

The Researchers Report 2012

Country Profile: Bulgaria



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1. Key data

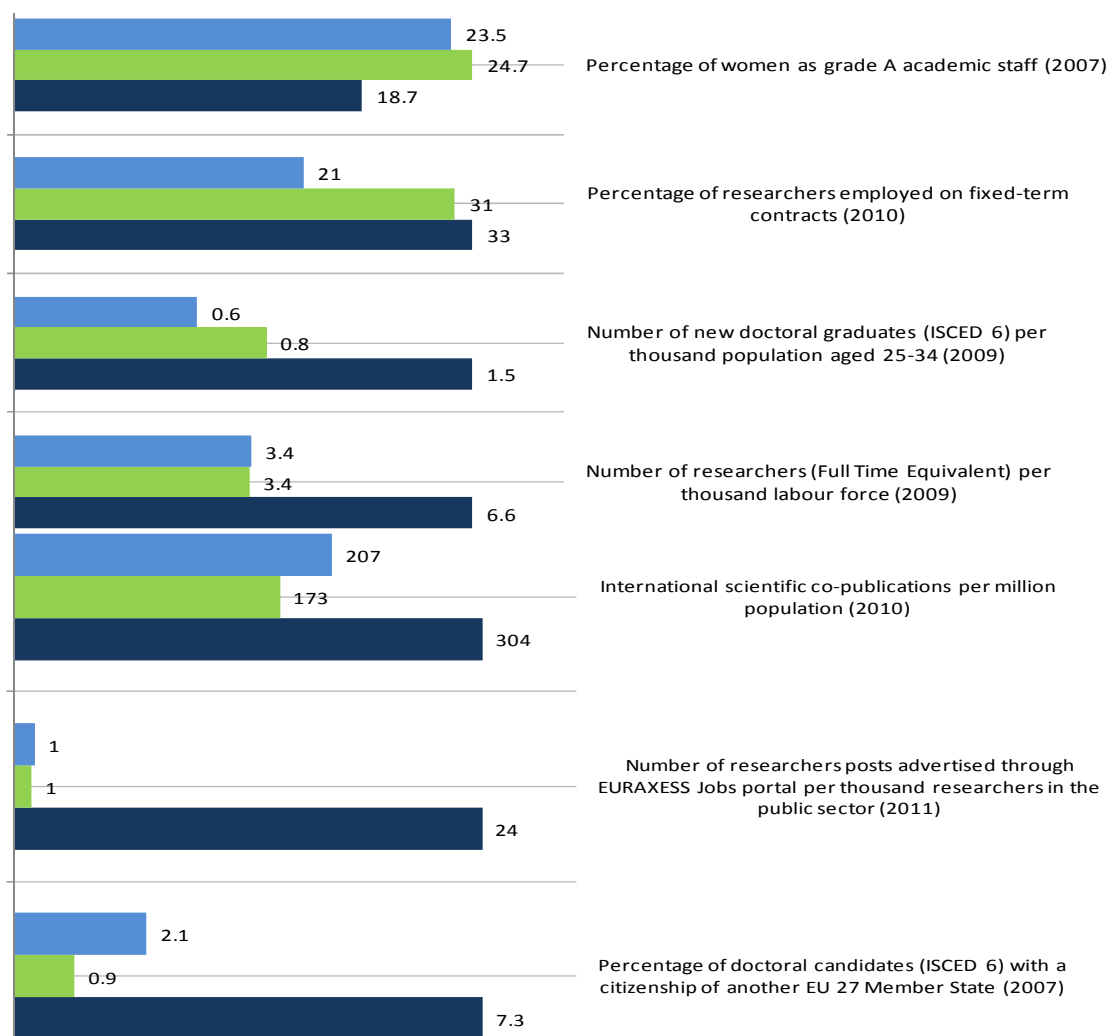
National R&D intensity target

“Bulgaria is one of the countries with the lowest R&D intensity in the EU. Bulgaria’s R&D intensity has been decreasing over time, from 0.57% in 1999 to 0.53% of GDP in 2009; i.e. around four times less than the EU-27 average. The very low level of private R&D investment in the economy is particularly worrying. At 0.16% of the GDP in 2009, having increased however from 0.10% of GDP in 2002, Bulgaria ranks the lowest in the EU. The sectoral specialisation in low technology sectors and the current scarcity of medium and high technology firms in the economy is responsible for this low level of private R&D. A substantial increase of the R&D spending, both in absolute and relative terms, will be instrumental for Bulgaria in order to raise the economic competitiveness and secure high-quality jobs. Aware of the need to raise R&D investment, the Bulgarian Government approved a national target for R&D intensity for 2020 of 1.5% of GDP. This target is rather ambitious and will be reached only if strong efforts and reforms based on a long-term strategy is put in place and implemented in a sustained manner.”¹

Key indicators measuring the country’s research performance

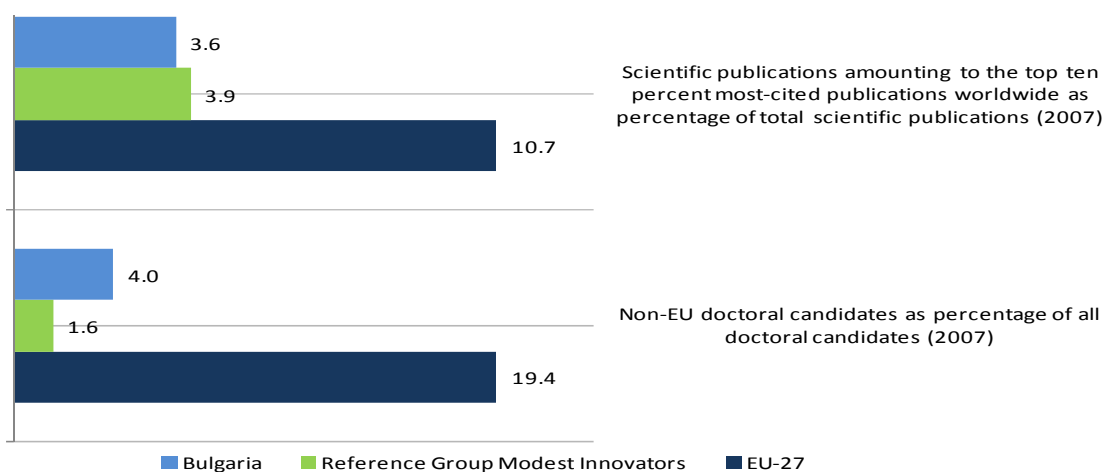
The figure below presents key indicators measuring Bulgaria’s research performance against a reference group and the EU-27 average².

Figure 1: Key indicators – Bulgaria



¹ European Commission (2011), “Innovation Union Competitiveness Report 2011”.

² The values refer to 2011 or the latest year available.



Source: Deloitte

Data: Eurostat, SHE Figures, EURAXESS Jobs Portal, Science Metrix/Scopus (Elsevier), Innovation Union Scoreboard 2010

Notes: Based on their average innovation performance across 24 indicators, Bulgaria, Latvia, Lithuania and Romania show a performance well below that of the EU27. These countries are the Modest Innovators³.

Stock of researchers

The table below presents the stock of researchers by Head Count (HC) and Full Time Equivalent (FTE) and in relation to the active labour force.

Table 1: Human resources – Stock of researchers

Indicator	Bulgaria	EU Average
Head Count per 1 000 active labour force population (2008)	3.77	9.45
Head Count (2008)	13 416	-
FTE per 1 000 active labour force population (2009)	3.43	6.63
Full time equivalent (FTE) (2009)	11 968	-

Source: Deloitte

Data: Eurostat

2. National strategies

The main challenge for Bulgaria, as well as for many other EU Member States, is to increase the average level of investment in R&D. Following an update for 2020, the Bulgarian target has been set at 1.5% of GDP (compared to 3% of GDP for the EU as a whole). In 2010, Bulgarian investment in R&D amounted to 0.55% of GDP, making it difficult to guarantee the necessary quality of research and maintenance of a minimum educational and scientific standard. The reasons for Bulgaria’s low level of R&D spending include:

- An archaic model of governance characterised by inefficient human resource management;
- Highly unfavourable age distribution and lack of a vision for renewal of academic staff;
- Lack of continuous exchange of young staff between universities and other organisations;
- Excessive numbers of administrative staff and burdensome administrative procedures;
- Insufficient exploitation of modern online technologies in support of administrative work;
- Lack of a strategic vision and a strong fiscal policy in support of science development;
- An imbalance in sectoral funding of science between public expenditure (70%) and low levels of private funding;
- An unfavourable structure of public sector expenditure and a lack of resource concentration;
- An artificial separation of science and higher education, resulting from the science and innovation system which existed in Bulgaria until the 1990’s and a vision of universities’ role purely as educational bodies;
- A lack of financial instruments for science, coupled with a lack of sectoral research programmes;

³ European Commission (2011), “Innovation Union Scoreboard 2010”.

- Inefficient use of different funding sources to solve specific scientific tasks or a significant social problem.

In order to address these challenges, the Bulgarian Government has taken measures aimed at initiating and promoting an all-embracing modernisation of its R&D structures. The table below provides an overview of key measures in support of Bulgaria’s R&D targets and attractive employment conditions in public research institutions.

Table 2: National strategies

Measure	Description
Career Development Centres (ongoing)	Operational at national and regional level, Career Development Centres assist young students in choosing a study discipline as well as finding a vocational training place.
Law on the Development of Academic Staff	The Law on the Development of Academic Staff grants universities autonomy in defining policies for their staff.
Law on Innovation (planned for 2012)	The planned Law on Innovation will address issues related to human resources in the research profession. In particular, it will stimulate researchers to work for and in small and medium-sized enterprises (SMEs).
Law on Scientific Research Promotion (2003)	The Law on Scientific Research Promotion regulates the management and application of state policy in the field of scientific research by supporting a range of strategic activities, among which: <ul style="list-style-type: none"> – Stimulating the participation of scientific organisations and universities in international programmes and projects; – Providing awards for research excellence and ‘chair competence’, according acknowledgement and enhancement of the prestige of researchers in society and attracting young people to become researchers.
National Research Strategy (2010)	Adopted in 2010, the National Research Strategy aims to: <ul style="list-style-type: none"> – Formulate a national science policy which puts in place conditions and defines prospects for attaining the Europe 2020 targets; – Initiate and promote a process of modernisation of current R&D structures as a necessary condition for increasing public funds for science; – Contribute to the transformation of Bulgarian society into a knowledge society. <p>The Strategy envisages achieving this in three ways:</p> <ol style="list-style-type: none"> 1. Increase the intensity, effectiveness and efficiency of R&D activity, including: <ul style="list-style-type: none"> – Develop Bulgaria’s research potential by creating attractive conditions for pursuing a scientific career, professional growth, qualifications and specialisation of scientists; – Integrate Bulgarian science into the European Research and University Areas. 2. Establish a sustainable education-science-business relationship as a basis for the development of a knowledge-based economy: <ul style="list-style-type: none"> – Stimulate the private sector’s involvement in scientific activity; – Strengthen the integration of the knowledge-triangle elements. 3. Create an environment conducive to scientific activity.
National Roadmap for Research Infrastructure (2010)	The National Roadmap for Research Infrastructure identifies significant national scientific complexes and/or facilities with the potential to compete at national, regional and European level. The strategic objectives of the National Roadmap are: <ul style="list-style-type: none"> – Concentrate effort and resources, focusing on priority research areas with a potential for strategic and dynamic competitive development; – Internationalise research and innovation by developing regional partnerships between regional facilities and pan-European infrastructure complexes and networks; – Provide an open-access policy towards research infrastructures, securing access to different groups of researchers and other stakeholders; – Support networking and cooperation between academia and business by providing expertise; – Create conditions for quick commercialisation of scientific products and services to enhance the dynamics of economic development; and – Create conditions for the application of new training methods with a view to attracting and retaining young people.
Sciex Programme (2009-2016)	Sciex is a promotion tool for research teams from all disciplines, consisting of team members from the new Member States and Switzerland. Sciex fellows (no age restrictions) from new Member States pursue research in cooperation with Swiss researchers in Swiss research

Measure	Description
	institutions. Ideal working and framework conditions support the success of their research.

Source: Deloitte

3. Women in the research profession

Quotas to ensure a representative gender balance

There are no specific quotas in place regulating the balance between men and women in the research profession.

Maternity leave

Under the Bulgarian Labour Code, PhD students receive fixed grants (incorporating social security provisions) for three years. The Labour Code grants women researchers the right to interrupt and extend their contract during maternity leave. However, other contracts (stipends, fellowships, or equivalent) do not guarantee the right to maternity leave. The right depends on the contractual conditions and on the researcher's level of income in the previous 18 months.

4. Open, transparent and merit-based recruitment

Recruitment system

Job vacancies are published on university websites (however mostly in Bulgarian), as well as on the EURAXESS jobs portal. In addition, job vacancies are published on other platforms (e.g. the labour agency). It is not a statutory requirement, however, to advertise job vacancies on the EURAXESS jobs portal.

EURAXESS Service Network

In 2011, the number of researchers posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 1 in Bulgaria compared with 1 among the Innovation Union reference group and an EU average of 24.

The coordination of EURAXESS Bulgaria is handled by Sofia University and the Institute of Technology and Development (ITD) Foundation. The Bulgarian network is made up of contact persons and local contact points based in universities and research organisations to serve researchers' mobility. The EURAXESS portal contains practical information on professional and daily life, as well as information on job opportunities.

5. Education and training

Measures to attract and train people to become researchers

The table below summarises key measures aimed at training and attracting young people to become interested in science and ultimately to pursue a research career.

Table 3: Human Resources – Key programmes and Initiatives

Measure	Description
Famelab Contest (ongoing)	Organised by the British Council and supported by the Ministry of Education, Youth and Science, the science communication contest, Famelab, aims at boosting young people's interest in science. Young scientists are encouraged to present their research ideas in a competitive context.
Law on School Education (2012)	The new Law on School Education provides a framework for life-long learning in the Bulgarian school system. More specifically, it introduces a reform of the Bulgarian school system by defining profiles for a broad spectrum of study disciplines. The reform will align the Bulgarian education system with market demands. The document does not provide specific measures aimed at increasing the number of students graduated in science, technology, engineering and mathematics (STEM). However, it provides an overview of different study disciplines and offers a description of possible career paths.
National Young Talents Contest (ongoing)	The National Young Talents Contest aims to attract young students (between 14 and 21) to draw up competitive scientific projects. As part of the contest, students are expected to choose a scientific problem and prepare a scientific proposal with the help of an experienced researcher. Winners of the national competition are invited to compete at European level in the "EU Contest for Young Scientists".
Sofia Science Festival (ongoing)	As part of the Sofia Science Festival (organised by the British Council and supported by the Ministry of Education, Youth and Science), young students (including winners from the

Measure	Description
Young Researchers Programme (National Science Fund) (2011-present)	national science contests) present science and scientific results to a young audience (including kindergarten children) with the aim of raising young people’s interest in science. The Young Researchers Programme supports PhD students in preparing a scientific project. Scientific teams must consist of young researchers (not older than 35 years).

Source: Deloitte

A new University Rating System (introduced in 2011) offers young students a comprehensive and transparent overview of the education system. The platform provides an overview of university programmes and a comparison of universities’ (performance) at different levels. The new transparent rating system will stimulate students’ interest in science and encourage students to pursue a researcher career.

The Bulgarian Government has not introduced any specific measures to increase the number of doctoral graduates in science, technology, engineering and mathematics (STEM) in particular. However, a number of instruments have been put in place with the aim of increasing the number of students taking science to an advanced level.

In order to increase the number of students taking science to an advanced level, the Bulgarian Government has introduced a new Law on Academic Staff. The Law grants universities autonomy over their staffs’ career development/progression and aims to encourage young students to pursue a career in research.

The Bulgarian Government has not taken any specific measures designed to increase the number of women taking science to an advanced level. In Bulgaria, there are more women than men in the research profession. It is rather difficult to attract men into research careers. Low salaries are a disincentive. Men are more likely to pursue a career in the private sector where the chances of getting a higher salary are better.

Doctoral graduates by gender

The table below shows the number of doctoral graduates in Bulgaria by gender as a ratio of the total population.

Table 4: Doctoral graduates by gender

Indicator	Bulgaria	EU average
New doctoral graduates (ISCED 6) per 1 000 population aged 25-34 (total) (2009)	0.6	1.5
Female Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2009)	0.6	1.4
Male Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2009)	0.5	1.6

Source: Deloitte

Data: Eurostat

Funding of doctoral candidates

Under the Bulgarian Labour Code, all PhD students receive fixed grants (including social security cover) for three years. In order to improve research funding opportunities, the National Science Fund (NSF) offers doctoral candidates the possibility of participating in competition-based science projects which can serve as an additional source of income. Approximately 30% of the resources of the NSF are dedicated to young researchers. In addition, bilateral research cooperation schemes with foreign partners provide the possibility for improving researchers’ funding opportunities.

Measures to increase the quality of doctoral training

In addition to (new) policies aimed at improving the research profession in Bulgaria (see chapter 2 “National strategies), bilateral programmes such as the “Sciex” Programme with Switzerland, are considered not only as measures for importing researchers’ funding opportunities, but also as instruments for increasing the quality of doctoral training in Bulgaria.

Skills agenda for researchers

The Bulgarian Government has not put in place a dedicated ‘Skills Agenda’ aimed at improving researchers’ employment skills and competencies. However, the improvement of researchers’ skills and competencies is

addressed in different laws and regulations (see chapter 2 “National strategies”) and forms part of national and international research projects.

6. Working conditions

Measures to improve researchers’ funding opportunities

Based on a new Law, the Bulgarian Ministry of Education, Youth and Science has signed an agreement with dedicated banks granting special loans to students. Guaranteed by the Ministry, loans can be used by students to finance their (PhD) studies or can function as financial support during maternity leave. Generally, the state-guaranteed loans aim at improving students’ and researchers’ working conditions.

Remuneration

In Bulgaria, researchers’ remuneration levels are lower than the EU average. However, researchers can improve their income by participating in competition-based funding schemes (e.g. projects supported by the National Science Fund – for more information, see chapter 5 “Education and training”). In addition, bilateral cooperation schemes (e.g. with Switzerland) offer researchers the possibility of improving their salaries. The Government has not introduced any additional (policy) measures to increase researchers’ remuneration levels.

Researchers’ Statute

In Bulgaria, researchers are not recognised as a specific workforce and hence do not enjoy a special status. However, a number of laws and regulations define rights and obligations for workforces engaged in research-related activities. The Bulgarian Labour Code contains rules and regulations on salaries, maternity leave, social security, etc. In addition, the Law on the Bulgarian Academy of Sciences, the Higher Education Law and the Law on the Agricultural Academy contain rules and regulations on the functioning of the research system. More specifically, the legislative texts grant autonomy to universities and research institutes in defining (researchers’) salaries, developing and implementing independent strategies, and ensuring freedom of research. Academies are obliged by law to report scientific results directly to the Bulgarian Parliament.

‘European Charter for Researchers’ & ‘Code of Conduct for the Recruitment of Researchers’

In 2007, representatives of the Bulgarian Directors Council (made up of the largest Bulgarian Universities) have signed the ‘Charter & Code’.

Autonomy of institutions

Bulgarian universities and research institutes enjoy autonomy in defining their staffs’ salaries and are autonomous in developing and implementing independent strategies. For more information on the institutions’ autonomy, see the section on “Researchers’ Statute” above.

Career development

The “Law on the Development of Academic Staff” enables universities to define their own staff policy. In addition, it provides a mechanism for regulating the careers of scientific personnel. The implementation of the new Law will result in a qualification and career development system for academic staff (planned for 2014).

Shift from core to project-based funding

According to “Regulation No. 9”, ten percent of a university’s budget should come from project-based funding. Universities and research institutes can apply for funding on a competitive basis. As a rule, money is to be invested in improving research infrastructures. Progress must be reported to the Ministry every six months. The improvement of research infrastructure resulting from additional funds is designed ultimately to improve researchers’ working conditions in universities and research institutes.

Social security benefits (sickness, unemployment, old-age)

The table below provides an overview of the extent to which publicly funded fellowships, stipends, grants or the equivalent provide sickness benefits, unemployment benefits, and/or old-age benefits for researchers compared with researchers working on employment contracts.

7. Collaboration between academia and industry

The table below summarises measures put in place by the Bulgarian Government in order to boost collaboration between academia and industry, and to foster doctoral training in cooperation with the private sector.

Table 5: Collaboration between academia and industry

Measure	Description
Innovation Fund (ongoing)	Supported by the Ministry of Economy, Energy, and Tourism, the Innovation Fund encourages industrial PhDs, and strengthens links between the research community and businesses.
Law on Innovation (planned for 2012)	The planned Law on Innovation will address issues related to human resources in the research profession. In particular, it will stimulate researchers to work for and in small and medium-sized enterprises (SMEs). It will also encourage Universities to offer education using innovative programmes.
Science + Business Project (2011)	The Science + Business Project provides a platform for researchers to carry out projects in collaboration with industry. Supported by Universities, research institutes and businesses, the scheme fosters skills and knowledge transfer between the different parties. Research projects must address societal challenges and provide solutions which are market-oriented.

Source: Deloitte

8. Mobility and international attractiveness

In 2007, the percentage of doctoral candidates (ISCED 6) who were citizens of another EU-27 Member State was 2.1% in Bulgaria compared to 0.9% among the Innovation Union reference group and an EU average of 7.3%⁴. In the same year, non-EU doctoral candidates were 4.0% of all doctoral candidates in Bulgaria compared with 1.6% among the Innovation Union reference group and an EU average of 19.4%⁵.

Non-competitive salaries, archaic research infrastructures, the administrative burden, a low level of R&D funding (0.55% of GDP in 2010) as well as a low level of funding from industry are the main obstacles to researchers' mobility in Bulgaria (see chapter 2 "National strategies" for information on the Government measures aimed at addressing these problems).

Measures aimed at attracting and retaining 'leading' national, EU and third country researchers

As a result of the low attractiveness of the Bulgarian research system (low salaries, archaic research infrastructure, administrative burden, low level of (private) funding, etc.), it is difficult to attract national researchers back home or to attract third-country researchers to work in Bulgaria. However, Bulgarian researchers nurture their networks with Bulgarian colleagues working on international projects abroad. Generally, provisions allowing third-country researchers to work in Bulgaria do exist (such as the Foreign Nationals Act) but do not result in (leading) national and third-country researchers being attracted to Bulgaria.

Inward mobility (funding)

In the framework of the National Science Fund, a "Re-integration Grant" (2009/2010) was put in place to attract national researchers working abroad to return to Bulgaria. However, due to the comparative disadvantage of the Bulgarian research system, the grant was not able to attract sufficient numbers of researchers to return home. Consequently, it was stopped in 2011.

Outbound mobility

The "Sciex" Programme with Switzerland and other bilateral research programmes support researchers' outbound mobility and foster knowledge-transfer. There are more outbound researchers than those wishing to pursue a career in Bulgaria.

The Science + Business Project supports young researchers in gaining practical (work) experience in foreign research institutions. As part of this initiative, young researchers receive training abroad in foreign research infrastructures. The project provides stipends to PhD students as well as a three-year funding scheme for post-docs.

⁴ See Figure 1 "Key indicators – Bulgaria"

⁵ Ibid.

Promotion of 'dual careers'

Dual careers are not specifically promoted by institutions or by Government programmes/initiatives.

Portability of national grants

The Bulgarian Government has not put in place any specific measures supporting the portability of grants

Access to cross-border grants

As a general rule, national grants and fellowships are not open to non-residents.

Measures encouraging inter-sectoral mobility

The Science + Business project supports young researchers in gaining practical (work) experience in foreign research institutions. For more information, see chapter 7 "Collaboration between academia and industry" and chapter 8 "Mobility and international attractiveness".