European Research Area
Facts and Figures 2014

TURKEY
ERA compliance in research-performing organisations (RPOs)

In share of institutions

- Cluster ERA-compliant
- Cluster Limited ERA compliance
- Cluster ERA not applicable

Source: DG RTD, ERA policy reforms unit, ERA survey 2014

Public funding for Research

Source: Eurostat and OECD

GBAORD in 2012
(millions of EUR)
EU 90 670.3

GBAORD/capita, 2012 (EUR)
EU 178.6

Researchers

Number of researchers, 2011 (headcount)
EU 2 545 544

Number of researchers/1 000 active population, 2011 (headcount)

Source: Eurostat

Gender

Share of women researchers, 2011 (headcount)

Share of women PhD graduates, 2012 (% based on headcount)

Share of women senior researchers, 2010 or latest available data (% based on headcount)

Proportion of women heads of institutions in the Higher Education Sector, 2010 (% based on headcount)

Source: Eurostat and She figures (2013)

1 = Ranking among EU Member States
* Source: DG RTD, Economic Analysis Unit
Publications by researcher (2000-2011)*
EU 2.89

Co-publications with researchers from outside the EU, by researcher (2000-2011)*
EU 0.45

Co-publications within the EU, by researcher (2000-2011)*
EU 0.45

PCT patent applications by researcher, 2010*
EU 0.020
MORE EFFECTIVE NATIONAL SYSTEMS

Research and innovation system

The most important change in the political context and the Research and Innovation (R&I) structure is the establishment of Ministry of Science, Innovation and Technology (MoSIT) which replaces the existing Ministry of Industry and Trade (MoIT) with a decree law published in the Official Gazette on 3 June 2011. The science, technology and innovation-related duties of the MoSIT are defined as the development, implementation and coordination of the S&T and innovation policies, and the promotion of the R&D and innovation projects, activities and investments. All main actors in the system, including the Scientific and Technological Research Council of Turkey (TÜBİTAK) and the Turkish Academy of Science, are connected to the MoSIT. The Turkish Patent Institute (TPE), the National Metrology Institute (UME), the Turkish Accreditation Agency (TÜRKAK), the Turkish Academy of Science (TÜBA) and the Turkish Standards Institute (TSE) which are government institutions related to R&D polices, are also affiliated to the MoSIT.

The recent amendment promulgated in TÜBİTAK's legislation in July 2012, aims to increase the functionality of TÜBİTAK in commercialisation of R&D output in TÜBİTAK's research centres. Moreover, the amendments aim also at supporting venture capital funds.

National strategy for research and innovation

The National Science, Technology and Innovation Strategy 2011-2016 adopted in December 2010 by the Supreme Council for Science and Technology (BTYK) focuses on human resources development for science, technology and innovation, transformation of research outputs into products and services and enhancing interdisciplinary research, highlighting the role of SMEs, R&D infrastructures and international cooperation.

Furthermore, the new decisions taken on the 24th BTYK held in August 2012 focus on increasing the quality of primary and secondary education, restructuring of abroad graduate scholarship programmes, of university entrance system and on the preparation towards participation to Horizon 2020. Furthermore, two additional decisions related to the previous ones were taken, namely the establishment of a coordination committee for integrity, harmonisation and target orientation in R&D, innovation and entrepreneurship support mechanisms and improvement of public procurements to support innovativeness. The new decisions of the 25th BTYK are focused mainly on the e-government related issues. Furthermore, health becomes a priority area in S&T policies.

Research and innovation funding

Between 2000 and 2011, Turkey’s total gross expenditure on R&D (GERD) has increased by more than 10 times on TRY basis reaching EUR 4,535 million (TRY 11 154 million) in 2011 according to the Turkish Statistical Institute (TURKSTAT). In 2010, GERD was EUR 4 657.08 million (TRY 9 267 million). GERD/GDP ratio which is around 0.85 in 2010-2011. One of the reasons is Turkey’s is the higher GDP growth rate. The average GDP growth rate between the last two years (2011-2012) is 8.85 %. In order to increase the GERD/GDP, the growth rate of GERD should be higher than the GDP growth rate. Also, another reason is that the increase in GDP is not correlated with an increase in GERD. In Turkey, higher education institutions (HEIs) still have higher share in performing R&D. 46 % of R&D is done by HEIs in Turkey.
Project-based funding in the country

Both institutional and project-based funding are available for universities and public R&D centres. For project-based funding, universities and public R&D centres apply to the programmes carried out by the Scientific and Technological Research Council of Turkey (TÜBİTAK). These programmes finance ‘bottom-up’/‘free funding’ projects. Nearly half of the state funding is allocated for competitive programmes. In 2011, nearly 37% of the state budget for R&D was allocated to project-based subsidies, while 25% was earmarked for public research institutes and 38% was allocated for universities (BTYK 23, 2011).

Use of core principles of international peer review

For the assessment of the projects TÜBİTAK uses external experts. The main selection criteria include the quality of the scientific, technological and economic aspects of the project; quality of the project planning, and quality of the applicant. External national experts are appointed for the assessment of the projects. With similar selection criteria, KOSGEB applicants are assessed by external experts together with experts from KOSGEB.

Institutional funding based on institutional assessment

In this respect, there is a shift to competitive, target based, thematic approach in funding research. Traditionally TÜBİTAK follows a bottom up model in funding research; research groups who meet the criteria receive funding. Within competitive approach, new Research and Innovation funding programmes are launched; those are mission-oriented, thematic ones targeted to produce solutions to specific social and technological problems Turkey faces.

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6 EUR 1=TRY 2.3363 (Central Bank of Turkey’s effective sale rate for 30.10.2012)
such as electrical vehicles, mechatronics, energy storage, solar energy, coal technologies, underground water, erosion, and desertification. Competitive approach aims to fund the best research groups in those thematic, mission oriented, newly launched programmes. Funding goes to groups offering best methodologies and solutions as identified in the call topic. Those targeted calls also aim to enhance/realise coordination among previously funded R&D projects in Turkey.

Participation of international experts to evaluation panels is both legally and practically open and perceived as critical to assess the international competitiveness and novelty of the research and innovation projects. Peer reviews for allocating project-based funding may be carried out by national and/or international experts. TÜBİTAK can base funding decisions on the results of international peer review carried out by other organisations and those carried out under the responsibility of organisations other than hers. Thus international peer review process is both legally and practically accepted in the organisation. Mostly the international peer review results are accepted while allocating national funds to ERA-NET projects, projects funded under JPIs and international S&T agreements. TÜBİTAK handles engagement of international experts as processes helping to carry towards internationalisation and promotion of excellence at international standards. It helps to reach internationally accepted research norms, values, quality and it is deemed highly important for improving excellence in TRA.

For a more effective NIS, TÜBİTAK is planning a monitoring and impact assessment process concerning national research programmes. Those initiatives are directed towards elaborating and understanding the main results, output and in a broader perspective the impact of the research and innovation projects funded nationally. Impact assessment studies are designed to provide feedback for revising the existing mechanisms and devising new tools and policies for better results. Thus, it is believed to increase the efficiency of allocation of R&D funds.

TRANSNATIONAL COOPERATION
Implementing joint research agendas

Framework Programmes (FPs) appear as the main tool for international cooperation in S&T. Turkey makes huge investments and efforts to make TRA actors exploit the benefits proposed by FPs such as networking, knowledge and technology transfer, joint innovation activities, access to new markets, etc. Other than FPs, TÜBİTAK carries out project-based bilateral cooperation with 28 organisations from 24 countries, and it is in cooperation with 90 global and regional organisations through specific S&T agreements by the end of 2013. Moreover, between the years 2007-2012 TÜBİTAK participated in total 41 ERA-NETs in which 107 Turkish institutions participated through around EUR 15.6 million. In 2012, EUR 7.4 million are spent through bilateral cooperation and ERA-NETs which makes approximately 0.12 % of R&D expenditure realised in 2012. Turkey participates in 9 Joint Programming Initiatives (JPIs) except Cultural Heritage JPI. Turkey also participates to Article 185 initiatives, namely Eurostars and EMPIR on European research on metrology in FP7 and its participation continues under Horizon 2020.

Strategic Research Agendas SRAs are implemented jointly with JPI partners and joint research priorities are built within ERA-NETs and Article 185 initiatives. Common funding and evaluation principles applied in ERA-NET, JPIs and Article 185 initiatives together with partner countries add on further enhancement of cooperation among researchers from applicant countries. Turkey is represented in European Research Area Committee (ERAC) and its subcommittees as High Level Group for Joint Programming (GPC), Strategic Forum for International cooperation (SFIC), Knowledge Transfer Group, Steering Group For Human Resources and Mobility (SGHRM).

10 TÜBİTAK Database.
11 TÜBİTAK Database.
Besides, COST and EUREKA are critical tools for international cooperation in STI. Turkish research actors participate to 194 ongoing COST actions and have 44 EUREKA projects and Turkey ranked as 4th most successful country out of 32 countries in EUREKA due to the statistics by the end of 2013. Turkey also participated to other cooperation programmes and activities like European Space Agency (ESA), European Molecular Biology Conference (EMBC), Black Sea Economic Cooperation, NATO, OECD, etc.

RESEARCH INFRASTRUCTURES

Financial commitments for the construction and operation of ESFRI, national, regional research infrastructures of pan-European interest

Research infrastructures gradually gained weight in Turkish STI Policy agenda parallel to the encompassing reform process in recent years. Strategy of funding and developing research infrastructures (RIs) is mainly dealt with Development Plans.

During the ninth Development Plan period from 2007-2013, a TRY 2.4 billion (around EUR 1 billion) was spent for development of research infrastructures in universities and public bodies in priority technology areas identified by the above-mentioned Development Plan and Supreme Council for Science and Technology. Currently there are 108 research infrastructures activated, 65 thematic RIs are being developed and 97 advanced research centre projects are underway. Those research centres are mainly on the areas of materials science, life sciences including biotechnology, aviation and space, information and communication technologies, defence industry and nanotechnology. On the other hand, research centre laboratories are accomplished in 20 universities and in 62 university laboratories are being developed in order to enhance research capacity of universities.

Ministry of Development is working on ESFRI Roadmap in order to build linkage between nationally funded Research Infrastructures and the platform. There is also an on-going preparation for ERIC regulation in Turkey.

Under the Research Infrastructures scheme of the 7th Framework Programme (FP7) 38 projects are funded from which Turkish partners could get EUR 8.8 million. 300 researchers from Turkey could get access to leading European research infrastructures and 12 research institutes did get EUR 10.9 million direct infrastructure and capacity building support under Research Potential (RegPot) Programme.

12 TÜBİTAK Database.
14 TÜBİTAK Database.
OPEN LABOUR MARKETS FOR RESEARCHERS

Open, transparent and merit-based recruitment of researchers

According to the Council of Higher Education (HEC) regulations, all open research positions in public universities must be announced on the website of the universities at least 15 days prior to the application deadline\(^\text{15}\).

TÜBİTAK is the EURAXESS Network coordinator in Turkey. Interested researchers can find online information\(^\text{16}\) regarding 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\(^\text{17}\).

Although Charter and Code (C&C) is not binding for Turkey, in the light of integration with Europe, C&C principles are applied in most of the institutionalised research organisations in their recruitment process.

A new legal arrangement is realised to enable foreign researchers or experts to easily come, get residence permit and work in Turkey for certain periods of time for projects funded under European Union Programmes. This special residence permit rescues researchers from red tape to apply for a work permit and facilitates the process for researchers coming to Turkey in EU funded projects including Framework Programmes.

To support brain gain, TÜBİTAK also put in use new research funding and fellowship programmes similar to the Marie Skłodowska-Curie fund. This national programme is specially targeted to Turkish researchers in USA, Japan, Canada and other countries and became very successful in bringing these researchers to TRA, thus ERA. Under this programme ‘2 232-Brain’ (Incoming Research Fellowships for Turkish Citizens) additional financial support provided to researchers besides their salaries for 4 years, those returned to Turkey from abroad.

TÜBİTAK also launched a new process with universities, academic organisations and leading industrial organisations to attract researchers from USA, Canada and Japan. Leading Research institutes in Turkey are negotiated to create job opportunities for qualified Turkish researchers in those developed countries. TÜBİTAK demands those kinds of job advertisements every three months and shares job opportunities with the targeted researchers. Currently an online platform is being prepared to widely distribute those kinds of job opportunities to a wider community. The platform will be finalised at the end of this year. It will greatly enhance the brain gain process for TRA.

In order to strengthen quantitatively and qualitatively the human potential in research and technology in Turkey, the Scientific and Technological Research Council of Turkey (TÜBİTAK) encourages researchers worldwide to come and visit the Turkish Research Area.

To achieve the aim of making Turkey more attractive for top researchers, TÜBİTAK provides various fellowships as well as coordinating the dissemination of EU Framework Programmes funds. Moreover, research-performing organisations including universities, research institutes and industrial organisations located in Turkey provides special research positions only for the researchers having international research experience.

This website, giving information about the ‘National and European Funding Mechanisms’, presents attractive research vacancies for researchers, living and conducting active research abroad, who wish to be integrated into the Turkish Research Area, to spend his/her sabbatical in Turkey, to spend the summer in Turkey, or to collaborate with Turkish Research Area.

\(^ {15} \) EURAXESS Turkey country profile: http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Turkey_Country_Profile_ RR2013_FINAL.pdf

\(^ {16} \) http://euraxess.tubitak.gov.tr/euraxess-turkey

\(^ {17} \) Ibid.
Support mobility between private and public sector

The support schemes for incoming, outgoing and reintegration fellows are coordinated in TÜBİTAK by BİDEB (The Science Fellowships and Grant Programmes Department). BİDEB implemented more than 25 science fellowships and grant schemes for research careers. Nearly half of these Programmes are national grants for Turkish citizens. Within these programmes, undergraduate, graduate and postdoctoral studies of the researchers and scientific events are supported by TÜBİTAK.

Researchers careers

According to TÜRKSTAT (2012), 58% of researchers are employed in universities, 33% in the private sector and 9% in government. Turkey has bilateral social security agreements with 21 countries. Citizens of countries which have signed social security agreement with Turkey based on the principle of reciprocity can certify that they are subject to insurance in their own country.

Cross-border access to and portability of national grants

In the past, foreign researchers conducting projects funded by TÜBİTAK were at a disadvantage compared to Turkish researchers, as they were not entitled to obtain the ‘Project Incentive Bonus’. The relevant regulation was recently amended.

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18 TÜBİTAK Database.
19 EURAXESS Turkey country profile: http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Turkey_Country_Profile_RR2013_FINAL.pdf
20 Ibid.
GENDER

National policies do not address specifically the gender equality in research. Therefore, there are no direct support programmes for the gender equality, or a special set of rules for regulating the working conditions of female researchers.

KNOWLEDGE CIRCULATION

Open access (OA) for publications and data resulting from publicly-funded research

Turkish Academy Network and Information Center (ULAKBİM) under TÜBİTAK aims to build research and education networks among research organisations and universities, and enable linkage of those institutes with their national and international counterparts. It aims to provide information technologies support as well as necessary documentary services including access to knowledge to foster production of scientific knowledge in Turkey. TÜBİTAK provides digital services as scientific publications repository, research data repository and computing services. Some of the scientific publications provided by TÜBİTAK is available online and free of charge and the institution also makes research data online and free of charge.

ULAKNET

The Turkish Academic Network and Information Center (ULAKBİM) was founded as a R&D Facility Institute in 1996. ULAKBİM’s main objectives have been set as operating a high speed computer network enabling interaction within the institutional elements of the national innovation system, and providing information technology support and information services to help scientific production. ULAKBİM consists of National Academic Network (ULAKNET) Unit, which undertakes the task of formation and operation of research and education network infrastructure in Turkey. The number of users of ULAKNET has reached to approximately three million in 2012.21

Open innovation (OI) and knowledge transfer (KT) between public and private sectors

In 2012, TÜBİTAK launched a programme [25] which offers grants of up to TRY 1 million per year to universities to encourage them to establish new Technology Transfer Offices (TTO) and to develop existing ones. The programme aims to facilitate collaboration between universities and industrial enterprises and allow industry to benefit from new information-based technologies. The TTOs supported under the programme receive a grant of up to TRY 1 million per year from TÜBİTAK. Based on results of yearly evaluations, the support period can be extended up to 10 years. The scope of the grant covers personnel expenses, transportation, subsistence and accommodation costs, tools, equipment, software, purchase of publications, service fees, meetings, presentations and organisational expenses, certified financial consultancy fees, and general expenses.

Cahit Arf Information Center (CABİM)

Cahit Arf Information Center provides information and document delivery services nationwide, using traditional and electronic means, in order to meet the information needs of academia, public and industrial sectors, and to contribute to the production of scientific information in Turkey. In 2012, approximately 125,000 people benefitted from the services of the Center [22].

To create equal opportunity of access to academic information resources for researchers within Turkey, TÜBİTAK EKUAL (Electronic Resources National Academic Licence) Project is implemented in the centre. Within this project 17,739 electronic journals are accessed from databases together with 51 million bibliographical records and 1.2 million conference proceedings, etc. [23].

Turkish National e-Science e-Infrastructure (TRUBA)

Turkish National e-Science e-Infrastructure (TRUBA) Strengthening Project mainly aims to meet the needs of researchers who carry out the studies in Turkey, ongoing national and international projects on high performance computing, distributed computing and scientific data warehouse. The project is the continuation of the developed project TR-Grid Research e-Infrastructure Strengthening (TR-Grid ReIS). During this project, administrative and technical motivation which was generated in TR-Grid ReIS project will be maintained increasingly and TRUBA computing and storage resources for national researchers will be increased to be equivalent as resources available at few centres in Europe. In 2010, this e-infrastructure provided services to 78 different public institutions [24].

23 Ibid., p. 8.
24 Ibid., p. 1.