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Hot STI issues

- Reforming and restructuring education as part of the broader innovation system.
- Raising tertiary attainment and overall STI skills more generally.
- Increasing innovation in the services sector and longer-term R&D investment.

General features of the STI system: Austria's STI system has been steadily expanded and upgraded. BERD increased from 1.42% of GDP in 2002 to 1.88% of GDP in 2010. Links between industry and science are sound; and a high share of public research is funded by industry (Panel 1^(o)). Integration with international networks is good: 57% of scientific articles and 26% of PCT patent applications (above the OECD median) were produced through international collaboration (1^{(a)(tr)}). The relative number of PCT patents filed by universities and public labs is close to the OECD median (1^(p)). PCT patent applications suggest an RTA in environment-related technologies (which has however declined somewhat in recent years), catch-up in emerging technologies, and weak performance in ICTs. Only 19% of the adult population is tertiary-qualified (1^(s)), but a relatively high 32% of the labour force is employed in S&T occupations (1^(v)). Austria has only 8.7 researchers per thousand total employment, but the PISA science scores of 15-year-olds are close to the OECD median (1^(t)). ICT infrastructure indicators vary around the median. Austria has 25 fixed broadband and 33 wireless subscribers per 100 inhabitants 1^{(k)(l)}). It has a relatively large number of autonomous networks (1^(m)). The e-government readiness index is slightly below the median, similar to that of Iceland and Spain (1⁽ⁿ⁾).

Recent changes in STI expenditures: GERD was 2.75% of GDP in 2011, well above the OECD average. It grew by 3.6% a year between 2005 and 2011, the fastest growth among EU countries. Austria aims for GERD to

increase to 3.76% of GDP by 2020, ideally with up to 70% financed by the private sector. In 2011, industry funded a relatively high 45% of GERD, while government funded 39%. The share of GERD financed from abroad (16% in 2011) is one of the highest among OECD countries.

Overall STI strategy: In March 2011, the Austrian Council of Ministers announced a new Research, Technology and Innovation (RTI) Strategy: The Way to Become a Leader in Innovation for 2011-20. It focuses on improving the links between education and innovation, developing risk and venture capital, stimulating competition, improving innovation governance, and implementing structural change to encourage more dynamic research, innovation and knowledge-intensive industries.

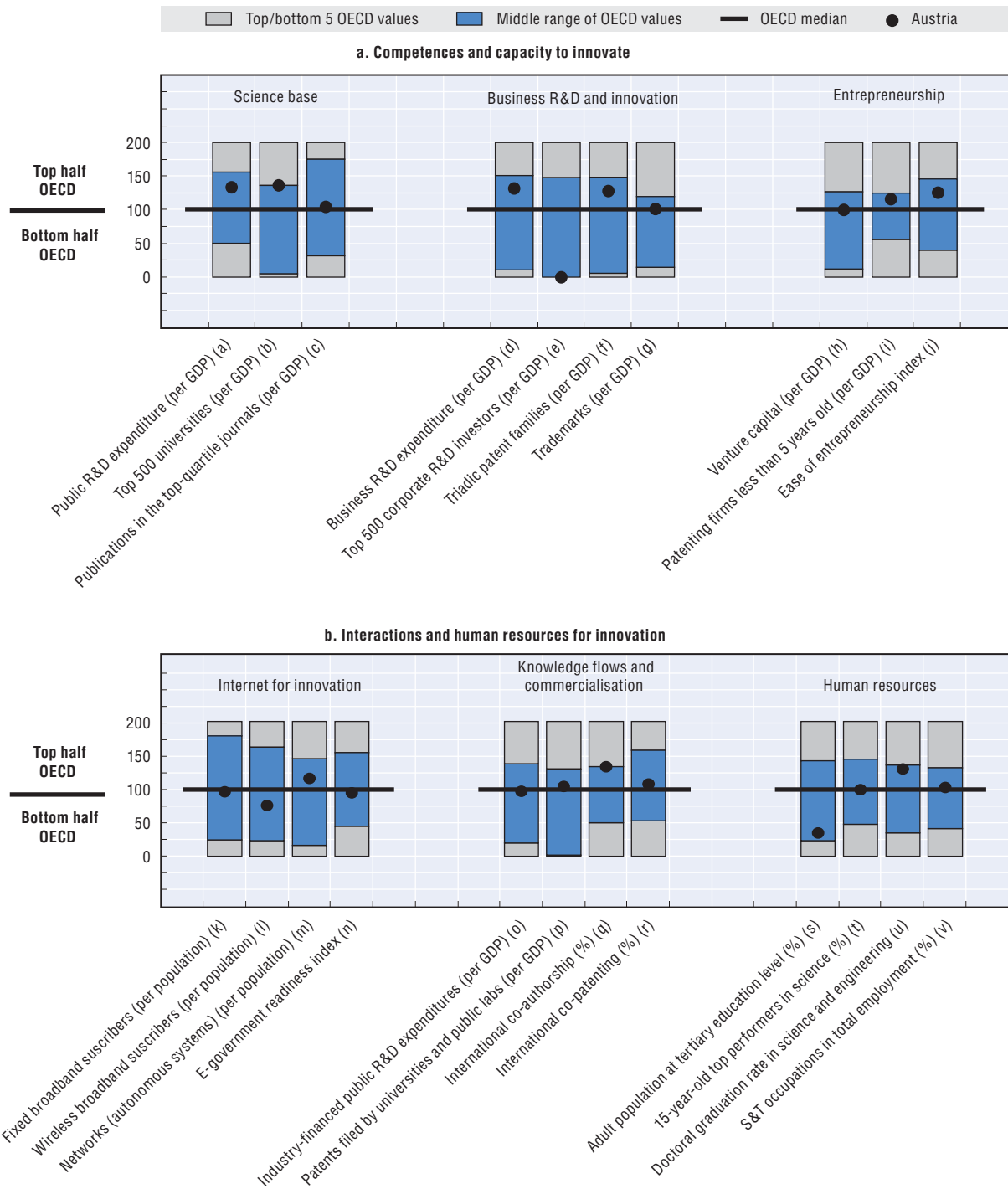
STI policy governance: STI policy continues to be formulated and implemented by three key ministries. The Federal Ministry of Science and Research (BMWF) is responsible for tertiary education and basic research; the Federal Ministry of Transport, Innovation and Technology (BMVIT) manages the public budget in applied research; and the Federal Ministry of Economy, Family and Youth (BMWFJ) is responsible for the Christian Doppler Research Association (CDG) and the Josef Ressel Centres. The Federal Ministry of Finance is in charge of allocation of funds. Austria has a good evaluation culture. Recent evaluations include the Science Conference, the CIR-Ce Network Projects, the Laura Bassi Centres of Expertise and the Josef Ressel Centres.

Key figures

Labour productivity, GDP per hour worked in USD, 2010	49.6	GERD, as % of GDP, 2011	2.75
(annual growth rate, 2005-10)	(+1.5)	(annual growth rate, 2005-11)	(+3.6)
Environmental productivity, GDP per unit of CO₂ emitted in USD, 2009	5.16	GERD publicly financed, as % of GDP, 2009	0.97
(annual growth rate, 2005-09)	(+5.7)	(annual growth rate, 2006-09)	(+7.0)

Figure 10.3. Science and innovation in Austria

Panel 1. Comparative performance of national science and innovation systems, 2011



Note: Normalised index of performance relative to the median values in the OECD area (Index median = 100).

Science base: Austria has a sound science base, with comparatively high public-sector R&D expenditure (1^(a)), competitive university rankings (1^(b)) and good international publications (1^(c)).

Business R&D and innovation: Austria has a competitive export-oriented sector, including innovative SMEs with strong performance in niche markets, and provides a balanced mix of direct and indirect support for business R&D. Overall, public support leans more towards the business sector (Panel 4). In 2011, the innovation voucher was doubled to USD 13 891 and the tax credit was changed to a simpler tax premium and was raised from 8% to 10%. Firms conducting R&D are expected to increase by 10% between 2010 and 2013 and by 25% by 2020. During 2011-14 an additional USD 1 billion will go to support the RTI system through the tax premium. Another measure is the Services Sector Initiative (*Dienstleistungsinitiative*).

Entrepreneurship: The RTI Strategy aims at an increase of 3% a year in research-intensive firms (particularly SMEs) over the medium term. To address gender imbalances, the BMWF fForte Coaching programme (Women in Research and Technology) offers courses to assist women with grant proposals and finance.

ICT and scientific infrastructures: Development of an information society is a national priority. *Kompetenzzentrum Internetgesellschaft*, an Internet competence centre, was established in 2010 and made recommendations for developing ICT infrastructure. Use of the Internet has increased: more than 90% of 16-to-24-year-olds have access to personal computers and the Internet.

Clusters and regional policies: A national platform for clusters was established in 2008; there are now around 50 cluster initiatives, with 3 500 participating enterprises, and 20 technology parks. Almost every federal state runs a cluster initiative or incubator to link companies and research institutions around thematic priorities. Nationwide, there are more than 100 innovation infrastructure sites (*Impulszentren*).

Knowledge flows and commercialisation: Because of past weaknesses in strategic R&D collaboration between academia and industry, programmes to

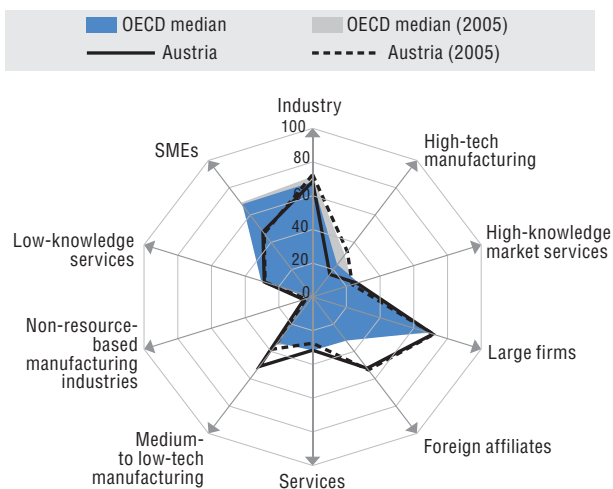
improve collaboration have been established: the competence centres for excellent technologies (COMET), co-operation and innovation networks (COIN-Net), and initiatives of the Christian Doppler Society and the Josef Ressel Centres. The Laura Bassi centres of expertise support a forum in which skilled female and male researchers from academia and the private sector work together. Recent initiatives include new rules and guidelines governing ownership and licensing of publicly funded research results and IPR licensing support for PRIs.

Human resources: Education is a key part of the RTI Strategy. Better education is critical for improving Austria's innovation system and raising standards of living. The New Secondary School (*Neue Mittelschule*) programme is a major educational reform and the MINT-Initiative aims to improve maths, IT, natural sciences and technology education. *Forschungskompetenzen für die Wirtschaft* is an initiative to build R&D skills. The Lifelong Learning Strategy and the Lifelong Guidance Strategy aim to increase human capital at all levels. Joint ministerial programmes to stimulate overall STI skills include *Jugend innovativ*, *Sparkling Science* and *Generation Innovation*. There are several programmes at the tertiary and higher education levels.

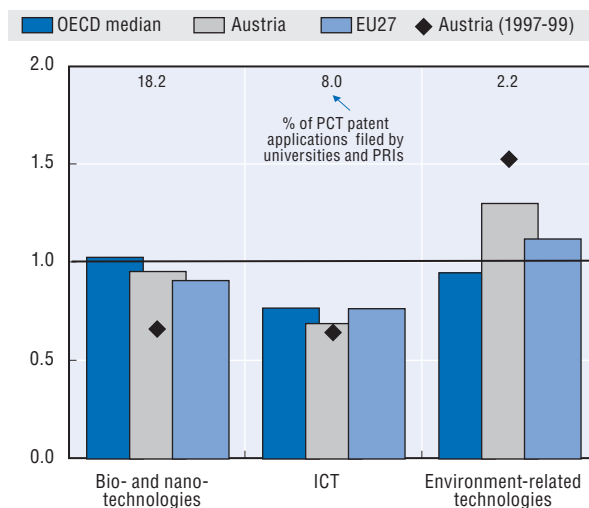
Globalisation: The goal of the go-international programme of the Austrian Chamber of Commerce is to improve internationalisation and technology transfer; the USD 54 million *Internationalisierungsoffensive* helps Austrian exporters and investors to remain competitive.

Green innovation: Based on the 2010 Energy Strategy, an Energy Research Initiative (ERI) is planned to support the development of technologies notably for the production of renewable energy sources and the storage of CO₂. The Cleantech Initiative was launched to provide risk capital for innovative enterprises in energy and environmental technologies. The AWS Bank's capital injection of USD 8.3 million is expected to make around USD 42 million available in funding. Priority is also given to the development of a more sustainable and efficient transport system through initiatives such as E-Mobility.

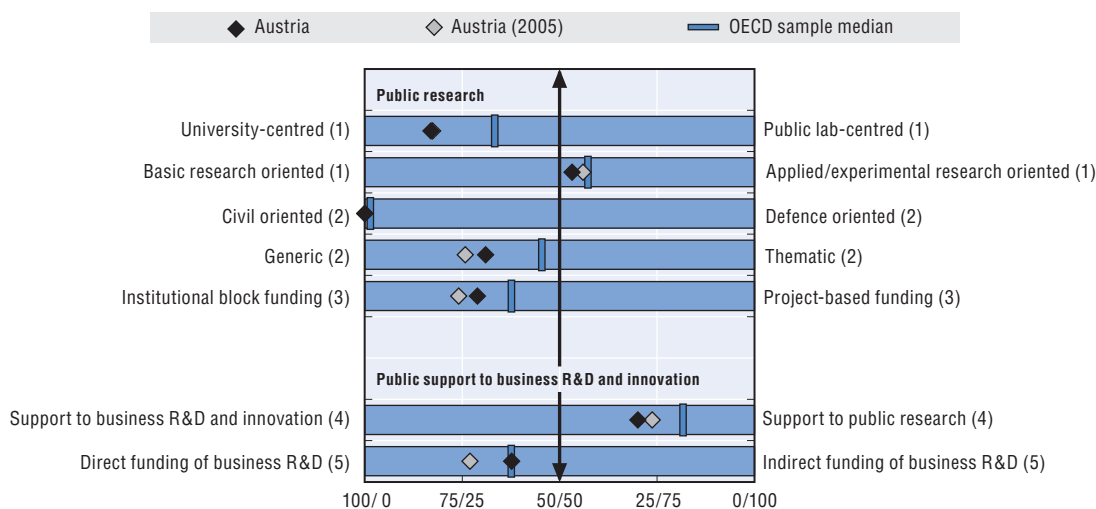
Panel 2. Structural composition of BERD, 2009
As a % of total BERD



Panel 3. Revealed technology advantage in selected fields, 2007-09
Index based on PCT patent applications



Panel 4. Overview of national innovation policy mix, 2010



1. Balance as a percentage of the sum of HERD and GOVERD.
2. Balance as a percentage of total GBAORD.
3. Balance as a percentage of total funding to national performers.
4. Balance as a percentage of the sum of HERD and GOVERD funded by government and higher education and components of (5).
5. Balance as a percentage of the sum of indirect funding of business R&D and innovation through R&D tax incentives and direct funding of BERD through grants, contracts and loans.

Source: See reader's guide and methodological annex.

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