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Researchers' Report 2014

Country Profile: Turkey



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1. Key data

National R&D intensity target

“R&D intensity in Turkey has increased progressively from 0.48% in 2000 to 0.92% in 2012. Over this period R&D intensity experienced an average annual growth rate of 5.9%. Turkey has set a target of increasing the share of R&D investment to 3% of GDP by 2023. This requires a significant catch-up dynamic in order to make sustained strides in order to reach the 2023 target.

Turkey experienced a remarkable increase in R&D expenditure in all sectors between the years 2000 and 2012. In 2012, 45.1% of GERD was in the business enterprise sector in 2012; thus the business enterprise sector’s R&D expenditure exceeded the higher education R&D expenditure. Turkey aims to increase business enterprise R&D expenditures as a percentage of GDP to 2% by 2023.

Turkish research and innovation are also benefitting from support from the EU budget. The main instrument is the 7th Framework Programme for Research and Development. The total number of participants in the 7th Framework Programme in Turkey is 879 (out of 5 982 applicants), receiving more than EUR 145.1 million. The success rate of participants of 14.7 % is below the EU average success rate of 21.95 %.”¹

Key indicators measuring the country’s research performance

The figure below presents key indicators measuring Turkey’s performance on aspects of an open labour market for researchers against a reference group and the EU average².

Figure 1: Key indicators – Turkey



Source: Deloitte

Data: Eurostat, SHE Figures, EURAXESS Jobs Portal, UNESCO OECD Eurostat education survey, Innovation Union Scoreboard 2014, MORE2.

Notes: Based on the average innovation performance, Turkey belongs to the group of “Modest innovators” showing a performance well below that of the EU³.

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.

¹ European Commission (2013), “Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013”

² The values refer to 2013 or the latest year available.

³ European Commission (2014), “Innovation Union Scoreboard 2014”

Table 1: Human resources – Stock of researchers

Indicator	Turkey	EU Average/Total
Head Count per 1 000 active labour force (2011)	5.20	10.55
Head Count (2011)	137 452	2 545 346
FTE per 1 000 active labour force (2011)	2.73	6.75
Full time equivalent (FTE) (2011)	72 109	1 628 127

Source: Deloitte

Data: Eurostat

The national R&D targets of Turkey for 2023, which were agreed by the Supreme Council of Science and Technology (BTYK) in 2011, are to:

- Increase the number of FTE researchers to 300 000 (compared with 64 341 in 2010);
- Increase the number of FTE researchers in the private sector to 180 000 (compared with 25 342 in 2010).

2. National strategies

The Supreme Council for Science and Technology (BTYK), established in 1983, is the highest ranking STI policy-making body in Turkey. The Scientific and Technological Research Council of Turkey (TÜBİTAK) is responsible for improving the research environment in Turkey, providing scientific advice to the government and acting as the secretariat of the BTYK⁴.

The SCST functions as a mutual learning platform as well as setting the STI policy direction for Turkey. In addition, it encourages the development of policy proposals for specified topics in a participatory environment. The National Science, Technology and Innovation Strategy 2011-2016, which prepared in this context, was approved at the 22nd meeting of the SCST.

The table below presents key programmes and initiatives intended to implement the strategic objectives to train enough researchers to reach Turkey’s R&D targets, to promote attractive working conditions, and to address gender and dual career issues.

Table 2: National strategies

Measure	Description
National Science, Technology and Innovation Strategy 2011-2016 (2010)	The Strategy aims to create more output from existing research capacity and enhance needs-oriented research capacity by sustaining the increased performance in science, technology and innovation gained over the previous five years.
National Science and Technology Human Resources Strategy and Action Plan 2011-2016 (2010)	<p>The Strategy aims to increase the number of R&D personnel and to improve the distribution of R&D personnel across professions and employment sectors. The main targets are:</p> <ol style="list-style-type: none"> 1. Increase the number of human resources for science and technology (HRST) and improve the distribution of HRST across sectors; 2. Improve the research environment, researchers’ skills and experience; 3. Provide better working conditions for researchers; 4. Increase the mobility of researchers; 5. Develop the recruitment capacity of R&D personnel. <p>The Strategy brings together researchers, international and national academics, private sector R&D managers and public sector lab managers, and deals with the following issues: obstacles in research, solutions and international good practice, and suggestions and mechanisms to attract international researchers to Turkey.</p>
Tenth Development Plan (2014-2018)	<p>Five-Year Development Plans are prepared and coordinated by the Ministry of Development. The most recent Development Plan covers 2014-2018. One of the four main pillars of the plan rests on developing human resources and is described as “Qualified Individuals, Strong Society”. The objectives of the Plan are expected to be fulfilled through “Primary Transformation Programmes”.</p> <p>Two of these transformation programmes focus on human resources:</p> <ul style="list-style-type: none"> – “Development of Basic and Occupational Skills”; and

⁴ Turkey Country Page. Erawatch, Available at:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/tr/country?section=Overview&subsection=BasicChar
 Accessed 24.04.2012.

Measure	Description
	<ul style="list-style-type: none"> – “Attracting Qualified Human Resources from Abroad”.
Turkish Industrial Strategy Document (2011-2014)	<p>The Turkish Industrial Strategy Document was prepared and coordinated by the Ministry of Science, Industry and Technology. It determined that skills and human resources are a horizontal industry policy area and the policies directed to the objectives recognise that:</p> <ul style="list-style-type: none"> – The capabilities and adequacy of the labour force are Turkey’s most critical horizontal industrial policy given the potential impact on the private sector’s productivity and competitiveness. Improving labour force capabilities and capacity for innovation will be considered as priorities at the core of industrial policies in order to ensure that Turkey moves to a high value-added production structure; and – Importance needs to be attached to consistency between industrial policy goals and policies designed to improve human resources. <p>Supply and demand in the labour force will be important in shaping industrial policies. On the demand side, high value-added industries and service activities will want a more highly skilled workforce available for employment. On the supply side, the objective will be to raise the quality of education provided to school-age children to meet that of developed countries, and support for education programmes in companies for individuals. Implementation of business policies will effectively improve the supply of qualified labour. Considering the brief shelf life of information, a suitable environment will be created for sustained improvement in workforce capabilities and remaining abreast of developments.</p>
National Committees	
Science and Technology Human Resources Coordination Committee (STHRCC) (2009) (no longer operational)	The STHRCC was responsible for improving the working environment for researchers in Turkey, such as enhancing governance in higher education institutions, raising researchers’ income, and further increasing the stock of qualified researchers as well as encouraging university-industry collaboration.
Science and Technology Human Resources Strategy Advisory Committee (2010) (no longer operational)	This Committee was established by TÜBİTAK in 2010 to advise on the efforts in drafting the Science and Technology Human Resources Strategy. The Committee consisted of distinguished academicians returned from abroad, private sector representatives, representatives of the Council of Higher Education (YOK), the State Planning Organization and the Ministry of Finance.

Source: Deloitte

3. Women in the research profession

Measures supporting women researchers in top-level positions

In 2010, the percentage of women grade A academic staff was 28.1% in Turkey compared with 31.2% among the Innovation Union reference group and an EU average of 19.8%⁵.

4. Open, transparent and merit-based recruitment

Recruitment system

According to Council of Higher Education (HEC) regulations, all open research positions in public universities must be announced on the websites of the universities at least 15 days prior to the application deadline⁶.

EURAXESS Services Network

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 0.4 in Turkey compared with 9.0 among the Innovation Union reference group and an EU average of 43.7⁷.

⁵ See Figure 1 “Key indicators – Turkey”.

⁶ Overall progress in EPR implementation, December 2009, Annex II

⁷ See Figure 1 “Key indicators – Turkey”.

TÜBİTAK is the EURAXESS Network coordinator in Turkey⁸. Interested researchers can find information online (<http://euraxess.tubitak.gov.tr/euraxess-turkey>) on accommodation, day care and schooling, intellectual property rights, language courses, recognition of qualifications, salaries and taxation, social and cultural aspects, social security, pension rights and healthcare, visas and work permits.

5. Education and training

Doctoral graduates by gender

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

Table 3: Doctoral graduates by gender

Indicator	Turkey	EU Average
New doctoral graduates (ISCED 6) per 1 000 population aged 25-34 (2011)	0.4	1.7
Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2011)	0.3	1.6
Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2011)	0.4	1.8

Source: Deloitte

Data: Eurostat

Funding of doctoral candidates

TÜBİTAK has a wide range of funding programmes for both students and graduates aiming to develop their careers, skills and experience. The table below presents the scholarship schemes available for students and researchers in Turkey.

Table 4: Funding schemes for students and doctoral graduates

Measure	Description
Graduate scholarships	
Graduate Fellowships Programme for International Students	Highly qualified students who are intending to complete their MSc or PhD studies in Turkey are entitled to travel and research grants in the fields of Natural Sciences, Medical Sciences, Engineering and Technological Sciences, and Social Sciences and Humanities.
International Research Fellowship Programme for PhD Students	A research fellowship programme for PhD students who are registered in PhD programmes in Natural Sciences, Medical Sciences, Engineering and Technological Sciences, and Social Sciences and Humanities, at universities or research centres in Turkey to perform research abroad that cannot be performed within the infrastructure in Turkey.
International Graduate Fellowship Programme	A graduate fellowship programme for graduate students who are pursuing their MSc or PhD studies at research centres or universities abroad.
National Scholarship Programme for Graduate Students	A scholarship programme for Turkish students following a MSc or PhD at a university in Turkey.
Research Fellowships for Foreign Citizens	Highly qualified foreign PhD students or postdoctoral researchers are awarded research fellowships to conduct part of their research in Turkey. Travel and research grants are allocated for those studying/carrying out research in the fields of Natural Sciences, Medical Sciences, Engineering and Technological Sciences, and Social Sciences and Humanities.
Post-doctoral	
Fellowship Programme for Visiting Scientists and Scientists on Sabbatical Leave	A fellowship for international scientists/researchers who would like to give workshops/conferences/lectures, or conduct R&D activities in Turkey in the fields of Natural Sciences, Engineering and Technological Sciences, Medical Sciences, Agricultural Sciences, Social Sciences and Humanities. The programme aims to promote Turkey's scientific and technological collaboration with the countries of the prospective fellows.
Post-doctoral Research Scholarships	<ul style="list-style-type: none"> – National Postdoctoral Research Scholarship Programme targeting scientists who perform research in Natural Sciences, Medical Sciences, Engineering and Technological Sciences, and Social Sciences and Humanities in Turkey; – International Postdoctoral Research Scholarship Programme targeting scientists who perform research abroad in Natural Sciences, Medical Sciences,

⁸ Ibid.

Measure	Description
	Graduate scholarships
	Social Sciences and Humanities, and Engineering and Technological Sciences.

Source: TÜBİTAK

In addition, the State Planning Organization (SPO) funds universities to develop researcher human resource development programmes which aim to train PhD graduates in accordance with national priorities, and the needs of universities and industry⁹.

Measures to increase the quality of doctoral training

In Turkey, almost all universities aim to improve the quality of their education and research activities in line with the Bologna Process. Governance reform in Turkey has mainly focused on developing the 'Quality Management Standards for HEIs' issued by the Council of Higher Education (YOK). The YOK approved the fields of education and programmes under the National Qualifications Framework in January 2011 as part of the Bologna process. Four universities were selected for the pilot implementation¹⁰.

6. Working conditions

Remuneration

For information, see the country profile on remuneration of researchers from the MORE2 study on the EURAXESS website.¹¹

Autonomy of institutions

There are 175 Turkish universities, of which 64 are privately owned. Universities employ around 120 000 academic staff

In Turkey, every university has a budget for staff salaries and their regular activities. For the year 2013, the total budget of the universities was around EUR 5.1 billion.

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

Turkey has bilateral social security agreements with 21 countries. Citizens of countries which have signed a social security agreement with Turkey based on the principle of reciprocity can certify that they are subject to insurance in their own country¹².

7. Collaboration between academia and industry

In Turkey, the Public Research Grant Committee (KAMAG) aims to increase the number of scientists and researchers as well as to enhance the relationships between public institutions, universities and industry.

The Engineering Research Grant Committee (MAG) funds national scientists in the fields of mechanical, chemical, metallurgical, civil, industrial, textile and mining engineering, and architecture in order to generate information and technology, and transform the results into services and/or products for public use in connection with universal developments and national priorities.

In addition, the Technology and Innovation Funding Programmes Directorate (TEYDEB) facilitates cooperation between industry and academia to encourage active involvement in technology development and innovation activities. There are currently six technology groups in TEYDEB to improve collaboration activities between academia and the business sector:

1. Machinery, Manufacturing Technologies Group (MAKITEG);
2. Materials, Metallurgical and Chemical Technologies Group (METATEG);
3. Transportation, Defence, Energy and Textile Technologies Group (USETEG);

⁹ Overall progress in EPR implementation, December 2009, Annex II

¹⁰ Turkey Country Page. Erawatch, Available at:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/tr/country?section=Overview&subsection=BasicChar
Accessed 24.04.2012.

¹¹ <http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies>

¹² Overall progress in EPR implementation, December 2009, Annex II

4. Electrical and Electronics Technologies Group (ELOTEG);
5. Information Technologies Group (BILTEG);
6. Biotechnology, Agriculture, Environment and Food Technologies Group (BIYOTEG).

Furthermore, collaboration projects to fulfill the needs of industry are funded by the TÜBİTAK 1505 University-Industry Collaboration Grant Programme. The programme aims to commercialise the know-how existing in universities/research institutes, transferring it to industry as products or processes.

To meet the R&D needs of industrialists, the Ministry of Science, Industry and Technology conducts the following programmes through cooperation between industry and university:

- Industry Theses Programme (SAN-TEZ);
- Technological R&D Patent Support Programme;
- Technological R&D Investment Support Programme; and
- Technological R&D Promotion and Marketing Support Programme.

High-tech R&D carried out via industry-university collaboration is supported by the SAN-TEZ programme.

8. Mobility and international attractiveness

In 2011, non-EU doctoral candidates made up 3.2% of all doctoral candidates in Turkey compared with 2.0% among the Innovation Union reference group and an EU average of 24.2%¹³.

The Turkish government is developing bilateral and multilateral agreements for research promotion through TÜBİTAK. The International Cooperation Department is responsible for the management of TÜBİTAK's international programmes:

- bilateral cooperation with a variety of countries at intergovernmental or inter-institutional level, such as common research projects, financial support for several different types of activities i.e. common scientific meetings, exchange of scientists, scientific visits, etc;
- cooperation with Regional and International Organisations, such as COST (European Cooperation in the field of Scientific and Technical Research), ESA (European Space Agency), ESF (European Science Foundation) and EMBC (European Molecular Biology Conference), and regional organisations, such as Organization of the Black Sea Economic Cooperation and international organisations like NATO, OECD and UNESCO. As part of these collaborations, Turkish scientists participate in events, develop science and technology policies, support and conduct research and development activities, and play a leading role in the creation of a science and technology culture with the aim of improving the competitive power and prosperity of the country;
- cooperation with the European Union (EU), such as the 7th Framework Programme (2007-2013).

Inward mobility (funding)

Foreign researchers conducting projects funded by TÜBİTAK are eligible for the 'Project Incentive Bonus' that Turkish researchers can obtain.

The www.workpermit.gov.tr website provides extensive information on the procedures for receiving a work permit.

¹³ See Figure 1 "Key indicators – Turkey".