expenditures in 2009 was 7,479.75m (2007: 6,867.82m). Statistik Austria estimates that Austrian R&D expenditure will exceed 8b in 2011.

As in the previous years, R&D expenditure has grown faster than the GDP, and consequently the percentage of GDP spent on R&D has increased, reaching 2.52% in 2007 and 2.79% in 2009. In 2010 and 2011, however, the GERD/GDP ratio will remain at constant level.

The three major sources of financing R&D in Austria are the corporate sector, the public sector and international sources. R&D funding by the higher education sector is included in the data for the public sector and not separately available. The main R&D performing sectors are the corporate sector, the higher education sector and the public sector. The corporate sector comprises two sub-sectors: the business sector, i.e. for-profit manufacturing and service enterprises, and the cooperative sector which comprises non-profit oriented research institutes performing R&D for companies.

The corporate sector is the largest R&D sector in Austria: in 2009 it financed 47.0% (2007: 48.7%) of R&D in Austria and it accounts for 68.1% (2007: 70.6%) of R&D performed in terms of volume. A conspicuously high share of business R&D, slightly above 22%, is financed from foreign sources.

The public sector funded 35.6% of R&D expenditures in Austria in 2009 (2007: 32.9%). This is a sharp increase compared to 2007. It is caused by anti-cyclical R&D investment by the public sector and by stagnating R&D investments of the corporate sector. The public sector allocated 65.6% (2007: 63.9%) of its funds to the universities (which is an increase of almost 2 percentage points compared to 2007), 21.1% (2007: 22.1%) to the corporate sector and 13.2% (2007: 13.9%) to research in the public sector, whose overall financial share stagnates already since the first half of the last decade. It seems that the trend of the last years, which was characterised by an increasing share of public R&D appropriations to the corporate sector and decreasing public R&D funding for the HES, came to a halt. Within the public sector the financial distribution is as follows:

- National government: 73.68 (2007: 72.97%)
- Provincial governments ('Laender'): 10.27% (2007: 11.64%)
- Municipal governments: 0.33 (2007: 0.38%)
- Others: 15.72% (2007: 15.00%). This category includes the higher education sector as a funder and bottom-up competitive funding by national agencies (FWF, FFG)

Funding from abroad is the third most important source for financing R&D in Austria. The larger part of this money is spent by foreign companies and international organisations; short of 10% of funding from abroad are from the EU.

The private non-profit sector in Austria is small and accounts for a low share in both financing and performing R&D (0.56% and 0.48%). Compared to 2007, however, its importance as funding sector increased by 30% (in absolute appropriations) and it even could double its R&D finances as performance sector. This might also be caused by statistical underestimations of this sector in the previous years. The private non-profit sector depends to a large extent from its own sources and financing from abroad (incl. EU).

Structure of the research system

Policy level

The Austrian Parliament wields legislative power. Two committees deal with research related matters: the Committee on Science and the Committee on Research, Technology and Innovation which was established by the current coalition government in 2007. In practice, the policy debate and the development of new policy measures in S&T takes place outside the parliament to a large extent and the main drivers are the ministries in charge.^[1]

At the federal level responsibility for research and technology policy is borne by three ministries: the [Ministry of Science and Research \(BMWF\)](#)

, the [Ministry of Transport, Innovation and Technology \(BMVIT\)](#), and the [Ministry of Economy, Family and Youth \(BMWFJ\)](#). There is no formal mechanism of co-ordination between these ministries. The Ministry of Finance (BMF) governs the allocation of financial resources and sets, at least implicitly, standards for the design, implementation and monitoring of programmes. Thus it plays an important role within the research policy system even though it is not directly responsible for the Austrian R&D policy.

There are two major advisory bodies: the [Austrian Council for Research and Technology Development \(Austrian Council\)](#), established in 2000, advises the government on all matters related to research, technology and innovation. The [Austrian Science Board](#) is the main advisory body for all university-related matters. It advises the BMWF and also the parliament and the universities.

Operational level

Funding for research, technology development and innovation is managed by three major agencies on behalf of the ministries: the [Austrian Science Funds \(FWF\)](#)

is the major body for the promotion of basic research, the [Austrian Research Promotion Agency \(FFG\)](#) is the major funding body for the promotion of applied research and development, and the [Austria Wirtschaftsservice \(AWS\)](#) is specialised in funding innovation projects in companies and hosts the secretariat of the [National Foundation for Research, Technology and Development](#).

Research performers

The biggest research performers in terms of volume are the universities and the business enterprise sector. The scope and share of research carried out by non-university research institutes has increased in recent years, not least due to several targeted promotion programmes, whereas the private non-profit sector accounts for a very small share.

[1]

Hofer 2009

Recent Research Policy Developments

On 8 March 2011, the [Austrian Federal Government's Strategy for Research, Technology and Innovation for the next decade was launched](#)

. According to its motto *realising potentials, increasing dynamics, creating the future: becoming an Innovation Leader*, this strategy addresses measures to strengthen national research structures with a focus on excellence, to foster the innovative capacity of companies, enable thematic priority setting, raise the efficiency of governance, and linking research, technology and innovation to the education system. The strategy should also help to mobilise research, technology and innovation for the grand challenges of society and the economy. Hence, with its 2020 perspective, the strategy is considered a guideline to approach the Europe 2020 national

R&D target, and to contribute to the implementation of the Innovation Union. The Austrian R&D target for 2020 is 3.76%. Within three months the high level research, technology and innovation Task Force constituted herself on 22 June 2011 to organise and supervise the implementation of the strategy.

In April 2011, Univ.-Prof. Dr. Karlheinz Tschäpferle, former rector of the University of Innsbruck became **new minister of science**. His predecessor, Dr. Beatrix Karl, became minister of justice.

In May 2011, the **evaluation of the FEMTECH programme**

has been published (Gerhardter et al. 2011). The evaluation summarizes that the combination of awareness and promotional measures has worked to address the topics of equal opportunities and promotion of women in the RTI political area. However, the evaluation recommends a reduction of the measures' heterogeneity as well as an improved communication for the purpose of an adaptation to the needs of the target groups is required in order to exploit the existing potentials.

In July 2011, the **evaluation of the COIN programme**

has been published (Warta and Geyer 2011). It identified several shortcomings connected to the heterogeneity of the target groups, which calls for better focusing efforts in the future. Moreover, a lack of precise requirements and assessment criteria was criticised, which rather led to projects with low additionality. Also a vague USP and delineation with other programmes was identified.

In August 2011, the **evaluation of the**

innovation voucher instrument, which was implemented in 2007 in Austria, has been published (Good and Tiefenthaler 2011).

Overall, the innovation voucher programme was well perceived by SMEs. The evaluation ascertained a high satisfaction in terms of networking, new divisions of labour between SMEs and research organisations, knowledge transfer and innovation stimulation.

Regarding a better **assistance for migrants in terms of acquisition of German language skills**

, the policy debate in the second half of 2011 centred on the sources of financing language training for children prior to school enrolment. A solution was found in October 2011. Progress could also be attained in facilitating the usage of the human capital of third country foreigners who graduated in Austria. They are now entitled to enter the Austrian labour market immediately after their final study degree without undergoing the more heavy procedure which is foreseen for third-country foreigners who live abroad and who are looking for job opportunities in Austria.

A **performance contract for the Austrian Academy of Sciences**

, (ÖAW), Austria's largest non-university R&D organisation, has been concluded on 4 November 2011 for the very first time. This was not free of frictions. For the performance contract period 2012-2014 a global budget of € 224m has been agreed (plus additional dedicated funds for fellowships and international programmes as well as membership fees), which would - if no countermeasures are taken - result in a deficit of around € 38m to € 40m due to liabilities of previous years and increasing personnel costs.

On 24 November 2011 the **Austrian Council**

called for a further **upgrading of the research premium for smaller enterprises**, although the research premium already increased at 1 January 2011 from 8% to 10%. Furthermore, the Austrian Council encouraged the introduction of 'proof of concepts' measures and a generally more benevolent evaluation of risky R&D projects submitted to public funding programmes.

Moreover, in November 2011 the **Austrian Council**

recommended a number of further improvements, such as

- the inclusion of technology transfer activities in performance contracts of universities,
- the introduction of formal return-options for failed academic spin-offs,
- the introduction of 'proof of concepts' measures,
- a generally more benevolent evaluation of risky projects,
- a preferential fiscal treatment of capital used for venture capital and business start-up financing,
- an increase of the research premium (especially for smaller enterprises) and
- an improvement of the services of the Austrian Patent Office.

On 20 December 2011 a Decision was taken by the Council of Ministers **to replace the Hauptschule (grammar schools) by the neue Mittelschule (new secondary school) until 2019**

. This school type foresees a differentiation between basic general education and advanced general education in the field of German, mathematics and a first foreign language in the last 2 years. The assessment of advanced general education should correspond to the Gymnasium qualification level and, thus, should make the transfer into higher secondary schools easier. Team teaching and additional six hours of school education are foreseen to attain this qualification level.

On 21 December 2011, **core elements of the higher education plan (Hochschulplan) were presented**

to the public by the Minister of Science and Research. The plan foresees a radical reform of the financing systems of universities in the years to come (including access resp. capacity limitations for certain fields of study, a re-introduction of tuition fees and compensation payment for non-Austrian students).

In February 2012, a number of **Austrian universities decided to re-introduce students fees**

Research Policy Goals

Since 2000 the Austrian governments have taken comprehensive measures to strengthen the competitiveness of the Austrian economy. The National Reform Programmes comprise mainly R&D-related measures already initiated, planned or started before and / or

outside the NRP and the NRP rather puts them into a new context. After the premature new elections in September 2008, the federal government basically adhered to the seven reform priorities laid down in 2005. The NRP as well as all implementation reports are available for download on the website of the EC.

With respect to R&D and innovation the following objectives have been set out in the NRP:

- to develop a comprehensive research strategy for 2020
- to prepare a national action plan to enlarge the career opportunities and mobility of researchers
- to support cross-border research co-operation by enabling transnational programmes among EU Member States
- to promote the participation in European research infrastructure
- to define 'priority regions' for international co-operation beyond the EU.

The objective to raise R&D investment to 3% of GDP by 2010 has been undisputed and is confirmed in the second NRP.

The new government programme 2008-2013 defined the following goals for Austria's R&D policy:

- To increase the share of national R&D expenditure to 3% by 2010 and to aim for 4% by 2020. Through additional public funding a further increase of private R&D spending with a special focus on SME and the attraction of industrial research headquarters should be triggered. In fact, however, the government refrained from the 4% objective and defined 3.76% until 2020 as new goal.
- To develop a comprehensive national R&D policy strategy and to improve efficiency and coherence of R&D public funding based on the results of the 'system evaluation' which finished in mid 2009. The national R&D strategy was published early 2011.
- To reform the institutional funding for non-university research institutions by introducing multiannual budgets based on performance targets. This reform is not yet accomplished.
- To develop human resource by a set of new and existing measures, with a special focus on young and female researchers as well as on mobility. New career models shall be developed and implemented at Austrian public universities and a quantitative target has been set for tertiary education, i.e. to increase expenditures to 2% of GDP.
- To foster international co-operation of all Austrian research performers especially within the European Union.
- To strengthen basic research as the necessary prerequisite for innovation through an 'initiative for excellence'.
- To support mission-oriented research which aims at solving societal problems, e.g. climate change, aging of society, migration etc.
- To further develop the Austrian public universities after the University Act 2002 and to improve universities' research infrastructure.

The [national R&D&I strategy](#).

Research Policy Focus

Thematic R&D priorities

GBAORD is around € 2.4b in 2011, which is basically at the same level as 2010. The highest shares of GBAORD in 2011 by socio-economic objectives can be found in the categories promotion of the general advancement of knowledge (29.8%), promotion of industrial production and industry (25.6 %), and promotion of health (21.6 %).^[1]

Around two thirds of direct public funding is distributed via bottom-up programmes which are not pre-assigned to any thematic priority.

The multitude of structural and thematic programmes shares the rest.

Thematically targeted R&D priority funding still remains relatively small in Austria. Most thematic R&D programmes are managed by FFG, which spent around 24% (2009: 27%) of its funds on thematic programmes on behalf of the ministry in charge.

Apart from one exception in the field of agriculture and environment, the respective thematic programmes are launched by the ministries responsible for RTDI and not by sectoral ministries. Generally speaking, thematic programmes support application-oriented research and technology development in collaborative projects (making science-industry cooperation a non-thematic priority in many thematic programmes) or industrial research projects in a moderately pre-defined thematic field, and they are normally complemented by a set of specific additional measures (e.g. networking, feasibility studies etc.). The typical target groups are universities, research institutes and companies. Projects can normally be submitted during limited calls for proposals and they are selected for funding in a standard selection procedure, generally involving assessment by national and international experts. For more information about thematic activities in Austria please follow the links to the respective programme templates.

According to the FFG statistics for 2010, a total of € 134m (2009: € 138m) were provided to thematic programmes by the responsible ministries in the year 2010. The budget was allocated to thematic priorities as follows (2010 data):

- technologies for sustainable development (incl. energy) (€ 51.2m) (2009: € 38.2m),
- ICT (€ 30.1m) (2009: € 26.4m),
- transport technologies (incl. aeronautics) (€ 37.9m) (2009: € 26.8m),
- genome research (€ 1.3m) (2009: € 21.5m),
- nano-sciences and nano-technologies (€ 1.8m) (2009: € 14m) and
- security research (€ 11.5m) (2009: € 11.4m).

For comparison: FFG managed a total funding budget (incl. guarantees) of approx. € 552m in 2010 (2009: € 545m).

In addition, the Climate Change and Energy Fund (KLIEN) provides funding, among other things, for R&D projects that develop sustainable energy technologies.

[1]

Statistics Austria, http://www.statistik.at/web_en/statistics/research_and_development_r_d_innovation/government_r_d_budget_analysis/index.html; accessed on 23 February 2012

Sectoral policies

Sectoral R&D policies are mainly implemented through thematic programmes. The 'traditional' backbones of direct funding, however, have been (and still are) the bottom-up project funding instruments offered through [FWF](#) and [FFG](#). During the last decade an increasing number and variety of targeted thematic and structural support programmes have been launched, addressing all sorts of structural deficits of the Austrian innovation system and promoting selected fields of science and technology. Analyses show that the culture of R&D cooperation in Austria has improved significantly and that the formerly missing link between science and industry is no longer a first order problem, however, still an issue in Austria's R&D policy.

A variety and a large number of policy measures in support of collaboration, networking and clustering have been designed and implemented. Among the public-private cooperation measures the 'competence centres' programmes is the most visible and " in terms of budget - largest activity. This programme promotes the long-term strategic R&D cooperation between companies and research institutions.

One of the first initiatives addressing the science-industry link in long-term collaboration was the Christian Doppler Research Association's programme of so-called [CD-Laboratories](#)

at universities, jointly funded by the [BMWVJ](#) and industry partners. In a similar way, the [Josef Ressel Centres](#) support public-private cooperation between business and universities of applied research. The [Ludwig Boltzmann Society](#) funds research in medicine, social sciences and humanities. It brings together researchers and partners from practice, but not necessarily from business.

On the level of research projects, the [BRIDGE](#)

programme has been developed to close a previously identified funding gap between projects in fundamental research and industrial development.

Collaborative projects are also one of the main funding instruments in thematic programmes. Furthermore, thematic cluster initiatives were launched by regional governments, Styria and Upper Austria being the pioneers.

In order to stimulate firms which do not perform R&D yet to get involved in R&D activities a low-key [voucher programme](#) is carried out since a few years. Another important element to broaden the number of R&D performing companies is indirect funding. It has been extended and grown significantly within only a couple of years ([innovation voucher plus programme](#)).

The [AplusB](#)

programme supports academic spin-offs mostly from universities and the [headquarter programme](#)

Overview

Data 2009	Burgenland	Kärnten	Nieder- Österreich	Ober- Österreich	Salzburg	Steiermark	Tyrol	Vorarlberg	Wien
Regional GERD as a percentage of Regional GDP	0.71	2.46	1.53	2.59	1.38	4.32	2.78	1.60	3.54
Regional BERD as a percentage of Regional GDP	0.63	2.10	1.35	2.32	0.86	3.07	1.56	1.47	1.77
Total R&D personnel (FTE) in the region (in 1000)	0.4	2.5	4.3	8.0	2.0	10.0	4.1	1.6	20.5

Whilst R&D policy is originally under the responsibility of the central government and has been a de facto monopoly of state-level policy making, beginning in the mid 90ies the Federal States started to implement their own RTDI policies with a strong focus on innovation. This process was triggered (i) by EU membership (Structural Funds), (ii) impulses for a more regional focus triggered through central government initiatives (e.g. competence centres) and (iii) by the availability of additional money mainly from privatisation of energy utilities and banks. Today, 7 out of the 9 existing federal states show an explicit research policy. Each federal state has either a own future-, science-, research- or innovation-concept or at least a strategic RTDI orientation embedded in other strategy documents at federal level.

In most cases, regional R&D policy is more or less innovation oriented; however, in Vienna, Styria, Salzburg and Upper-Austria, a strong research policy focus can also be observed.

This process of regionalisation outlined above has been accompanied by a process of 'agencification'. In the course of one decade, beginning in the mid-90ies, each Federal State has established and operates at least one development agency, developing and delivering measures, programmes, services.

On average, the Federal States together account for slightly below 4% of the total Austrian R&D expenditures. In terms of public funding, their share in R&D funding is around 10.3% of the entire public funding.

The breakdown of the total 2009 R&D expenditures by L nder (Federal States) showed that Vienna accounted for 31.8%; Styria, for 19.8%; and Lower Austria, for 12.1%. (The other figures are: Tyrol, 10.6%; Upper Austria, 9.2%; Carinthia, 7.6%; Vorarlberg, 4.7%, Salzburg, 3.4%, and Burgenland 0.9%).

In 2009, only Styria (4.32%), Vienna (3.54%) and Tyrol (2.79%) are exceeding the Austrian average in terms of GERD in % of gross regional product (2.72%), which underlines the relative R&D importance of these federal states compared to the other Austrian federal states. Upper Austria (2.59%) and Carinthia (2.46%) are close to average. Vorarlberg (1.60%), Lower Austria (1.53%), Salzburg (1.38%) and Burgenland (0.71%) show the lowest shares (Source: Statistics Austria).

In 2009, 20,254.3 full-time equivalents in R&D were employed in Vienna. This is a share of 35.9% (2007: 38%). 19% of FTE in R&D were employed in Styria, 16% in Upper Austria, 8.5% in Lower Austria, 8% in Tyrol, 5% in Carinthia, 4% in Salzburg, 3% in Vorarlberg and 0.8% in Burgenland (Source: Statistics Austria, own calculations).

Regional research programmes

As far as RTDI policy of the Federal States is concerned, their main focus is more on the innovation side. The main activities throughout most of the Federal States are (i) incubators (or similar innovation infrastructures), (ii) cluster initiatives, and (iii) co-financing of federal programmes.

With regard to innovation infrastructures, Austria is operating more than 100 sites throughout the country, which is, in an international view, a very high density (e.g. three times higher than in Germany). Most of them are so called "Impulszentren". There are also 20 technology parks.

Cluster initiatives and networking are broadly developed in Austria. Almost each Federal State is running some sort of cluster initiative, linking companies and research institutions around thematic priorities, e.g. automotive suppliers, wood and wood products, plastics, environmental technologies, biotechnologies etc. In total, the number of clusters exceeds 40.^[1]

Most of them are territorially confined to the federal state (or even subregional).

The third pillar in regional RTDI policy is the co-financing of federal programmes. In the late 90ies federal policy began to move from project-based to programme-based funding. A paradigm shift took place with the launch of the competence centre programmes performed by industry-academia partnerships. Styria was a frontrunner in this respect.

More recently, also the disputed system of follow-up financing for projects funded under national schemes and the instrument of foundation professorship ("Stiftungsprofessur") has been introduced.

Likewise, the introduction and rapid implementation of Universities of Applied Sciences has created a dense network of specialised higher education institutions. The regions are playing a prominent role both in the definition and in the governance of the respective programmes. The federal support programme COIN aims at strengthening the universities for applied sciences as R&D partners for local companies.

A concrete example for a regional RTDI programme is the follow-up programme 'Innovative Upper Austria 2010', which foresees a total investment 2005-2020 of approximately 600m. Five fields of action have been highlighted: in the area of R&D, the science-industry cooperations in the regional priorities in mechatronics, ICT, life science, innovative materials as well as logistics should be further enhanced and the follow-up funding for projects funded by the FFG expanded. Existing clusters should be further stabilised and stepwise internationalised (action field 2). In action field 3, enterprise infrastructure development should be further supported, including the operations of the CATT, an innovation management and service company for issues of technology- and mobility support. Action field 4 focuses on human resource development and action field 5 on training and vocational education.

An example for an explicit international inter-regional cross-border programme with research elements is the RTDI programme CIR-CE, which has been subordinated under COIN. Elements of RTDI cooperation are also found in more generally designed inter-regional and cross-border programmes such as CENTROPE.

[\[1\]](#)

see annex in report 2 of the Austrian system evaluation: WIFO, Prognos et al. (2009)

Fiscal Policies

As regards fiscal incentives, the following changes have been introduced in Austria recently (Law on the Budget: Budgetbegleitgesetz 2011, BGBl. I Nr. 111/2010):

- All old R&D tax-exempt schemes are phasing-out (temporary arrangement according to Â§ 124b Z 180 ESt), but the research premium (for industrial R&D for large, medium and small companies) remains as single element of tax-based research funding (Â§ 124b Z 180 EStG);
- the research premium was increased on 1.1.2011 from 8% to 10% for costs arising from intramural research and contracted research (specification of the assessment basis by an instruction of the Ministry of Finance, which itself is based on the Frascati Manual);

- perpetuation of the cap of € 100.000 for contracted research.

The savings programme of the Austrian government, which was negotiated in February 2012, foresees an increase of the cap for contracted research to € 1m. At the same time a more strict auditing of this scheme has been announced.

Previously, the Austrian Tax Code has granted tax incentives for expenditures related to inventions "valuable to the economy" since 1958. Since 1980 a volume-based allowance could be claimed on such expenditures or on expenditures relating to inventions protected under patent law. In 2000, an additional increment-based allowance scheme was introduced to deduct at a higher rate qualifying R&D expenditures exceeding the moving average levels of the last 3 years from the (corporate) income tax base. Even more fundamental was the introduction of the so-called Frascati-schemes. Expenditures on basic research, applied research and experimental development qualify for a volume-based allowance (research premium) and tax credit. The tax credit is refundable and thereby also benefits firms which - for lack of profit - pay no (corporate) income tax. Firms may either opt for the tax credit or for the volume-based allowance and may combine either of these instruments with the older allowance for inventions. However, the same R&D expenditure cannot be claimed twice under different schemes.

Generally speaking, Austria used several instruments until 2011, irrespective to the size of the company:

- volume-based tax allowances, i.e. a reduction of the tax assessment base at a maximum of 25% of the total R&D expenditures or for
- 'economically valuable' inventions, and for contracted research;
- incremental tax allowance up to 35% for those R&D expenditures that exceed the average of R&D expenditures over the past three years;
- a "research premium" of 10 % as of 2011.

The Austrian Court of Auditors estimated foregone taxes induced by fiscal funding on R&D to be as high as € 418 million in 2005 and quotes respective forecasts of the Ministry of Finance of about € 500 million for the year 2008, which are, however, disputed and likely overrated. The subsidy nature of the tax credit caused a jump of government funded R&D of the business enterprise sector by more than three percentage points. The number of companies making use of R&D tax incentive schemes increased significantly from 835 in 2001 (when they could only claim the allowance for inventions) to more than 2,500 in 2005 because of extended eligibility criteria. Quite many of the new users are comparatively small companies. Nonetheless, there is a heavily skewed size distribution in terms of absolute fiscal research subsidies which mirrors the high concentration of business R&D. 85% of the total R&D activities in the business sector are taking place in companies with more than 100 employees.

The [Austrian Research Promotion Agency \(FFG\)](#)

supports innovative start-ups with up to 70% financial subsidy for technologically risky but economically promising R&D projects. In this field also cooperation with the Austrian provinces exists. Other related activities are (i) the support for feasibility studies to verify if business ideas are technologically feasible, (ii) loan based support to facilitate the mid-term liquidity of start-up companies and (iii) the possibility to transform outstanding FFG loans into debtor warrants to enable a further uptake of credit capital. In this case, the company only has to pay back if an economic success of the project idea is realised.

To support young enterprises in the identification of potential partners and investors, FFG organises venture-capital-fora in which young entrepreneurs are matched with potential investors. A requirement is the previous funding of the young enterprise through FFG's basic programme. In addition, FFG also facilitates the contact to German, British and French venture-capital providers.

To foster a human resource based knowledge circulation between academia and business enterprises which do not have an own research unit, the 'young experts'-programme has been launched, under whose framework master thesis and PhD thesis, which are firmly embedded in the R&D work of a company, can be supported. The programme has been recently extended towards the co-financing of post-doc positions employed at companies.

By now, there are no incentives to foundations to invest more in R&D for public benefit but ideas for this are popping-up in the public discussion in front of the budget consolidation necessity and the already agreed public budget cuts for private non-profit research organisations.

Tax incentives for stimulating intellectual property rights and patents are not in place.

Human Resources Policies

Human Resource Policies in Austria comprise a wide range of different measures: The ministries responsible for R&D have launched two new initiatives addressing the 'next generation' of scientists and researchers: '[Sparkling Science](#)', supported by [BMWF](#), has the long-term objective of breaking down barriers between school education and the science system. The [BMVIT](#) is responsible for the second initiative, '[Forschung macht Schule](#)', which aims at attracting more children to a career in natural sciences and engineering, e.g. through internships in companies and research institutes, or other educational measures.

Since the demand for study programmes is unequally distributed in Austria, the BMWF launched an information offensive in August 2010 to stimulate more students to enrol in mathematics, informatics, natural sciences and engineering sciences (MINT-initiative) and to disburden highly demanded fields such as journalism, psychology, medicine and others.

No distinct policy or programme is available in Austria which directly supports the modification and adaptation of curricula to new (industrial) S&E needs, but the emergence of universities of applied sciences with their distinct orientation towards technical and practical higher education contributed significantly to match the demand of industrial S&T needs.

At the federal level, a variety of grants and scholarships supports incoming as well as outgoing PhD students as well as post-doc researchers. According to an analysis performed by the [Austrian Council](#), the volume of these measures was €23.3m in 2004. Although these measures are implemented by different organisations, information is accessible through a single web-based platform: <http://www.grants.at>. Moreover, the 'brainpower austria' programme aims at attracting Austrian expatriates as well foreign researchers to pursue their career in Austria. 'brainpower' provides information about job opportunities as well as organisational and financial support in the preparation of a relocation to Austria. As of 1 January 2008, immigration procedures for researchers from all over the world have been facilitated.

Both, the [FWF](#) and the [Austrian Academy of Sciences \(ÖAW\)](#) offer a number of financing opportunities in support of (young) researchers' careers. They range from doctoral schools to the 'Wittgenstein' prize for outstanding scientists. Information is accessible through the [grants'](#) portal.

To reduce the gender gap in science and technology on all levels, from education to careers in R&D is the objective of the inter-ministerial initiative [fFORTE](#) ('Women in Research and Technology'). It comprises a wide variety of measures which promote equal opportunities for women researchers, and each ministry involved addresses specific target groups in line with the respective ministry's portfolio of responsibilities.

The promotion of young scientists is also part of the government's programme. Apart from optimising the existing system of support measures, the government strives to overcome some important obstacles to researchers' careers, e.g. by establishing a tenure track system at Austrian universities, by solving the problem of pensions, or by fully implementing the Bologna process. As a quantitative target, expenditures for tertiary education shall be increased to 2% of GDP until 2020.

To enhance the professional qualification of young researchers, specific post-graduate training schemes have been established such as the [SOQUA-course](#)

on advancing the methodological and practical skills of social scientific researchers. Most important, however, is the reform of doctoral education in line with the Bologna requirements. In order to increase the quality of the doctorate education, more than half of the universities have committed themselves in their performance contracts to establish additional new [doctoral schools](#). [1]

Since the immigration of HRST to Austria is an important structural factor, Austria was among the first European Countries to both adopt the EC directive on researchers' visas and install a Researchers' Mobility Portal. On 1 July 2011 Austria launched the [Rot-Wei-Rot-Card](#)

which resumes the EU [blue card](#) regulation and which should facilitate the immigration of skilled labour to Austria. There are already now preferential access conditions for scientific personnel in place. In terms of social security or taxes, there are no different rules for foreign researchers in place.■

[1]

FWF 2010

Interaction between Knowledge Triangle Policies

In Austrian innovation policy, research is explicitly addressed as a key part of the innovation chain. Research and innovation policy are therefore closely interlinked. Educational policy, however, is not fully integrated in the functional knowledge triangle. This integration challenge has been featured in the Austrian R&D system's analysis as a challenge to be tackled throughout the next couple of years.[1]

Two of the three ministries in charge of research are also in charge of innovation policy agendas which address the business sector directly and, together with the [BMWF](#), also potential entrepreneurs among university researchers. In recent years, specific measures have been designed and implemented to stimulate entrepreneurship at Austria's universities and literally all ministries responsible for R&D in Austria are involved: the 'academia+business' programme ([AplusB](#)) launched by the [BMVIT](#) has established support infrastructures and services at universities in order to help researchers starting a business. Nine AplusB-Centres have been set up at (mostly) Austrian university locations (out of which one became integrated in another one in July 2010); with their activities they aim at stimulating and mobilising academic entrepreneurs, at providing support services to start-up companies and at optimising the conditions for them. Moreover, 88 impulse centres and 20 technology parks exist in Austria.

The '[uni:invent](#)'

programme supported universities and non-university research in patenting and exploiting their research results, providing information and advise on patenting and licensing of research results. 'uni:invent' was a joint initiative of the Ministry of Science and Research and the Ministry of Economy, Family and Youth but was terminated end of 2009. The elaboration of operational patent- and exploitation strategies has been taken up in the performance contracts of the universities. A national IP contact point has been nominated in the [Austrian Federal Ministry of Science and Research](#) and became operational in spring 2010.[2] Furthermore, as follow-up of uni:invent, a joint project between [AWS](#) and the universities to design best practice contract models for exploitation in cooperation with businesses was implemented and the [Federal Ministry for Economy, Family and Youth](#) continues to support prototype development through its [PRIZE](#) programme. Although technology transfer offices became institutionalised elements of the university fabric in Austria and uni:invent supported many of the recommendations of the European Commission on the management of intellectual property in

knowledge transfer activities, it will remain a challenge in the future to enhance the initiated cultural change at the universities in respect to IPRs and their exploitation.

Structural change towards a greater share of high-tech industries and innovative companies is perceived as a main objective of Austrian innovation policy, and therefore corporate venturing is a subject of policy measures. Due to the financial crisis, the means to support innovative SMEs by AWS, which acts as Austria's national promotion bank, have been increased. To support young enterprises in the identification of potential partners and investors, FFG organises venture-capital-fora in which young entrepreneurs are matched with potential investors. A requirement is the previous funding of the young enterprise through [FFG's basic R&D programme](#). In addition, FFG also facilitates the contact to German, British and French venture-capital providers and supports the technology rating "TechRate"®, which is acknowledged in the EU.

Next to national support measures a large variety of services and funding programmes have been initiated by the provinces; most of these measures are of a small scale in terms of budget and geographical range. In general, however, Austria continues to trail behind its European counterparts in the field of private equity and venture capital investments to GDP.[3]

To foster a human resource based knowledge circulation between academia and SMEs as well as large enterprises which do not have an own research unit, the [young experts-programme](#) has been launched, under whose framework master thesis and PhD thesis, which are firmly embedded in the R&D work of a company, can be supported. The programme has been recently extended towards the co-financing of post-doc positions employed at companies. The subsidy provided is with a 80% coverage of personnel costs very attractive.

Please find further information on Austria's innovation policy on the country pages in the [Prolnno database](#)

[1]

Aiginger, K., Falk, R. and Reinstaller, A. (2009): Synthesis report: Evaluation of government funding in RTDI from a systems perspective in Austria. Based on nine special reports, Vienna, May 2009, http://www.bmvit.gv.at/innovation/publikationen/endbericht_syseval.html

[2]

BMWF 2010

[3]

Inno-Policy TrendChart Austria 2009: European Commission Enterprise Directorate-General (2009)

Other Policies

Innovation-oriented public procurement policies in Austria were substantially activated by European deliberations and initiatives, but are still in an exploration and trial phase. The Austrian Federal Ministry of Economy issued a procurement guideline in 2007 which reflects the handbook of the European Commission and puts it into the Austrian context. The BMVIT, which is Austria's custodian of shares of a few state-owned enterprises with large procurement volumes, such as the Austrian Railways, the ASFINAG (responsible for motorways) or VIA Donau (responsible for waterway based transport) commissioned a study on good practices[1] and kicked-off a dialogue with large infrastructure providers about innovation oriented infrastructure policy and public procurement in 2009. The introduction of non-discriminating pre-competitive dialogues to explore the market and innovation potentials for certain areas has been identified as promising[2]. Application areas for enhancing innovation-oriented public procurement are for instance the national action plan for a ecologisation of public procurement or the green-electricity law (Ä#kostromgesetzÄ#). These first steps of the Austrian approach towards innovation-oriented public procurement can be characterised as mission-oriented and based on voluntary standards.

Apart from the three core ministries Ä#" BMWF, BMVIT, BMWFJ Ä#" the other ministries play a relatively small role in shaping Austria's R&D and innovation policy. This is also visible in their small share of public R&D expenditures: less than 10% are spent by others than the three core ministries. Half of this share is again spent by only two ministries: the Ministry for Education, Arts and Culture and by the Ministry of Agriculture, Forestry, Environment and Water Management. Both ministries use most of their R&D budget to finance or co-finance R&D institutions. The Ministry of Education also funds research performed at the federal museums, and the Ministry of Agriculture funds institutions that perform R&D in thematically relevant areas, often on the ministry's behalf, supplying data the ministry needs to fulfil its responsibilities.

Generally speaking, the links between R&D policy and other policies, especially sectoral policies, are quite weak in Austria, but there are also examples of the contrary, such as the Austrian Fund for Climate and Energy ('Klima- und Energiefonds'), which was established in 2007 as a joint initiative of the Federal Chancellery and three ministries linking policy objectives in the field of climate change with the funding of innovative projects, and also of R&D. Since its creation, the Austrian Council has called for coordinated actions of ministries and has partly linked its recommendations for budgetary allocations to increased coordination between the different ministries. As a result, some inter-ministerial 'umbrellas' have been established, e.g. for the promotion of women in science and research (the [FORTE-](#) initiative).

A more detailed analysis of the situation can be found in the reports of the recently concluded system evaluation of Austrian R&D funding. In there, some recommendations target the issue of policy mixes, e.g.

- to enlarge from a narrow innovation policy which focuses only on science and technology towards an enlarged approach which is characterised by its linkages towards educational policies and which puts more emphasis on innovation framework conditions such as competition issues, international openness and mobility;
- to advance from an imitation strategy to a frontrunner strategy characterised by the notion of excellence and thematic and economic leadership both in niches and qualitatively advanced businesses and industries;
- to transform from fragmented to coordinated and consistent public interventions based on a shared vision and a joint strategy;
- to change from a multitude of narrowly defined programmes to broader defined approaches based on prioritised fields of action (top-down);
- to upgrade from a fuzzy to a precise division of labour between Ministries and other system relevant stakeholders monitored by a central council;
- to improve from a bureaucratic to a modern outcome-oriented public management.

[1]

Buchinger and Steindl 2009

[2]

HÄrmann 2010

Government policy making and coordination

The Austrian research and technology policy is in principle in place since the year 2000 and mainly formulated and implemented by no less than three ministries:

The [Federal Ministry of Science and Research \(BMWF\)](#)

is responsible for tertiary education and for basic research in Austria, i.e. for the higher education sector (HES), for non-university research institutions such as the [Austrian Academy of Sciences](#) or the [Ludwig Boltzmann Research Society](#); moreover it holds responsibility for the [Austrian Science Funds \(FWF\)](#) and the [oead](#), the Austrian agency for international mobility and cooperation in education, science and research. The BMWF represents Austria at the European level on issues of international mobility and the European Framework Programme for RTD.

The [Federal Ministry of Transport, Innovation and Technology \(BMVIT\)](#)

manages the largest public budget in applied research. It holds a 50% stake in the [FFG](#), to which it contributes the majority of application-oriented research funding, and a 50% stake of the [AWS](#), and is the majority shareholder in the [Austrian Institute of Technology](#).

The [Federal Ministry of Economy, Family and Youth \(BMWFJ\)](#)

holds the remaining 50% of the FFG and the AWS. The ministry is responsible for the [Christian Doppler Research Association \(CDG\)](#) and the [Josef Ressel Centres](#) which are established at universities of applied sciences to meet corporate R&D demands.

The Federal Ministry of Finance is responsible for the allocation of financial resources to the other ministries. Moreover, the national funding for some research institutions is directly allocated by the Ministry of Finance, e.g. for the Institute of Advanced Studies and the Austrian Institute of Economic Research. In recent years the Ministry of Finance's influence on the Austrian R&D policy has increased, in particular because it sets standards for the design, implementation and monitoring of programmes. There is no formal mechanism for the co-ordination of the ministries activities. The R&D budgets of the sectoral ministries (e.g. for agriculture, health etc.) are comparably small and most of these budgets are allocated to subordinated research institutions that support the sectoral ministries in the fulfilment of their responsibilities. The largest sectoral R&D budget (â€63m in 2009) is handled by the Federal Ministry for Agriculture, Forestry, Environment and Water Management, i.e. 2.9% of the total federal R&D expenditure. The coordination between the national and federal states level lacks regularly structured information and alignment mechanisms beyond specific singular cases. The issue of joint ownership, the exchange and adjustment of priorities and approaches, not the least of experience and learning - and the issue of co-financing â€ has more and more come under pressure. Due to the high degree of autonomy of Austrian Federal States, each of them is responsible for the programme coordination of the regional programmes and each of them has developed its own capacities and procedures in programming.

Science Policy Advice

There are two formal bodies for science policy advice: the [Austrian Council for Research and Technology Development](#) and the [Austrian Science Board](#).

The Austrian Council for Research and Technology Development (Austrian Council) was established by law on July 11, 2000 and constituted on September 6, 2000. The tasks of the Austrian Council are

- to advise the federal government, the ministers and the "LÃnder" in all matters related to research, technology and innovation
- to define a long-term national RTD strategy
- to monitor the step-by-step implementation of this strategy
- to set up guidelines for national research and technology programmes and for promoting RTD institutions
- to give recommendations for strengthening Austria's position in international programmes and co-operations

- to make proposals for national RTD programmes in the international framework
- to make proposals for improving the co-operation between science and industry, and
- to lay down guidelines for evaluation of institutions.

The Austrian Council has eight voting members; four are nominated by the Minister for Science and Research, and four by the Minister for Transport, Innovation and Technology. New Council members have been appointed in the second half of 2010 for a period of 5 years. The new Council is headed by a renowned industrialist (and former minister of finance) and is composed of five researchers (one is rector of the Technical University), two managers of companies and one management consultant. In addition, the Austrian Council has four non-voting members: the Ministers of the three core ministries responsible for R&D, and the Minister of Finance.

The Austrian Science Board ('Wissenschaftsrat') was established by law with the University Act 2002. Its tasks are

- to advise the federal minister in charge, the legislative bodies and the universities in all matters concerning universities and science policy,
- to observe and analyse the Austrian universities and science system considering the European and international trends, and
- to develop proposals for its advancement.

The Austrian Science Council has 11 members, most of them scientists from Austria.

In November 2010, the [Science Conference](#)

Tools for policy advice

The evaluation culture in Austria is well developed. Ex-post, interim and, to a lesser degree, ex-ante evaluations are standard practice at programme, institution and system's level evaluations. However, like elsewhere, a gradual deficit in ex-post impact evaluations can be ascertained. The legal framework for evaluation has been improved (with the Universitätsgesetz 2002 as well as the so-called RTD-Directives), state-of-the-art methods have been introduced, international conferences organised and the quantity of evaluations has increased. Between 2003 and 2007 more than 50 evaluations have been carried out in the area of RTDI policy. Since 2008 around 6 evaluations are yearly published^[1]

In the years 2008 and 2009, a large-scale evaluation of the Austrian research funding system involving 22 national and international experts has been carried out. In the course of this systems evaluation^[2]

, 5,000 companies, 1,400 research institutes and 50 experts have been consulted.

The main stakeholder in R&D evaluation in Austria is the [Platform Research & Technology Policy Evaluation \(fteval\)](#)

. It was founded in 1996 as an informal cooperation of policy-makers, research funders and evaluation practitioners and aims at presenting approaches and methods of evaluation, discussing the current evaluation practice on an international level and, thus, contributing to the development of an evaluation culture. In November 2006, its members re-founded the Platform as a society. fteval has also drawn up Evaluation Standards for Research and Technology Policy^[3], addressing policy makers and practitioners. The members of the platform voluntarily adopted these standards, which are currently under revision, for their own work, although not always implemented them in practice as the ad-hoc termination of basic funding for non-profit research organisations without any evaluation attempt by the BMWF has evidenced at the end of 2010.

The Austrian Council of Research and Technology Development is a key player in policy advice regarding STI matters and the use of related tools like evaluations and studies. The Council played an important role in turning programme evaluation into a common practice. In its strategy 2020, the Council defines as one of its functions the evaluation of the RTDI system and sub-systems.

In terms of evaluation providers, the Austrian scene is dominated by non-university research institutions like WIFO, KMU ForschungAustria, [Joanneum](#)

and others. All of them are member of fteval. Finally, the research funders at national (FWF, FFG) or state level (e.g. [WWTF](#) in Vienna) are also promoting the usage of evaluations. Both FWF and FFG have been evaluated in 2004 for the first time in their history. According to fteval (2007), the development of evaluation culture in Austria has also been driven by these bodies. Evaluations of state level funders are still less common, but vary considerably from state to state.

At the beginning of the 1990ies, the Austrian Technology Monitoring System (ATMOS) was implemented as a research activity. The first systematic Foresight study in Austrian between 1996 and 1998. It involved expert panels and two Delphi exercises and innovatively combined technology foresight with a society and culture Foresight.^[4]

No other national foresight exercise of comparable scale has been carried out since then, although renowned foresight experts in the field of R&D are working in Austria.

Benchmarking approaches are occasionally used in Austria in the area of RTDI policy. In the year 2002, two workshops on benchmarking science and technology policy have contributed to European level initiatives and policy-making. The BMVIT indicates benchmarking together with output-oriented performance assessment, foresight, monitoring and impact assessment as part of its strategic intelligence for horizontal policy coordination in the area of science, technology and innovation^[5]

Public consultation tools for R&D policy have only occasionally been used in Austria. They are mostly employed by the Austrian Council. Three citizens' conferences, one in the 1990s on the ozone layer, one on genetic data in 2003 and one on the energy society in 2009 have been organised. According to an evaluation of the second of these exercises^[6]

the impact of these tools in Austrian policy-making was limited. A comprehensive "research dialogue" exercise ("Forschungsdialog") was implemented throughout 2008 with much PR but lesser concrete factual impact.

In terms of semi-public consultation tools for RTDI policy, the annual "Technologiegespräche Alpbach", organised in the framework of the European Forum Alpbach, provide an important internationally recognised discussion platform for policy stakeholders, national and international experts and researchers[7]

[1]

<http://www.fteval.at/cms/en/home/evaluation-studies/>

[2]

for the results, please refer to: <http://www.bmvit.gv.at/en/innovation/policy/evaluation.html>

[3]

<http://www.fteval.at/cms/en/home/standards/download-standards.html>

[4]

Aichholzer 2001

[5]

<http://www.bmvit.gv.at/innovation/forschungspolitik/leitlinien.html>

[6]

Bogner 2004

[7]

<http://www.bmvit.gv.at/service/publikationen/innovation/alpbach/index.html>

Actors in policy implementation

The [Austrian Science Fund \(FWF\)](#)

, established in 1968, is Austria's main body for the promotion of basic research in all fields of science. FWF funds individual scientists and research teams. The [BMWF](#) is responsible for FWF and its budget. FWF is mainly governed by elected representatives of the scientific community. FWF funding is predominantly absorbed by researchers from the universities and from the Austrian Academy of Sciences. Most of the budget is spent through [thematically open bottom-up project applications](#). In addition, FWF manages a few more targeted programmes, of which the most important ones are:

- the [special research area priority programme](#)
- [Translational-Research-Programme](#)
- the [START](#)-programme to support young, but excellent individual researchers
- the [Wittgenstein](#) award to support most outstanding individual researchers
- the [doctorate colleges programme](#) etc.

The [Austrian Research Promotion Agency \(FFG\)](#)

is the largest Austrian organisation for the promotion of applied research and innovation. Its main task is the support of business R&D and cooperative research in [bottom-up programmes](#) as well as in defined thematic priority programmes, mainly addressing companies and their scientific partners. Moreover, it provides information services with respect to European cooperation, and it hosts the [Austrian Aeronautics and Space Agency](#). FFG was established in 2004. Two ministries are responsible for FFG, the [BMVIT](#) and the [BMWFJ](#).

FFG manages " in addition to the thematically bottom-up programme ("[Basisprogramm](#)"

) " a series of mission-oriented programmes, which are either thematically or structurally defined, such as:

- "[benefit](#)" (intelligent technologies for elderly)
- "[FIT-IT](#)" (ICT research)
- [GEN-AU](#) (genome research programme)
- [BRIDGE](#) to support and improve links between basic research and applied research
- [COIN](#) to stimulate and to increase innovation activities of companies and to promote their interaction and cooperation with universities of applied sciences and other research institutes
- [COMET](#) (competence centre programme)
- [IV2S plus](#) (intelligent transport systems and services)
- [innovation voucher](#) Austria and [innovation voucher plus](#) programme
- [KIRAS](#) (Austrian security research programme)
- [Josef Ressel Centres](#) to establish links between the HES and economy
- [Laura Bassi Centres of Expertise](#)
- [NANO](#) etc.

The [Austria Wirtschaftsservice Gesellschaft \(AWS\)](#)

was established in 2002 as state owned banking institutions for the funding of innovation projects in companies as well as for seed financing and supporting start-ups. It is 100% owned by the Republic of Austria, represented by the [BMWFJ](#) and the [BMVIT](#). With

respect to research, AWS hosts the secretariat of the [National Foundation for Research, Technology and Development](#), established in 2004, and endowed by the Austrian National Bank and the ERP-Funds.

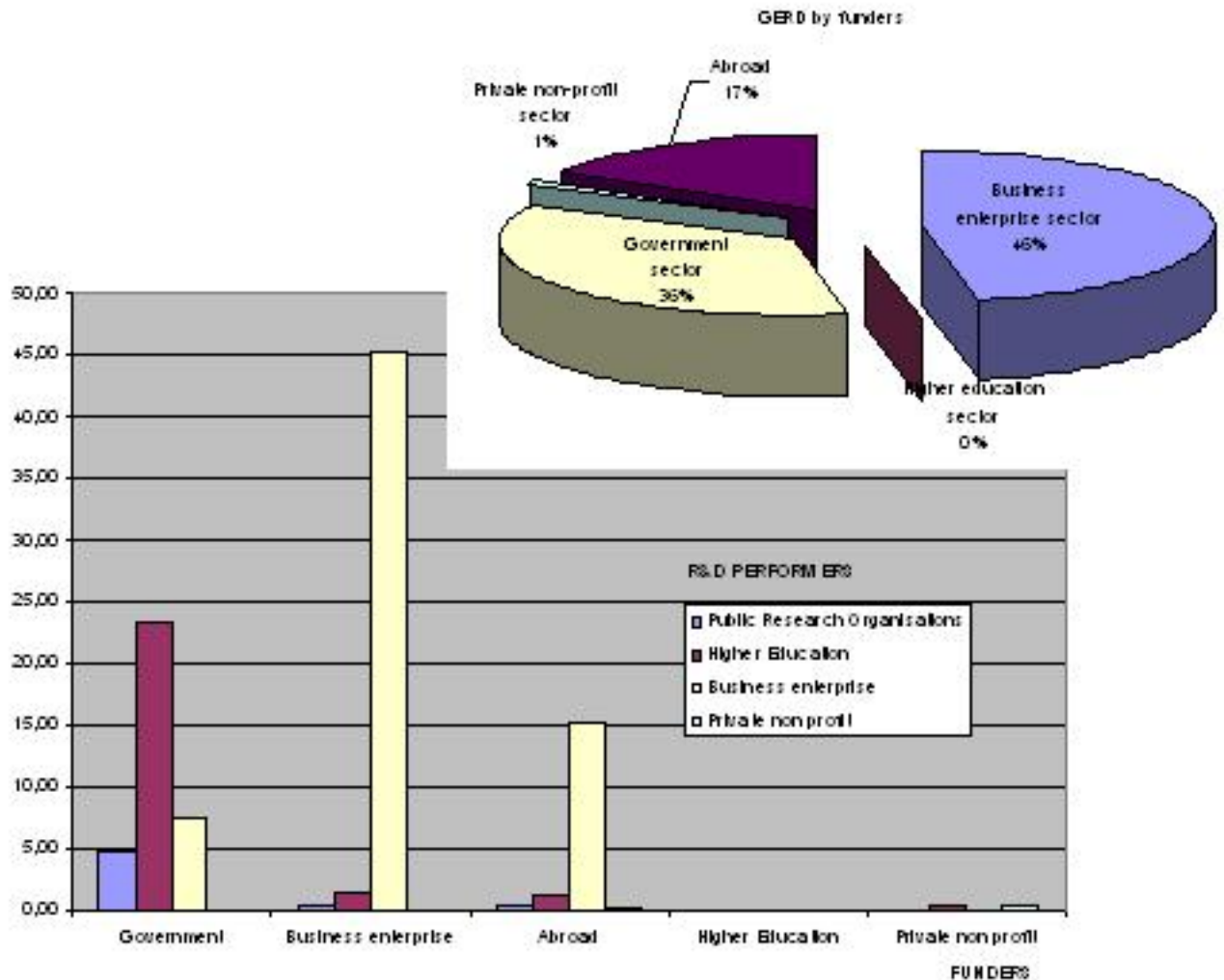
As of 1 January 2009 the former [Ã#AD](#) (Austrian exchange service) became by law the [oead](#)

, a company owned by the Republic of Austria to act as agency for international mobility and cooperation in education, science and research. It is strongly focused on supporting educational mobility (outgoing and incoming national scholarships; promotion of European scholarship programmes), lifelong learning, international development cooperation and mobility support for bilateral and multilateral research projects. In terms of R&D relevance, the main programmes managed by oead are:

- [APPEAR](#) to support research for development cooperation
- [â##sparkling scienceâ##](#) to bridge between schools and research etc.

Funding flows

	2007	2008	2009	2010	EU average 2010
GERD (million)	6,867.82	7,548.06 e	7,479.75	7,890.68 e p	245,673.066 s
GERD per capita	829.1	907.4 e	895.2	942.1 e p	490.2 s
GERD as % of GDP (R&D intensity)	2.51	2.67 e	2.72	2.76 e p	2.0 s
BERD in million Euro	4,845.9	5,323.6 e	5,092.9	5,372.7 e p	151,125.561 s
GERD financed by business enterprise as % of total GERD	48.7	46.1 e	47.1	44.3 e p	54.1 s (2009)
GERD funded by abroad as % of GERD	17.9	16.4 e	16.8	16.4 e p	8.41 s
Total civil R&D appropriations (GBAORD) in million Euro	1,770.12	1,986.63	2,149.78	2,412.59 p	86,428 s
GBAORD as % of general government expenditure	1.33	1.42	1.48	1.61 p	1.5 s



The three major sources of financing R&D in Austria are the corporate sector, the public sector and international sources. R&D funding by the higher education sector is included in the data for the public sector and not available separately. The main R&D performing sectors are the business enterprise (or corporate) sector, the higher education sector and the public sector. The corporate sector comprises two sub-sectors: the business sector, i.e. for-profit manufacturing and service enterprises, and the cooperative sector which comprises non-profit oriented research institutes performing R&D for companies, e.g. the Austrian Institute of Technology, Joanneum Research or the Competence Centres.

According to Statistik Austria^[1]

, the business enterprise sector is the largest R&D sector in Austria: in 2009 it financed 47.0% of R&D in Austria and it accounts for 68.1% of R&D performed in terms of volume. A conspicuously high share of business R&D, above 22%, is mainly financed from foreign business sources.

The public sector funded 35.6% of R&D expenditures in Austria in 2009. It allocated 65.6% of its funds to the universities, 21.1% to the business enterprise sector and 13.2% to research in the public sector.

Within the public sector, the national government contributes 74% to R&D funding, the states 10%, the municipalities 0.3% and others 16%. The latter category includes the higher education sector as a funder and bottom-up competitive funding by national agencies (FWF, FFG), which, however, are funded by the state-level.

Funding from abroad is the third most important source for financing R&D in Austria. The larger part of this money is spent by foreign companies and international organisations and benefits the business enterprise sector in Austria. Short of 10% of funding from abroad are returns from the EU.

The private non-profit sector in Austria is small and accounts for a low share in both financing and performing R&D (0.56% and 0.48% respectively in 2009).

[1]

http://www.statistik.at/web_de/statistiken/forschung_und_innovation/f_und_e_in_allen_volkswirtschaftlichen_sektoren/index.html

[1]

Austrian national GBAORD data differs considerably from EUROSTAT.

Government sector

Overview

Most recent comprehensive data of R&D expenditure in Austria is from 2009. The total volume of R&D expenditures in 2009 was €7,479.745m. Statistik Austria estimates that Austrian R&D expenditures have reached a total of €7890,68m in 2010 and €8286,3m in 2011. Like in the previous years R&D expenditure has grown faster than the GDP, and consequently the percentage of GDP spent on R&D has increased, reaching 2.78% in 2010 according to Statistics Austria^[1]

GBAORD in Austria has increased impressively in the last year from 0.67% of GDP in 2005 to 0.86% in 2010. The increase of the R&D quota in Austria in 2010 was mainly due to the R&D appropriations of the public sector, which increased substantially by 10.9% compared to 2009, while the expenditures by industry stagnated (+ 0.1%). The R&D expenditures from abroad, which mainly benefit the corporate sector, decrease at minus 0.6% compared to 2009. The anti-cyclical investment of public funds in 2009 and 2010 is likely to come to an halt in 2012 because of the necessity to consolidate the public budget.

Most public money for R&D in Austria is channelled through institutional funding, which goes predominantly to universities. The share of competitive public R&D funding is comparatively low in Austria. Most of the competitive public R&D funding is organised within thematically open bottom-up approaches. Competitive structural and thematic R&D programmes, however, have increased in importance in the last years.

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^[1]

which differs slightly in this respect with EUROSTAT.

Institutional Funding

Around 82% of institutional funding provided on national level went to universities, 6% to international organisations, 5% to the Austrian Academy of Sciences, 4% to non-university research organisations (mainly to the [Austrian Institute of Technology](#)), and 2% to a number of smaller research institutes^[1]. In addition to national funding, some public research centres are co-financed by the federal states, in particular [Joanneum Research](#) in Styria, [Upper Austrian Research](#) or Salzburg Research.

Institutional funding on the federal level is mainly administered by the BMWF, responsible for the universities and the Austrian Academy of Sciences, and by the BMVIT, which represents the republic as co-owner of the AIT.

The HES changed considerably with the [University Act of 2002](#)

which bases institutional funding to universities on three-year performance contracts between each university and the BMWF. Block granting amounted to 78 % of university revenues in 2008, which is one of the highest shares in Europe, while 16% was third party funding and 6 % tuition fees^{[2][3]}. 20% of the block grants are performance-linked, depending on the achievement of performance targets and quality indicators.^[4] According to the CHEPS study, however, input-related criteria are of more importance than output-related criteria.^[5] The performance contract defines the services to be provided by the university, including teaching, research, mobility, co-operation, strategy, specialisation, etc. Approximately 22% of research conducted at universities is financed by competitively allocated public research grants, while 78% is financed through operational grants for research. ^[6]

The Austrian Government has announced in its governmental programme that institutional funding for the AIT and other non-university research institutes will also be reformed and should be based on multiannual programmes and performance targets in the future. By now, the only concrete step in this direction was the abolishment of institutional grants for a large number of private non-profit research organisations (around 70) motivated mainly by the necessity to consolidate the public budget.

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^[1]

Schibany, A. and Jäger, L.: The Mix of R&D Policy Instruments, 2005; available for download in German on the FTEVAL website

^[2]

CHEPS et al (2008): Progress in higher education reform across Europe. Funding Reform, p. 45

^[3]

Note: tuition fees have been largely abandoned since then.

^[4]

(data taken from "Science in Austria - Statistics 2008" issued by the BMWF

^[5]

CHEPS et al (2008): Progress in higher education reform across Europe. Funding Reform, p. 52

[\[6\]](#)

CHEPS et al (2008): Progress in higher education reform across Europe. Funding Reform, p. 54

Competitive funding

The major sources for project-based funding of R&D activities defined 'bottom-up' are the general programmes of Austria's two major funding agencies [FWF](#) and [FFG](#). Both programmes were first launched in 1968 and although the portfolio of research funding mechanisms has been expanded substantially they still play a key role.

The FWF is the main funding organisation for basic research in Austria, open to all fields of science. Projects can be submitted by individual researchers as well as by teams. Each project is evaluated by international peers and funding decisions are taken according to the standards of the international scientific community. In 2009 [\[1\]](#)

, most of the FWF funding went to Austrian universities (86%); 4.7% to the Austrian Academy of Science and 9.3% to other R&D institutions (including universities from abroad) or to applicants with no current affiliation. In 2010, the total approved funding volume was around €171.8m (compared to €148m in 2009 and €176m in 2008). In 2010, the volume of funding granted to regular stand-alone projects was €82.95m (2009: €76.3m and 2008: €89.9m) and to the larger National Research Networks and Special Research Programmes received €23 (2009: 12.5m and 2008: €23m). Larger budgets volumes were also allocated to international programmes (€14.91m) and doctoral programmes ("[Doktoratskollegs](#)") (€17.1m).

Through its [general programme](#)

, the FFG funds R&D projects performed by Austrian companies individually or in cooperation with scientific partners. The programme is open to all fields of business R&D. In 2010, the volume of funding granted (incl. guarantees) in the general programme was €270.5 (2009: €263.5m and 2008: €283.2m).

To close the perceived funding gap between the two major Austrian funding agencies, the [BRIDGE](#) initiative has been launched: it is implemented as a twin-programme by the FWF through its translational-research-programme (€8.4m in 2010) and the FFG through its "bridge"-programme (€11.8m in 2010) and funds projects between basic and applied research.

Bottom-up innovation projects are supported by [AWS](#)

The third largest share of public R&D funding in Austria is spent on research programmes. The major part of these programmes addresses functional priorities, e.g. scholarships and grants for individual researchers or the cooperation between various players of the research system, mostly academia and business.

In terms of budget and visibility, the cooperation between academia and business has been and still is the most important functional priority of the targeted research programmes. It has been addressed in dedicated programmes, such as the 'centres of excellence' programme (€[COMET](#)

€), €[COIN](#)€, the [Christian-Doppler-Laboratories](#), the [Josef Ressel Centres](#), the [Research Studios Austria](#) or the [Ludwig Boltzmann Institutes](#). In 2008, COMET was launched with a funding spent by FFG amounting to €125.18m. The funding for COMET was €9m in 2009 and €84.9m in 2010. The Centres and Labs are funded for a maximum duration of 7 or 10 years with intermediate evaluations and stop-or-go-decisions on the way. They are larger than individual research projects and can be considered as 'temporary institutions.' In 2010 FFG spent €22.7m within the COIN programme.

In addition to these specific collaboration programmes, also most thematic programmes place a strong emphasis on the co-operation between science and partners from practice.

It is fair to state that funding for industry-academia R&D co-operation is no longer a bottleneck in the Austrian research and innovation system.

Next to functional priorities, the support for specified technology fields considered particularly promising to yield an above-average momentum for growth and structural change towards high-tech industries has become important. Since the early 1990s, approaches to tackle societal challenges have been added. In comparison to bottom-up programmes, thematic funding is increasing, but remains still relatively small, despite the large number of around 15 thematic programmes encompassing literally several tens of sub-priorities. These programmes (apart from few exceptions) apply the same or similar funding instruments and selection procedures. They are initiated and 'owned' by one of the ministries responsible for R&D and managed by one of the funding agencies, mostly by FFG.

According to the FFG statistics, a total of €134.0m (2009: €138.2m and 2008: €109m) were provided to thematic programmes by the responsible ministries in the year 2010. The budget was allocated to thematic priorities as follows (2010 data):

- technologies for sustainable development (incl. energy) (€51.2m) (2009: €38.2m),
- ICT (€30.1m) (2009: €26.4m),
- transport technologies (incl. aeronautics) (€37.9m) (2009: €26.8m),
- genome research (€1.3m) (2009: €21.5m),
- nano-sciences and nano-technologies (€1.8m) (2009: €14m) and

- security research (€11.5m) (2009: €11.4m).

For comparison: FFG managed a total funding budget (incl. guarantees) of approx. €552m in 2010 (2009: €545m).

[1]

Forschungs- und Technologiebericht, 2010.

Other modes of funding

The development of human resources is supported through a large number of measures provided not only by ministries but also by regional authorities and private institutions. At the federal level, the system of scholarships and grants has been streamlined in recent years and a single entry point through a web-based platform has been established: <http://www.grants.at>

Moreover the promotion of women in science and research is an important challenge for the Austrian innovation system. The respective funding and support measures are co-ordinated under the umbrella of the FFORTE initiative.

Important in terms of HRD in S&T is the doctorate schools programme of the FWF (Doktorantenkollegs), which has been funded with slightly more than €21m in 2009.

The two most outstanding awards in Austria in the field of S&T are the Wittgenstein-price (€2.8m in 2009) for the most reputed top researchers and the START-programme (€6.3m) which supports younger high potentials to establish and lead own scientific teams.

The headquarter programme supports R&D projects of international companies which are economically active in Austria, if they intend to establish R&D headquarters in Austria or to approach upcoming new themes or to increase their R&D activities in their core thematic areas both substantially and sustainably. The funding allocation for this programme in 2009 was around €26m.

Also the brainpower programme aims at promoting Austria as a research location internationally and strives to attract foreign as well as expatriate researchers to work in Austria.

The support and promotion of start-up companies is another example of a functional priority programme line funded by FFG (Programmlinie Hightech Start-up) with a funding budget of €11.4m in 2009.

The innovation cheques-programme has been funded with €4m in 2009.

Substantial support for companies is also provided through tax incentives.

More information can be found in the Trendchart country report for Austria on the Trendchart website: www.proinno-europe.eu/trendchart

www.proinno-europe.eu/trendchart

Business Enterprise Sector

Overview

The largest share of R&D expenditures in Austria is financed by the business sector. According to the last available comprehensive survey data from Statistik Austria for 2009, the corporate sector invested €3,520.02m in R&D, or 47.0% of total spending on R&D in Austria. It performed €5,092.90m or 68.1% of R&D in Austria.

Since 2007, major shifts in business sector R&D occurred: the average yearly rate of growth in the business sector financed R&D was 10.1% in the period from 1999-2007, but stagnated almost since then (0.4% average yearly growth rate between 2007 and 2010). The appropriations from abroad grew correspondingly at a yearly average rate of 6.6% in 1999-2007, but declined by -1.5% between 2007 and 2010. While the federal government sector increased anti-cyclically its share of R&D expenditures from 28% in 2007 to 35% in 2010, the % of gross R&D financed by the domestic corporate sector decreased to 43% (compared to 49% in 2007). Together with its R&D financing from abroad, the percentage of gross R&D financed by industry in 2010 is expected to be around 60%. [1]

[1]

BMWF, BMVIT, BMWFJ 2010

Intramural

The business sector finances its in-house R&D mostly from own sources (€3,391m in 2009) and by (a stagnating share of) foreign investment (€1138). In 2009, the public sector funded - through direct and indirect measures - a considerable share of total business R&D performance (11%) including the cooperative sector. 3/4 of the public funding for the corporate sector stems from the [research premium](#)

According to 2009 R&D data, the Austrian corporate sector overall achieved an R&D rate (R&D expenditures as a percentage GDP) of 1.85% and it is estimated that it will achieve 1.89% in 2010. In 2009 (last year of comprehensive statistical data) 67.5% of business R&D was performed in the productive sector (2007: 69.8%) and 31.6% in the service sector (2007: 29.4%). The most R&D investing industries are devices for electricity production and distribution (16.2% off all R&D performed in the business sector); machine building (10.7.4%); motor vehicles and their components (7.2%); electronic components and semi-conductors (5.4%); IT devices and electronic and optical goods (without electronic components) (4.98); pharmaceuticals (3.8%) and chemical production [without pharmaceuticals) (3.4%). Together they account for 51.7% of R&D in the business sector. From the service sector three branches are outstanding:

- engineering and architecture offices incl. technical, physical and chemical investigations: 7.6% of all R&D performed in the business sector
- research and development: 6.3%
- R&D in biotechnology: 6.1%.

An analysis of business R&D structure is available in the 2008 edition of the Austrian Research and Technology Report. For the first time, the high-tech knowledge intense service sector had a higher R&D-intensity (in % of gross value added) than the Austrian high-tech productive sector. The share of the productive sector in % of R&D expenditures of the total corporate sector slightly decreased in Austria from 73% in 2002 to 70% in 2007, while the share of the service sector in % of R&D expenditures of the total corporate sector slightly increased from 26% to 29% in the same period. The strongest growth in this respect was in the medium-tech productive sector (from 36% in 2002 to 44% in 2007) and in the hi-tech knowledge intensive service sector (from 12% to 15%). This growth was at the (relative) expense of the high-tech sector, whose relative share declined from 33% in 2002 to 22% in 2007.^[1]

A recent assessment published in the Austrian Research and Technology Report 2010^[2]

, concludes that the structural change of Austria's economy in terms of value added, production and employment proceeds at internationally average pace.^[3] Although the business service sector benefited most from this structural transformation, also traditional industries such as automotive industry, metallurgic and machine-building industries could increase their importance. The structural change regarding R&D expenditures in the productive sector is by way of comparison rather moderate. The increase of the corporate R&D quota in Austria has been mainly caused by an extension of R&D expenditures within established branches rather than by structural shifts towards more R&D intense branches. The rising R&D quota during the last decade evidences that even without structural changes considerably growth in R&D is possible. However, the study clearly addresses a fundamental data and systematisation problem at the level of industries and economic branches. On one hand many enterprises from the high-tech sector could be identified without any R&D expenditures and on the other hand a noteworthy share of research-intense companies could be detected in branches with assumed low R&D intensity. Nevertheless, it remains a fact that in Austria the group of medium to high and the high-tech sector observe a considerably higher growth of R&D-intense companies than the low-tech sector.

While basic research is mostly performed in the higher education sector, experimental research (with 62.7%) and applied research (31.6%) dominate the corporate sector. Basic research increased in the corporate sector from 4% in 2002 to 5.7% in 2009.

[\[1\]](#)

BMWF, BMVIT und BMWFJ (2010)

[\[2\]](#)

BMWF, BMVIT und BMWFJ (2010)

[\[3\]](#)

Berger 2010

Extramural

In 2009, 96.3% of business R&D expenditures were used to finance R&D performed within the business sector, either within the financing company or by other organisations within the business sector (including the cooperative sector, which includes for instance the [AIT](#)

or the [competence centres](#)). It is estimated that approximately a fifth of the R&D expenditure by the corporate sector is outsourced, mainly to companies. At average, 57% of all externally contracted R&D activities are awarded to foreign organisations (mostly companies), of which the associate companies are the main receivers (58%). Regarding domestic extra-mural R&D spending of Austrian companies, around 50% of this share are awarded to other Austrian companies and around a third to associated domestic companies. The share of business R&D financing for the higher education sector, the public research sector and the private non-profit research sector is 3.7% in 2009. Another 2.9% were spent for the cooperative research sector within the business sector in 2009.

In 2009, the business sector spent €101.5m in the higher education sector, representing a share of 5.2% of the total higher education budget (2007: 5.7%). €102.2m went to the cooperative sector research institutes, representing 21.7% of their allocated budget. €23.8m were allocated to the public research sector, representing a share of 6.0% of the total public research sector budget (2007: 9.3%) and €3.5m were allocated to the private non-profit sector, representing a share of 9.7% (2007: 14.7%) within this sector.

Funding from abroad

According to the most recent available comprehensive census data of R&D financing in Austria, funding from foreign sources finances 16.8% of R&D in Austria in 2009 (2007: 17.9%), amounting to € 1.26b (2007: € 1.23b). Although international funding has grown in absolute terms, its relative share of total funding has decreased slightly. The reason is that both the corporate and public sectors in Austria have increased their R&D expenditure at higher growth rates.

Out of the € 1.26b from foreign sources, the funds from the EU in 2009 were only € 111.5m accounting for 8.9% of foreign R&D funding in Austria (2007: 8.2%) and for only 1.5% of total R&D funding. More than 90% of foreign funding came from companies abroad and (to a minor extent) from international organisations and went to a very large extent to the corporate sector in Austria. R&D performed by Austrian subsidiaries of international companies plays the most important role in absorbing these investments.

The differences in the relative distribution of funds from EU sources and other international sources (mainly companies) is conspicuous: while in 2009 50.2% (2007: 53.7%) of all EU funding goes to the higher education sector, other international sources invest their R&D funding to 96.5% (2007: 97.4%) into the business enterprise sector.

Regarding FP7, the highest participation comes from the university sector (39%), followed by the non-university research sector (21%)^[1]

. The share of SMEs is 19% and that of large industries is 7%. The rest (14%) are other organisations or not specified. Since FP5, Austria has a positive juste-retour. Around 1.5 % of total yearly R&D funding in Austria originates from the European Framework Programmes for RTD.

For the Structural Funds (SF) planning period 2007 – 2013 a total of € 1,204.5m are available for Austria. The Austrian Strategic Reference Framework lists "Innovation- and knowledge-based economy" as one of three strategic objectives, which includes

- Increasing R&D activities, achievement of the Barcelona objectives;
- Increasing the number of innovators and radical innovations, prioritising SMEs;
- Increasing resource productivity and innovations in ecological and energy technologies.

No fewer than 18 regional and interregional programmes have been designed for the ESF and ERDF funds in Austria. A financial breakdown according to EU Areas of Assistance has been published in the National Reform Programme 2008-2013; it shows that the importance of R&D and innovation has increased tremendously to 43.5% of the total budget, i.e. € 524m compared to € 143m or 14% in the previous planning period. Austrian provinces have earmarked approx. 20% of their SF budget on R&D (without innovation) equalling approx. € 240m (2006-2013). For innovation measures more is earmarked, but the accountability is disputed. According to a study by Ohler et al.^[2]

, the SF budget spent on R&D ranges in the Austrian provinces between 6% and 25%. The main activities funded are cluster initiatives, incubators and competence centres. Since Austria is not a cohesion country, SF play a minor role compared to the total R&D expenditures in Austria: less than 0.5 % of total yearly R&D funding in Austria originates from this source. Nevertheless, most regional innovation actors rely to a great extent on ERDF contributions^[3]. Regional actors focus on a broad innovation policy (developing an innovation friendly environment, creating science-industry links, developing absorptive capacity) while R&D is mainly funded by national actors. On the other hand, the national level (in particular the agencies FFG and KPC) withdrew significantly from the ERDF co-funded R&D support and from ERDF co-funded Eco-Innovation support on risk minimisation grounds ("play safe approach"). Avoidance of heavy administrative burden was one of the reasons for this.^[4] —

^[1]

data from November 2011 by proviso

^[2]

F. Ohler, Strategic Evaluation on Innovation and the Knowledge-based Economy in Relation to the Structural and Cohesion Funds, for the Programming Period 2007-2013, Country Report Austria, 2006

^[3]

Resch, A. (2010): Expert evaluation network delivering policy analysis on the performance of cohesion policy 2007-2013. Task1: policy paper on innovation " Austria.

^[4]

Resch, A. (2010): Expert evaluation network delivering policy analysis on the performance of cohesion policy 2007-2013. Task1: policy paper on innovation " Austria.

Private non profit sector

In Austria, there are no large charitable research foundations, as they can be found elsewhere. A number of small foundations exist, financing mainly prizes, awards or scholarships. They are typically restricted in scope e.g. to certain fields of research, or some functional priorities. The share of the private non-profit sector in both financing and performing R&D in Austria is small with 0.56% and 0.48% respectively in 2009. Compared to 2007, however, a remarkable increase can be detected.

The largest private-non profit organisation funding R&D in Austria is the [Vienna Science and Technology Fund \(WWTF\)](#) with an annual budget of approximately € 7m. The WWTF supports basic research performed mainly by Vienna-based research teams in a number of thematic priority programmes. Among the largest privately organised non-profit research institutes in Austria is the [Centre for Social Innovation \(ZSI\)](#).

In 2011, the [Austrian Ministry of Science and Research](#)

planned to identify and engage private philanthropic resources to support a few R&D priorities, but until now no positive results could be achieved.

The first public budget consolidation measures, which were approved already end of 2010, brought severe hardship to many independent R&D performers, which are not directly owned by the state or the federal states, due to a termination of general (not project related) financial public support to private non-profit research organisations in Austria.

Higher Education Institutions

In 2009, R&D performed in the higher education sector (HES) amounted to €1,952m (26.1% of GERD). This is a considerable relative increase compared to 2007 (23.8) and might indicate a renunciation from the trend of the years before, where the relative share of HES was continuously decreasing. 89.5% of these funds come from the public sector (2007: 88.3%), 5.2% from the corporate sector (2007: 5.7%), and 4.4% from abroad (2007: 4.9%). While between 2002 and 2007 both corporate and international funding has grown, a reverse trend could be observed during 2007 and 2009, when public funding (although already at a very high relative level) became even more important. The share of the General University Funds (GUF) in % of total university budget allocation in Austria still belongs to the highest ones in the EU. GUF allocation is based on two components: firstly, block funding based on a performance contract which considers the criteria "need", "demand", "performance" and "societal objective" and a formula-bound budget share of up to 20% which is based on indicators. An enlargement of the formula-bound block and a stronger weighting of research within in order to emphasise the scientific excellence orientation is occasionally discussed.

Within the HES the 22 public universities play by far the largest role as research performers, consuming 90.1% of the sector's R&D budget in 2009; another 5.38% goes to the Austrian Academy of Sciences (2007: 4.98%) and 3.04% to the 'Fachhochschulen' (Universities of Applied Sciences) (2007: 2.99%). The rest is allocated to private universities and other institutions. The public universities are the backbone of basic research in Austria. Their traditional missions are teaching and research. They have been increasingly expected to cooperate with companies and other partners from practice. Research is essential for career advancement and tenure track.

The Austrian universities are mainly mass universities. On average, one professor at a university is responsible for 116 students (winter term 2009/2010)[1]

. The bad student-to-teacher ratio in some subjects, the introduction of knock-out entry examinations in some highly demanded studies etc. led to ongoing student protests. Despite the abolishment of tuition fees in March 2009, social mobility remains a problem, mainly caused by the Austrian primary education system with its early differentiation mechanisms. As elitist signpost to counterbalance the mass-image of Austrian universities, the [Institute of Science and Technology Austria \(IST Austria\)](#) has been founded.

After the reform of the Austrian university system in 2002, the Austrian Universities' Conference has been re-established as a non-profit association under private law. It handles the internal coordination of the 21 public Austrian universities (without the Danube University Krems), represents them in national and international organisations and it is the public voice of the universities.

Starting in 1993, 21 Universities of Applied Sciences have been established in order to diversify tertiary education in Austria and to meet the demands of the labour market. Their main task is tertiary, practice-oriented education. However, some of them have established R&D facilities and these efforts have been supported by the RTDI programme [COIN](#) and the [Josef Ressel Centres](#) programme. The Universities of Applied Science focus on applied research and technology transfer, mainly addressing regional companies and complementing the activities of universities.

Since the year 2000, private institutions can offer tertiary and postgraduate studies and they can be accredited as a 'private university' if they meet the requirements defined in the University Accreditation Act. Meanwhile, there are 13 private universities; their main activity is education and their share in the R&D performance of the HES was 1.2% in 2009.

In the winter term 2009/2010, 332,624 persons were enrolled in the HES, out of which 53.6% were women and 20.9 % foreigners. 68,806 were freshmen. Most students (255,561 persons or 82.2%) were enrolled at the public universities, out of which 53.7 % were women. 21.3% were foreign nationals. In addition, 36,085 students (11.1%) were enrolled at universities of applied sciences, out of which 45.9% were women and 11.9% foreigners.

In 2009, slightly more than 50% of research conducted in the HES falls under the category of basic research, 39.4% belongs to applied research (2007: 42%) and the remaining 8% to experimental development.[2]

In 2008, the Austrian universities applied for 287 patents[3], while 38 patents have been granted in 2007 (21 in 2006).[4] At yearly average, around 2,100 new doctorate holders are produced by the Austrian universities.[5] In 2007, 40,524 scientific publications were published by university staff, which was an increase of 6% compared to the previous year. Out of these, 9,351 were published in peer reviewed journals listed in SCI, SSCI and A/HCI.

The [Austrian Academic Portal](#)

is a web-based information service providing basic information about the HES and also many research institutes. Detailed statistics and reports of the universities and the higher education system in Austria can be found at the [uni:data warehouse](#).

[1]

Statistisches Taschenbuch 2010, BMWF

[2]

Statistisches taschenbuch 2010, BMWF and Statistik Austria: http://www.statistik.at/web_de/statistiken/forschung_und_innovation/f_und_e_in_allen_volkswirtschaftlichen_sektoren/index.html, accessed on 26 February 2012

[3]

Wissenschaft in Österreich 2010, BMWF

[4]

Universitätsbericht 2008, BMWF

[5]

Universitätsbericht 2008, BMWF

Public research organisations

There are 272 public research organisations in Austria according to the last available full census data from 2009, which comprise a number of very different institutions. Their tasks range from basic research to providing R&D services for industry. As R&D performers they play a small role compared to the business sector and the university sector; together they perform approx. 5% of R&D in Austria. If the public research organisations are included, which are listed in the HES (namely the 62 institutes of the Austrian Academy of Sciences) and the 55 organisations summarised as 'cooperative sector' and subsumed under the corporate sector in the official statistics, then they all together perform approx. 13% of R&D in Austria.

The oldest public research organisation in Austria is the [Austrian Academy of Sciences \(ÖAW\)](#) focusing mainly on basic research, complementary to the research performed at Austrian universities. In official Austrian statistics, it is subsumed under the HES.

The [Austrian Institute of Technology \(AIT\)](#)

is the largest non-university research institute. AIT is jointly owned by the Republic of Austria (with a share of 50.5%) and by a consortium of companies. Its main task is to perform application-oriented R&D for / with companies.

Moreover, there is a small group of research institutes with a strong regional focus, financed mainly by the regional government of the province where they are located. These institutes normally focus on applied research and technology development. The largest of these institutes is [Joanneum Research](#)

, which is active beyond the regional level also in national and international cooperation; other, smaller players are [Upper Austrian Research](#) and [Salzburg Research](#).

The 'Kompetenzzentren' (Centres of Excellence or Competence Centres) are a special case. Through the funding programmes [COMET](#),

and the former [K-plus](#) and K-ind, more than 40 'Centres of Excellence' have been established since 1998, linking partners from science and industry in jointly defined long-term research programmes. More than 1,500 researchers both from science and business are working together on basis of jointly defined research programmes. The actual 'Centre of Excellence' is a legal entity (e.g. a limited company) and receives up to 60% of public funding. They have had a strong positive impact on the Austrian innovation system.

Whereas the governance of the Austrian universities has changed significantly with the [University Act of 2002](#)

which bases public financing for each university on a 3-years performance contract, the financing of public research organisations is still dominated by their traditional patterns.

On the federal level the idea of signing performance contracts as well with the public research organisations (except the 'Kompetenzzentren') has recently entered the agenda.

Business enterprise sector

2,946 companies conducted systematically R&D in Austria in 2009 (2007: 2521). This number has significantly grown compared to the 1,317 companies in 1998. Together, they employed in 2009 67.9% of all researchers in Austria, i.e. 38,302.9 fulltime equivalent employees (2007: 36,988.6), which almost doubled compared to 1998 (Source: Statistik Austria).

2,946 companies reported R&D expenditures in 2009. 59% of these companies employed less than 50 people, however, these small companies accounted for only 11% of corporate R&D expenditures (2007: 9.9%). 71.3% of R&D expenditures come from the 427 large companies with more than 250 employees (2007: 72.3%), although they account for only 14.5% of all companies financing R&D (2007: 16.8%) - see table (2009):

Size (No. of Employees)	Number of companies	% of companies	R&D expenditures (€)	% of expenditures
1-49	1,739	59.03%	561,138	11.02%
50-249	780	26.48%	899,444	17.66%
250 and more	427	14.49%	3,632,320	71.32%
<i>Total</i>	<i>2,946</i>	<i>100%</i>	<i>5,092,902</i>	<i>100%</i>

The IPTS Industrial R&D Investment Scoreboard ranks the 1,000 companies investing the largest sums in R&D. According to the 2010 ranking, the top 10 R&D investors in Austria are ranked within the EU as follows:

- 164: Voest-Alpine, industrial metals (steel) (151 in 2009) (<http://www.voestalpine.com>)
- 193: Borealis, plastics (polyolefines) (183 in 2009) (<http://www.borealisgroup.com/>)
- 238: Intercell, biotechnology (vaccines) (263 in 2009) (<http://www.intercell.com>)
- 286: Andritz, Industrial machinery (264 in 2009) (<http://www.andritz.com>)
- 289: Zumtobel; electronic equipment (lighting) (326 in 2009) (<http://www.zumtobel.at>)
- 295: Telekom Austria, telecommunications (285 in 2009) (<http://www.telekom.at>)
- 341: Novomatic, leisure (slot machines) (374 in 2009) (<http://www.novomatic.com>)
- 362: KTM Power Sports, automobiles and parts (motor-bikes) (283 in 2009) (<http://www.ktm-bikes.at>)
- 474: AT&S Austria Technologie und Systemtechnik, electrical components and equipment (<http://www.ats.net>)
- 484: RHI, industrial machinery (refractories) (434 in 2009) (<http://www.rhi-ag.com>)

The Scoreboard ranking of R&D financing does not take into account industrial R&D performed by companies located in Austria, but owned and financed by international companies with their headquarters abroad. This holds, among others, for one of the largest industrial R&D performers in Austria, Siemens Austria, and " retrospectively - also for the former VA Tech which ranked in earlier versions of the Scoreboard until it was taken over by Siemens Austria.

Most Austrian companies active in R&D perform these activities in-house, however, some (large) companies have turned their R&D departments into dedicated research companies, for example the Research Institute of Molecular Pathology which is owned by the Boehringer Ingelheim Group, or the Novartis Institute for BioMedical Research, owned by Novartis.

Non-corporate private Research and Technology Organisations

The private research and technology organisations (RTO) in Austria are a heterogeneous group performing R&D in many fields of science and technology. Some of them receive public co-financing. However, in a number of cases this contribution accounts for only a small fraction of their budget. In terms of overall volume their role as R&D performers is small compared to universities and the public research organisations. Many of the private RTO are small and highly specialised in their field of research. For these reasons, the private RTO in Austria are not very visible as a group.

Therefore, we selected some of the larger organisations as examples:

The [Ludwig Boltzmann Society \(LBG\)](#)

has been established in 1961 mainly to complement the established academic research system in promising research areas. It is a private non-profit organisation that funds basic and applied research in the cultural and social sciences, the humanities and in human medicine. In 2008, the LBG society (including its institutes) had approx. 309 employees (243FTE), an increase of 25% compared to 2006. It is jointly financed by the [Ministry of Science and Research \(BMWF\)](#), the [National Foundation for Research, Technology and Development](#), the City of Vienna, private sponsors and member as well as by regional and local authorities.

[Austrian Cooperative Research \(ACR\)](#)

is the association of the so-called 'Cooperative Research Institutes' in Austria with a strong focus on SME support. ACR was founded in 1954 and has 17 full members and six non-regular members as well as two associated members. The ACR institutes perform measurement & testing, contracted R&D and technology & knowledge transfer, mainly for small and medium-sized companies in Austria. In 2010, all ACR full members together had 574 employees (2009: 621) and a turnover of €51.2m. In 2010, R&D activities account for 31% of turnover. ACR is supported by the [Federal Ministry for Economy, Family and Youth \(BMWFJ\)](#) through a dedicated funding programme.

For 70 smaller non-profit organisations, which are organised on private law basis as associations or limited companies, but partially largely depending on public subsidies, the Austrian Ministry of Science and Research has terminated its basic funding contribution as of 31 December 2010 as a response to the budget consolidation crisis.

Labour Market for Researchers

According to Statistic Austria, 96,502 persons were employed in R&D in 2009 (2007: 89,458). This equals 56,437.5 full time equivalents (FTE) (2007: 53,252.2). Out of these, 34,663.7 FTE are researchers; 67.9% of FTE are employed in the business enterprise sector, 26.7% in the HES and 4.7% in the government sector.^[1]

The small rest is employed in the private-non-profit sector. Compared to the EU average, Austria shows very high employment shares for researchers in the corporate sector, and very low ones in the government sector. A comparatively low share of female researchers in Austria is conspicuous, especially in the corporate sector.

Regarding HRST, Austria was one of only four EU MS where the share of HRST in the total employment fell between 2004 and 2007.^[2] In terms of the core definition of HRST (people who have a third level education and work in a S&T occupation), Austria belongs to the laggards in the EU with 11.1% of total employment, compared to the EU average of 16.3%. This is especially caused by the low tertiary education quota, which is also expressed in a relatively low level of S&T graduates per 1000 persons aged 20-29, where the Austrian share is 11.0% in 2007 (EU: 13.4%), but already considerably higher than in 2002, where the Austrian share was only 7.9%.^[3] The total number of PhD students in Austria in 2007 was slightly more than 18,000 or 3.46% of all PhD students in the EU27 and, thus, clearly above Austria's population share in the EU, which is around 2.5%.

Austria disposes a high share of foreigners among its HRST. Each year between 0.4 % and 0.7 % of all employed HRST in Austria are immigrating to Austria, which is above the European average^[4]

. While in the EU at average 0.3 % of HRST (in the core definition) in 2007 worked one year before abroad, this share in Austria is almost double as high (0.59%). This is mainly due to a considerably above EU average immigration of people with tertiary education to Austria. Austria partially balances its low share of population with tertiary education in this respect. Even more significant is that in Austria 15.9 % of all HRST (in its core definition) were born abroad, while the EU average is 9.0 %. However, like in most small European countries, also a remarkable share of Austrian born HRST lives abroad. According to the European working force census (2007), 0.8 % of all Austrians are working in other EU countries.

Overall, both the mobility of researchers and support for internationalisation through the opening up of the labour market for researchers are well developed in Austria. Non-Austrians are eligible in competing for permanent research and academic positions. Depending on the funding programme, research grants are also partly portable. For the recognition of academic diplomas and certificates, Austria has since long established a National Academic Recognition Information Centre which provides efficient support. With regard to the mobility of researchers, Austria was among the first European Countries to adopt both the EC directive concerning researchers' visas and to install a Mobility Portal.

A wide range of measures (e.g. the outgoing [Erwin Schrödinger Grants](#) or the incoming [Lise-Meitner-Programme](#)) aims to provide support for the international mobility of researchers. In recent years, special emphasis has been placed on attracting expatriate researchers back to Austria (e.g. [brainpower Austria programme](#)).

Researchers from third countries who wish to work at a research institution or a researching company in Austria for more than 6 months may choose from three modes of residence depending on the intended period of stay and activity.^[5]

Late 2010 a new immigration regime to become effective mid of 2011 was announced: the [rot-weiß-card](#), which should simplify the immigration for qualified personnel, including HRST to Austria.

The development of the Austrian HES has generated different kinds of employment. In the [old](#) regime, most academic staff at universities received, following temporary employment contracts and a kind of tenure status, the status of civil servants with life-long employment. However, based on the University Act from 2002 universities are now free to contract researchers based on private law.

[\[1\]](#)

Eurostat (2010): Europe in figures [Eurostat yearbook 2010](#).

[\[2\]](#)

Eurostat (2010): Europe in figures [Eurostat yearbook 2010](#).

[\[3\]](#)

Eurostat (2010): Europe in figures [Eurostat yearbook 2010](#)

[\[4\]](#)

BMWF, BMVIT, BMWFJ 2010

[\[5\]](#)

More information is provided in the analytical country report Austria 2010.

Research Infrastructures

According to a recent stock-taking study on research infrastructures (RI),^[1]

Austria is comparatively well supplied with small research infrastructures, but a deficit concerning larger, internationally visible infrastructures is evident. In 2009, the [Austrian Council](#) recommended to connect Austrian R&D closer with international infrastructures, to plan research infrastructures in a more integrative manner through the implementation of a national research infrastructures platform, which should prepare a national research infrastructure roadmap embedded in a long-term master plan; and to secure adequate financial resources sustainably.

On the 27 February 2009, the Austrian Parliament ratified the Austrian membership to ESO, but further endeavours to systematically tackle the issue of RI in Austria are at least interrupted due to the financial and economic crisis and the need to consolidate the public budget as of 2010. Nevertheless, Austria is member in major inter-governmental RIs, such as CERN (since 1959), ESRF and ILL (through the Austrian Academy of Sciences), EMBL (since 1974), ESA (since 1987) and the European Centre for Medium Range Weather Forecasts ECMWF.

According to the latest available ESFRI implementation report (2009), a national Austrian road map is still in preparation but has not yet been published.

Austria participates (cut-off date March 2010) in three ESFRI projects, namely ESRF Upgrade and ILL20/20 in the field of materials and analytical facilities and BBMRI in the field of biological and medical sciences. The decision concerning E-ELT (the European extremely large telescope for optical astronomy) is still pending. The participation concerning CLARIN, CESSDA and SHARE (all in the field of social sciences and humanities) is planned, while the participation concerning FAIR in the field of physical sciences and engineering has been suspended due to budgetary reasons.^[2]

[1]

Austin, Pock and Partners 2010

[2]

BMWF, BMVIT, BMWFJ 2010

Research Organisations

To support quality assurance in the HES in Austria, the [Austrian Agency for Quality Assurance \(AQA\)](#) was established as an autonomous institution in 2004 as a joint initiative of the former Austrian Rectors' Conference, the Austrian Conference of Universities of Applied Sciences, the Austrian Union of Private Universities, the Austrian National Union of Students and the former Federal Ministry for Education, Science and Culture. AQA is a full member of international networks for quality assurance (ENQA, CEE network and INQAAHE) and registered in the European Quality Assurance Register for Higher Education. As one of the first European agencies AQA has undergone an external evaluation co-ordinated by ENQA in 2007.

Austrian universities are to a very high degree autonomous. The development towards autonomy started already with the University Act 1993 with a separation between decision and control functions and the introduction of global budgets. Comprehensive personnel responsibility for universities was attained in 2001 with the service law for university personnel ([Universitätsslehrerdienstrecht](#)), including the abolishment of public servants status for new employees. The rector became supervisor for the entire university personnel. With the [University Act 2002](#)

finally, all universities became autonomous legal entities of their own ([Vollrechtsfähigkeit](#)), guaranteed by the constitution (Art. 81c B-VG). The control of legality is still a matter of state, but universities conclude under their own behalf and right business and contracts. Highest institutions within the university fabric became the university council, the rector and the senate.

The universities have also financial autonomy in terms of global budgets based on performance contracts with three years duration. In return, cost accounting and planning as well as intellectual capital reports became compulsory.

Public expenditures for higher education were \approx 3.045b in 2008, which is 1.08 % of GDP and 3.79 % of public budget spending (BMWFW 2009). The highest share of this public expenditure falls under the category [general university funds](#) (GUF), which was \approx 2,396,291m in 2008 and which increased considerably in 2009 (\approx 2.648b) and 2010 (\approx 2.874) (BMWF, BMVIT, BMWFJ 2010). The R&D share of GUF has been constantly around 47 % during the last five years. 80 % of the block funding granted to universities is [global funding](#) and 20 % are formula based budget allocation. 14 % of the university budget comes from competitive funding and contracted research. Tuition fees, which were around 5.6 % of the university revenues in 2008, were abolished as of March 2009 [1] and had to be substituted by public budgets.

Eleven criteria are considered in the calculation of the formula budget, which are subsumed under three overall blocks (1) education, (2) R&D and (3) social objectives. [2]

There are currently discussions to put more emphasis on research parameters such as bibliometric indicators, which would lead to more competition among the universities in this field and eventually to concentration processes.

The distribution of the money within the university is left to the universities themselves, which means that they could make decisions for allocating resources autonomously in line with their research priorities. The process of establishing R&D priorities, however, is still in its exploratory phase and rather the exception than the rule. [3]

[1]

BMWF 2009

[2]

Verordnung der Bundesministerin für Bildung, Wissenschaft und Kultur über das formelgebundene Budget der Universitäten in der Fassung vom 22.11.2010.

[3]

Wissenschaftsrat 2010

Knowledge Transfer

Since 2001 the publicly funded [AplusB](#) programme supports spin-offs from universities, universities of applied sciences and non-university research organisations. A recent evaluation confirmed the successful conception of the AplusB programme [1] but emphasises an increased attention towards more experienced researchers, further flexibility concerning the length of stay of business founders within the programme, increased international exchange of knowledge and an intensification of the AplusB platform among other issues. In 2010, nine AplusB centres operated in Austria and provided awareness raising and stimulation for academic entrepreneurship, consultancy, training and assistance for a duration of 1.5 years and support through cooperation with financiers and other support structures and programmes. The centres include around 150 partners coming from different institutional background, such as foreign academic partners, domestic

R&D partners, financial partners, media partners, intermediary partners such as incubators and business partners. The target for the next couple of years is to facilitate in total around 320 academic spin-offs.

Inter-sectoral mobility in Austria is low, although no hard factors restrict mobility of researchers between the public and the private sector. Researchers employed in the public sector are allowed to work for industry on a part-time, consultancy or other basis, provided that their contracts do not include competition clauses which prohibit such arrangements. Through the gradual abolishment of civil servants status at universities and the introduction of private law-based labour contracts further mobility obstacles have been removed. However, different soft factor still aggravate the inter-sectoral mobility. For instance, the number and quality of publications becomes increasingly central to access an academic position as well as for career promotion, which is a systemic inter-sectoral mobility dilemma, because industry researchers are less stimulated or even not allowed to publish results of their work. To foster inter-sectoral mobility between academia and business enterprises which do not have an own research unit, the 'young experts'-programme has been launched, under whose framework master thesis and PhD thesis, which are firmly embedded in the R&D work of a company, can be supported. The programme has been recently extended towards the co-financing of post-doc positions employed at companies.

Under the 'uni:invent' programme,

whose aim was to unlock and exploit research outputs in economic terms, 13 university transfer offices were established, 50 transfer managers were professionally trained along a dedicated job profile and more than 30 innovation scouts were established at 17 Austrian universities, which increased the performance of the TT offices [2]. Despite the termination of this programme in 2009, technology transfer offices became institutionalised elements of the university fabric in Austria, although not on each and every university. ■■

[1]

Heydebreck and Petersen 2008

[2]

AWS 2010

Cooperation, coordinations and opening up of national research programmes within ERA

Austrian research organisations are actively engaged in the European Framework Programme for RTD, COST and EUREKA. As of November 2011, Austria is the 10th successful EU member state in FP7 with 2,095 approved participations. The share of Austrian participations in % of all approved participations of the EU is 3%, which is considerably higher than the Austrian share of researchers, scientists and engineers (RSE) in % of all RSE in the EU27 (2.3%). Austria is net receiver in FP7. The financial just return to Austria in FP7 by now is 2.67 % [1]

, which is more than €100m per year and, thus, the third largest competitive funding source for R&D in Austria.

Austrian organisations are above average successfully involved in 'social sciences and humanities', 'security research', 'ICT', 'space' and 'environment' as well as in 'support for coherent research strategies', 'international cooperation', 'science in society' and 'regions of knowledge'.

Data available from mid 2009 shows a high acceptance of EUREKA in Austria, especially from industrial organisations. Austria participates in 8 % of all projects running mid 2009. The financial volume of these projects is around €1.4b. [2]

Thematic priorities of Austrian participation are in ICT, industrial production technologies, agriculture and food technologies and transport technologies.

Early December 2010, major findings of the recent evaluation [3]

of Austria's support structures for FP7 and EUREKA as well as on the impact of European research initiatives on the Austrian R&D system were publicly presented, which confirmed a general positive FP approach and absorption in Austria, but was more critical towards EUREKA in this respect.

Austrian researchers participate in almost 70 % of the running COST actions. In total, Austria is ranked 14th among the 36 COST countries in terms of the country rate of participation in 2009. [4]

Most demanded by Austrian participants are the fields of agricultural research and biotechnology, medical research, social sciences, chemistry, material sciences, ICT, forestry research and meteorology.

With data status of May 2010, Austrian organisations participate in 58.3 % of the 60 funded ERA-NET and ERANET-PLUS projects funded under FP7. The Austrian ERA-NET participation is especially strong in 'international cooperation', 'actions of horizontal nature', 'food, agriculture, fishery and biotechnology', and 'nano-sciences, nano-technologies, materials and production technologies'.

For the time being, Austria participates in the Art. 185 initiatives 'Eurostars', 'Ambient assisted living', and the European metrology research and development programme (EMRP

) and in the joint programming initiatives [5] 'Agriculture, food security and climate change', 'A healthy diet for a healthy life', 'Climate Knowledge for Europe' (as co-leader), 'More years, better lives (formerly known as 'Health & Ageing')', 'Urban Europe' (as coordinator), 'Cultural Heritage and Global Change: a new challenge for Europe' (as observer), and 'Water challenges' (as observer) and shows interest in the joint programming initiative 'Neurodegenerative Disease Research'.

Austria is founding member of the public-private-partnership based JTI 'Artemis' [6]

and engaged in ENIAC. —

[1]

Proviso 2010, November

[2]

<http://www.ffg.at/content.php?cid=32&sid=309>; accessed on 25 November 2011 and complemented by information taken from BMWF and FFG (2011): Compilation of Joint Programming Initiatives - JOIN IN!, published on 28 September 2011 (http://rp7.ffg.at/upload/medialibrary/Booklet_final.pdf).

[3]

â##Evaluation of Austrian Support Structures for FP 7 & Eureka and Impact Analysis of EU Research Initiatives on the Austrian Research & Innovation Systemâ##, Technopolis 2010

[4]

COST 2010

[5]

<http://www.era.gv.at/space/11442/directory/11767.html>; accessed on 25 November 2010.

[6]

â##Advanced Research and Technology for Embedded Intelligence and Systemsâ##

International S&T cooperation

Austria makes use of manifold instruments, measures, programmes and initiatives to support international cooperation. These comprise research and research mobility funding, maintenance of a few Austrian liaison offices in third countries, engagement in political initiatives and support to substantial international networks with a high Austrian push factor as well as participation in relevant European networks to support the S&T dialogue with third countries (e.g. [WBC-INCO-NET](#), [SEE-ERA.NET PLUS](#), INCO-NET EECA, ERA-NET RUS etc.).

However, by now, no shared internationalisation strategy exists and most of the R&D internationalisation instruments lack critical mass.

Orientation

No dedicated internationalisation strategy exists in Austria so far. Most advanced and comprehensive is the internationalisation strategy of the [BMWf](#)

, which was submitted to the Council of Ministers in 2008. It comprises a European dimension, a neighbourhood dimension, selected bilateral cooperation priorities, the insight to make use of multilateral cooperation with third countries and a notion on international responsibility towards global goals. Most of these issues were reflected in the [governmental R&D strategy published early 2011](#). In terms of an integrated strategy, however, it should be complemented by the strategic approach of the [BMWfJ](#) towards Central and Eastern European countries and the strategic approach of the Austrian Federal Ministry of European and Foreign Affairs towards education and science within its development cooperation policy, which, however, will also be substantially reduced during the next couple of years due to the budget consolidation crisis. Evidently, also issues of international technology policy and industrially oriented R&D need to be further integrated. In none of the existing strategic papers, a dedicated focus on grand challenges can not be ascertained.

Due to the integration of many of Austriaâ##s neighbouring countries into the EU, the former predominant internationalisation focus of Austria on these countries through uni- or bilateral measures clearly decreased.

The initially diversified ASO-network for instance had to first close its locations in Budapest and Bratislava, then Brno and in March 2010 in Sofia. The ASO in Ljubljana closed its operations by the end of 2011. Also [CIR-CE](#)

, which has been incorporated in the [COIN](#)

Instruments

Austria has intergovernmental bilateral S&T agreements with Argentina, Bulgaria, China, Croatia, the Czech Republic, France, FYR of Macedonia, Hungary, India, Korea, Montenegro, Poland, Romania, the Russian Federation, Slovakia, Slovenia, Spain and Ukraine. Between 1997 and 2006, 2,854 projects could be supported within these S&T agreements. The funding of the Austrian [Federal Ministry of Science and Research](#)

was â#~ 5.5m to subsidise the mobility costs of the participating researchers. The intergovernmental bilateral S&T agreements are predominantly used by universities for additional mobility funding. The agreements are usually not or only very roughly thematically defined and encourage a bottom-up approach.

The policy focus has shifted from a bilateral cooperation perspective towards a multilateral perspective in two aspects. Firstly, it is recommended to use bilaterally supported projects for the preparation of proposals to be submitted under the FP. A recent study identified only a partial suitability of this approach[1]

. Secondly, bilateral S&T programmes are increasingly included in international ERA-NETs to exploit synergies with other EU MS. The sustainability of the Austrian involvement in these international ERA-NETs, however, is not secured. For the time being, Austria coordinates the [Southeast European ERA-NET PLUS](#), and the Austrian Federal Ministry of Science and Research is active in the international ERA-NETs with Russia, Korea, India and China. In these ERA-NETs strong elements, which are characteristic for joint programming endeavours, are employed between the European partners and also between them and their third country cooperation partners. From a strategic point of view, Austria participates also in [INCO-NETs with Southeast Europe](#), Southeast Asia, Latin America and Eastern Europe and Central Asia in order to advance policy dialogue and support joint policy making.

Mobility programmes remain the main instruments to support R&D internationalisation. Austria employs a number of unilateral and bilateral mobility schemes for researchers from third countries and participates also in similar European initiatives. Among these programmes are (Schuch 2008):

- the [Salzburg Medical Seminars](#) which enable short research stays in Austria of medical doctors from Eastern and Southeast Europe as well as Central Asia;
- the [translational brainpower](#) programme which aims to include foreign scientists into projects at the interface between basic and applied research;
- the intergovernmental S&T agreements, which support research mobility between Austria and her partner countries (see section 3.5.2) in both directions;
- the [brainpower Austria](#) programme, which initially addressed Austrian researchers abroad, but more and more addresses also foreign researchers interested to work in Austria;
- the [Lise-Meitner-Programm](#), which supports the stay of experienced researchers in Austria;
- the scientific exchange programme of the Austrian Academy of Sciences with its many partners around the globe;
- the CEEPUS-programme which supports students and faculty mobility in the region of Central and Southeast Europe.

In addition to these larger mobility schemes, a number of individual mobility opportunities exist, which can be accessed under Austria's central grants database www.grants.at

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[1]

Schuch 2010

Solving the Grand Challenges through Transnational R&D Cooperation

The Austrian R&D instruments to support transnational R&D cooperation are by tradition not oriented towards grand challenges, but usually based on thematically open bottom-up approaches. An exception to this rule is Austria's participation in the "European Collaborative Research Programmes" ([EUROCORES](#)

), i.e. the thematic research programmes of the [ESF](#). But this concerns mostly R&D cooperation within Europe. Within international R&D programmes sometimes yearly thematic priorities are defined, which occasionally also address grand challenges (e.g. former ASO call for proposals on [South Eastern Europe's Scientific Response to: Biodiversity protection, climate change and energy scarcity](#) in 2008/2009). Moreover, thematic priorities are defined within the international ERA-NETs, in which grand challenges can be addressed (e.g. KORANET [call for proposals on "Research for life-long health"](#) in 2010). Finally it has to be mentioned that Austria's participation in JPI's also indicates a move towards grand challenges.

Correspondent name

Klaus Schuch

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