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Germany

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GERMANY

Germany has traditionally been one of the OECD's top performers in science, technology and innovation. With a mature national innovation system, including a number of large, well-established research institutions and firms, it has a large and growing share in total OECD high- and medium-high-technology exports, and is the fourth most intensive patenter in the OECD area (adjusted for population). However, its productivity performance has been slipping against the leading OECD countries. Extracting greater benefits from existing innovation capabilities will be essential to boost productivity and maintain high living standards.

Germany aims to reach the EU Lisbon Strategy target of 3% of GDP invested in R&D by 2010, and in 2006, gross domestic expenditure on R&D (GERD) reached 2.53% of GDP. Business performs 70% of GERD, followed at a distance by the higher education sector (16.3%). In 2002-04, 4.4% of small and medium-sized enterprises (SMEs) and 22.4% of large firms collaborated with higher education on innovation.

For human resources in science and technology (HRST) performance is mixed. More than 30% of new degrees in Germany are awarded in science and engineering (compared to an OECD average of 23%), and a higher than average number of graduates also receive doctorates in these subjects. As in Denmark, Switzerland and Sweden, over 35% of total employment is in HRST occupations. However, the tertiary graduation rate is among the lowest in the OECD area, potentially narrowing the skills base for innovative activities. Compared to similar

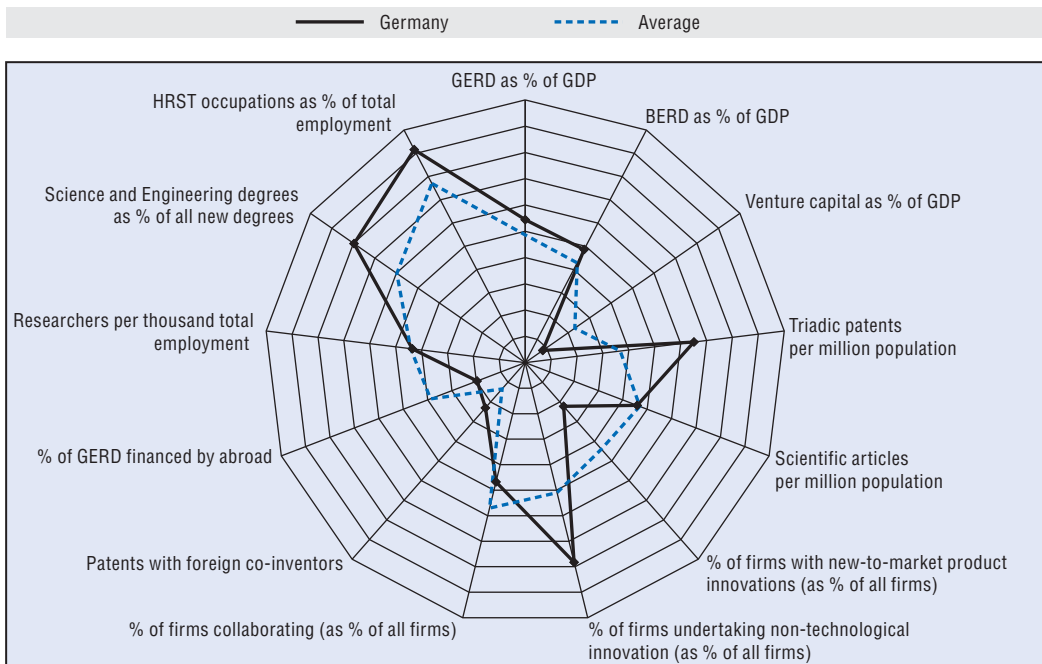
OECD countries, the number of R&D personnel and researchers has grown very slowly.

In-house product innovation is high and many firms also perform non-technological innovation. Germany shows particular strength in environmental science – almost one-quarter of environmental technology patent applications to the European Patent Office, and almost one-fifth of the technologies sold worldwide in the sector, originate in Germany.

Germany has a wide range of policies to support innovation. The federal government's High-Tech Strategy (launched in 2006) is a national strategy which encompasses all ministries. It sets out strategies for 17 "future fields" and aims at translating ideas from basic technologies as rapidly as possible into marketable products, services and processes. In February 2008, the federal government launched an Internationalisation Strategy to attract researchers, students and foreign investment with a strong focus on R&D. Under the Initiative for Excellence, Germany is providing project funding to support graduate schools, "excellence clusters" and frontier research at universities. Several new policies address tertiary graduation rates, including the Higher Education Pact 2020 and the Qualifications Initiative.

A key challenge is to accompany innovation-specific policies with broader reforms that continue to lower regulatory and administrative barriers to entrepreneurship and to foster competition to further bolster the environment for innovative activity. In addition, improving outcomes from the education system will be crucial for generating and absorbing new technologies.

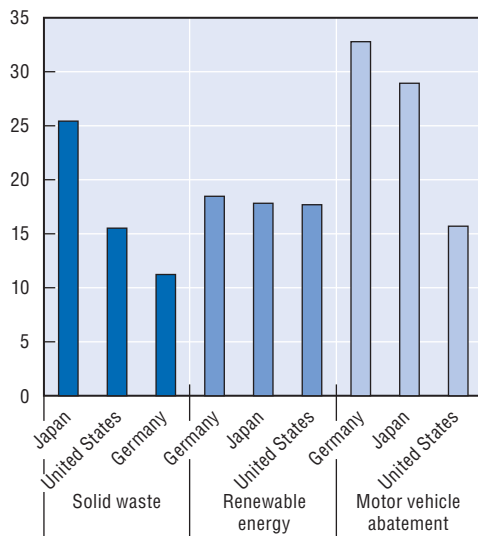
Science and innovation profile of Germany



StatLink <http://dx.doi.org/10.1787/452612130756>

Shares in environmental technology patents filed under the Patent Co-operation Treaty

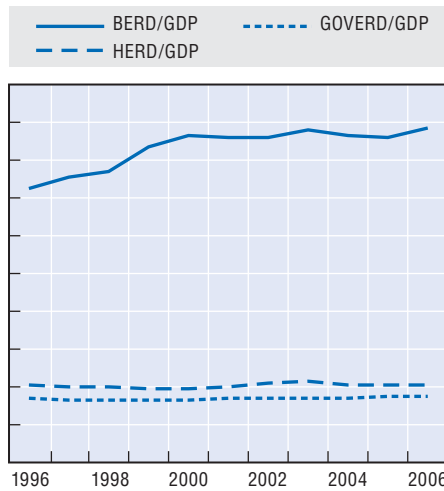
Top three countries, 2000-04



StatLink <http://dx.doi.org/10.1787/452663424643>

R&D expenditure, 1996-2006

As a percentage of GDP



StatLink <http://dx.doi.org/10.1787/452687551413>

Chapter 3

Science and Innovation: Country Notes

This chapter complements Chapters 1 and 2 by providing an individual profile of the science and innovation performance of each OECD country, as well as observers to the OECD Committee on Science and Technology Policy (Brazil, Chile, China, Israel, Russia and South Africa), in relation to their national context and current policy issues. The graphs enable countries to see some of their relative strengths and weaknesses as compared to other countries' performance.

The common indicators in the first (radar) graphs were selected on the basis of current policy issues. They focus on research and innovation inputs, scientific and innovation outputs, linkages and networks, including international linkages, and human resources. A standard set of indicators is used; however, when data are not available, alternative indicators may be applied. The annex provides a full list and description of the indicators, methodological notes and data sources.

For each indicator in the radar graph, the country with the maximum value is set at 100, taking into account all OECD and non-OECD countries with available data. The average is calculated by taking into account all OECD countries with available data (non-OECD countries are excluded from the average). The annex provides further details.

The radar graphs are accompanied by country-specific figures that further illustrate national characteristics and underpin policy-specific comments. The selection of comparator countries in these graphs aims to highlight the general position of the focal country and, in some instances, data on other countries may also be shown.

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