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COMMISSION STAFF WORKING DOCUMENT

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Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

European Research Area Progress Report 2014

{COM(2014) 575 final}

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

Research and innovation policies are the responsibility of the Parliament, the Cabinet and the Ministries. There are different coordination mechanisms at this level. A dedicated Cabinet council called the Economic Affairs, Infrastructure and the Environment Subcommittee (REZIM) is concerned with issues related to the economy, science and research policies, higher education and innovation, and consists of the ministers most closely involved with these matters. Its counterpart at ministry level is called the Economic Affairs, Infrastructure and Environment Committee (CEZIM). For consultations between Parliament and the Cabinet, both the Upper and Lower House have a Committee for Education, Culture and Science. On both these levels there is an Economic Committee addressing innovation.

Different ministries play a role in implementing these policies, by means of different instruments and with the help of specific actors in the innovation system. The most prominent ministries involved, as reflected in the budget to be allocated, are the Ministry of Education, Culture and Science (OCW) and the Ministry of Economic Affairs (EZ). The Ministry of Education, Culture and Science has broad political-administrative and financial responsibility for public-sector research in the Netherlands. Most of its budget is in the form of institutional funding. The Ministry of Economic Affairs is responsible for facilitating a competitive business climate and primarily addresses industry-orientated research and development (R&D) and innovation.

Funding bodies:

The main actors and institutions responsible for allocating funds for research and innovation in the universities are the responsible ministries, OCW and EZ, and a group of main funding bodies: the Netherlands Organisation for Scientific Research (NWO), the Royal Netherlands Academy of Arts and Sciences (KNAW) for scientific research and the Netherlands Enterprise Agency (RVO.nl) (the latter allocates financing instruments that are aimed at industrial research, innovation and collaborative projects). Funding for scientific research in Dutch universities is provided along three routes:

1) Institutional funding, mainly by the Ministry of Education, Culture and Science for the higher education institutions (HEIs) (including university hospitals with involvement from the Ministry of Public Health, Welfare and Sports). Institutional funding of the Agricultural University of Wageningen by the Ministry of Economic Affairs;

2) Competitive funding based on scientific excellence by the NWO and KNAW both KNAW and NWO also fund their own institutes;

3) Project-based funding from different sources like industry, foundations and international organisations.

KNAW primarily funds its own institutes but also offers limited competitive funding for some programmes (and prizes/awards). Research is also funded by some ministries own knowledge institutes, and by their policy-oriented research.

Public research organisations for applied research are partly financed by the Ministry of Economic Affairs, other ministries and partly by private organisations for applied research.

The country has adopted a national strategy for research and innovation which consists of two dedicated policies addressing research and innovation. These are described in the corresponding policy documents 'Quality in diversity - Strategic Agenda for Higher Education, Research, and Science' (to be renewed in the fall of 2014 by the new vision on Science Policy) and 'To the Top - Towards a new Industrial Policy' (2011), the specific part of the new Enterprise Policy.

The nine Top Sectors of the Enterprise Policy should (among other things) promote the synergy and coherence of research and innovation activities on economic and social priorities, and foster public-private cooperation and leverage private investments. Public-private partnerships (PPPs) are stimulated by means of the TKI supplement (named after the 19 'top consortia for knowledge and innovation' that commenced the implementation of Top Sector research roadmaps) and the MIT (MKB Innovatiestimulering Topsectoren), the latter targeting small and medium-sized enterprises (SMEs).

The new Innovation Policy has coincided with the start of a major shift from direct funding of research and innovation to indirect funding by fiscal measures. Thus, investments in private R&D are stimulated primarily by tax measures, notably from 2012 onwards. Additional funds are available for the Top Sectors (TKI supplement) and for fundamental research; the latter will continue to be allocated competitively based on scientific excellence and mainly by the research council NWO. The shift in the funding of business R&D could lead to a larger share of user-inspired types of fundamental and applied research in the Netherlands’ overall research output, with more short-term economic and societal impact.

The government of the Netherlands has an instrument for the periodic review of selected national policies areas. The aim is to identify various policy options and possibilities for future savings, and to achieve more value for money based on ex ante and ex post evaluations. During such a review, the Ministry of Finance, the ministry in charge of the policy area and independent organisations are brought together to assess the effectiveness and efficiency of the existing policy tools. A recent review of the science policy reconfirmed the relevance of the national science policy and proved the effectiveness and efficiency of the policy tools under consideration. Therefore, on the basis of this evidence it was concluded that the science system works well and that no general revision is needed. However, there may be areas where adjustments would be desirable to make operating the system more 'future proof'. The conclusions will be taken up in the new vision on Science Policy, which will appear in the fall of autumn 2014.

The effect of the Top Sector policy on fundamental research will be closely monitored by the Advisory Council on Science and Technology Policy (AWT), which will issue a second monitoring report by the end of 2014.

N.W.O and KNAW are also working on new strategies.

The Netherlands has a Country Specific Recommendation: 'Protect expenditure in areas directly relevant for growth such as education, innovation and research'.

In terms of research and innovation (R&I) funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in the Netherlands represented EUR 279 per inhabitant in 2012 (EUR 179 in the EU-28). In 2013, the GBAORD per inhabitant was EUR274. In 2012, the total GBAORD corresponded to 1.5 % of total government expenditure (total government expenditure provides a partial indication of the effort made by national public authorities on R&D as they do not account for the substantial fiscal measures) and 0.8 % of gross domestic product (GDP) (Eurostat).

The analysis of the evolution of GBAORD in the period during the economic crisis (2007-2012) shows that in nominal terms, the growth rate of the total GBAORD in the Netherlands has been higher than the growth rate of the total EU GBAORD. GBAORD as a share of GDP has regressed in the Netherlands but less than the evolution observed in the EU-28.

However, the GBOARD does not show the complete picture for the Netherlands. Apart from direct support to R&D, indirect support by fiscal measures (tax benefits) plays an important role in the Netherlands. The sum of direct and indirect support has increased over the period 2007-2012 and was close to 1 % of GDP in 2012. In 2013 fiscal measures were slightly over EUR one billion on a total direct and indirect government expenditure on R&D and innovation of almost EUR six billion.

According to the Rathenau report 'Total investment in Research & Innovation 2012-2018' the government continues its R&D funding largely through institutional funding. The share of project funding will decrease in the coming years according to the multiannual budget from 29 to 24 %, and the share of institutional funding will increase from 71 to 76 % in 2018.

The effectiveness and efficiency of the Dutch research system is also being pursued by introducing new competitive funding elements in the education agenda of the universities. From the institutional funding for education, 7 % of the budget for education by universities is performance-based. Furthermore, the number of PhDs a year is also part of the institutional funding of the universities and is a performance criteria. Other notable changes in the funding of research in the Dutch research system include the increasing proportion of competitive funding for applied research, more money for participation in European research programmes and the TKI supplement, which can be used for research projects (but always in collaboration with public research institutes). The competitive funding for fundamental research through N.W.O grants is being continued.

1.2. Project-based funding applying the core principles of international peer review

Both the Enterprise Policy and the research agenda are orientated towards competitive forms of funding. The new or updated measures for competitive funding (institutional and project-based), as presented in the 2014 budget agreement, include the following:

• TKI supplement: In 2013, the 19 Top Consortia for Knowledge and Innovation (TKIs) started organising the research agenda of their own sectors. Organisations who wish to participate in research projects and innovation activities coordinated by TKIs can provide funding for public-private research projects. Companies should provide cash or (starting in 2014) in kind means for at least 40 % of the project cost. This private investment then generates the TKI supplement – equal to 25 % of the project cost – which the TKI can subsequently use for additional research, development and innovation projects.

• The government will gradually increase spending on fundamental research to EUR 100 million, for both independent research and the fundamental research carried out in the joint programmes with the Top Sectors. The increased spending started at EUR 25 million in 2014, rising to EUR 75 million in 2015, 2016 and 2017, and reaching EUR 100 million from 2018.

The NWO contributed EUR 235 million to fundamental/basic research themes drawn by the private sector and the government in the Top Sector Innovation Contracts during the period 2012-2013. In accordance with the coalition agreement in 2012, the NWO is expected to designate EUR 275 million for excellent basic research in the Top Sectors in 2015, from it's total means of EUR 625 million.

• The Gravity (Zwaartekracht) programme offers additional institutional funding for top research consortia in the Netherlands. This is competitive institutional funding for a maximum of ten years and aims to support outstanding research in consortia with top researchers from various universities and research institutes.

To increase the effectiveness and efficiency of publicly funded institutes for applied research (TO2), the government published a vision on the methods and governance in 2013. The way forward in these areas requires new and more cohesive methods in programming and conducting this research, methods which are more closely tailored to the top sector policy and future challenges. In 2014, the TNO will be releasing a new strategic plan and all other applied research institutions (TO2) have produced a joint strategic framework that has been sent to Parliament in July.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders' total budget allocated as project-based funding	National level	89.2 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based	EU level	66.2 %	2013	ERA survey 2014

funding				

The share of research funders in the Netherlands who responded to the survey and support project-based funding is higher than the EU average.

The Dutch Science System has as a basis for its evaluation the national Standard Evaluation Protocol 2009-2015. This lays down four main assessment criteria: quality, productivity, feasibility/vitality and societal relevance. A separate international committee is appointed to evaluate each institute, working on the basis of a self-evaluation report from the institute and a site visit. The most recent evaluations of the NWO and KNAW are being conducted in 2014. In addition, the KNAW and NWO institutes, as well as university groups, are also evaluated. A new evaluation protocol was published in March 2014. The principles of peer-review depend on the funding organisation: these are mainly the NWO for scientific research and the RVO for industrial research.

NWO

The core principles of peer-review are that all funding provided by the NWO is based on international peer-review standards. The implementation of international peer-review standards is described in detail in the application guides, through website information for applicants and strategy documents.

Netherlands Enterprise Agency (RVO)

The RVO, formerly Agency NL, is responsible for implementing innovation policy measures, including the tax benefits WBSO and RDA. It also collects most of the data associated with these policies, which are often the basis for evaluating of the individual instruments. The performance of the RVO itself is measured by a number of operational indicators and targets, which are stated in the annual contract between the RVO and the Ministry of Economic Affairs.

1.3. Institutional funding based on institutional assessment

HEI:

The effectiveness and efficiency of the Dutch research system is also being pursued by introducing new competitive funding schemes for the education agenda in the universities. As the institutions are autonomous, performance agreements were agreed in the autumn of 2012 with mechanisms for financial sanctions. Seven per cent of the university budget for the education agenda for 2012-2016 is performance-based rather than via institutional funding. This relates only to the institutional funding for universities, thus excluding the funding through the N.WO, which is all allocated by means of competition. As of 2013, additional resources are available for quality and profile, representing about 7 % of educational funding. Of this, 5 % is for quality (conditional funding) and 2 % for profile (selective budget). The funding in the period 2013-2016 will be awarded on the basis of the performance agreements

with individual universities and colleges. For education and academic achievement (quality), an amount of EUR 200 million will be available in 2013, rising to EUR 245 million in 2016.

Public Research Organisations (PROs):

The Dutch Science System has as a basis for its evaluation the national Standard Evaluation Protocol 2009-2015. This lays down three main assessment criteria: research quality, relevance to society and viability (being equipped for the future). An international committee is appointed to evaluate each institute, working on the basis of a self-evaluation report from the institute and a site visit. Judgement by an international committee is both qualitative and quantitative and provides recommendations. Furthermore, the committee also evaluates the PhD programmes and research integrity. The most recent evaluations were conducted in 2013.

Top Sectors:

Developments related to the Top Sectors are being monitored on a continuous basis. After the introduction of the report by the Theeuwes commission (on evaluation methodology), several instrument evaluations (i.e. WBSO, Innovation Credit) have adopted the new guidelines for evaluation.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	7.8 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

The share of research funders in the Netherlands who responded to the survey and support institutional assessment for the allocation of institutional funding is lower than the EU average.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It supports also bilateral and multilateral initiatives.

Indicator	Level/cluster	Value	Year	Source

Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	11.3 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	National level	9.2 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders’ total budget in the Netherlands allocated to transnationally coordinated R&D is higher than the EU average.

The share of responding funders’ research and development budget in the Netherlands dedicated to jointly defined research agendas with other EU organisations is lower than the EU average.

Cooperation between institutions of Member States, Associated Countries and Third Countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of participation of the Netherlands in the total participation is 6.9 % and the country received 8.4 % of total European Commission contribution. FP7 funding represents EUR 181 per inhabitant (the EU average is EUR72 per capita) for the period 2007-2013 and 5.6 % of the gross domestic expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average 3 % of GERD for the same period).

Through the N.W.O the government has provided a stimulus for co-financing participation in European programmes (EUR36 million for 2014-2017).

Concerning joint programming initiatives, the country participates in all ten of the ongoing initiatives and is coordinating one of them. These initiatives are Neurodegenerative diseases (Alzheimer), Food security, Agriculture and Climate Change (FACCE), Cultural heritage and global change: a new challenge for Europe, Healthy diet for healthy life, The demographic change (More Years, better life), Antimicrobial resistance - An emerging threat to human health, Connecting climate knowledge for Europe (Clik'EU), Water challenges for a changing world, Healthy and productive seas and oceans, and Urban Europe - Global challenges, local solutions.

The NWO supports the participation with the European Science Foundation joint schemes (European Cooperative Research Projects and Eurocores programmes), COST actions, EUREKA and Joint Technology Initiatives. Furthermore, NWO participates in in the realisation of a joint strategy of European research councils and is involved in international/European fora and meetings about European joint programming, international research infrastructures etc. Joint research agenda's in Joint Programming Initiatives, ERA-nets, and article 169/185 networks are managed by the NWO.

The NWO also supports research and actions in the domain of several broad themes that relate to national and international agendas. The selection of these themes is based on an inventory of the priorities of the government, the TNO innovation programmes and European themes. In the period 2011-2014, they are: healthy living, water and climate, cultural and societal dynamics, sustainable energy, connecting sustainable cities and materials: solutions for scarcity.

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in five programmes, and led one of them. In Horizon 2020, the country is already involved in all four of the existing initiatives: EDCTP, AAL, Eurostars and EMRP.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 105 ERA-Nets, of which 25 are currently still running. The country has also participated in eight ERA-Net Plus actions - of which five are still running - in areas with high European added value and additional EU financial support topping up their joint call for proposals.

Joint research agendas and ERA-Net (Plus) networks form an important contribution to international research collaboration. The Dutch government has announced that EUR 150 million will be provided to strengthen fundamental research. A substantial portion of this sum could be used to facilitate participation in the European research programme, Horizon 2020. Also, the TKI supplement (EUR 101 million in 2014) will partially be used for co-financing EU projects.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the country has developed a specific policy, the bilateral agenda. The country monitors the implementation of cooperation programmes.

Additionally, NWO provides funding for several specific joint research projects for international research collaborations with prioritised scientific disciplines. In 2013, projects open for application were: Digging in the data challenge, CoCoon, Conflict and Cooperation in the Management of Climate Change, Open Research Area Plus – social sciences, collaboration with Brazil (CNPq, FAPESP), collaboration with India – Intelligent Grids, Indo-

Dutch science industry collaboration – Computer Sciences, Social science collaboration: India-the Netherlands, Science industry cooperation: the Netherlands-China/Hé programme of innovation cooperation, collaboration with South-Africa: Astronomy and enabling technologies for astronomy.

KNAW has two large international collaboration programmes, with China and with Indonesia. Within these scientific collaborations, the following programmes are currently open and have some predefined priorities or joint research agendas:

• Scientific cooperation with China-Programme of Strategic Scientific Alliances (PSA), which is mainly for material sciences, biotechnology/drug research and environmental science (EUR1.36 million per year);

• Scientific Programme with Indonesia Netherlands (EUR10 million combined budget from KNAW and NWO for the duration of the programme).

Some of the competitive NWO- and KNAW, instruments support international research collaboration as well. All the funding provided by these research councils is subject to international peer-review assessment. NWO and KNAW also have several collaboration agreements for supporting visits, joint workshops and research projects, but without predefined priorities.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	2.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (national level)	0.5 %	2013	ERA survey 2014

Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0 %	2013	ERA survey 2014

The share of responding funders' research and development budget in the Netherlands allocated to collaboration programmes carried out with third countries is similar to the EU average.

Within the ERA compliant cluster in the Netherlands, the share of organisations' research and development budget originating from third countries is lower than that within the EU's ERA-compliant cluster.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

The NWO has several programmes supporting international collaboration (joint research agendas), researchers' mobility (Money follows researcher) and international exchanges (Money follows cooperation), which involve Memoranda of Understanding between the NWO and other research councils, and coordinated and joint evaluation procedures following international peer-review standards (lead agency approach, for example in the ORA Programme).

There is no information available about cross-border interoperability initiatives in relation to reporting requirements, intellectual property rights (IPR), or on specific provisions removing legal barriers/laws.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	83.3 %	2013	ERA survey 2014
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development	National	3.5 %	2013	ERA survey

budget allocated through peer review carried out by institutions outside the country	level			2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in the Netherlands who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is higher than the EU average.

The share of responding funders' project-based research and development budget in the Netherlands allocated through peer review carried out by institutions outside the country is higher than the EU average.

3. RESEARCH INFRASTRUCTURES

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

The Netherlands participates in the following large international research infrastructures: ESA, CERN, EFDA, EMBL, ESO and ESRF. In 2012, the country contributed 1.2 % of the GBAORD to the activities carried out by CERN, the European Molecular Biology Laboratory (EMBL), the European Southern Observatory (ESO), the European Synchrotron Radiation Facility (ESRF), the Institut Laue-Langevin (ILL) and the European Commission’s Joint Research Centre (JRC) (Eurostat).

In terms of participation in the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of 18 of them. The country coordinates four of them: CLARIN-ERIC, DARIAH, LIFEWATCH and EATRIS.(37 %)

In terms of financial commitments to the development of these research infrastructures, the Netherlands is committed to funding seven of them. They are: CLARIN-ERIC, ESSurvey, SHARE-ERIC, BBMRI, KM3NeT, SKA, PRACE (ex HPC).

With regards to participation in the European Research Infrastructure Consortium, the Netherlands is involved in six of the seven consortia that adopted the legal framework designed by the European Commission to facilitate the establishment and operation of research infrastructures of European interest, which involve several European countries. The Netherlands is hosting SHARE-ERIC (until early 2013, then to Germany), CLARIN ERIC and EATRIS ERIC, and is a member of ESS ERIC, BBMRI-ERIC and EURO-ARGO ERIC.

In terms of support for the development and implementation of research infrastructures, the Netherlands has contributed around EUR150 million since 2008 towards overall policy measures/strategies. The national roadmap on research infrastructures which was published in 2008 and updated in 2013, includes references as well as an appendix to the participation of The Netherlands in the development of the research infrastructures mentioned in the ESFRI roadmap. In fact, most of them are part of or related to ESFRI.

3.2. Access to research infrastructures of pan-European interest

In terms of access to Research infrastructures, among the research infrastructures coordinated by The Netherlands, access to 26 of them has been funded by the European Commission.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for the Netherlands in the Researchers' Report 2014 [http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Netherlands Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and the recent progress made in several key areas.

Stock of researchers

There were 58 447 full time equivalent (FTE) researchers in the Netherlands in 2011. This represents 6.7 researchers per 1 000 labour force, compared with 7.6 among the Innovation Union reference group (Innovation Followers) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS jobs portal per thousand researchers in the public sector was 153.8 in the Netherlands compared with 72.3 among the Innovation Union reference group and an EU average of 43.7.

In 2012, 63 % of university-based researchers were satisfied with the extent to which research job vacancies were publicly advertised and made known by their institution (More2 survey, 2012).

In the Netherlands, each institution is an autonomous employer with its own personnel and recruitment policies and no legal instrument exists to influence the autonomy of the institution. There is in some cases a statutory obligation to publish a job vacancy on relevant national online platforms.

4.3. Attractive careers

The Ministry of Education, Culture and Science provides the universities and large companies with information about the 'Charter & Code' principles. The Association of Universities in the Netherlands (VSNU) endorsed the principles of the Charter & Code on behalf of all

universities in the Netherlands. Furthermore, the Maastricht Graduate School of Governance, the Maastricht University, Tilburg University, the UNESCO-IHE Institute for Water Education, the University of Amsterdam, the University of Twente and Utrecht University have signed the Charter & Code as an individual organisation.

By May 2011, 11 Dutch organisations were involved in the Commission's Human Resources (HR) Strategy for Researchers of which five had received the HR Excellence in Research logo for their progress in implementing the Charter & Code.

Clear career development provisions are negotiated individually throughout the recruitment process between the researchers and the university/public research institute. Some universities offer researchers the possibility of a route to a tenured position.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 1.9 in 2011, compared with 1.6 among the Innovation Union reference group and an EU average of 1.7.

In 2009 and 2010, the NWO developed a programme to strengthen the Dutch PhD system at the request of the Minister for Education, Culture and Science, and in collaboration with the Association of Universities in the Netherlands (VSNU) and the KNAW. Following the advice of an evaluation committee on the design of the first two rounds, the NWO decided to continue the graduate school programme. The NWO graduate programme creates an excellent educational and research environment for highly talented young researchers. It is a structural programme that offers schools a funding opportunity for the appointment of four PhD students. These PhDs form part of a school that, possibly in collaboration with an educational establishment, provides a coherent educational and research programme covering both the master's and PhD routes.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship from another EU-27 Member State was 20.4 % in the Netherlands compared with 4.2 % among the Innovation Union reference group and an EU average of 7.7 %. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 20.9 % in the Netherlands compared with 16.9 % among the Innovation Union reference group and an EU average of 24.2 %.

The government of the Netherlands does not provide funding for inward mobility, including the return of Dutch researchers from abroad. The NWO runs bilateral exchange programmes (for instance with Belgium, Germany, China, India, Japan, South Korea, etc.) that encourage scientific collaboration and the mobility of researchers. The NWO's Rubicon Programme aims to stimulate young recently graduated PhD students to acquire international experience. The programme offers researchers, who have completed their doctorates in the previous year, the chance to gain experience at a top research institution outside the Netherlands for a maximum period of two years.

Universities, research institutions and industrial partners cooperate closely to create or support different tools to develop partnerships between academia and industry. For instance, the issue of encouraging researchers to move from the public to the business sector and vice-versa has been embedded in the Strategic Agenda for Higher Education and Science Policy and the National Innovation Strategy of the Netherlands. An example of inter-sectoral mobility being encouraged as a result of the Strategic Agenda and the National Innovation Strategy is the Dutch government's 'top sector policy', which aims to boost the innovation climate and collaboration through the creation of public-private partnerships.

5. GENDER

5.1. Foster cultural and institutional change on gender

The Dutch Emancipation Policy (2013-2016) strives to enhance the empowerment of girls and women and the emancipation of lesbians, gay men, bisexuals and transgender (LGBT). The participation of women in public research is not explicitly addressed, but the need for gender balance in health care and health research is acknowledged and a number of measures for this policy area foreseen.

A cultural and institutional change on gender is supported by initiatives like Girls Day, the Charter Talent to the Top Foundation, and the Dutch Network for Women Professors.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting gender equality in research	National level	98.9 %	2013	ERA survey 2014
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (national level)	81.1 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	Limited compliance to ERA cluster (national	1.8 %	2013	ERA survey 2014

	level)			

The share of research funders in the Netherlands who responded to the survey and support national policies on gender equality in public research is higher than the EU average.

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations that have adopted Gender Equality Plans is higher than that within the EU's ERA-compliant cluster.

In the Netherlands, university boards and department chairs are responsible for stimulating gender policies. Dutch universities attract international talent and, according to the 2013 Innovation Union Scoreboard, the Dutch innovation system is the most innovative among EU Member States (EC 2013b). More and more research establishments have signed the Talent to the Top Charter, which had initially been established for business enterprises.

The country has provisions for a balanced participation of women and men in research programmes and/or projects. It has set up awards, fellowships and/or other similar mechanisms to support specifically female researchers.

Both the research councils NWO and KNAW run programmes devoted to encouraging women to pursue an academic career. Although almost half of Dutch PhD graduates are female, there are less women in higher academic functions. Gender equality in research is actively supported by a variety of means (e.g. emancipation policy grants, FOM bridging subsidies, Aspasia Programme, LEAP!).

The NWO Plural Programme aims to move more women at Dutch universities to a position as a lecturer in the area of Earth and Life Sciences (ALW).

Another NWO grant (Aspasia) is intended to encourage the promotion of female Vidi grant candidates to associate and full professorships. Aspasia ensures that more female assistant professors progress to the level of associate or full professor. Aspasia was set up together with the Ministry of Education, Culture and Science, the Association of Universities in the Netherlands (VSNU).

Athena is a grant scheme intended for female researchers who have received a Veni grant from NWO Chemical Sciences and the premium stimulates an appointment as assistant professor in permanent employment. Athena encourages the appointment of female researchers in chemistry at a university, or an equivalent fixed position at a research institute.

KNAW Merian Prize

A prize for awarding a woman who will inspire others to embark on a career in science or scholarship. The biennial prize is conferred on an outstanding female researcher working alternately in the social sciences or humanities and in science.

FOM-bridging subsidies

The Foundation for Fundamental Research on Matter (FOM) promotes, coordinates and finances fundamental physics research in the Netherlands. It is an autonomous foundation responsible to the physics division of the national research council the NWO. Its annual budget is EUR 99,2 million. FOM supports the appointment of a woman in permanent employment in physics, for example after having worked in a university abroad or to bridge the wage gap between a lecturer and professor position. FOM can subsidise up to five years.

FOM/V network initiatives for female physicists - Minerva Prize (FOM)

With this scheme, the Foundation for Fundamental Research on Matter (FOM) encourages the visibility of women in physics in order to encourage more women physicists to remain in the scientific community. The Minerva Prize is one of the activities under the Fom/v-stimuleringsprogramme to promote female physicists.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	83.4 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	9.4 %	2013	ERA survey 2014

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations implementing recruitment and promotion policies for female researchers is higher than that within the EU's ERA-compliant cluster.

Gender and women’s studies are taught at various Dutch universities and there is a Netherlands Association for Women’s Studies.

ZonMW (The Netherlands Organisation for Health Research and Development), the division for medical research of the NWO, has published 'Kleurstof': a document on diversity issues in research (gender diversity but also diversity in terms of ethnic background, age, etc.)

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting the inclusion of gender dimension in research content	National level	24.2 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	47 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

The share of research funders in the Netherlands who responded to the survey and support gender dimension in research content/programmes is lower than the EU average.

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations that include the gender dimension in research content is higher than that within the EU's ERA-compliant cluster.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision-making, the Netherlands Organisation for Scientific Research (NWO) has defined targets for its own board and committees.

Indicator	Level/cluster	Value	Year	Source
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (EU level)	33.6 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	49.8 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	1.2 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	32.1 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in the Netherlands, the share of gender-balanced recruitment committees for leading researchers in research-performing organisations is higher than that within the EU's ERA-compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in the Netherlands is lower than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access (OA), the current Dutch government supports the principles of access to and dissemination of scientific information, but does not intend to invest substantially in the furthering of open access and preservation. In November 2013, a letter was sent by the Cabinet to Parliament giving its vision on the further development of open access based upon the 'Golden Road'. Nevertheless, access to (and preservation of) scientific information is being ensured by a variety of initiatives. These include the

establishment of the NWO 'incentive Fund Open Access', the KNAW's open access policy and its Data Archiving and Networked Services (DANS) initiative, the NARCIS scheme, and an e-depot.

Related to open access to publications, the national research council of the Netherlands (NWO) encourages research results acquired with NWO funding to be accessible to the public. It has an Incentive Fund Open Access, a pilot in the humanities for starting open access journals, and has launched a call for proposals for all disciplines served by NWO for starting open access journals. It should be noted that NWO also co-finances OAPEN (Open Access Publishing in European Networks) – a European project now turned into an organisation – focusing on open access publishing of books.

In the Netherlands, the scientific community and libraries are actively engaged in developing policies for open access. All Dutch research universities have one or more repositories, and from 2010, all articles by Dutch researchers in Springer journals will be made available via Open Access. Since 2005, all Dutch universities, the Netherlands Association of Universities of Applied Sciences, the KNAW, NWO, the Royal Library and SURF have signed the Berlin Declaration on open access to knowledge in the sciences and humanities.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to publications	National level	95.7 %	2013	ERA survey 2014
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	10.3 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	1.4 %	2013	ERA survey 2014

The share of research funders in the Netherlands who responded to the survey and support OA to publications is higher than the EU average.

Within the ERA-compliant cluster in the Netherlands, the share of publicly funded scientific publications in OA amongst research-performing organisations is lower than that within the EU's ERA compliant cluster.

DANS (Data Archiving and Networked Services) encourages researchers to archive and reuse data in a sustained manner, e.g. through the online archiving system EASY. DANS also provides access, via NARCIS.nl, to thousands of scientific datasets, e-publications and other research information in the Netherlands. In addition, the institute provides training and advice, and performs research into sustained access to digital information. DANS ensures that access to digital research data keeps improving.

Research Data Netherlands is a collaboration between DANS and the 3TU. A datacentre was initiated in 2013. Several universities and research institute have joined the Dutch Dataverse Network (DDN), jointly managing the international open source application Dataverse Network for archiving and opening up research data by the researchers themselves.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to data	National level	22.3 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (EU level)	54.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national level)	77.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	Limited compliance to ERA cluster (national level)	3.8 %	2013	ERA survey 2014

The share of research funders in the Netherlands who responded to the survey and support OA to data is lower than the EU average.

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations making scientific research date systematically available online and free of charge publicly funded is higher than that within the EU's ERA-compliant cluster.

With respect to repositories, NARCIS (National Academic Research and Collaborations Information System) provides access to scientific information including (open access) publications from the repositories of all the Dutch universities, KNAW, NWO and a number of research institutes, and datasets from some data archives, as well as descriptions of research.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to open innovation (OI) and knowledge transfer (KT) between public and private sectors, the Netherlands has developed a Knowledge transfer strategy. It fosters an open circulation of knowledge between companies and research organisations and is implemented as follows. Following a EUR80 million subsidy programme, which has ended, knowledge transfer or, more broadly, valorisation is considered now as an integral part of the mission of Dutch higher education institutions as laid down in Dutch law (‘Third mission'). This is illustrated by the increased number of staff working in related activities and knowledge transfer capacities, which are increasingly acknowledged and rewarded in the human resources policies of the institutions. Furthermore, in the performance agreements between the government and the HEIs as agreed in autumn 2012, valorisation appears as one of the priorities. The implementation of the strategy is accompanied by a monitoring system. Funding organisations have specific funding lines dedicated to the implementation of knowledge transfer.

Funding organisations support the professionalisation of knowledge transfer activities, a necessary condition to increase the rate of success of the programme. The NWO institutes have set up an Industrial Liaison Officers Network (ILO-net) where they regularly organise company contact days to encouraging collaboration between industry, government and civic society organisations.

Strategic partnership and/or the definition of joint collaborative research agendas between academia and industry are supported by funding organisations in the Netherlands. The Top Sector approach (part of the Enterprise Policy) has exacerbated the public-private cooperation, which used to be fragmented and temporarily financed between entrepreneurs, researchers and government. An example of a relevant measure is the Top Consortia for Knowledge and Innovation (TKI). TKIs were established in 2012 to coordinate and match public-private research, which includes the creation of linkages with European research programmes (such as Horizon 2020). Top Sectors also strategically collaborate in human capital agendas, better regulation and economic diplomacy, involving regional and local governments, thus building and maintaining a comprehensive, multilevel agenda for competitiveness and innovation.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	100 %	2013	ERA survey 2014
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	6.1 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	0.3 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	87.7 %	2013	ERA survey 2014
Share of responding research performing organisations having or	Limited compliance	10.2 %	2013	ERA survey 2014

using a structure for knowledge transfer activities	to ERA cluster (national level)			
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	72.7 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	Limited compliance to ERA cluster (national level)	10.2 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	0.6 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	0.3 %	2013	ERA survey 2014

The share of research funders in the Netherlands who responded to the survey and support national support to KT, OI, technology transfer offices (TTOs) and private-public interaction is higher than the EU average.

Within the ERA-compliant cluster in the Netherlands, the share of research performing organisations having funding originating from the private sector is similar to that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations having or using a structure for knowledge transfer activities is higher than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations having dedicated staff employed in knowledge transfer activities is higher than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in the Netherlands, the share of research personnel whose primary occupation is in the private sector (in full time equivalents) is lower than that within the EU's ERA-compliant cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

In relation with the implementation of Digital ERA, the Netherlands has not set up a strategy for its implementation. However, the country has implemented a research and education network, essential to make digital services possible.

The usage of e-infrastructures is supported through the creation of SURF. SURF is a foundation for ground-breaking innovations in information and communication technologies (ICT), allowing researchers and higher education institutions to make optimal use of the potential of ICT and improve their quality. In accordance with the government's response to the advice by ICTRegie on ICT research, funds are made available for ICT-infrastructure such as computer networks (SURFnet, GigaPort), e-Science and high-performance computing.

Concerning digital services, the country provides federated services, cloud services and premium services.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	87.7 %	2013	ERA survey 2014

Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	11.1 %	2013	ERA survey 2014

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations providing digital research services (i.e. cloud services, a research collaboration platform, etc.) is higher than that within the EU's ERA-compliant cluster.

6.4. Uptake of federated electronic identities

Netherlands was a member of an identity federation in both 2011 and 2013. The country is a member of eduGAIN, a service intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) partners' federations.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	49.7 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	0.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in the Netherlands, the share of research-performing organisations providing federated electronic identities for their researchers is higher than that within the EU's ERA-compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 34 research performing organisations in Netherlands answered the 2014 ERA survey, which represents 34.3% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in Netherlands shows that 50.0 % of them are in the 'ERA compliant' cluster, 46.9 % can be classified in the 'limited compliance to ERA' cluster and 3.1 % of organisations in the 'ERA principles are not applicable' cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of 'weighted' organisations are 88.2 % for the 'ERA compliant' cluster, 11.7 % for the 'ERA limited compliant' cluster and 0.1 % for those organisations where ERA principles are not applicable.

Three large technical universities did not reply to the survey, which diminishes the representativeness of the results of the research performance organisations.

For the indicator 'Share of total budget allocated as project based funding' it should be noted that part of the funding of RPO's is directly by ministries without intervention by any funding organisation. As a consequence the percentage is relatively high compared to official figures.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013
Research and innovation system			
Intensifying budget for fundamental research	2013	X	X
Project-based funding applying the core principles of international peer review			
Standard Evaluation Protocol 2009-2015 (updated March 2014)	2014	X	X
Additional funds for fundamental research	2013	X	X
Competitive funding programs for research and innovation (NWO, KNAW and Agentschap NL)	2013	X	X
Institutional funding based on institutional assessment			
Improving the quality and profiles of Higher Education institutions	2013	X	X

Implementing joint research agendas			
Joint Research Projects Bio-based Economy			
Co-funding for participation in European research programmes	2013	X	X
Top Sectors: 2013 update of innovation contracts	2013	X	X
Participation in Joint Programming, article 185 initiative, ERA NET+	2013	X	X
Openness for international cooperation with third countries and regions			
Bilateral agenda			
NWO and KNAW programmes for international collaboration			
Interoperability, mutual recognition of evaluation results and other schemes			
NWO cooperation in research themes	2013	X	X
SME Innovation scheme topsectors	2013	X	X
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
Dutch roadmap for large scale research facilities	2013	X	X
Update ESFRI roadmap	2013	X	X
Attractive careers			
NWO Talent Scheme (Vernieuwingsimpuls) and other individual grant schemes			
Measures to develop ERA in relation to HR Strategy for Researchers			
Foster cultural and institutional change on gender			
Emancipation policy 2013-2016	2013	X	X
Gender balance in the decision-making process			

NWO Aspasia Programme			
Open access to publications and data resulting from publicly funded research			
towards Golden open access in 2024	2013	X	X
NARCIS - National Academic Research and Collaborations Information System			
Open innovation and knowledge transfer between public and private sectors			
TKI surcharge	2013	X	X
MBO Centres for Innovative craftsmanship, HBO Centers for entrepreneurs, RAAK programme	2013	X	X
"Technology Pact" to address skills shortages in technology	2013	X	X
MKB Innovation Scheme for Top Sectors (MIT)	2013	X	X
Valorisation and knowledge transfer by Higher Education institutions and NWO	2012	X	
High Tech start up Fund	2011		
Technical Pact	2013	X	X

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

The Polish public research and development (R&D) sector went through major changes that result from numerous legislative acts adopted in 2010 (science reform) and 2011 (higher education reform) – altogether eight laws and 92 ordinances. They establish new institutions and rules. The Ministry of Science and Education (MNiSW) manages the science budget and supervises two key funding agencies: the National Science Centre (NCN), financing basic science projects, and the National Centre for Research and Development (NCBiR), financing applied research and innovative development. The MNiSW is assisted by the Committee for Science Policy (KPN) for priority setting and the Committee for Evaluation of Scientific Research Institutions (KEJN), evaluating the performance of public sector research performing organisations. The Polish Agency for Enterprise Development (PARP) is an agency under the Ministry of Economy (MG), which distributes Structural Funds under the MG, but also other innovation-related measures. The Ministry of Regional Development (MRR) defines the policies and regulations related to the absorption of EU funds. Several other ministries have dedicated programmes, stimulating innovation and funding research projects in relevant sectors. The Foundation for Polish Science (FNP) is a non-governmental institution, partly funded from the science budget, the EU Structural Funds and other sources, that award research grants and scholarships.

In 2011, 105 public higher education institutions (PHEIs) and 207 public research organisations (PROs) were actively conducting R&D activities as well as the Polish Academy of Sciences (PAN).

Since 2013, Poland has had a multi-annual research development and innovation (RDI) plan – The Strategy for the Innovation and Effectiveness of the Economy for the years 2012-2020 'Dynamic Poland' – coordinated by the Ministry of Economy. The strategy is the highest level policy document related to RDI in Poland and sets quantifiable objectives in R&D funding, indicators to measure their fulfilment and delegates specific tasks to different governmental institutions. Among the R&D objectives listed are: adjust the structure and increase the effectiveness of public research expenditure in RDI; develop international scientific and educational cooperation; develop infrastructure for research and knowledge transfer; support researchers' mobility in the science and economy sectors; create a culture of innovative academic entrepreneurship; strengthen links between business and academia; use intellectual property rights, patents and scientific information effectively.

The National Research Programme 'Foundations for the science and technology policy and innovation policy of the state' (NRP) that was issued in 2011 has set all-encompassing national R&D priorities.

In terms of research and innovation (R&I) funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in Poland represented EUR 36 per inhabitant in 2012 (EUR 179 in the EU-28). In 2012, total GBAORD corresponded to 0.8 % of total government expenditures and 0.4% of Gross Domestic Product (GDP) (Eurostat).

The analysis of the evolution of GBAORD in the period during the economic crisis (2007-2012) shows that in nominal terms, the rate of growth of total GBAORD in Poland has been higher than the rate of growth of total EU GBAORD. In terms of R&D efforts, the rate of growth of GBOARD in Finally, GBAORD as a share of GDP has evolved positively in Poland even when it regressed at EU28 level.

1.2. Project-based funding applying the core principles of international peer review

The Act on principles of science financing (2010) established financing modalities for NCN and NCBiR, assuring gradual increases in the allocated funding for competitive calls. The share of competitive, project base funding has increased from 44.63% in 2009 to a planned 63.79% in 2012 and 63.71% in 2013. In 2013, the ten programmes managed by NCN and the 23 programmes managed by NCBiR were distributing 54.25% of the science budget through open competitive calls. Besides those agencies, the Ministry of Science and Higher Education (MNiSW), the Foundation for Polish Science (FNP) and the Polish Agency for Enterprise Development (PARP) run five and respectively four and four research programmes. The NCBiR as well as the PARP fund research enterprises.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	92 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in Poland who responded to the survey and support project-based funding is higher than the EU average.

National peer review is used by all the funders (NCN, NCBiR, MNiSW, FNP and PARP) and peer-review rules are defined by legislation or publicly available procedures and are compliant with international standards for peer-reviews. For NCN, the principles for excellence, impartiality, appropriateness for purpose/impact, as well as efficiency and speed, are applied. The NCN also involves foreign reviewers in the evaluation of selected proposals. Transparency is a principle embedded in the Act on the principles for Science Funding, to be applied for all research funding organisations.

The reliance on the core principles of peer-review is also required for all R&D funding that is distributed based on the Operational Programme 'Smart Growth' (POIR), in the framework of the distribution of the EU Structural Funds for 2014-2020.

1.3. Institutional funding based on institutional assessment

Institutional funding is partly statutory (based on the number of researchers) and partly the result of an evaluation. In 2012, The MNiSW amended the standards for the institutional assessment of public R&D organisations (both universities and research institutes), promoting internationally significant research and the successful commercialisation of research results. Nationwide performance evaluations are managed by the newly established, independent Committee for Evaluation of Scientific Research Institutions (KEJN) and are based on transparent, pre-defined criteria. The detailed assessments include bibliometric measures (with numbers of publications taking into account impact factors of specific academic journals), scientific awards to researchers, patents, revenues from industry co-operation (such as commercialisation of research results) and external R&D funding, normalised by the numbers of R&D employees in an organisation. The first institutional evaluation using the new criteria was performed in 2013. The institutional assessments are carried out at the level of individual institutes and faculties. Among the 963 scientific institutions evaluated, 3.8% received the highest "A+" rank, and 31.9% were assigned to "A" category, while B- and C-ranked organisations will benefit from only limited institutional funding. It is planned that institutes classified in category C will be liquidated, commercialised or merged into other institutes. The next evaluation is planned to take place in 2017 with using new criteria tha are planned to be proposed in 2015-16, which will also involve researchers in the revision process.

The MNiSW develops a nationwide online system POL-ON, which will make the results of institutional assessments publicly available alongside the bibliometric indicators.

The Ministry has also set rules for selecting leading research institutions in each scientific discipline, the so-called KNOWs – National Leading Scientific Centres. The KNOW status (Centres of Excellence) is linked to an assessment exercise conducted every five years that evaluate research results, the relationship between the teaching process and the socio-economic environment, as well as a full financial report. The selected centres receive additional funding. This measure is reinforced by the 2014 National Reform Programme.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	6.8 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

The share of research funders in Poland who responded to the survey and support institutional assessment for the allocation of institutional funding is lower than the EU average.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It supports also bilateral and multilateral initiatives.

The Strategy for the Innovation and Effectiveness of the Economy for the years 2012-2020 'Dynamic Poland' includes among its R&D objectives the development of international scientific and educational cooperation. The National Research Programme contains a list of priority areas partially coinciding with the grand challenges. These are reflected in the Strategic Research and Development Programmes of NCBiR and the Resolution of the Council of NCN concerning priority areas for fundamental research. In 2013, a dedicated inter-disciplinary committee was set up to make recommendations on how funds for international research cooperation should be distributed by the MNiSW, while the R&D funding agencies NCN and NCBiR have had corresponding institutional arrangements since 2010. The future Operational Programme "Smart Growth" (POIR), which defines the rules for distributing the EU Structural Funds during the 2014-2020 period, includes measures to foster the internationalisation of Polish science through support for the creation of international research agendas and to stimulate cross-border R&D.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	3.4 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	National level	2 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders' total budget in Poland allocated to transnationally coordinated R&D is lower than the EU average.

The share of responding funders' research and development budget in Poland dedicated to jointly defined research agendas with other EU organisations is higher than the EU average.

Cooperation between the institutions of Member States, Associated Countries and third countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of Poland's participation in the total participation is 1.9 % and the country received 1.1 % of the total European Commission contribution. FP7 funding represents EUR 10 per inhabitant (the EU average EUR 72 per capita) for the period 2007-2013 and 3.4 % of the Gross Domestic Expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average 3 % of GERD for the same period).

Concerning joint programming initiatives, the country participates in seven of the ten ongoing initiatives. These initiatives are Neurodegenerative diseases (Alzheimer), Food Security, Agriculture and Climate Change, Cultural Heritage and global change: A new challenge for Europe, Healthy Diet for Healthy Life, The Demographic change (More Years, Better Life), Antimicrobial resistance - An emerging threat to human health and Water Challenges for a Changing world.

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in five programmes. In Horizon 2020, the country is already involved in three of the four existing initiatives.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 61 ERA-Nets, of which 15 are currently still running. The country has also participated in nine ERA-Net Plus actions - of which six are still running - in areas with high European added value and received additional EU financial support to top up their joint call for proposals.

Poland has bilateral research agreements and cooperation programmes with the Czech Republic, Germany (Polish-German Foundation for Science), Israel, Luxembourg (Pollux programme) and Norway (Polish-Norwegian Research Fund). Funding within bilateral agreements is offered via the NCN and NCBiR dedicated programmes (e.g. HARMONIA).

The Visegrad fund (between the Czech Republic, Hungary, Poland, and Slovakia) also provides research grants from a 'common pot' contribution from all the countries involved.

Cross-border interoperability of national programmes is based on the Act on the principles of science financing (2010). There are standard procedures for co-funding Polish researchers from academia or industry to participate in international initiatives and using international peer review in national funding decisions.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the country has not developed a specific policy. Poland has bilateral agreements with Singapore and Taiwan (with the co-funding managed by the NCBiR).

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	1.4 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (national level)	0.3 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

The share of responding funders' research and development budget in Poland allocated to collaboration programmes carried out with third countries is lower than the EU average.

Within the ERA compliant cluster in Poland, the share of organisations' research and development budget originating from third countries is lower than within the EU ERA compliant cluster.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

Mutual recognition of evaluations that conform to international peer review standards is illustrated by the programme "Ideas Plus", established by the MNiSW in 2010 and supporting the participants of the European Research Council (ERC) competition 'IDEAS', who did not qualify for funding from the ERC.

It seems that the recent 2013 call for proposals for the POLLUX 'Innovation in Services' within the bilateral agreement with Luxembourg is based on a joint peer review evaluation process.

No funders apply the so called 'lead agency' procedures, i.e. the 'Money cooperation' and 'Money follows researchers' schemes.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	88.4 %	2013	ERA survey 2014
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	1 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in Poland who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is higher than the EU average.

The share of responding funders' project-based research and development budget in Poland allocated through peer review carried out by institutions outside the country is higher than the EU average.

3. RESEARCH INFRASTRUCTURES

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

Poland participates in the following large international research infrastructures: ESA, CERN, EFDA, ESRF, EU.XFEL and ILL. In 2012, the country contributed 2.5 % of GBAORD to the activities carried out by CERN, the European Molecular Biology Laboratory (EMBL), the European Southern Observatory (ESO), the European Synchrotron Radiation Facility (ESRF), the Institut Laue-Langevin (ILL) and the European Commission's Joint Research Centre (JRC) (Eurostat).

In terms of participation in the development of research infrastructures included in the European Strategy Forum on Research Infrastructure (ESFRI) Roadmap, the country participates in the preparatory phase of 21 of them (42 %).

In terms of financial commitments to the development of these research infrastructures, Poland is committed to funding four of them. They are: CLARIN, ESSurvey, XFEL and FAIR.

With regard to participation in the European Research Infrastructure Consortium (ERIC), Poland is involved in four of the nine consortia, which adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest involving several European countries. Poland is a member of CLARIN ERIC and ES Survey ERIC, and an observer in BBMRI ERIC and EURO-ARGO ERIC.

In terms of support to the development and implementation of research infrastructures (RIs), the highest level policy document, the Strategy for the Innovation and Efficiency of the Economy for the years 2012-2020 (2013) (SIEG) listed as one of the objectives the further development of RIs based on the Polish Roadmap of Research Infrastructure (PMDIB). Already in 2010 the Act on the principles of science financing established open competitive calls for large R&D infrastructure investments. Additionally, several ordinances of the Minister of Science and Higher Education (MNiSW) (2010-2011) earmarked parts of the science budget for RIs, defined investment criteria and, selection modes involving peer-reviews, and opened up the competitions to business enterprises as well.

The MNiSW published the updated Polish Roadmap for Research Infrastructures in August 2014. The new roadmap includes 53 research projects, among which 30 are national projects and 23 are international ones, whilst 13 are already in their implementation phase. According to the MNiSW, the inclusion of the research projects in the Roadmap does not involve any financial commitment from public authorities. Moreover, no information on financial commitment is mentioned in the updated roadmap.

The 2014 National Reform Programme considers the establishment of research and innovation infrastructures, especially those of European interest, among its priorities. One of the implementing measures it announces is a draft legislative amendment adopted by the MNiSW to ensure more efficient financing of strategic research infrastructures, in line with the ERA actions and based on PMDIB. The draft amendment is expected to be adopted by the autumn of 2014.

In the future POIR for 2014-2020, several measures address infrastructure investments, including dedicated funding for projects from the PMDIB with explicit requirements to ensure the availability of the funded RI to other organisations, and to prepare financial plans, taking into account the costs of set-up and maintenance, as well as the expected fees charged to external users.

3.2. Access to research infrastructures of pan-European interest

In terms of access to research infrastructures, the existing legal framework does not prevent foreign researchers from using the RIs in Poland. The POIR includes measures that would help optimise the use of existing Ris for applied research and development, especially jointly with business enterprises and international partners. Funding for Ris included in the national roadmap (PMDIB) requires that external access is facilitated, with clearly defined access policies and fees.

The MNiSW provides an exhaustive list on its website of the ESFRI projects implemented in Poland. In the meantime, the MNiSW continues the development of an online system POL-ON, which will publish detailed information about scientific organisations, including the availability of research infrastructures. In 2013, the NCBiR published legal interpretations online and offered tools that facilitate the commercial uses of publicly-funded Ris. Access to one the research infrastructures coordinated by Poland has been funded by the European Commission.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for Poland in the Researchers' Report 2014
[http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Poland_Country_Profile_RR 2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

Stock of researchers

There were 64 133 full-time equivalent (FTE) researchers in Poland in 2011. This represents 3.7 researchers per 1 000 labour force, compared with 5.3 among the Innovation Union reference group (Moderate Innovators) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS jobs portal per thousand researchers in the public sector was 143.2 in Poland, compared with 39.9 among the Innovation Union reference group and an EU average of 43.7.

In 2012, 62% of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (More2 survey, 2012).

The Law on Higher Education of 2011 requires Polish higher education institutions to publish job vacancies on the EURAXESS portal. A provision in the amended Law also states that all scientific posts in HEIs must be filled via a competition (Article 118a). This facilitates scientists' careers and enables young scientists to have better access to grants (from the National Science Centre and the National Centre for Research and Development) through open competitions. Experts from both national and foreign science centres are able to participate in the competitions.

4.3. Attractive careers

The Polish government actively promotes the implementation of the 'Charter & Code' by research institutions and funders. By May 2014, 7 Polish organisations were involved in the Commission's Human Resources Strategy for Researchers of which 4 had received the 'HR Excellence in Research' logo for their progress in implementing the Charter & Code.

In 2011, the Polish government adopted the Long-Term Financial Plan for 2011-2014, which provides for a 30% salary increase for higher education employees, including researchers, over a three-year period, starting from 2013.

The number of older scientists strongly outnumbers young highly qualified researchers, preventing the latter from climbing the academic career ladder. This results in an outflow of young scientists from HE institutions and makes it hard for Polish science to compete with the best global centres. One of the changes introduced in the amended Law on Higher Education (2011) is a regulation stating that the contract of a nominated academic teacher must expire when they turn 65. The age limit for professors is 70.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 0.5 in 2011 compared with 1.2 among the Innovation Union reference group and an EU average of 1.7.

The Polish government introduced a financial incentive to provide more funding to around 30% of doctoral candidates. Doctoral programmes are evaluated by the Polish Accreditation Committee as part of an institutional assessment. The procedures for obtaining the doctoral degree have been made more transparent and quality-oriented. Measures to improve researchers' competencies and skills, particularly those of young researchers, are included in

the long-term Poland 2030 Strategy, the National Development Strategy 2020 as well as in the Human Capital Development Strategy adopted in June 2013.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU-27 Member State was 1.7% in Poland compared with 4.2% among the Innovation Union reference group and an EU average of 7.7%. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 1.9% in Poland compared with 5.2% among the Innovation Union reference group and an EU average of 24.2% (Researchers' Report, 2014).

The Foundation for Polish Science has a number of schemes to support inward mobility. The overall objective of the welcome Programme is to engage outstanding researchers from abroad in creating research teams in Poland and intensify the degree of international cooperation of Polish institutes and universities. The projects must be of at least three years' envisaged duration. The objective of the homing plus Programme is to encourage young Polish scholars abroad to return to Poland. The programme is also open to young Doctors of Philosophy (PhDs) who are citizens of other countries but interested in taking up a post-doctoral fellowship in Poland. The project carried out under the programme may last from one to two years.

As prominent scientists and the best laboratories are dispersed all over the country, Poland needs science centres where the knowledge and appropriate funding are clustered in order to raise the level of Polish science and to compete internationally. Leading National Research Centres (KNOWs) have existed since 2012 to fulfil this role, bringing together the best scientists, students and doctoral candidates. The KNOWs were selected via a competition in eight knowledge and education areas: liberal arts, social studies, science, technical studies, medical and health-related studies, life sciences, agriculture and forestry, and art. They receive five-year subsidies and are autonomous in deciding how to spend the money, e.g. on salaries or by establishing special doctoral grants. In July 2013, the Ministry of Science and Higher Education announced a competition for the next group to receive additional funding and KNOW status. The results of the competition will be announced in 2014.

5. GENDER

5.1. Foster cultural and institutional change on gender

The basis of equality for women and men in Poland is the principle of equality before the law, which is embedded in the Polish Constitution. The main institution for gender equality is the Department for Women, Family and Counteracting Discrimination in the Ministry of Labour and Social Policy, which has operated since 1 January 2006.

General legislative acts prohibit discrimination and protect women during their period of pregnancy and maternity leave. Recently, the government published a proposal to amend the Labour Code and the Act on financial benefits from social insurance in the case of sickness and maternity (2013). In 2013, it also introduced measures on flexitime, paid parental leave, child-care facilities and returning to work after bringing-up a child, as well as support and

financial contributions to projects promoting equal opportunities for working men and women.

Additionally, the 2014 National Reform Programme promises to reinforce measures such as maternity and parental leave and provision of child-care facilities, and fostering a work-life balance and career progression in order to raise the employability of women.

In the research field, Poland has specific legal and soft measures in place to promote gender equality. Poland belongs to the EU countries with traditionally high proportions of women involved in R&D activities. In 2011, 65.5 % of all university graduates were women, including 51.5 % of new doctorate graduates. Women make up 22.05 % of all the professors employed in Poland and out of 524 members of the Polish Academy of Sciences, in 2011 only 20 (3.81 %) were women.

In January 2014, the Minister of Science and Higher Education issued a statement, confirming the importance of gender-related research and linking it to the Polish and EU legal framework. The Central Statistics Office (GUS) monitors gender balance at national level and many public sector R&D institutions publish corresponding data in their annual reports.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting gender equality in research	National level	61.4 %	2013	ERA survey 2014
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (national level)	19.3 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

The share of research funders in Poland who responded to the survey and support national policies on gender equality in public research is lower than the EU average.

Within the ERA compliant cluster in Poland, the share of research performing organisations which have adopted Gender Equality Plans is lower than within the EU ERA compliant cluster.

In 2012, female researchers represented 42.1 % of the recruitments in the higher education sector and 20.3 % of academics in Grade A. This is slightly above the EU average (18.7 %).

The country has measures supporting a return to work after parental leave. In the science and higher education field, the recruitment, retention and career progression of female researchers is fostered by several measures: fixed-term contracts are extended by the periods of maternity leave and additional leave to raise children; doctoral studies are prolonged under the same conditions; the annual workloads of women giving birth and raising children are reduced. Article 28 of the 2010 Law on the principles of financing science stipulates that a grant or scholarship can be interrupted during a period of maternity or parental leave. Periods of maternity leave and leave for taking care of children are not included in the calculation of maximum age for grants for young researchers for the NCN and NCBiR's programme LIDER. The Foundation for Polish Science runs the ‘Parent-bridge programme’, which aims to enable researchers who are raising young children to return to advanced research work as well as to enable pregnant women to carry out research projects which are financed from external sources.

In Poland there are awards, fellowships and/or other similar mechanisms to support specifically female researchers. Several soft measures are put in place to foster cultural and institutional change on gender. The Conference of Rectors of Polish Technical Universities manages a programme called 'Girls on technical universities', compiles lists of 'women-friendly' technical universities, thus establishing dedicated contact points for women. The MNiSW in cooperation with the magazine Elle offers financial awards 'Girls of the future' for outstanding female researchers. L’Oréal, with the support of UNESCO, offers scholarships for women-scientists.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female	ERA compliant cluster (national	24.4 %	2013	ERA survey 2014

researchers	level)			
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	7.3 %	2013	ERA survey 2014

Within the ERA compliant cluster in Poland, the share of research performing organisations implementing recruitment and promotion policies for female researchers is lower than within the EU ERA compliant cluster.

Gender mainstreaming in the contexts of research projects is not actively promoted, but multiple research programmes include the topic alongside a long list of potential research areas in social studies, without earmarking funds specifically for this particular area. Dedicated gender studies are available at, among others, the University of Warsaw and the Polish Academy of Sciences.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the inclusion of gender dimension in research content	National level	0 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	23 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in	Limited compliance to ERA cluster	2.1 %	2013	ERA survey 2014

research content	(national level)			

The research funders in Poland who responded to the survey did not provide information on support to the inclusion of gender dimension in research content/programmes.

Within the ERA compliant cluster in Poland, the share of research performing organisations which include the gender dimension in research content is lower than within the EU ERA compliant cluster.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision making, Article 48 of the Law on Higher Education stipulates that the minister for higher education makes sure that at least 30 % of the members of the Polish Accreditation Committee are women. The Law obliges the Committee to strive to ensure a gender balance in its work, among others that there should be a balanced representation of women on the Main Council of Science and Higher Education and the Central Committee for Scientific Degrees and Titles.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (EU level)	33.6 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	29.7 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	10.8 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	16.4 %	2013	ERA survey 2014
Share of gender-balanced research	EU level	35.8 %	2013	ERA survey

evaluation panels amongst responding research funding organisations				2014

Within the ERA compliant cluster in Poland, the share of gender-balanced recruitment committees for leading researchers in research performing organisations is lower than within the EU ERA compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in Poland is lower than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access, the NCBiR model agreement makes open access mandatory. Additionally, several measures have been put in place by the MNiSW to guarantee open access for Polish researchers and students to a variety of research results: gold open access publications in Springer's journals; licence for the Virtual Library of Science; digitisation of scientific journals and their electronic distribution. In 2012, the MNiSW defined criteria and modalities for evaluation of Polish scientific journals: these journals get extra points if they publish contents of articles online.

Additionally, patented inventions can be used for scientific, non-commercial research without the need to license the invention or pay royalties.

The future POIR includes support to adjustments of ICT infrastructure, which is necessary to enable open access to scientific publications in Poland.

The NCBiR model agreement requires publications to be made available via open access – either green with deposition in repositories or gold, as the costs of publication covered by most R&D support programmes. The same model agreement also requires software to be free or open source.

Index Copernicus offers basic access to data free of charge.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to publications	National level	73 %	2013	ERA survey 2014
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing	ERA compliant cluster (EU	18 %	2013	ERA survey 2014

organisations	level)			
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	14.3 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	5.4 %	2013	ERA survey 2014

The share of research funders in Poland who responded to the survey and support Open Access to publications is higher than the EU average.

Within the ERA compliant cluster in Poland, the share of publicly funded scientific publications in OA amongst research performing organisations is lower than within the EU ERA compliant cluster.

No policy measures supporting open access to data have been identified.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to data	National level	73 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (EU level)	54.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national level)	49.5 %	2013	ERA survey 2014
Share of responding research performing organisations making	Limited compliance	22.2 %	2013	ERA survey

scientific research data available on-line and free of charge	to ERA cluster (national level)			2014

The share of research funders in Poland who responded to the survey and support Open Access to data is higher than the EU average.

Within the ERA compliant cluster in Poland, the share of research performing organisations making available on-line and free of charge publicly funded scientific research data systematically is lower than within the EU ERA compliant cluster.

As regards repositories, the Federation of Digital Libraries, which is managed by the by Poznan Supercomputing and Networking Centre (PSNC) archives, digitises the contents of Polish libraries, including scanned scientific publications. The Virtual Library of Science, established in 2010, aggregates commercial publication databases into a common platform. Additionally, the Centre of Open Science CeON (managed by the University of Warsaw) also maintains open access repositories, including books, and offers legal advice on open access.

Additionally, an ongoing project called 'Interdisciplinary System for Interactive Scientific and Scientific Technical Information (SYNAT)', funded by the NCBiR and developed by the University of Warsaw and Warsaw University of Technology, will establish an open repository of scientific publications and data for all researchers and institutions in Poland to use.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to Open Innovation and Knowledge Transfer between public and private sectors, Poland stresses the importance of knowledge transfer and cooperation between scientific institutions and industry and supports open innovations in the overall Strategy for the Innovation and Effectiveness of the Economy for the years 2012-2020 (2013) and its implementing Enterprise Development Programme (PRP).

Several legislative acts set relevant rules regarding intellectual property rights (IPR) for both universities and research institutes, and include the possibility or obligation to commercialise publicly funded research results, encourage the establishment and use of academic spin-offs, oblige universities to set up technology transfer entities and include performance in commercial knowledge transfer as part of the institutional assessments for R&D organisations. Additionally, the MNiSW and the Polish Enterprise Agency have published several guidelines related to knowledge transfer.

The POIR and the 'Operational Programme "Innovative Economy' (POIG) include measures to stimulate the cooperation between business and scientific organisations, such as building of mixed consortia and internships/secondments from business to academia; centralising funds

for enterprises in a single agency and changes in the application and evaluation procedure of grants.

The 2014 National Reform Programme includes business-academia cooperation as one of its main priorities. There are several programmes in the field of applied research and development (BRIdge VC, BroTech, Innovation Creator, LIDER, PBS, BLUE GAS, GEKON, INNOMED, INNOLOT, CuBR), strategic programmes (STRATEGMED, BIOSTRATEG, Modern material technologies) and programmes supporting the process of commercialisation of the results of R&D activities for economic purposes (Graf-Tech, InnoTech, Spin-Tech, Start-Tech), which were already implemented or are prepared for implementation during the 2014–2020 period. Most of these programmes are financed under the NCBiR.

The MNiSW also manages programmes for training personnel in technology transfer offices (TTOs) and hiring technology brokers for public universities (for example through programmes such as TOP 500 Innovators and 'Brokers of Innovation'). It has also published several guidebooks on the topic.

Strategic partnerships between academia and industry are supported by the NCBiR through sectoral programmes such as INNOMED and INNOLOT (for the specific sectors of medicine and aviation) but there are also horizontal, bottom-up programmes to establish joint research agendas.

Within the framework of the European Semester cycle, the European Commission highlighted in the 2014 Country Specific Recommendation the need for Poland to strengthen the links between research, innovation and industrial policy.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	61.4 %	2013	ERA survey 2014
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014

Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	4.7 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	2.7 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	63.3 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	Limited compliance to ERA cluster (national level)	19.2 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	52.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge	Limited compliance to ERA cluster	16.5 %	2013	ERA survey 2014

transfer activities	(national level)			
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	0.1 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	0.3 %	2013	ERA survey 2014

The share of research funders in Poland who responded to the survey and support KT and OI, TTOs and Private Public interaction is lower than the EU average.

Within the ERA compliant cluster in Poland, the share of research performing organisations having funding originating from the private sector is lower than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Poland, the share of research performing organisations having or using a structure for knowledge transfer activities is lower than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Poland, the share of research performing organisations having dedicated staff employed in knowledge transfer activities is lower than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Poland, the share of research personnel whose primary occupation is in the private sector (in Full Time Equivalents) is lower than within the EU ERA compliant cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

In relation to the implementation of Digital ERA, Poland has not set up a strategy for its implementation. However, the Ministry of Science and Higher Education proposed amendments to the Act on science financing which foresee the future integration of ICT

systems. These would in turn support information sharing about institutions, research projects and researchers.

Through the Poznan Supercomputing and Networking Centre (PSNC), which is affiliated with the Institute of Bioorganic Chemistry at the Polish Academy of Sciences the country has implemented a research and education network, which is essential to make digital services possible.

The POIR intends to fund the development of ICT infrastructures that are needed for open access to scientific publications.

Concerning digital services, the country provides cloud services and premium services.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	66.2 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	13.8 %	2013	ERA survey 2014

Within the ERA compliant cluster in Poland, the share of research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.) is lower than within the EU ERA compliant cluster.

6.4. Uptake of federated electronic identities

Poland was a member of an identity federation in 2011 through the Poznan Supercomputing and Networking Centre (PSNC) The country is member of eduGAIN, a service intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) partners' federations. It operates PIONIER – the Polish Optical Internet network.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	31.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	8.2 %	2013	ERA survey 2014

Within the ERA compliant cluster in Poland, the share of research performing organisations providing federated electronic identities for their researchers is lower than within the EU ERA compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 54 research performing organisations in Poland answered the 2014 ERA survey, which represents 22.2% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in Poland shows that 35.2 % of them are in the 'ERA compliant' cluster, 59.3 % can be classified in the 'limited compliance to ERA' cluster and 5.6 % of organisations in the 'ERA principles are not applicable' cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of 'weighted' organisations are 69.9 % for the 'ERA compliant' cluster, 27.7 % for the 'ERA limited compliant' cluster and 2.4 % for those organisations where ERA principles are not applicable.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since	New measure

		2012	since 2013
Research and innovation system			
National Smart Specialisations	2013	X	X
The Strategy for the Innovation and Effectiveness of the Economy for the years 2012-2020 “Dynamic Poland”	2013	X	X
Project-based funding applying the core principles of international peer review			
National Research Program “Foundations for the science and technology policy and innovation policy of the state”	2011		
NCN, NCBiR, Ministry of Science and Higher Education (MNiSW), the Foundation for Polish Science (FNP) and Polish Agency for Enterprise Development (PARP) programmes			
Peer-review in national programmes	1991		
Ordinance of the Minister of Regional Development concerning the award of financial support based on the Operating Programme Innovative Economy, 2007-2013, by the Polish Agency of Enterprise Development (PARP)	2012	X	
Act on National Research & Development Centre (NCBiR)	2010		
Act on National Science Centre (NCN)	2010		
Act on principles of science financing (modified in 2010)	2010		
Ordinance of the Director of NCBiR concerning the principles of selection and compensation of experts at NCBiR Resolution of the NCN Counil concerning establishment and modalities of work of the panel of experts	2013	X	X

Institutional funding based on institutional assessment			
Institutional assessment by the Committee for Evaluation of Scientific Research Institutions (KEJN)			
Ordinance of the Minister of Science and Higher Education concerning the conditions and modes of applying for the status of KNOW (National Leading Scientific Institution) Communication of the Minister of Science and Higher Education concerning the call f	2011		
Act on higher education (including amendments from 2011)	2011		
Ordinance of the Minister of Science and Higher Education concerning conditions of programme and institutional assessment	2011		
Implementing joint research agendas			
JPIs, EIROs, Artile 185, ERA-NETs - participation of Poland			
Amendment to the Ordinance of the Minister of Economy amending the ordinance concerning financial support offered by the Polish Agency of Enterprise Development linked to operational programs	2011		
Ordinance of the Minister of Science and Higher Education concerning the conditions and modes of awarding public support for financing international scientific cooperation	2011		
Resolution of the Council of NCN concerning priority areas for fundamental research The Strategic Research and	2012	X	

Development Programs of NCBiR			
Polish participation in LIFE+	2008		
Interoperability, mutual recognition of evaluation results and other schemes			
The Visegrad Fund			
Ordinance of the Minister of Science and Higher Education concerning the criteria and mode of award and settlement of funds for financing international scientific co-operation	2011		
NCN's program "HARMONIA"	2010		
Bilateral agreements			
Communication of the Minister of Science and Higher Education concerning the establishment of Program "Ideas Plus"	2010		
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
Development of online system POL-ON	2011		
Polish Roadmap for Research Infrastructures (updated)	2014	X	X
Ordinances of the Minister of Science and Higher Education (MNiSW) (2010-2011)	2010		
Access to research infrastructures of pan-European interest			
Legal interpretations supporting use of publicly funded RIs	2013	X	X
Draft Operational Programme "Innovative Economy" (POIG)	2007		
Open, transparent and merit-based recruitment of researchers			
Operations of 10 EURAXESS Service Points in 10 different cities in Poland	2011		
Establishment of EURAXESS POLAND	2009		

portal			
Attractive careers			
Draft Operational Programme "Human Capital "			
Scientific Visa package			
The Ordinance of the Minister of Science and Higher Education concerning the documentation of studies; Ordinance of the Minister of Science and Higher Education concerning conditions of programme assessment and institutional assessment (2011)	2011		
Ordinance of the Minister of Science and Higher Education concerning recognition of foreign scientific degrees, and titles in the area of arts	2011		
Ordinance of the Minister of Science and Higher Education concerning doctoral studies and doctoral scholarships	2011		
Endorsement of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers by Polish Academy of Sciences	2008		
Gender balance in the decision-making process			
Code of a researcher's ethics	2012	X	
Polish Labour Code Act on the implementation of some regulations of the European Union concerning equal treatment (2010) Act on financial benefits from social insurance in the case of sickness and maternity (2013)	2010		
L`Oreal Polska Grants			

The Act on scientific degrees and scientific title and titles in the area of arts (amendments from 2011)	2011		
Ordinance of the Minister of Science and Higher Education concerning conditions for work remuneration and award of other work-related benefits for employees of public higher education institutes	2011		
Awards "Girls of the future"	2009		
Programme "Girls on technical universities"	2008		
NCBiR Programme LIDER	2010		
Programme 'BRIDGE'	2010		
Polish-Norwegian Research Programme			
Open access to publications and data resulting from publicly funded research			
Draft guidelines of the amendments to the Act on science financing (2012)			
DRIVER initiative			
Virtual Library of Science	2010		
Centre of Open Science CeON	2012	X	
Ordinance of the Minister of Science and Higher Education establishing programme 'Index Plus'	2011		
Index Copernicus	2006		
SYNAT - Interdisciplinary System for Interactive Scientific and Scientific Technical Information			
Act on Industrial Property Rights	2000		
Springer's open choice programme	2010		
Communication of the Minister of Science and Higher Education	2010		

concerning the establishment of National Programme for the Development of Humanities			
Model agreement for applied research projects, funded by National Research & Development Centre (NCBiR)	2011		
Open innovation and knowledge transfer between public and private sectors			
Amendment to the Act on higher education	2013	X	X
The NCBiR Programme “BRIdge Mentor”	2013	X	X
The NCBiR Innovation Creator Programme	2008		
The Ordinance of the Minister of Science and Higher Education concerning the criteria and modes of awarding scientific ranks to scientific organisations	2012	X	
Draft Operational Programme 'Smart Growth' (POIR)			
The GRAF-TECH Programme The BLUE – GAS POLISH SHALE Gas Programme	2011		
The NCBiR Programme "BRIdge VC"	2013	X	X
The NCBiR Programme "SPIN-TECH"	2012	X	
Program 'Innovation Brokers'	2013	X	X
Program 'Top 500 Innovators Science - Management - Commercialisation'	2011		
Enterprises Development Programme	2013	X	X
INNOTECH programme IniTech programme	2013	X	X
The NCBiR Programmes: LIDER			

Programme; KadTech Programme; DEMONSTRATOR+ Programme			
'Commercialisation of B+R for practitioners' (Komercjalizacja B+R dla praktyków) - KT guidelines by the Ministry of Science and Higher Education	2010		
Harmonise policies for public e-infrastructures and associated digital research services			
Poznan Supercomputing and Networking Center (PSNC)	1993		

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

On the policy level, research and innovation policies are the responsibility of the Prime Minister's office, which is advised by the National Council for Science and Technology and the main ministries in charge of supporting research and development (RD): the Ministry for Education and Science and the Ministry for the Economy. The Ministry for Education and Science (MES) is responsible for designing and implementing research policies, for the development of international research cooperation activities and for producing R&D statistics. Other sectorial ministries also allocate funds to R&D, but their importance in R&D funding is not comparable.

On the operational level, Portugal has operational programmes financing the research system together with the major executive agencies, notably the Fundação para a Ciência e a Tecnologia or Foundation for Science and Technology (FCT) that operates as a research council. The FCT is the public agency responsible for implementing the Portuguese Science and Technology government policy. Its mission consists of promoting the advancement of scientific and technological knowledge in Portugal, exploring opportunities that become available in any scientific or technological domain to attain the highest international standards in the creation of knowledge, and to stimulate their diffusion and contribution to improve education, health, environment, and the quality of life and wellbeing of the general public.

At the research performers' level, there are several agencies that perform R&D activities, namely the academic R&D units and the public laboratories. The majority of the scientific research in Portugal takes place in R&D institutions financed and evaluated regularly by the FCT. Currently there are 293 R&D units and 26 associate laboratories, where more than 22 000 researchers are given the opportunity to perform research, and who have a central role in both advancing research and national development, while establishing their institutions as international centres of excellence to address issues of national and global relevance.

The country has not adopted a national strategy for research and innovation.

The FCT developed a diagnosis of the national research and innovation system in 2013, which has contributed to the development of the Portuguese National Strategy for Research and Innovation for Smart Specialisation, which articulates national and regional levels and will be launched soon.

In terms of research and innovation (R&I) funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in Portugal represented EUR148 per inhabitant in 2012 (EUR 179 in the EU-28). In 2013, the GBAORD per inhabitant was EUR 151. In 2012, the total GBAORD corresponded to 2 % of total government expenditures and 0.9 % of gross domestic product (GDP) (Eurostat).

Since 2007, the business sector has become the most important actor in the R&D system, with a share of 47 % in the national gross domestic expenditures on R&D (GERD) in 2012. In 2001, when R&D expenditure was still at 0.85 % of GDP, the public sector's share in R&D

funding was 61 % and the business sector's share was only 32 %. Most funding from the business sector (98.2 %) was for its own use. Funds coming from abroad were dispersed through the different types of R&D performers.

The resources under the category 'abroad' included EUR 411 million from the EU Framework Programme but did not include EU Structural Funds for research, which are channelled through the government budget. European Structural and Investment (ESI) Funds provided EUR 307 million in the 2007-2013 period. But if the broader domain of 'Research, innovation and entrepreneurship' is considered, which includes several other themes related to research activities together with the information society measures, support for specialised business services, technology transfer and advanced training, the amount of earmarked funds is EUR 5 189 million.

The FCT is the main research-funding agency (in charge of 31 % of the total R&D budget) and in 2013 the FCT invested EUR 423.8 million in science and research. The FCT provided the following funding: to research projects (with around 2 300 active projects and funding of about EUR 90 million p.a.); to career development with the aim of recruiting 1 000 outstanding researchers by 2016 (EUR 47 million p.a. provided through several programmes); to supporting around 10 000 PhD students, post-doctoral researchers and researchers at other stages in their career through scholarships, (EUR 160 million p.a.); to funding 293 R&D units and 26 associate laboratories (EUR 56 million p.a.) where approximately 22 000 researchers work; to international cooperation agreements (EUR 44 million p.a.); to the online scientific library b-on, and the management and operation of the Science Technology and Society Network (EUR 13 million p.a.); to scientific meetings, publications, travel grants and to the public understanding of science (EUR 8 million p.a.). All these figures are averages for 2011-2013 and provided by the FCT.

1.2. Project-based funding applying the core principles of international peer review

Project-based funding is allocated through the FCT.

The share of research funding allocated on a competitive basis has been on the rise in Portugal over recent years. However, delays in publishing calls for research projects and also the fact that the decisions on funding these projects have been delayed has led to a shrinking of the share of funding associated with project-based competitive funding.

The following are examples of measures where a competitive allocation of funding applies:

- The 2010 Regulation of access to scientific research and technology development (RTD) funding sets the general conditions of access and allocation of funding to projects financed by the FCT;

- The R&D projects, managed and implemented by the FCT since 2000, consist of competitive calls that are open to all disciplinary areas;

- The R&D Units consist of incentives for business firms to create R&D units aiming at enhancing the productivity, competitiveness and integration into the global market;

• The 2012 Incentive Programme aims at stimulating national research institutions to raise extra funding outside the scope of the FCT funding. Specifically, it awards an extra 30 % to competitive contracts of research institutions stemming from national or international funding or from business companies and it awards an extra 70 % in relation to contracts stemming from the Seventh Framework Programme (FP7).

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	79.7 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and support project-based funding is higher than the EU average.

According to the 1999 Decree on the Legal Statute on Scientific Research Institutions, regular independent evaluations are required. External evaluations made by independent panels of internationally recognised experts are promoted by the FCT and are held in accordance with this law.

The culture of international peer review is firmly established in the university system in Portugal. The main exception to this rule is the funding that supports the network of public laboratories, which is not usually linked to peer-review mechanisms. However, the research teams that work in these laboratories also submit proposals for funding for their research projects to the regular 'R&D projects – Projects of Scientific and Technological Development Research' calls, and with this component they are under the 'principles of international peer review'.

1.3. Institutional funding based on institutional assessment

Institutional funding is increasingly allocated based on institutional assessments.

Until 2011, the research institutions were mainly financed through multiannual block funding and since then it has been increasingly based on performance.

The evaluation of research institutions is defined by law and the FCT organises regular assessments of national R&D institutions. These evaluations occur approximately every five years, and currently the national R&D institutions are being evaluated with the support of the European Science Foundation. The evaluation exercise is based on periodic assessments by an international panel of experts, based on the R&D institutions' reports and activity plans as well as direct contacts with researchers and onsite visits by the evaluation panel. After each

assessment, all R&D institutions are awarded a qualitative grade, which determines the level of funding to be awarded until the next evaluation takes place, or until a mid-term review.The institutions ranked excellent or good are invited to participate in the calls for 'strategic projects'.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	8.9 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and support institutional assessment for the allocation of institutional funding is lower than the EU average.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It supports also bilateral and multilateral initiatives.

Transnational cooperation has been a key objective of Portugal’s Science and Technology (S&T) policy over the past 40 years. This is reflected, amongst others, in the large number of bilateral agreements that Portugal has signed with other EU countries and with several universities in the United States of America (USA).

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	6.3 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research	National	3.8 %	2013	ERA survey

and development budget dedicated to jointly defined research agendas with non-national EU organisations	level			2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders' total budget in Portugal allocated to transnationally coordinated R&D is higher than the EU average.

The share of responding funders' research and development budget in Portugal dedicated to jointly defined research agendas with other EU organisations is higher than the EU average.

Cooperation between institutions of Member States, Associated Countries and third countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of Portuguese participation in the total participation is 2 % and the country received 1.2 % of the total European Commission's contribution. FP7 funding represents EUR 43 per inhabitant (the EU average is EUR 72 per inhabitant) for the period 2007-2013 and 3.6 % of the gross domestic expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average is 3 % of GERD for the same period).

Concerning joint programming initiatives, the country participates in three of the ten ongoing initiatives. These initiatives are Neurodegenerative disease research (Alzheimer), Water challenges for a changing world and Healthy and productive seas and oceans. Portugal has observer status in the initiatives Cultural heritage and global change: A new challenge for Europe and Urban Europe–Global challenges, local solutions.

In terms of programmes undertaken jointly by several Member States (so-called Article 185 initiatives of the Treaty on the Functioning of the European Union, Portugal was involved in four programmes co-funded through FP6 and FP7. In Horizon 2020, these programmes continued into second phases and the country is already involved in all four of the existing initiatives: AAL2, EDCTP2, EMPIR and Eurostars2.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. Portugal has participated in a total of 59 ERA-Nets, of which 29 are currently still running. The country also has participated in five ERA-Net Plus actions – of which three are still running – in areas with high European added value and additional EU financial support topping up their joint call for proposals.

Concerning research agreements with EU Member States and/or Associated Countries, Portugal has numerous bilateral and multilateral agreements. An example of a strategic

bilateral initiative under this action is the International Iberian Nanotechnology Laboratory (INL). This initiative is the result of a joint collaboration between the Portuguese and Spanish Governments. Although INL has suffered from the budgetary difficulties faced by both countries, for which a number of solutions are being implemented to open INL up to wider transnational collaborations, it is an example of transnational cooperation in science and research.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the country has not yet developed a specific policy, although scientific and technological cooperation with China, India, North African countries and the Community of Portuguese-speaking Countries, including Brazil, Angola, Mozambique and Cape Verde, has been a priority. It is also proceeding on cooperating with universities in the USA on programmes that are specifically targeted for advanced training and research. The general monitoring of the cooperation programmes' implementation is based on quantitative indicators, such as the number of open calls, the number of funded projects or the amount of associated funding, but on what regards cooperation programmes with the US universities, independent evaluations have been conducted, namely by the Academy of Finland, after the end of their first editions, which has allowed for a revision and readjustment of the programmes' curricula, objectives and activity profiles.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	2.5 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third	ERA compliant cluster (national	0 %	2013	ERA survey 2014

countries	level)			
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

The share of responding funders' research and development budget in Portugal allocated to collaboration programmes carried out with third countries is higher than the EU average.

Within the ERA-compliant cluster in Portugal, there seems to be no research and development budget originating from third countries.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

Mutual recognition of evaluations that conform to international peer-review standards in bilateral or multilateral programs takes place in many programmes. National funding institutions apply international peer-review standards. The main countries with which Portugal has bilateral or multilateral initiatives/agreements/programmes which allow for mutual recognition of evaluations, are the following: Czech Republic, France, Germany, Hungary, Italy, Poland, Serbia, Slovenia and Spain.

The common funding principles proposed by the Commission for the implementation of joint programmes are almost fully applied (with the exception of intellectual property rights) by funding agencies in the country in several bilateral and multilateral joint calls. Their implementation is supported through contracts with the FCT where the objectives, evaluation criteria, budgets, payment terms and conditions, as well as the respective management rules (including operation of the Boards of Directors, management and annual external international review) are defined.

No information was found as to whether funding agencies implement 'Money follows cooperation', a scheme which allows small parts of a project funded by one of the participating research councils to be conducted in a different country. No information was found as to whether funding agencies implement 'Money follows researchers', a scheme which enables researchers moving to a research institution in a different country to transfer ongoing grant funding to the new institution and continue research activities according to the original terms and objectives.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders which can base their project-based research and	National level	100 %	2013	ERA survey 2014

development funding decisions on peer reviews carried out by non-national institutions				
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	0 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is higher than the EU average.

Research funders in Portugal who responded to the survey indicated that they do not allocate project-based funding based on peer-reviewed decisions made by non-national institutions.

3. RESEARCH INFRASTRUCTURES

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

Portugal participates in the following large international research infrastructures: ESA, CERN, EFDA, EMBL, ESO and ESRF. In 2012, the country contributed 1 % of the GBAORD to the activities carried out by CERN, the European Molecular Biology Laboratory (EMBL), the European Southern Observatory (ESO), the European Synchrotron Radiation Facility (ESRF), the Institut Laue-Langevin (ILL) and the European Commission’s Joint Research Centre (JRC) (Eurostat).

In terms of participation in the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of 22 of them (44 %).

In terms of financial commitments to the development of these research infrastructures (RIs), Portugal is committed to funding two of them (ESSurvey, ECRIN) and has signed Memoranda of Understanding (MoUs) of another eight (ELIXIR, INSTRUCT, EMSO, EPOS, EMBRC, LIFEWATCH, CLARIN, SKA).

With regard to its participation in the European Research Infrastructure Consortium (ERIC), Portugal is involved in two of the six consortia that adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest involving several European countries. Portugal is a member of ESS ERIC and ECRIN-ERIC.

The FCT is developing the first National Roadmap for Research Infrastructures, aligned with the ESFRI Roadmap, taking into account the results of a national consultation that took place in 2013 with the aim of identifying RIs of strategic interest. The decision on the infrastructures selected is expected in the first quarter of 2014. On the basis of this decision, financial commitments to national, European and international RIs will be defined in the roadmap.

3.2. Access to research infrastructures of pan-European interest

The completion of the design of the National Roadmap for Research Infrastructures is expected to contribute to improved conditions for cross-border access to RIs.

In addition, there are several information services that facilitate cross-border access to Portuguese RIs, such as the MERIL database, which includes information on the European RIs and the specific webpages for each RI.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for Portugal in the Researchers' Report 2014
[http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Portugal_Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

Stock of researchers

There were 50 061 FTE researchers in Portugal in 2011. This represents 9.0 researchers per 1000 labour force compared with 5.3 among the Innovation Union reference group (Moderate Innovators) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 3.4 in Portugal compared with 39.9 among the Innovation Union reference group and an EU average of 43.7.

In 2012, 46 % of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (MORE2 survey, 2012).

In Portugal, procedures for recruiting researchers are generally open and transparent. However, the existing legislative framework sometimes makes the system less effective than it might be. Portuguese institutions do not always publish job vacancies online and English is not always used.

4.3. Attractive careers

The ‘Charter & Code’ has not yet been implemented in Portugal. The FCT, the Rectors’ Council and the Council of Associate Laboratories have established working groups to analyse the possible implementation of the ‘Charter & Code’.

By May 2014, 3 Portuguese organisations were involved in the Commission’s Human Resources Strategy for Researchers of which 1 had received the "HR Excellence in Research" logo for their progress in implementing the Charter & Code.

The current R&D Units and Associate Laboratories Evaluation System was established in 1996 and there were only small changes up to its current version of 2007. The system evaluates the researcher working conditions offered by Portuguese Institutions. The evaluation procedure includes periodic assessments by international experts, as well as reports and activity plans. The evaluation exercise results in the award of a qualitative grade, which determines the volume of funding to be received by the institution up to the next evaluation.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 1.6 in 2011 compared with 1.2 among the Innovation Union reference group and an EU average of 1.7.

The The Fundação para a Ciência e a Tecnologia (FCT) is implementing a major fellowship programme, including five year contracts for PhD holders and post-doc, and PhD grants in an effort to increase the number of students taking science to a doctoral level. Nevertheless, the Government of Portugal has not adopted any concrete measure to increase the number of female students taking science to an advanced (doctoral) level as the female percentage is already high.

All PhD programmes promoted by Portuguese Universities are accredited and evaluated by the National Evaluation and Assessment Agency (A3ES), which guarantees their quality. The Agency also has a mandate to provide the Portuguese State with expertise in matters of higher education quality assurance, participate in the European quality assurance system (EQAR),

and coordinate assessment and accreditation activities in Portugal with international institutions.

The FCT has three evaluation criteria when selecting researchers to be funded: the merit of the candidate, the merit of the project and the quality conditions of the host Institution, including career provisions.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU-27 Member State was 3.2% in Portugal compared with 4.2% among the Innovation Union reference group and an EU average of 7.7%. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 12.0% in Portugal compared with 5.2% among the Innovation Union reference group and an EU average of 24.2%.

The FCT has launched a number of key programmes aimed at attracting and retaining leading EU and third-country researchers to Portugal. Since 2011, in order for a non-national researcher to enrol for PhD training, a Portuguese residence permit has been a prerequisite. For post-doctorate candidates, there is no such restriction. The FCT has implemented the Marie Curie co-funded programme WELCOME II – Promoting the return of researchers to the European Research Area. This Programme promotes the mobility of researchers holding the nationalities of an EU Member State or an FP7-Associated Country to FP7, who has lived in any third country for at least the last three years, to join institutions located in Portugal. Third countries are neither Member-States nor Associated Countries with FP7.

Individuals may apply for a doctoral degree grant in a company in Portugal that satisfies the criteria set out in Article 30 §1 of Decree Law No 74/2006 of 24 March 2006 for the purpose of carrying out doctoral degree work in the business environment on subjects of interest to that enterprise, as long as this work is accepted by the university that confers the respective doctoral degree. FCT funds 50% of the fellowship and the company the remaining 50%. In 2012, some 100 fellowships were funded.

In order to qualify for this type of grant, a work plan must be submitted detailing the objectives, the support to be provided for the recipient’s research activity in the enterprise, and the expected interaction between the enterprise and the university where the recipient is enrolled in the doctoral degree programme. The form of articulation between the academic orientation for the doctoral programme provided by a university professor or researcher and the corresponding company supervision must be set forth in a protocol signed by both entities involved. These grants are, in principle, one year in length, renewable for up to a total of four years, and cannot be awarded for periods of fewer than three consecutive months.

The Government of Portugal has not put in place concrete measures encouraging researchers to move from the public to the business sector and vice-versa. This choice remains personal and is made on an individual basis.

5. GENDER

5.1. Foster cultural and institutional change on gender

Portugal has no specific gender provisions in the field of public research.

Gender equality is a fundamental constitutional right, enforced through different laws. Laws and acts foster gender equality mostly in public employment and education. The key instruments for promoting gender equality are the National Plans for Equality, Gender, Citizenship and Non-discrimination. The 2014-2017 Plan was launched after a public consultation and aims at promoting gender equality in line with the European Pact for Equality among Men and Women. Notably, the new plan introduces the Gender Studies category in the FCT research financing lines, and a research project aimed at assessing women's participation in information and communication technologies (ICT) education courses.

The Commission for Citizenship and Gender Equality (GIC), the national mechanism for the promotion of gender equality, provides technical and financial support to the implementation of gender equality action plans in universities, focusing on the promotion of gender equality in organisational structures, management practices – selection/recruitment procedures, career development and rewarding mechanisms – and on family- work-life reconciliation. Two Portuguese universities have gender equality action plans.

The Comissão para a Igualdade no Trabalho e Emprego (CITE) or Commission for Equality in Labour and Employment also promotes gender equality.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting gender equality in research	National level	36.6 %	2013	ERA survey 2014
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (national level)	4.4 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and support national policies on gender equality in public research is lower than the EU average.

Within the ERA-compliant cluster in Portugal, the share of research performing organisations that have adopted Gender Equality Plans is lower than that within the EU ERA-compliant cluster.

The country has measures supporting a return to work after parental leave. The same position is guaranteed by law after maternity leave.

It has set up awards, fellowships and/or other similar mechanisms to support female researchers specifically. Portugal annually hosts the L'Oréal Portugal medals of Honour for Women in Science, intended to promote scientific research at the post-graduate level in Portuguese universities or other organisations of recognised merit in the field of health sciences and environmental sciences.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	13.9 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	0.2 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Portugal, the share of research performing organisations implementing recruitment and promotion policies for female researchers is lower than that within the EU ERA-compliant cluster.

The 2014-2017 National Plan for Equality, Gender, Citizenship and Non-discrimination has introduced the Gender Studies category in the FCT research financing lines.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**

Share of responding funders supporting the inclusion of gender dimension in research content	National level	0 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	64.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	0.7 %	2013	ERA survey 2014

The research funders in Portugal who responded to the survey did not indicate any support to the inclusion of gender dimension in research content/programmes.

Within the ERA-compliant cluster in Portugal, the share of research performing organisations which include the gender dimension in research content is higher than that within the EU's ERA-compliant cluster.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision making, there are no initiatives or regulations promoting equal gender representation in academic and research committees, boards and governing bodies. Portugal has not set up gender quotas or any measures ensuring balanced composition of governing bodies of higher education institutions.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of gender-balanced recruitment committees for leading researchers	ERA compliant	33.6 %	2013	ERA survey 2014

amongst responding research performing organisations	cluster (EU level)			
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	41.6 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	3.5 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	5.1 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Portugal, the share of gender-balanced recruitment committees for leading researchers in research-performing organisations is higher than that within the EU's ERA-compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in Portugal is lower than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access (OA), there is a specific policy on open access to publications since May 2014.

Related to open access to publications, the Foundation for Science and Technology (FCT) adopted a policy on open access to publicationsin May 2014. According to the policy, peer-reviewed publications must be made available in one of the institutional OA repositories of the OA Scientific Repository of Portugal (RCAAP – Repositório Científico de Acesso Aberto de Portugal; more details below).

According to the 2009 report 'Open Access in Portugal – A State of the Art Report', which was commissioned by the RCAAP, most Portuguese universities have their own institutional

repository and OA developments in Portugal have been mainly achieved by institutional repositories and self-archiving (Green OA), and to a lesser extent with open access publishing (Gold OA).

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting open access to publications	National level	33 %	2013	ERA survey 2014
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	23.3 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	1.1 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and support Open Access to publications is lower than the EU average.

Within the ERA-compliant cluster in Portugal, the share of publicly-funded scientific publications in OA amongst research-performing organisations is higher than that within the EU's ERA-compliant cluster.

Concerning open access to data, the FCT made a policy statement on open access to data in May 2014, however it was more cautious than open access to publications. The FCT encourages researchers to make research data available in open access if and when they judge it possible and appropriate. The RCAAP, established in 2008, is the most significant initiative. Currently more than half a million documents are accessible in OA through RCAAP.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting open access to data	National level	33 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (EU level)	54.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national level)	78.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	Limited compliance to ERA cluster (national level)	5.7 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and support open access to data is similar to the EU average.

Within the ERA-compliant cluster in Portugal, the share of research-performing organisations making available online and free of charge publicly-funded scientific research data systematically is higher than that within the EU's ERA-compliant cluster.

Regarding repositories, there are four:

- RCAAP (Repositório Científico de Acesso Aberto de Portugal or Portugal Open Access Science Repository), a recognised repository of publications and data;

- The DeGóis Curricula Platform, an instrument for gathering, supplying and analysing the intellectual and scientific production of Portuguese researchers;

- b-on or the Online Knowledge Library, which provides unlimited access to a large database of scientific publications for researchers. Portugal decided in 2013 to continue funding b-on. EUR 40.6 million will be paid to the publishers that supply the contents of the b-on over a three-year period (2013, 2014 and 2015);

- OpenDoar Webpage, which stores the collections of 43 Portuguese repositories.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to Open Innovation (OI) and Knowledge Transfer (KT) between public and private sectors, Portugal has not developed a knowledge transfer strategy.

However, there is a relevant initiative under preparation called GAIN (Global Innovation Acceleration Network) that aims at providing a national structure for technology transfer. GAIN results from a partnership between the Ministry of the Economy and the Ministry of Education and Science. In practical terms GAIN will be based on the collaboration between the FCT (Science and Technology Foundation), the ADI (Innovation Agency), the IAPMEI (Institute for Business Investment) and the four partnerships between Portugal and universities in the USA. Its objectives are the following: creation of spin-offs and commercialisation of technology and knowledge; creation of an international network of Portuguese incubators (Portuguese Global Innovation Hub); observation and monitoring of technology transfer activity.

Two relevant measures support the implementation of research training agreements with private sector organisations through the FCT:

- PhD scholarships in industry (Bolsas de Doutoramento em Empresas, BDE): these provide grants to researchers who wish to develop research work in the business environment leading to a doctoral degree;

- Mobility grants: grants to researchers to perform R&D activities in companies or other public or private entities, to participate in advanced training programmes involving business associations and scientific institutions or universities, or to carry out activities that promote technological innovation, namely in firms dedicated to risk capital management, technological intermediation, management of intellectual property and scientific consulting.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	100 %	2013	ERA survey 2014
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research	ERA	6.8 %	2013	ERA survey

performing organisations' research and development budget financed by the private sector	compliant cluster (EU level)			2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	1.4 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	0.6 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	71.5 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	Limited compliance to ERA cluster (national level)	1.4 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	70.2 %	2013	ERA survey 2014

Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	Limited compliance to ERA cluster (national level)	0.5 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	1.6 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	0.4 %	2013	ERA survey 2014

The share of research funders in Portugal who responded to the survey and support national support to KT and OI, TTOs and Private Public interaction is higher than the EU average.

Within the ERA-compliant cluster in Portugal, the share of research performing organisations having funding originating from the private sector is lower than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in Portugal, the share of research-performing organisations having or using a structure for knowledge transfer activities is lower than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in Portugal, the share of research-performing organisations having dedicated staff employed in knowledge transfer activities is higher than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in Portugal, the share of research personnel whose primary occupation is in the private sector (in full-time equivalents) is lower than that within the EU's ERA-compliant cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

In relation to the implementation of Digital ERA, Portugal has not set up a strategy for its implementation. The country has implemented a research and education network, which is essential to make digital services possible. This network is FCCN or NREN, the Portuguese National Research and Education Network, a specialised Internet service provider dedicated to supporting the needs of the research and education communities within the country.

Concerning digital services, the country provides premium services.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	86.2 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	7.9 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Portugal, the share of research-performing organisations providing digital research services (i.e. cloud services, a research collaboration platform, etc.) is higher than that within the EU's ERA-compliant cluster.

6.4. Uptake of federated electronic identities

Portugal was not a member of an identity federation in 2013. The country is not member of eduGAIN, a service intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) partners' federations.

However, Portugal has signed the policy to join eduGAIN through RCTSaai.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	74.1 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	1.4 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Portugal, the share of research-performing organisations providing federated electronic identities for their researchers is higher than that within the EU's ERA-compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 62 research-performing organisations in Portugal answered the 2014 ERA survey, which represents 17.2 % of the total number of researchers in the country (total number of researchers in the country as of 2011) and around one third of research-performing organisations.

The principal component and clustering analysis of research-performing organisations in Portugal shows that 40.7 % of them are in the ‘ERA-compliant’ cluster, 39.0 % can be classified in the ‘limited compliance to ERA’ cluster and 20.3 % of organisations in the ‘ERA principles are not applicable’ cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results vary significantly. Indeed, the shares of ‘weighted’ organisations are as follows: 87.9 % for the ‘ERA-compliant’ cluster; 8.7 % for the ‘ERA-limited compliant’ cluster; and 3.5 % for those organisations where ERA principles are not applicable.

Seven regional authorities, which fund research, have not responded to the ERA survey.

Regarding the indicator ‘Share of funders supporting gender equality in research' it should be noted that it is lower than the EU average due to the existence of overarching laws supporting equality.

Regarding the indicator ‘Share of research-performing organisations which have adopted gender equality plans', it should be noted that gender equality in research applies in practice, with more than 45 % of researchers being women.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013
Research and innovation system			
Diagnosis of the national research and innovation system by FCT	2013	X	X
Project-based funding applying the core principles of international peer review			
Regulation of access to scientific RTD funding	2010		
Incentive Programme	2012	X	
R&D projects - Projects of Scientic and Technological Development Research			
SWOT analysis in order to identify areas of R&D competitive advantages	2013	X	X
Planned reform of the System of Fiscal Incentives to R&I in the Industry	2013	X	X
Institutional funding based on institutional assessment			
R&D Units	2007		
Implementing joint research agendas			
Creation of the International Iberian Nanotechnology Laboratory (INL)	2005		
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
Design of the National Roadmap for Research Infrastructures	2013	X	X

Open, transparent and merit-based recruitment of researchers			
Programme 'FCT Researcher'	2013	X	X
Statute of University Teaching Career	1979		
Attractive careers			
Euraxess in Portugal			
Supporting structured innovative doctoral training programmes			
FCT PhD Programmes	2012	X	
New typology and diversity of doctoral programs	2012	X	
Foster cultural and institutional change on gender			
L'Oréal Portugal Medals of Honor for Women in Science			
CITE (Comissão para a Igualdade no Trabalho e Emprego) or Commission for Equality in Labour and Employment			
Gender balance in the decision-making process			
Fifth National Plan for Equality, Gender, Citizenship and Non-discrimination (2014-2017)	2014	X	X
Parliament Resolution 46/2013 'No labor discrimination of women'	2013	X	X
Fourth National Plan for Equality, Gender, Citizenship and Non-discrimination (2011-2013)	2011		
Open access to publications and data resulting from publicly funded research			
Repositório Científico de Acesso Aberto de Portugal (RCAAP)	2008		
DeGóis Curricula Platform	2008		
b-on - Online Knowledge Library	2005		
Open Access (OA) policy to	2014	X	X

publications, by FCT			
Policy statement on Open Access and sharing of research data, by FCT	2014	X	X
Open innovation and knowledge transfer between public and private sectors			
Strategy for Intellectual Property in R&D projects			
GAIN - Global Innovation Acceleration Network	2013	X	X
Programme of Applied Research and Technology Transfer to the Industry	2012	X	
Uptake of federated electronic identities			
eduGAIN			

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

Research and innovation policies are the responsibility of the Ministry of National Education (MNE), which formulates policies in cooperation with other sectoral ministries. The MNE also manages the national research and innovation strategy and coordinates the main implementation instruments, i.e. the National Research and Innovation Plan and the research and development (R&D) programme.

At the level of R&D funding and implementation, the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI), which is under the authority of the MEN, plays a key role in implementing the research and innovation plan and allocating higher education funding. Other public funders include the Romanian Academy, which allocates the budget for its research institutes, and the Ministry of Economy and the Ministry of Agriculture, which manage sectoral research, development and innovation (RDI) plans. Public performers include coordinating organisations such as the Romanian Academy, the Academy of Medical Sciences, the Academy of Agriculture and Forestry Sciences and the Academy of Technical Sciences, national R&D institutes, public research institutes, and universities.

Romania has developed the National Strategy for Research, Development and Innovation 2014-2020, which is currently under Government approval and which is aligned with the Europe 2020 Strategy, Innovation Union, Horizon 2020 and the European Research Area (ERA). The National Strategy highlights the need for research to be better translated research into innovation, R&D efforts to be better aligned with the Smart Specialisation Strategy and an improved quality of fundamental research. The National Strategy is implemented through the National Plan for Research, Development and Innovation (2014-2020) and the Operational Programme 'Competitiveness' – priority axis ‘Research, technological development and innovation for supporting business and competitiveness’. In parallel, Romania has also developed the National Competitiveness Strategy, which is to be approved during summer 2014. Moreover, Romania’s 2014 National Reform Programme highlights the need to ensure Romania’s integration into the ERA.

In terms of research and innovation (R&I) funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in Romania represented EUR14 per inhabitant in 2012, which represents less than 10 % of the EU28 average (EUR179). In 2013, the GBAORD per inhabitant increased to EUR15. In 2012, the total GBAORD corresponded to 0.6 % of total government expenditures and 0.2 % of Gross Domestic Product (GDP) (Eurostat).

The analysis of the evolution of the GBAORD in the period during the economic crisis (2007-2012) shows that in nominal terms, the growth rate of the total GBAORD in Romania has been higher than the growth rate of total EU GBAORD. The GBAORD as a share of GDP has regressed more in Romania than the regression observed in the EU-28.

In order to achieve the R&D objectives, the National Strategy for Research, Development and Innovation 2014-2020 includes annual plan for R&D public expenditure for the entire period 2014-2020. However, this planning may be jeopardised by the current fiscal and budgetary measures (Fiscal and Budgetary Strategy 2014-2016 and the Law of the National Budget 2014, No. 356/2013) which de facto significantly limit R&D spending. Moreover, EU structural funds for R&D allocated for the period 2014-2020 will most likely be comparable to the previous cycle, meaning that the R&D target is dependent on government resources. Tax credits for businesses (50 % additional tax deduction on R&D expenditure) to support the commercialisation of research results were introduced as part of the Government Ordinance 8/2013; however, the measure is not fully operational, as the implementing acts have yet to be finalised.

1.2. Project-based funding applying the core principles of international peer review

Project-based funding is allocated by the Executive Agency for Higher Education, Scientific Research, Development and Innovation Funding through the National Plan for Research, Development and Innovation as well as through the Operational Programme Competitiveness. As part of the National Plan, project-based funding is allocated to a variety of R&D projects and schemes with a structure which is similar to the EU FP7.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	97.9 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in Romania who responded to the survey and support project-based funding is higher than the EU average.

The core principles of international peer review are systematically implemented within the framework of the National Plan for Research, Development and Innovation and the Research, Development and Innovation Operational Programme for EU structural funds. With regard to the National Plan for Research, Development and Innovation, all proposals need to be drafted in Romanian and English. Earlier legislation foresaw the use of foreign evaluators for the evaluation of R&D projects, programmes and institutions (at least 50 % foreign experts). However, this provision has been scrapped as part of the Government Ordinance 1241/2013.

1.3. Institutional funding based on institutional assessment

Institutional funding is not allocated based on institutional assessment. The issue faced by the Romanian public research systems is the limited amount of institutional funding. The need to ensure stable institutional funding and a better link to institutional funding with institutional assessment has been acknowledged in the National Strategy for Research, Development and Innovation 2014-2020. Institutional funding is provided to the Romanian Academy -which receives a relatively constant amount that correlates with the number of researchers – and to national R&D institutes, through the Programme. With regard to universities, it should be noted that from 1994 onwards, Romanian universities have not received any institutional funding for their research activities. The only source of funding for their research activities is through project-based funding. The issue of a highly fragmented public research sector has been recognised in Romania's 2014 National Reform Programme and the National Strategy for Research, Development and Innovation 2014-2020, which calls for a restructuring and streamlining of public research institutes to allow for a concentration of funding. The reform of universities and public research organisations launched in 2011 aimed at restructuring the public research sector and introducing institutional assessment for the allocation of institutional funding. Between 2011 and 2013, 39 of the 46 national R&D institutes were assessed. However, this exercise has not led in practice to significant changes to the allocation of institutional funding for research-oriented universities nor to a reduction or streamlining of public research organisations.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	0 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

Research funders in Romania who responded to the survey indicated that they do not have measures supporting institutional assessment for the allocation of institutional funding.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The National Strategy for Research, Development and Innovation 2014-2020 emphasises the need to better align R&D efforts with societal challenges.

Indicator	Level/cluste	Value	Year	Source

	r			
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	3.8 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	National level	3 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders' total budget in Romania allocated to transnationally coordinated R&D is lower than the EU average.

The share of responding funders' research and development budget in Romania dedicated to jointly defined research agendas with other EU organisations is higher than the EU average.

Cooperation between institutions of Member States, Associated Countries and Third Countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of Romanian participation in the total participation is 0.9 % and the country received 0.4 % of total European Commission contribution. FP7 funding represents EUR7 per inhabitant (the EU average is EUR72 per capita) for the period 2007-2013 and 4.4 % of the Gross Domestic Expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average 3 % of GERD for the same period).

The National Strategy for Research, Development and Innovation 2014-2020 outlines Romania's participation in Horizon 2020. Moreover, the elaboration of the National Strategy for Research, Development and Innovation 2014-2020 is aligned with Horizon 2020.

Concerning Joint Programming Initiatives (JPIs), the country participates in six of the ten ongoing initiatives, coordinating none of them. These initiatives are Food Security, Agriculture and Climate Change, Cultural Heritage and global change: a new challenge for Europe, Healthy Diet for Healthy Life, Antimicrobial resistance - An emerging threat to human health, Water Challenges for a Changing world, and Healthy and Productive Seas and Oceans.

The National Strategy for Research, Development and Innovation 2014-2020 specifically foresees funding for JPIs and highlights the need to concentrate R&D resources on the four areas identified in the Smart Specialisation Strategy (bio-economy, information and communication technologies, space and security, energy and climate change and eco-nanotechnologies).

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in three programmes. In Horizon 2020, the country is already involved in three of the four existing initiatives.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 96 ERA-Nets, of which 36 are currently still running. The country also has participated in eight ERA-Net Plus actions of which four are still running - in areas with high European added value and additional EU financial support topping up their joint call for proposals.

The country participates in the EU Strategy for the Danube Region (EUSDR), a multilateral (and macro-regional) strategy that has been developed by the Commission in cooperation with 11 countries in the Danube region (Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine). It includes science and technology cooperation across the region and by the end of 2013 six scientific clusters had been launched, for example a cluster in energy and sustainability research.

Romania participates in the development of ESA and CERN programmes as a full and candidate Member State, respectively. The National Strategy for Research, Development and Innovation 2014-2020 outlines Romania’s strategy vis-à-vis existing and new initiatives and foresees related funding.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the country has set up approximately 17 bilateral research agreements. In particular, it has agreed on research programmes with Switzerland, Norway, Iceland and Liechtenstein, which provide for joint research projects and thematic research calls. The country also has agreements with the United States of America (USA), South Africa, China, Korea, Russia and Turkey. The National Strategy for Research, Development and Innovation 2014-2020 outlines Romania’s approach to cooperation with third countries, notably through the funding of bilateral calls. The country does not monitor the implementation of cooperation programmes.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' research	National	0.8 %	2013	ERA survey

and development budget allocated to collaboration programmes carried out with third countries	level			2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (national level)	0 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

The share of responding funders' research and development budget in Romania allocated to collaboration programmes carried out with third countries is lower than the EU average.

Within the ERA compliant cluster in Romania, the organisations did not received funding originating from third countries.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

Mutual recognition of evaluations that conform to international peer review standards is implemented in Romania routinely as part of its joint programmes or bilateral agreements. This is the case under the Swiss-Romanian cooperation programme and within the framework of Romania’s international agreements with Austria, Belgium (Wallonia), Cyprus, Germany, Greece, Italy, Slovakia, Slovenia, Turkey and Hungary. Moreover, the ERA-like grant scheme provides grants to researchers who have been successfully evaluated but not retained for funding by the European Research Council (ERC) competition.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	99.9 %	2013	ERA survey 2014
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	1 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in Romania who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is higher than the EU average.

The share of responding funders' project-based research and development budget in Romania allocated through peer review carried out by institutions outside the country is higher than the EU average.

3. RESEARCH INFRASTRUCTURES

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

In terms of participation to the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of eight of them (0,16 %). The country coordinates none of them.

In terms of financial commitments to the development of these research infrastructures (RIs), Romania is committed to funding two of them: Extreme Light Infrastructure – Nuclear Physics (ELI-NP), and FAIR. Romania has allocated a large budget for the development of the ELI-NP, which is the largest research infrastructure to be built in Romania. With the ELI-NP infrastructure, Romania has been a pioneer in the use of EU structural funds for investing in a pan-European research infrastructure.

With regard to the participation in the ERIC, Romania participates in one (CERIC-ERIC) of the seven consortiums that adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest which involve several European countries.

In terms of support to Research Infrastructures, Romania's has been increasingly involved in the development and implementation of research infrastructures. The national roadmap for research infrastructures was produced in 2007 by the Romanian Committee for Research Infrastructures (CRIC). Moreover, the National Strategy for Research, Development and Innovation 2014-2020 announces the development of a new national roadmap for research infrastructures, which should be in line with the Smart Specialisation Strategy. The updated roadmap will also include references to the participation of Romania in the development of the research infrastructures mentioned in the ESFRI Roadmap.

3.2. Access to research infrastructures of pan-European interest

The National Strategy for Research, Development and Innovation 2014-2020 mentions the setting up of a National Research Infrastructure Registry, aiming at facilitating access to research infrastructures for public and private users. Romania facilitates researchers' access to the ESFRI projects in which the country participates. Support to access is mainly provided through the Sectoral Operational Programme 'Increase of Economic Competitiveness (SOP-IEC) priority axis 2: Operation 2.2.1 - Development of the existing R&D infrastructure and creation of new infrastructures, laboratories and research centres.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for Romania in the Researchers' Report 2014
[http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Romania_Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

Stock of researchers

There were 16 080 full-time equivalent (FTE) researchers in Romania in 2011. This represents 1.6 researchers per 1000 labour force compared with 3.0 among the Innovation Union reference group (Modest Innovators) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS jobs portal per thousand researchers in the public sector was 24.7 in Romania compared with 9 among the Innovation Union reference group and an EU average of 43.7.

In 2012, 51% of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (More2 survey, 2012).

The recruitment system is regulated by the Government Decision on general principles for recruitment in the public sector (HG No.286/2011), the Law on the Statute of R&D personnel (Law no. 319/2003) and the National Education Law (Law No.1/2011). National legislation does not impose online advertising of public research positions. It is mandatory that research vacancies are published in the Romanian Official Journal, newspapers and at the universities' headquarters. Higher education institutions (HEIs) and R&D institutions have their own internal procedures on recruitment which are in accordance with these laws and are generally published on the institutions' website.

A set of policies has been developed to make the system more open and transparent, such as the Scientific Visa and other admission conditions for foreign researchers.

4.3. Attractive careers

Romania actively promotes the implementation of the principles of the 'Charter & Code' through the information package for the recruitment of researcher (PN II). In the publicly financed R&D recruitment procedures, the 'Charter & Code' are not specifically mentioned. However, the main principles of this document are reflected in the main policy documents on recruitment.

By May 2014, four Romanian organisations were involved in the Commission's Human Resources Strategy for Researchers of which two had received the "HR Excellence in Research" logo for their progress in implementing the Charter & Code.

Education Law No. 1/5 January 2011 changed the old system of public university funding based on the number of students to a system based on an internal assessment and performance classification of all departments carried out every five years.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 1.7 in 2011 compared with 1.1 among the Innovation Union reference group and an EU average of 1.7.

The Romanian Law on Education (2010) has brought some changes that are designed to enhance the quality of doctoral training, such as: increases in performance-based funding for doctoral studies; dual statute of students as both doctoral students and research assistants or university assistant for a pre-determined period; the mobility of research grants; more flexibility in the internal organisation of the doctorate schools and enhanced autonomy for the university; a requirement that doctoral programmes be organised only on a full-time basis; a national code of doctoral studies of which the objective is to promote and implement procedures for enhancing the quality of the organisation and content of doctoral programmes, rights and obligations of doctoral students, doctorate coordinators and others.

Massive support for doctoral and post-doctoral schools was provided by the Sectoral Operational Programme 'Development of Human Resources', which targeted 12000 Doctors of Philosophy (PhDs) and 2000 post-doctorals in order to contribute towards the development of potential human resources for RDI. Unfortunately, for the moment, the access of these graduates to the R&D system is quite low, given the scarcity of projects and the restrictions on employment in the public sector. The total budget for this support was EUR325 million. In 2011, there were 88 projects which supported 9734 PhDs at a total cost of approximately EUR24133 per PhD.

Given the drastic reduction in funding for most research programmes, it can be estimated that recent infrastructures are underused, while the prospects of the new PhD graduates embarking on a research career are unclear. The long-term underfinancing has already been a determinant of a substantial brain drain, as Romania has one of the largest scientific amongst the European countries, with an estimated 15000 researchers.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU-27 Member State was 1.6 % in Romania compared with 1.7 % among the Innovation Union reference group and an EU average of 7.7 %. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 2.1 % in Romania compared with 2.0 % among the Innovation Union reference group and an EU average of 24.2 %.

In Romania, the balance between inward and outward flows of researchers is severely tilted towards the outward flows, as Romania is one of the EU countries with the highest losses of qualified R&D personnel. This situation is caused by several factors, including the low market demand for researchers, low salaries in the science and technology (S&T)/RDI system, low political importance attached to the role of science, research and innovation for economic growth, in spite of the government rhetoric, insufficient/inadequate research infrastructure, insufficient funding of programmes meant to increase the attractiveness of S&T/R&D careers and, more recently, significant additional cuts brought about by the economic crisis, etc. The mobility of scientists and the attractiveness and consolidation of scientific careers is supported by several funding schemes under the Human Resources Programme of the 2007-2013 National RDI Plan, but most of them were discontinued after the sharp budget cuts of 2009 and have so far not been reactivated.

The Human Resources Programme of the 2007-2013 National RDI Plan has a few mobility schemes that allow PhD students to conduct innovation projects in firms, such as projects supporting the mobility of PhD candidates (which provides funding for three months in a public or private research lab) and post-doctoral research projects for the development of an independent career for young Romanian PhD researchers, especially by granting them access to top research infrastructure. In 2012, SOP-IEC priority axis 1 launched the first call for support to the development of 'poles of competitiveness' in Romania. The poles of competitiveness are described as an association, in a defined geographic area, among undertakings, research centres and educational institutions engaged in collaborative partnership (according to a joint development strategy) in order to generate synergies around a set of innovative projects aimed at one or more markets. Also, SOP-IEC priority axis 2 'Promoting innovation in enterprises' supports the secondment of highly qualified personnel from research organisations to small and medium enterprises (SMEs) for a maximum period of of three years.

5. GENDER

5.1. Foster cultural and institutional change on gender

Regarding general legislation on gender equality, Romania provides for one of the longest periods of childcare leave in Europe (Law 111/2010 amended by Governmental Ordinance 124/2011). However, there are no measures that address gender equality in research besides a government ordinance (Government Ordinance 111/2010), which supports career breaks for PhD candidates. This may be explained by the fact that women are well represented in the research sector.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (national level)	18.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality	Limited compliance to ERA	0.3 %	2013	ERA survey 2014

Plans	cluster (national level)			

The research funders in Romania who responded to the survey did not declare any support to gender equality in public research.

Within the ERA compliant cluster in Romania, the share of research performing organisations which have adopted Gender Equality Plans is lower than within the EU ERA compliant cluster.

Several scholarships have been granted to support female careers under the National Fellowship Programme 'UNESCO L'Oréal for Women in Science'. This programme is implemented in partnership with the National Commission for UNESCO, L'Oréal Romania, the Romanian Academy and the National Authority for Scientific Research.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	29.2 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	2.9 %	2013	ERA survey 2014

Within the ERA compliant cluster in Romania, the share of research performing organisations implementing recruitment and promotion policies for female researchers is lower than within the EU ERA compliant cluster.

Concerning gender dimension in research content/programmes, there are no measures reported.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting the inclusion of gender dimension in research content	National level	0 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	14.3 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	2.9 %	2013	ERA survey 2014

The research funders in Romania who responded to the survey did not declare any support to the inclusion of the gender dimension in research content/programmes.

Within the ERA compliant cluster in Romania, the share of research performing organisations which include the gender dimension in research content is lower than within the EU ERA compliant cluster.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision making, there are no measures reported.

Indicator	Level/cluster	Value	Year	Source
Share of gender-balanced recruitment committees for leading researchers amongst responding research	ERA compliant cluster (EU	33.6 %	2013	ERA survey 2014

performing organisations	level)			
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	12.2 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	24.4 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	70 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA compliant cluster in Romania, the share of gender-balanced recruitment committees for leading researchers in research performing organisations is lower than within the EU ERA compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in Romania is higher than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access, Romania's 2014 National Reform Programme and the National Strategy for Research, Development and Innovation 2014-2020 support the gold open access standard access for publishing the results of publicly funded research. Moreover, the development of open access has been spearheaded by the stakeholder-driven initiative Kosson as part of OpenAIRE (see below). There is, however, no overall legislative or policy provision supporting open access to publications and data.

Related to open access to publications, a notable initiative at stakeholder level is the Kosson initiative promoted by the Transylvania University, Brașov and the Romanian Library Association. Kosson is a member of OpenAIRE and it supports the development of open access to scientific publications. Kosson has been active in launching a debate around good practices, methods, standards and policies for open access. The majority of publications is

published through peer-reviewed scientific journals and afterwards may be published on open access communities such as http://www.acces-deschis.ro/en/ and http://www.kosson.ro

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	13.9 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	2.8 %	2013	ERA survey 2014

The research funders in Romania who responded to the survey did not declare any support to open access to publications. Within the ERA compliant cluster in Romania, the share of publicly funded scientific publications in OA amongst research performing organisations is lower than within the EU ERA compliant cluster.

Concerning open access to data, the Kosson initiative also supports the development of open access to scientific data.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting open access to data	National level	99.9 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making	ERA compliant	54.2 %	2013	ERA survey

scientific research data available on-line and free of charge	cluster (EU level)			2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national level)	37.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	Limited compliance to ERA cluster (national level)	13.4 %	2013	ERA survey 2014

The share of research funders in Romania who responded to the survey and support Open Access to data is higher than the EU average.

Within the ERA compliant cluster in Romania, the share of research performing organisations making available on-line and free of charge publicly funded scientific research data systematically is lower than within the EU ERA compliant cluster.

With respect to repositories, there is currently no overall legislative or policy measure. However, the Kosson initiative on open access supports the development of standards for the management and storage of data.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to open innovation and knowledge transfer between public and private sectors, knowledge transfer has been acknowledged as a strategic policy objective in the National Strategy for Research, Development and Innovation 2014-2020 and Romania's 2014 National Reform Programme.

The National Strategy includes tax credits to foster public-private partnerships and 'competence centres' (i.e. public-private platforms). Several other measures have provided support to public-private cooperation. Knowledge transfer has been supported by ReNITT, which is a network for innovation and technological transfer and is made up of 12 technology transfer centres, 12 centres for technological information and 15 technological and business incubators. Four scientific and technological parks complement ReNITT. Although the activities of these entities remain relatively modest, efforts are deployed to enhance their institutional capacity (see below). The support measure to innovative start-ups and spin-offs, launched in 2008 with a total budget of EUR18.5 million, has provided funding for the creation of spin-offs that implement the recent results resulting from research projects and doctoral theses of researchers employed in public R&D institutes and academics from public

universities. Moreover, various schemes (e.g. the National RDI Plan (2007-2013), SOP IEC and the information package and de minimis aid scheme for innovation vouchers) have financed partnerships between academia/research institutes and the private sector. Romania has not developed a knowledge transfer strategy.

Regarding support to technology transfer offices (TTOs), the National Strategy for Research, Development and Innovation 2014-2020 includes measures supporting the development of knowledge transfer skills and professionals (i.e. knowledge transfer training, intellectual property rights exchange platforms and secondment of personnel). The professionalisation and strengthening of the institutional capacity have also been supported by the 'Development of NASR's public policy-making capacity in the field of innovation and technology transfer to ensure a sustainable socio-economic development' project (2011-2013) which was co-funded by the European Social Fund through SOP 'Development of the Administrative Capacity', priority axis 1. With a total budget of approximately EUR3 million, this project aimed at creating a national network of innovation managers in the national and local administration.

The draft Strategy 2014-2020 and its related implementation instruments include measures supporting the development of incubators and transfer centres at regional level, as well as the temporary detachment of R&D personnel between the public and private sector.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	100 %	2013	ERA survey 2014
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	2.1 %	2013	ERA survey 2014

Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	0.2 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	39.6 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	Limited compliance to ERA cluster (national level)	0.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	30.1 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	Limited compliance to ERA cluster (national level)	0.3 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private	ERA compliant cluster (EU	2.9 %	2013	ERA survey 2014

sector (in headcount)	level)			
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	1.7 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	0.3 %	2013	ERA survey 2014

The share of research funders in Romania who responded to the survey and support KT and OI, TTOs and Private Public interaction is higher than the EU average.

Within the ERA compliant cluster in Romania, the share of research performing organisations having funding originating from the private sector is lower than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Romania, the share of research performing organisations having or using a structure for knowledge transfer activities is lower than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Romania, the share of research performing organisations having dedicated staff employed in knowledge transfer activities is lower than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Romania, the share of research personnel whose primary occupation is in the private sector (in Full Time Equivalents) is lower than within the EU ERA compliant cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

As regards with the implementation of Digital ERA, the country has implemented a research and education network, which is essential to make digital services possible. RoEduNet is the Romanian National Research and Education Network (NREN), a specialised Internet service provider dedicated to supporting the needs of the research and education communities within the country. Moreover, an institutional data repository named ASPECKT for doctoral, postgraduate and undergraduate works was set up by the Transylvania University of Brasov. It is foreseen that this repository will be used for storing all the research activity carried out at the Transylvania University of Brasov.

Concerning digital services, the 2013 National Strategy for Romania's Digital Agenda includes measures supporting the development of digital services.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	42 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	13.2 %	2013	ERA survey 2014

Within the ERA compliant cluster in Romania, the share of research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.) is lower than within the EU ERA compliant cluster.

6.4. Uptake of federated electronic identities

Romania was not a member of an identity federation in 2013. The county is not member of eduGAIN, a service intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) partners' federations. The National Strategy for Research, Development and Innovation 2014-2020 supports the adoption of measures on e-identity to facilitate researchers' access to digital research services.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations in the sample providing federated electronic	ERA compliant cluster (EU	38.5 %	2013	ERA survey 2014

identities for their researchers	level)			
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	24.9 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	4.8 %	2013	ERA survey 2014

Within the ERA compliant cluster in Romania, the share of research performing organisations providing federated electronic identities for their researchers is lower than within the EU ERA compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 47 research performing organisations in Romania answered the 2014 ERA survey, which represents 27.3% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in Romania shows that 35.6 % of them are in the 'ERA compliant' cluster, 37.8 % can be classified in the 'limited compliance to ERA' cluster and 26.7 % of organisations in the 'ERA principles are not applicable' cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of 'weighted' organisations are 43.7 % for the 'ERA compliant' cluster, 14.5 % for the 'ERA limited compliant' cluster and 41.8 % for those organisations where ERA principles are not applicable.

However, the results for funding organisations should be interpreted with caution since two relatively important organisations did not respond to the survey.

It should also be noted that several RPOs answered 'not applicable' to a majority of questions, whilst their mandate allows them to implement ERA and their profile is very similar to organisations in the 'ERA compliant' and 'ERA limited compliance' clusters (i.e. these are relatively large universities and research centres). As a result of this self-reporting issue, these organisations have been clustered in the group 'ERA not applicable'. However, this does not

fully reflect their 'normal' behaviour. This is particularly visible in the section on knowledge transfer (see below).

For the indicator ‘Share of research performing organisations which have adopted Gender Equality Plans’, the relatively low share at national level is explained by the fact that gender distribution in science is relatively even between women and men.

For the indicators ‘Share of research performing organisations having or using a structure for knowledge transfer activities’ and ‘Share of research performing organisations having dedicated staff employed in knowledge transfer activities’, it can be noted that organisations in the ‘ERA not applicable cluster’ have a relatively high level of implementation. This is due to a self-reporting issue (i.e. organisations answering ‘not applicable’ in a majority of questions in the survey).

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013
Research and innovation system			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
Fiscal and Budgetary Strategy 2014-2016	2013	X	X
Law of the National Budget 2014, no. 356/2013	2013	X	X
Government Ordinance 8/2013	2013	X	X
Project-based funding applying the core principles of international peer review			
National Plan for Research Development and Innovation (2007-2013)	2007		
Government Decision no. 133/2011	2007		
Institutional funding based on institutional assessment			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
Education Law no. 1/5 January 2011	2011		
Governmental Decision no. 789/2011, Methodology for classification of universities and ranking of programme	2011		

studies, according to the provision of the Law on National Education no. 1/ 5 January 2011			
Governmental Decision no. 1062 /19 October 2011 regarding the methodology for the evaluation in view of classification of the units and organisations of the national R&D system	2011		
Implementing joint research agendas			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
Joint programmes and bilateral agreements			
Openness for international cooperation with third countries and regions			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
Interoperability, mutual recognition of evaluation results and other schemes			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
ERA-like projects			
Joint programmes and bilateral agreements			
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
National Roadmap for Research Infrastructures	2007		
Access to research infrastructures of pan-European interest			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X

Attractive careers			
Euraxess Romania			
Education Law no. 1/ 5 January 2011	2011		
Sectoral Operational Programme "Development of Human Resources", Doctoral and post-doctoral schools	2009		
Measures supporting doctoral and post-doctoral schools of excellence			
Governmental Decision 681/2011 regarding the Code for university doctoral studies	2011		
Government Ordinance 92/ 18.12.2012 regarding some measures in higher education and research	2012	X	
Provision of the Law of National Education (Law 1/2011) regarding the post-doctoral research studies	2011		
Gender balance in the decision-making process			
Law 111/2010 amended by Governmental Ordinance 124/2011	2010		
Governmental Ordinance 111/2010 regarding the leave and monthly financial support for child raising	2011		
Open innovation and knowledge transfer between public and private sectors			
Governmental Ordinance 8/23.01.2013 regarding the changes in the fiscal code	2013	X	X
ReNITT - network for innovation and technological transfer			
Development of NASR's public policymaking capacity in the field of innovation and technology transfer to ensure a sustainable socio-economic development' project	2011		

Support to innovative start-ups and spin-offs project - total budget of €18.5m	2008		
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X
Funding for research universities/institutes – enterprises partnerships through the National RDI Plan 2007-2013 & SOP Increase of Economic Competitiveness			
ANCS Decision no. 9039/01 March 2012 and no. 9038/01 March 2012 (information package and minimis aid scheme for innovation vouchers)			
National RDI Plan (2007-2013) and the SOP Increase of Economic Competitiveness: support to public-private partnerships			
Harmonise policies for public e-infrastructures and associated digital research services			
National Strategy for Romania's Digital Agenda	2013	X	X
Uptake of federated electronic identities			
National Strategy for Research, Development and Innovation 2014-2020	2014	X	X

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

Research and innovation policies are the overall responsibility of the Ministry of Education and Research and the Ministry of Enterprise, Energy and Communication. National government agencies carry out and monitor many of the policies.

The main governmental agencies supporting research and development (R&D) is the Swedish Research Council (VR), the Swedish Research Council for Health, Working Life and Welfare (Forte), and the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas). Among the other governmental research funding agencies can be noted the Swedish Energy Agency, various defence agencies, and the Swedish International Development Cooperation Agency (SIDA). Innovation and research of an applied nature is supported by the Swedish Agency for Innovation Systems (VINNOVA).

The main performers of basic research, but also of applied and strategic research are the 15 universities, which receive over 90% of the governmental appropriations for R&D by direct funding and funding from research councils. The several regional university colleges and the very small (albeit growing) R&D institute sector complement the universities but account for a very small share of the public R&D appropriations (Hallonsten and Holmberg 2013).

The public research funding system in Sweden is guided by quadrennial Research and Innovation Bills and the latest Research and Innovation Bill (2012/13:30) contains priorities for the period 2013 – 2016.

The 2012 National Innovation Strategy issued by the Ministry of Enterprise, Energy and Communication shares the analysis of the 2008 and 2012 Research and Innovation bills that Sweden needs to strengthen and improve the quality of the national R&D in order to keep a competitive position in the globalised knowledge economy. The innovation strategy is, however, mainly a framework vision statement and hence does not launch any concrete policies.

The 2012 Research and Innovation Bill stresses the necessity to link regional growth initiatives with national research and innovation policy. In May 2013 the government assigned the task of developing regional development programmes for 2014-2020 to regional and national authorities, including research and innovation strategies.

In terms of R&I funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in Sweden represented EUR 378 per inhabitant in 2012, more than twice the EU28 average (EUR 179). In 2012, the total GBAORD corresponded to 1.7% of total government expenditures and 0.9% of Gross Domestic Product (GDP) (Eurostat).

Additional funds are available from 2014, which are equivalent equivalent to an increase in appropriations of 3% (National Reform Programme - NRP 2014).

The analysis of the evolution of the GBAORD in the period during the economic crisis (2007-2012) shows that in nominal terms, the growth rate of the total GBAORD in Sweden has been higher than the growth rate of the total EU GBAORD. The GBAORD as a share of GDP has evolved positively in Sweden even when it regressed at the EU28 level.

1.2. Project-based funding applying the core principles of international peer review

The share of competitive funding for public R&D in Sweden has increased significantly and overtaken, not in real terms but relatively, a large share of university research that was previously funded by institutional block grants issued directly to the universities. The variations in the ratio between competitive and institutional funds are due to the various funding increases launched in the two recent research and innovation bills (2008 and 2012). In particular, the rather substantial increase in the share of institutional grants between the years 2009 and 2010 is due to the effectuation of the major increase of the institutional block grants issued in the 2008 research bill. The large increase of institutional grants has been matched by a similar increase of private funding which has kept the share of competitive funding larger than the institutional.

A corresponding increase in the project-based funding (also resulting from the 2008 research bill) of almost 20 % between 2008 and 2009 makes the long-term development of the ratio between institutional block grants and competitive funding largely unchanged in the past five year period (with a slight relative overall increase of the share of competitive funding from 50.9 % in 2007 to 52.5 % in 2011).

According to the Swedish NRP 2014, in 2013, 33% of central government funds was distributed through project-based funding.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	81.4 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in Sweden who responded to the survey and support project-based funding is higher than the EU average.

The peer review based assessment is the general rule within the Swedish Research Councils and VINNOVA, and the typical procedure is to have applications within general calls assessed by the scientific assessment boards that are either elected from the academic sector (research councils) or appointed by the director-general (VINNOVA).

However, the allocation of competitive public R&D funding in Sweden (mainly executed within the framework of the research councils) typically follows the procedure of internal peer review assessment boards with predominantly Swedish or Scandinavian members, with the exception of the 'excellence' funding programmes, i.e. the 2006 and 2008 Linnaeus Grants and the 2009 Strategic Research Areas grants (allocating in total EUR 30 million and EUR 300 million, respectively). These funding programs involved the use of international peer reviewers in the process of choosing grant recipients.

1.3. Institutional funding based on institutional assessment

The Research and Innovation Bill 2012 strengthened the institutional funding allocation on the basis of performance evaluation. In two steps, via the 2008 and 2012 Research Bills, parts of the institutional funding allocation to higher education institutions (HEIs) have been made competitive (performance-based); the 2008 bill earmarked 10% of all HEIs research block grant funding to a (primarily bibliometric-orientated) performance-based allocation scheme, and the 2012 bill increased the amount to 20% as of 2014.

According to the Swedish NRP 2014, in 2013, institutional funding represented 50% of the central government funds.

The Research and Innovation Bill 2012 defines that the distribution of funding between HEIs as being determined by quality, measured by two criteria: publications/references to publications and external research funds.

The 2012 Research and Innovation Bill described a move from bibliometric assessment to international peer review evaluation as the basis for reallocation of institutional funding. The Swedish Research Council has been charged with designing the system in all its specifics so that it can be implemented in 2018, at the earliest.

Sweden has developed a quality assurance system for evaluating research at universities that is aimed to result in an increasing quality of research. At the same time, however, traditional indicators are used, which might limit the growth of new research and the interaction with society (Joint Research Centre, JRC 2013).

In 2013 VINNOVA was tasked, in consultation with other central government research financiers, with designing methods and criteria for assessing the quality of higher education institutions' cooperation with the surrounding community (NRP 2014).

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	15.2 %	2013	ERA survey 2014
Share of responding funders' total	EU level	24 %	2013	ERA survey

budget allocated as institutional funding based on institutional assessment and/or evaluation				2014

The share of research funders in Sweden who responded to the survey and support institutional assessment for the allocation of institutional funding is lower than the EU average.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It supports also bilateral and multilateral initiatives.

Swedish governmental R&I policy is strongly based on the analysis that the competitiveness of the Swedish national economy and society hinges upon a strengthening of the Swedish national research and innovation system. Swedish research policy measures are designed by partly taking into account the policies of other European countries. The 24 Strategic Research Areas, identified in the 2008 Research bill and endowed with a specific funding programme allocating a total of EUR 300 million to 43 research environments in Swedish universities have been identified as also being highly relevant in the broader European perspective. Furthermore, VINNOVA began in 2011 launching calls aimed at solutions to grand challenges. The role of the Swedish research and innovation system in strengthening the long-term common European competitiveness is further strengthened in the latest Research and Innovation bill with a new coordination function for European partnership programmes. This function involves all Swedish research funding agencies. An additional SEK 200 million funding per year has been allocated to this function to meet the increased number of European partnership programmes.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	3.9 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with	National level	2.8 %	2013	ERA survey 2014

non-national EU organisations				
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders' total budget in Sweden allocated to transnationally coordinated R&D is lower than the EU average.

The share of responding funders' research and development budget in Sweden dedicated to jointly defined research agendas with other EU organisations is higher than the EU average.

Cooperation between institutions of Member States, Associated Countries and third countries is fostered by the Framework Programme (FP). In the Seventh Framework Programme, the share of Swedish participation in the total participation is 3.9% and the country received 4.3% of the total European Commission contribution. FP funding represents EUR 164 per inhabitant (EU average EUR 72 per capita) for the period 2007-2013 and 2.7% of the Gross Domestic Expenditures on R&D (GERD) for the period 2007-2011 (last available data) (EU average 3% of GERD for the same period).

Concerning Joint Programming Initiatives, the country participates in all ten of the on-going initiatives, coordinating one of them - Antimicrobial resistance - an emerging threat to human health.

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in five programmes. In Horizon 2020, the country is already involved in the four existing initiatives.

ERA-NETs facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 81 ERA-NETs, of which 19 are currently still running. The country has also participated in nine ERA-NET Plus actions - of which 7 are still running - in areas with high European added value and additional EU financial support topping up their joint call for proposals.

Sweden is actively cooperating with other Nordic countries in joint programmes and institutions within the Nordic Council of Ministers. Nordic cooperation involves Denmark, Finland, Iceland, Norway and Sweden as well as the three autonomous areas, the Faroe Islands, Greenland and the Åland Islands. The organisation of Nordic collaboration in research and innovation rests on two main pillars, one for research, NordForsk, and one for innovation, Nordic Innovation (formerly The Nordic Innovation Centre, NICE). In 2008 the Nordic Prime Ministers initiated the Top-level Research Initiative (TRI) and it is to date the

largest joint Nordic research and innovation initiative that has a research focus within climate, environment and energy.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the Swedish government adopted a Strategy for international cooperation in research and research based innovation in 2012 and it has framework agreements in the field of research with eight countries. International cooperation is however primarily implemented by the national agencies, the public research foundations and the universities themselves which have their own bilateral and multilateral agreements. Consequently, there are hundreds of cooperation agreements (JRC 2013).

The Swedish Research Council has several mobility grants, e.g. International postdoc, and the International Career Grant. In the last Research Bill a new grant was introduced, Grants for Recruitment of Leading Researchers. The Swedish Research Council for Health, Working life and Welfare (Forte) offers Forte Fellowships and Visiting Researchers. Further, the Swedish Foundation for Strategic Research (SSF) has a number of specific mobility grants aimed for mobility to both European and non-European countries. Mobility grants for exchange with Japan exist in a number of different forms and programmes organised by the SSF and VINNOVA. Examples of existing programmes include the Sweden-Korea Research Cooperation funded by the Swedish Foundation for International Cooperation in Research and Higher Education.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	1.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing	ERA compliant cluster	1.6 %	2013	ERA survey 2014

organisations originating from third countries	(national level)			
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0 %	2013	ERA survey 2014

The share of responding funders' research and development budget in Sweden allocated to collaboration programmes carried out with third countries is lower than the EU average.

Within the ERA compliant cluster in Sweden, the share of organisations' research and development budget originating from third countries is higher than within the EU ERA compliant cluster.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

Swedish Research Council (VR) participates in the European Science Foundation (ESF) peer review forum and ensures that all public bodies responsible for allocating research funds apply the core principles of international peer review (ESF Peer Review Guide). Sweden also participates in the ESF through 13 member organisations that are all public research funding bodies or academic societies and which represents 31% of the total number of research funding institutions. The Swedish Research Council cooperates with various international programmes, e.g 10 Nordforsk programmes, allowing for mutual recognition of evaluations (Nordforsk 2013).

The 2012 Research Bill highlights the need for the international dimension of research policy to be strengthened. With a trend towards encouraging international collaborations, opening funding programmes to external collaborators and funding international actors may become a viable option.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	89.3 %	2013	ERA survey 2014
Share of responding funders which can base their project-based research and development funding decisions on peer	EU level	38.5 %	2013	ERA survey 2014

reviews carried out by non-national institutions				
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	8.6 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in Sweden who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is higher than the EU average.

The share of responding funders' project-based research and development budget in Sweden allocated through peer review carried out by institutions outside the country is higher than the EU average.

3. RESEARCH INFRASTRUCTURES

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

Sweden participates in the following large international research infrastructures: European Space Agency (ESA), European Fusion Development Agreement (EFDA), European Molecular Biology Laboratory (EMBL), European Southern Observatory (ESO), European Synchrotron Radiation Facility (ESRF), European x-ray free electron laser (European XFEL) and Institut Laue-Langevin (ILL). The country contributes 1 % of the GBAORD to the activities carried out by Conseil Européen pour la Recherche Nucléaire (CERN), the EMBL, the ESO, the ESRF, the ILL and the European Commission’s Joint Research Centre (JRC) (Eurostat).

In terms of participation to the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of 29 of them (59%) and coordinates 2 of them: EISCAT_3D and ESSneutrons.

In terms of financial commitments to the development of these Research Infrastructures, Sweden is committed to fund 16 of them, namely: CESSDA, ESSurvey, EISCAT_3D, IAGOS, ICOS, LIFEWATCH, BBMRI, ELIXIR, EMBRC,ESRF UPGRADE, ESSneutrons,

XFEL, ILL 20/20, FAIR and PRACE (ex HPC). So far, Sweden has dedicated SEK 2988 M (EUR 326.7 M) to the conception and/or construction phases of research infrastructures included in the ESFRI roadmap.

With regard to participation in the European Research Infrastructure Consortium, Sweden is involved in two of the nine consortia which adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest involving several European countries, namely ESS SURVEY ERIC and BBMRI ERIC.

The Swedish national policy for research infrastructures and the commitments for the construction and operation of ESFRI infrastructures has resulted in significant investments in research infrastructures in general.

In 2007, the Swedish government publicly announced its candidature to host the European Spallation Source (ESS) and build it in Lund, Sweden. Simultaneously, a grassroots movement had promoted the next-generation synchrotron radiation facility MAX IV in Lund. The ESS plans for commencing construction are moving on with binding funding pledges from several countries. Those by Sweden, Denmark and Norway, cover 50% of the construction costs. MAX IV is currently being constructed in Lund and set for opening in 2016. On 16 December 2013, the Swedish Research Council decided to allocate a total of just over EUR 150 million for the operation of the MAX IV facility for the years 2013-2018.

The national roadmap for research infrastructures was published in December 2011 and includes specific references to the participation of Sweden in the development of the research infrastructures mentioned in the ESFRI roadmap.

3.2. Access to research infrastructures of pan-European interest

Among the research infrastructures coordinated by Sweden, the European Commission has funded access to ten of them.

Regarding cross-border access to research infrastructures, assessing access to large research infrastructures in Sweden is dependent on the decisions to be made with regard to the organisation and legal status of MAX IV, the ESS and the SciLifeLab. In the case of the ESS, effective access will be granted based on peer-review evaluation with scientific excellence and feasibility as main criteria according to policies to be decided by the future ESS organisation. The legal framework of ESS is planned to be a European Research Infrastructure Consortium (ERIC).

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for Sweden in the Researchers' Report 2014 [http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Sweden Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

Stock of researchers

There were 48,589 full-time equivalent (FTE) researchers in Sweden in 2011. This represents 9.7 researchers per 1000 labour force compared with 11.4 among the Innovation Union reference group (Innovation leaders) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 160.4 in Sweden compared with 47.6 among the Innovation Union reference group and an EU average of 43.7

In 2012, 64 % of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (More2 survey, 2012).

Since 1994, the Employment Ordinance requires HEIs to announce all job vacancies (both permanent or for a fixed period) for academic staff - including teachers and researchers - and to advertise all relevant information e.g. on the EURAXESS portal. To ensure that the information on the EURAXESS Sweden portal is adequate, VINNOVA has been appointed to administer the portal in cooperation with the Swedish Research Council, the Swedish Research Council Formas and the Swedish Council for Working Life and Social Research.

4.3. Attractive careers

The Association of Swedish Higher Education (SUHF), representing the Swedish Rector’s conference and thereby Swedish universities, signed the ‘Charter & Code’ in 2007.

By May 2014, four Swedish organisations were involved in the Commission’s Human Resources Strategy for Researchers and none of which had received the "HR Excellence in Research" logo for their progress in implementing the Charter & Code.

Higher education institutions and national funders are responsible for taking measures on researchers’ career development. Some institutions offer the possibility of a tenure track.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 2.9 in 2011 compared with 2.7 among the Innovation Union reference group and an EU average of 1.7.

In 2013, 61% of the doctoral students had employment contracts giving the same social benefits as other employees at the higher education institution concerned. Some universities already provide employment for all doctoral students and state funding may not be used for stipends. A research student doctoral grant is supposed to be converted to an employment relationship for a doctoral student in the last three years before their dissertation. Since 2001, the Swedish Higher Education Authority has been responsible for the quality of the higher

education system. Its duties include evaluations of the study programmes and their subject areas. Some Swedish universities offer research communication skills, intellectual property rights (IPR)-awareness, career management and entrepreneurship training in their effort to improve researchers' employment skills and competencies.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU-27 Member State was 10.9% in Sweden compared with 9.1% among the Innovation Union reference group and an EU average of 7.7%. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 21.9% in Sweden compared with 14.4 % among the Innovation Union reference group and an EU average of 24.2%.

Since 2006, European Economic Area (EEA) citizens have not needed a work permit to reside in Sweden. The Swedish government transposed the Scientific Visa Directive in 2008. HEIs may decide to allocate funding or other resources to retain or recruit outstanding researchers. The largest government research funding agency, the Swedish Research Council (SRC) funds a return phase for researchers who have spent 50% of their study time abroad. The Swedish Foundation for Strategic Research (SSF) has a number of specific mobility grants targeting both European and non-European countries. The Swedish Research Council also funds outgoing post-doctorates in all scientific areas.

The Swedish government has not put in place measures to encourage researchers to move from the public to the business sector and vice-versa. The researcher flow in Sweden is almost in one direction, namely towards industry. However, the Swedish Higher Education Ordinance provides for a position of 'adjunct professor' of up to six years part-time (20-50%). The adjunct professor should be an expert from the industry to be given the opportunity to work within a university for a certain period of time.

The VINN Excellence Centres (2004-15) are developed by the Swedish Competence Centres Programme (Centres of Excellence in Research and Innovation) and aim to strengthen the crucial link between academic research groups and industrial R&D in the Swedish National Innovation System.

5. GENDER

5.1. Foster cultural and institutional change on gender

In spite of the general strong showing of Swedish in the international rankings and evaluations of gender equality and equal opportunities policy, recent general policy initiatives at national level have had little involvement with policies aimed at providing equal opportunities in academia. The 2012 Research Bill mentions gender inequality once, and instructs the universities and higher education institutions to work harder to break the gender bias in education. It also announced a budget of 32 million SEK per year, to be allocated to VINNOVA, for practical equality research during 2013-2014.

In 2013, the Swedish Research Council was tasked to develop a plan for how the council should contribute to gender equality. The plan is expected to be implemented in 2014 (NRP 2014).

To encourage a rise in the proportion of women among professors the Government has set targets for the recruitment of women professors at 34 HEIs for the period 2012–2015. These targets are based on the calculated recruitment base (senior lecturers and post-doctoral research fellows) in different fields of research. There have been targets of this kind since 1997, although none were set for 2009–2011.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting gender equality in research	National level	79.5 %	2013	ERA survey 2014
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (national level)	95.8 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	Limited compliance to ERA cluster (national level)	3.1 %	2013	ERA survey 2014

The share of research funders in Sweden who responded to the survey and support national policies on gender equality in public research is lower than the EU average.

Within the ERA compliant cluster in Sweden, the share of research performing organisations which have adopted Gender Equality Plans is higher than within the EU ERA compliant cluster.

Regarding recruitment, retention and career progression of female researchers, it can be noted that there are hardly any legislative barriers to gender equality in the public Swedish R&D

system. The Swedish government largely leaves it up to the institutions themselves to achieve a gender balance in the academic sector.

The VINNOVA Vinnmer programme was intended for the underrepresented gender in the scientific field of application and for those researchers who have a PhD and who have completed their Post Doc qualification. The programme ended in 2014 and is now replaced by the more general Mobility for Growth programme.

General Swedish law guarantees that employers have to restore employees to the same positions after maternity or paternity leave. It is usually possible to extend a fixed-term contract due to maternity or paternity leave.

The Swedish Research Council assumes that research conducted with funding from the Swedish Research Council adheres to good research practice. In the evaluation of the applications and prior to decisions about grants, the following general guidelines are applicable to ensure gender equality. The Swedish Research Council's gender equality strategy prescribes the same success rate for grants and the same average size of the grants to apply to women and men with regard to the nature of the research and the form of grant. Prior to an evaluation panel determining its proposal for the allocation of the grants, the success rate for the grants in the proposal shall be calculated for women and for men. Gender equality should be used as a special condition for the prioritisation of applications equivalent in terms of quality (or close to equivalent). In these cases, applications from the underrepresented gender are to be given higher priority.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	76.8 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	1.9 %	2013	ERA survey 2014

Within the ERA compliant cluster in Sweden, the share of research performing organisations implementing recruitment and promotion policies for female researchers is higher than within the EU ERA compliant cluster.

Sweden has set up provision to integrate the gender dimension in research programmes and/or projects. The country has a dedicated budget for programmes funding women/gender studies.

VINNOVA aims to promote gender equality in appraisal of funding and within the organisation, and gender mainstreaming within research.

Statskontoret has been given the task to map and analyse the distribution of funds for research and doctoreal training from a gender perspective. The mission includes a study of the distribution process, among other the assesments upon which the distribution is made. the report is due on 31 Decemner 2014.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the inclusion of gender dimension in research content	National level	34.3 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	51.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	1.3 %	2013	ERA survey 2014

The share of research funders in Sweden who responded to the survey and support gender dimension in research content/programmes is lower than the EU average.

Within the ERA compliant cluster in Sweden, the share of research performing organisations which include the gender dimension in research content is higher than within the EU ERA compliant cluster.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision making, the Researchers Report 2013 mentions that in Sweden, quotas/national targets are not mandatory. However, there is an expectation that the number of members on boards, committees, panels etc. be as gender-balanced as possible.

In relation to the goal of having at least 40 % of the under- represented sex in committees, the Government gave a general instruction (Regulation) to the Swedish Research Council to establish and sustain equal gender representation on discipline-councils and peer review assessment boards and committees involved in the recruitment of academic staff. The panels assessing grant applications at the Swedish Research Council are expected to have a balanced composition with respect to gender; the Government's instruction to the Council is that the Council shall 'promote gender equality within its area of work'. The Council has, on the basis of this instruction, adopted its own gender equality strategy.

The share of the under-representing sex participate in committees involved in recruitment/career progression and in establishing and evaluating research programmes in Sweden is 49% (She Figures 2012).

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (EU level)	33.6 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	77.5 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	6.9 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding	National level	73.8 %	2013	ERA survey 2014

research funding organisations				
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA compliant cluster in Sweden, the share of gender-balanced recruitment committees for leading researchers in research performing organisations is higher than within the EU ERA compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in Sweden is higher than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of governmental policy, the 2012 Research and Innovation bill took one step towards institutionalising the open access principle in the Swedish public R&D system, by giving the Swedish Research Council and the National Library of Sweden the task of developing a national policy for open access to scientific information - research data and publications. This work is currently carried out in cooperation with research funding bodies, universities and higher education institutions. The work is not yet concluded and there has been no date specified for the delivery of these results.

Generally, the Swedish public R&D system is largely orientated to the international system of results circulation in peer review-based English-speaking journals owned and run by multinational publishing houses. Although there is a clear growth in the number of online, open access, journals among the ones preferred by the scientific community, open access publishing still, in most cases, requires the author to pay a fee for the review and publication in order to make the article freely available. Swedish universities spend large and growing sums of money on institutional subscriptions to the non-open journals, and this is considered a potential structural problem since the subscription costs only seem to increase for every year. The government has, consequently, adopted a strongly articulated policy that favours open access publishing and comprehensive efforts in the system to facilitate a relatively large increase in open access publishing in the Swedish universities.

Since 2010, the Swedish Research Council, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), the Swedish Research Council for Health, Working Life and Welfare (Forte), the Bank of Sweden Tercentenary Foundation (RJ), the Knut and Alice Wallenberg Foundation (KAW) has demanded that their grantees publish their results with open access. Almost all Swedish universities and higher education institutions have open, searchable databases where publications are listed and in many cases online versions of publications are openly accessible.

Related to open access to publications, two national initiatives to facilitate better access to scientific publications by indexing publications nationwide and promoting open access publishing are worthwhile mentioning. None of them are the result of direct governmental policymaking but they are more of a collaborative effort between public and private national organisations (agencies and foundations). First, the SwePub database, run by the National Library of Sweden makes it possible to search among articles, conference papers and doctoral dissertations published by researchers at Swedish universities and higher education institutions (all institutions except the Stockholm School of Economics are part of SwePub). The Swedish government gave an instruction to the National Library of Sweden to further develop the SwePub database in order to use for quality assured bibliometric analyses.

Second, the OpenAccess.se project is run and funded by the National Library of Sweden in collaboration with the Association of Swedish Higher Education (an voluntary interest organisation for Swedish universities and higher education institutions), The Swedish Research Council, The Royal Swedish Academy of Sciences, the Swedish Foundation for Humanities and Social Sciences and the Knowledge Foundation (a public research foundation). Within this project, the collaborators work with information and counselling, infrastructure and services, and policy development regarding open access publishing.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to publications	National level	22.7 %	2013	ERA survey 2014
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	21.9 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	1.3 %	2013	ERA survey 2014

The share of research funders in Sweden who responded to the survey and support Open Access to publications is lower than the EU average.

Within the ERA compliant cluster in Sweden, the share of publicly funded scientific publications in OA amongst research performing organisations is higher than within the EU ERA compliant cluster.

The share of research funders in Sweden who responded to the survey and support Open Access to data is lower than the EU average.

Within the ERA compliant cluster in Sweden, the share of research performing organisations making available on-line and free of charge publicly funded scientific research data systematically is higher than within the EU ERA compliant cluster.

The initiatives on EU level to build up research infrastructures for the facilitating of dissemination of data and results (e.g. European Social Survey, CESSDA, SHARE) are supported by the Swedish government who take active part as members in these initiatives.

The Swedish Research Council has evaluated Swedish researchers' need for e-infrastructures, such as large-scale computing resources for calculation and storage. The evaluation will be followed-up in 2014 (NRP 2014).

In Sweden there is an indication for 56 OpenAire data repositories and 44 in OpenDoar data repositories. Both the proportion of gold and green open access will be reported as well as the overall percentage of open access publications, both nationally as well as university (OpenAire).

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to open innovation (OI) and knowledge transfer (KT) between public and private sectors, Sweden has not developed a knowledge transfer strategy. However, in 2012 the Government adopted an Innovation Strategy aimed at strengthening the innovative climate. The Innovation Strategy takes a holistic view with the purpose of enhancing innovative capacity and meeting social challenges. The strategy emphasises, for example, the importance of all relevant actors being involved, the lowering of thresholds and the creation of incentives to advance different actors' capacity for growth and innovation. The innovation strategy includes several different areas of policy and affects a number of government bills over the period up until 2020.

The 2012 research and innovation bill also presented several measures of importance for increased commercialisation and utilisation of research results, including funding and relevant instructions to governmental agencies. The research policy target was broadened so that research can contribute to the development of society and industry's competitiveness, resulting in an overarching focus on utilisation. The measures include for example a new instrument focussing on societal challenges and further strengthening of industrial research

institutes, as well as new innovation offices at universities. It also includes measures and initiatives to strengthen the universities and colleges' assignment to work together with society and benefit from the research results, with the aim of bringing the lessons learned from this into the future performance based resource allocation system for 2018, which the Science Council is tasked to propose.

Funding organisations have specific funding lines dedicated to the implementation of knowledge transfer. In 2013 VINNOVA was tasked, in consultation with other research funders, with designing methods and criteria for assessing the quality of HEIs' cooperation with the surrounding community. From 2015 on funds will be allocated to HEIs on the basis of cooperation indicators and an expert assessment of quality in cooperation. (NRP2014)

A related task, assigned in 2013, is that VINNOVA, in consultation with the Swedish Research Council, is to support the HEIs' development of strategies for cooperation with the external community, and to work to ensure that research-based knowledge is utilised (NRP2014).

Also, innovation offices within all universities in Sweden have a special assignment to work with knowledge transfer at universities and very early stage commercialisation.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	55.1 %	2013	ERA survey 2014
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	15 %	2013	ERA survey 2014

Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	0.9 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	89.8 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	74.1 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	0.6 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national	0.2 %	2013	ERA survey 2014

	level)			

The share of research funders in Sweden who responded to the survey and support national support to KT and OI, technology transfer offices (TTOs) and Private Public interaction is lower than the EU average, which may be due to the higher share of basic research funded nationally.

Within the ERA compliant cluster in Sweden, the share of research performing organisations having funding originating from the private sector is higher than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Sweden, the share of research performing organisations having or using a structure for knowledge transfer activities is higher than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Sweden, the share of research performing organisations having dedicated staff employed in knowledge transfer activities is higher than within the EU ERA compliant cluster.

Within the ERA compliant cluster in Sweden, the share of research personnel whose primary occupation is in the private sector (in Full Time Equivalents) is lower than within the EU ERA compliant cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

Sweden has implemented a research and education network, which is essential to make digital services possible - SUNET. SUNET's aim is to provide Swedish universities and colleges and other organisations within the research and higher education area with access to well-developed and effective national and international data communication and related services that meet their needs, whatever their geographical location. NUNOC (Nordic University Operations Centre) is the 24/7 operations organisation established by NORDUnet to operate and support SUNET's network and services.

Sweden is part of NORDUnet (www.nordu.net) which is a joint collaboration by the five Nordic National Research and Education Net-works in Denmark (Forskningsnettet), Finland (Funet), Iceland (RHnet), Norway (Uninett) and Sweden (SUNET) and operates a world-class Nordic and International network and e-infrastructure service for the Nordic research and educational community. It is a member of GÉANT, which is the pan-European research and education network that interconnects Europe’s National Research and Education Networks (NRENs).

With regard to digital services, Sweden provides federated services.

Indicator	**Level/cluste**	**Value**	**Year**	**Source**

	r			
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	95.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	2.2 %	2013	ERA survey 2014

Within the ERA compliant cluster in Sweden, the share of research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.) is higher than within the EU ERA compliant cluster.

6.4. Uptake of federated electronic identities

Sweden was a member of an identity federation in 2011. Sweden is member of eduGAIN through the Swedish Academic Identity - SWAMID, operated via SUNET. eduGAINis a service that is intended to enable the trustworthy exchange of information which is related to identity, authentication and authorisation between the GÉANT (GN3plus) Partners' federations.

Indicator	**Level/cluste r**	**Value**	**Year**	**Source**
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic	ERA compliant cluster (national	17.3 %	2013	ERA survey 2014

identities for their researchers	level)			
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

Within the ERA compliant cluster in Sweden, the share of research performing organisations providing federated electronic identities for their researchers is lower than within the EU ERA compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 26 research performing organisations in Sweden answered the 2014 ERA survey, which represents 32.8% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in Sweden shows that 41.7 % of them are in the 'ERA compliant' cluster, 33.3 % can be classified in the 'limited compliance to ERA' cluster and 25.0 % of organisations in the 'ERA principles are not applicable' cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of 'weighted' organisations are 95.8 % for the 'ERA compliant' cluster, 4.0 % for the 'ERA limited compliant' cluster and 0.2 % for those organisations where ERA principles are not applicable.

For the indicator 'Share of research performing organisations having or using a structure for knowledge transfer activities' and 'Share of research performing organisations having dedicated staff employed in knowledge transfer activities', it can be noted that organisations in the 'ERA not applicable cluster' have a relatively high level of implementation.

For the indicator 'Share of research performing organisations providing federated electronic identities for their researchers', the figure may be an underestimation. According to official sources, approximately 50 % of all universities/university colleges in Sweden can provide researchers with federated electronic identity.

For the section on open innovation and knowledge transfer, it should be considered that the major technology engineering organisations did not respond to the ERA survey.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013
Project-based funding applying the core principles of international peer review			
Funding scheme aimed at most prominent researchers in Sweden	2013	X	X
Institutional funding based on institutional assessment			
Universities autonomy reform	2010		
2008 Research Bill	2008		
Government Bill 2012/Research and innovation	2012	X	
Government Bill 2012/Research and innovation	2012	X	
Implementing joint research agendas			
Strategic Research Areas	2008		
Openness for international cooperation with third countries and regions			
Strategy for international cooperation in research and research-based innovation	2012	X	
Interoperability, mutual recognition of evaluation results and other schemes			
Excellence' funding programs: 2006 and 2008 Linnaeus Grants and the 2009 Strategic Research Areas grants	2006		
Nordic Cooperation / Nordforsk / Top-level Research Initiative	2008		
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
National research infrastructure roadmap	2011		
Financial commitments to European Spallation Source (ESS), MAX IV	2009		
Access to research infrastructures of pan-European interest			
Access to MAX IV, ESS and SciFiLab			

Open, transparent and merit-based recruitment of researchers			
Euraxess web portal	2011		
Attractive careers			
Incentivize HEI to make international recruitment of prominent researchers	2013	X	X
Supporting structured innovative doctoral training programmes			
Measures to improve competitiveness of doctoral studies	2013	X	X
Gender balance in the decision-making process			
Law on gender balance and government instruction to the Swedish Research Council	2010		
Delegation for Gender Equality in the Higher Education Sector	2010		
Grant for practical equality research during 2013-2014 to Vinnova	2013	X	X
Vinnmer programme, replaced in 2014 ny Mobility and Growth programme	2013	X	X
Open access to publications and data resulting from publicly funded research			
Government Bill 2012/Research and Innovation (research data)	2012	X	
Government bill 2012:13:30 Research and Innovation (Scientific publications)	2012	X	
Open innovation and knowledge transfer between public and private sectors			
Government bill 2012/Research and Innovation	2012	X	
Innovation strategy	2012	X	
Harmonise policies for public e-infrastructures and associated digital research services			
SwePub database, OpenAccess.org	2010		

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

Research and innovation policies are the responsibility of the Ministry of Economic Development and Technology (MEDT) for technology policy, and the Ministry of Education, Science and Sports (MESS) is in charge of the education and science sectors as well as sports, with two Directorates: one in charge of higher education and the other in charge of science. The National Assembly is the top legislative body, and its two committees (Committee for Education, Science, Culture, Sport and Youth, and Committee for Economy) are in charge of discussing the legal and policy documents related to research and development (R&D) policy. Once cleared by the committees, the main legal documents (the Law on Research and Development, the National Research and Development Programme) are passed on to the Assembly for approval. Research support is provided mainly by the Slovenian Research Agency (ARRS) and by SPIRIT, the Public Agency of the Republic of Slovenia for the Promotion of Entrepreneurship, Innovation, Development, Investment and Tourism, which was established in 2012.

Slovenia currently supports sectors, strategies and products by funding of eight centres of excellence, seven competence centres and 17 development centres, which are all co-funded by structural funds. Annual calls by the Research Agency and SPIRIT are not limited to any priority field.

In 2010, the country adopted the Research and Innovation Strategy of Slovenia (RISS) 2011-2020, which covers virtually all activities in the field of R&D. It fosters the horizontal coordination of research and innovation (R&I) policies and a shift towards a target-oriented budget, aiming at a higher quality of life for all, using a critical reflection of society, an efficiency in addressing societal challenges and an increased added value per employee, while providing more and better jobs. The National Higher Education Master Plan (NHEMP) 2011-2020 was also adopted in 2010 and addresses a number of issues related with tertiary education. However, these strategies have only been partly implemented.

The Smart Specialisation Strategy for the period 2014-2020 period is being prepared.

In june 2014, the Council recommended that Slovakia streamlines priorities and ensure consistency between the 2011 Research and Innovation and the 2013 Industrial Policy Strategies with the upcoming strategies on Smart Specialisation and Transport, and ensures their prompt implementation and assessment of effectiveness.

In terms of R&I funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in Slovenia represented EUR 92 per inhabitant in 2012 (EUR 179 in the EU-28). In 2013, the GBAORD per inhabitant was the same (EUR 92). In 2012, the total GBAORD corresponded to 1.1 % of total government expenditures and 0.5 % of gross domestic product (GDP)(Eurostat).

The analysis of the evolution of the GBAORD in the period during the economic crisis (2007-2012) shows some differences. In nominal terms, the growth rate of total GBAORD in

Slovenia has been higher than the growth rate of of the total EU GBAORD. The GBAORD as a share of GDP has regressed in Slovenia but less than the evolution observed in the EU-28.

A new law has entered into force to strongly promote R&I investment in the form of tax incentives (100 % tax incentives to stimulate further business investments in R&D).

1.2. Project-based funding applying the core principles of international peer review

With regard to project-based funding, there are no official figures for Slovenia in 2012 and 2013. The Ministry of Education, Science and Sport allocates structural funds for R&D, based on competitive calls for projects. In addition, it allocates national funds to finance participation and construction of ESFRI projects and some other large Ris. This part is allocated non-competitively. Project-based funding includes researchers' salaries (up to 50 %).

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	24.9 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in Slovenia who responded to the survey and support project-based funding is lower than the EU average.

The core principles of international peer review are applied in Slovenia. Since 2008, the Management Board and Scientific Council of the Slovenian Research Agency adopted (i) rules on the procedures for (co-)financing and monitoring the implementation of research activities, and (ii) a methodology for evaluating applications to calls for proposals which are in line with EU standards. Funding agencies are independent and they base their decisions on excellence. There are no thematic priorities.

1.3. Institutional funding based on institutional assessment

Slovenia does not allocate institutional funding for R&D to research performing organisations. The institutional funding provided under the founder's obligations comprises part of the administrative costs, the fixed operating costs and the fixed costs of maintaining and repairing property and equipment. This implies that institutions have little room for manoeuvre in terms of strategic management. However "stable" funding is allocated directly to research groups. Research groups are evaluated every 3-5 years, which, in rare cases (cca 5%) may result in discontinued funding of some research groups. In such a case, the funds are reallocated to another group within the same institution, so that the total funding on

institutional level does not change. Consequently, "Share of institutional funding allocated on the basis of institutional assessment" is reported to be 0.

The National Reform Programme 2013 proposes to increase the institutional funding that is linked with the regular evaluation of research institutes and universities.

However, the situation may evolve in the future because national authorities have indicated that it is necessary to allocating a larger share of the funding to the basic institutional funding in order to empower the institutions (research centres and universities) to develop a strategic management within their organisations.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	7.9 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

The share of research funders in Slovenia who responded to the survey and support institutional assessment for the allocation of institutional funding is lower than the EU average.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It supports also bilateral and multilateral initiatives.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	1.3 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014

Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	National level	0.7 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders' total budget in Slovenia allocated to transnationally coordinated R&D is lower than the EU average.

The share of responding funders' research and development budget in Slovenia dedicated to jointly defined research agendas with other EU organisations is lower than the EU average.

Cooperation between institutions of Member States, Associated Countries and Third Countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of Slovenia's participation in the total participation is 0.8 % and the country received 0.4 % of the total European Commission contribution. FP7 funding represents EUR 74 per inhabitant (the EU average is EUR 72 per capita) for the period 2007-2013 and 4.5 % of the gross domestic expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average is 3 % of GERD for the same period). The RISS supports to intensifying cooperation within the European Union, especially in EU programmes and networks. Within this, a strong link between public-private research activities should be formed, further encouraging enterprises to participate with their R&D activities in the EU multilateral R&D and innovation programmes.

Concerning joint programming initiatives, the country participates in four of the ten ongoing initiatives. These initiatives are Neurodegenerative diseases (Alzheimer), Cultural heritage and global change: a new challenge for Europe, Healthy diet for healthy life and Connecting climate knowledge for Europe.

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in three programmes in FP7. In Horizon 2020, the country is already involved in three of the four existing initiatives.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 39 ERA-Nets, of which seven are currently still running. The country has also participated in seven ERA-Net Plus actions - of which three are still running (CORE organic plus, HERA JRP CR and WSF) - in areas with high European added value and additional EU financial support topping up their joint call for proposals.

Concerning research agreements with EU Member States and/or Associated Countries, Slovenia participates with Greece, Belgium and Switzerland. Additionally, the country participates in the European Strategy for the Danube Region (EUSDR), a multilateral (and macro-regional) strategy, which has been developed by the Commission in cooperation with 11 countries in the Danube region (Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine). It comprises science and technology cooperation across the region, and by the end of 2013, six scientific clusters had been launched, for example, a cluster in energy and sustainability research.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the country has not developed a specific policy. However, the RISS exposes the necessity for strong bilateral cooperation in the field of R&D, especially with the BRIC countries (Brazil, Russia, India and China). The RISS also states that the scientific cooperation should be improved with the most advanced countries, while for the South-eastern European countries (Western Balkans), Slovenia should become a 'hosting country for their excellent researchers and enterprises'. In 2012, the SRA co-financed 584 bilateral projects with 25 countries, which mainly covers the travel expenses of Slovenian researchers abroad and the daily costs of foreign researchers in Slovenia.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	0.7 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third	ERA compliant cluster (national	0 %	2013	ERA survey 2014

countries	level)			
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0 %	2013	ERA survey 2014

The share of responding funders' research and development budget in Slovenia allocated to collaboration programmes carried out with third countries is lower than the EU average.

Within the ERA compliant cluster in Slovenia, the organisations do not receive funding from third countries.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

Mutual recognition of evaluations that conform to international peer-review standards is supported by the Slovenian Research Agency, wich plays the role of the ‘executing agency’ following the lead agency decisions and adopting their evaluations as the domestic ones. One such case is the case of Slovenian-Belgian Flemish cooperation, where the Flemish evaluation is taken as the Slovenian one. The Slovenian Research Agency is a member of the European Science Foundation Forum on Peer Review. The Slovenian Research Agency undersigned one Memorandum of Understanding (MoU) on the unilateral administration and mutual recognition of evaluation procedures with the Austrian Science Fund (FWF). In 2014, Slovenia signed a Lead Agency Agreement (ARRS-OTKA) - Memorandum of Understanding with the Hungarian Scientific Research Fund, OTKA. When researchers from Slovenia are positively evaluated in an international peer review but not selected at the calls of the European Research Council (ERC) or by EUROCORES at the European Science Foundation, they can present their candidature in national call for the complementary scheme, which is permanently opened. In terms of interoperability, the legislation is in favour of cross-border cooperation and some measures have been adopted by the SRA, but progress is hindered by a single factor: the use of the Slovenian language. For example, only a few calls for projects/applications are prepared on a bilingual basis (Slovenian-English): it is the same with the issue of basic legal documents.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	67.2 %	2013	ERA survey 2014

Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	1 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in Slovenia who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is higher than the EU average.

The share of responding funders' project-based research and development budget in Slovenia allocated through peer review carried out by institutions outside the country is higher than the EU average.

3. RESEARCH INFRASTRUCTURES

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

Slovenia participates in the following large international research infrastructures: European Space Agency (ESA), Conseil Européen pour la Recherche Nucléaire (CERN) and European Fusion Development Agreement (EFDA). In 2012, the country contributed 0.02 % of the GBAORD to the activities carried out by CERN and the European Commission’s Joint Research Centre (JRC) (Eurostat).

In terms of participation into the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of eight (16 %) of them. In terms of financial commitments to the development of these research infrastructures (Ris), Slovenia is committed to funding five of them. They are: CESSDA, DARIAH, ESSurvey , SHARE-ERIC and FAIR. The convention on FAIR has been ratified by Slovenia, in which the country is planning to invest over EUR 20 million (around EUR 2.1 million in 2013). The Ministry of Education, Science and Sport allocates national funds to finance participation and

construction of ESFRI projects and some other large Ris. This part is allocated non-competitively.

With regard to participation in the European Research Infrastructure Consortium (ERIC), Slovenia is involved in two of the seven consortia that adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest involving several European countries. The country is member of SHARE-ERIC and of European Spallation Source Survey (ESS ERIC).

In terms of support to the development and implementation of research infrastructures, the national Roadmap on Research Infrastructures (RIR) was published in 2010-2011. The RISS proposes a systematic support to research infrastructure consortia, which will enable their successful operation, long-term management and development of integrated services with regards to specific needs in particular areas, open access, necessary training for users, efficient use of equipment, and provision of support to users in interpreting the results. The roadmap includes references to the participation of Slovenia in the development of the research infrastructures mentioned in the ESFRI Roadmap and includes planned expenditure per ESFRI project. RIR 2011-2020 also exposes the necessity to enhance the cross-border development of research infrastructures, especially in fields where comparable research equipment in Europe or the comparable infrastructure in the neighbourhood is not available. The National Reform Programme 2014 confirms that Slovenia is implementing the national programme in the field of research infrastructures and is actively participating in the establishment of the ERIC. It also indicates that the upgrading of infrastructure for research and innovation and capacities for development of excellence in research and innovation, and the promotion of competence centres, especially those of European interest, will be one of the investment areas defined in the Partnership Agreement for the use of European Structural and Investment (ESI) Funds.

3.2. Access to research infrastructures of pan-European interest

Access to research infrastructures is available to those already established (cf. Centres of Excellence etc.) as nationals and foreign citizens. However, Slovenia has quite complex legislation regarding fees for the use of RIs. Since 2009, the European Commission has funded access to five of the research infrastructures coordinated by Slovenia: TANIJS, P3-IMI-MF, SLONMR, SLONMR, JSI TRIGA REACTOR.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for Slovenia in the Researchers' Report 2014 [http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Slovenia Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

There were 8774 FTE researchers in Slovenia in 2011. This represents 8.6 researchers per 1000 labour force compared with 7.6 among the Innovation Union reference group (Innovation Followers) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 12.7 in Slovenia compared with 72.3 among the Innovation Union reference group and an EU average of 43.7.

In 2012, 41 % of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (More2 survey, 2012).

The fundamental recruitment system for researchers in public research and higher education institutions is based on general rules which are mandatory for all public servants in Slovenia. Additionally, the Slovenian Research Agency, which is responsible for funding, evaluation and distribution of national public funds for research activities, provides merit-based, open and transparent rules on funding different research activities (programmes, projects, young researchers, international cooperation, science meetings etc.) The Agency provides transparent procedures for evaluation and selection by public calls. All criteria and indicators, including the research and bibliometric references for evaluation and selection, are publicly available through its website.

4.3. Attractive careers

The Slovenian Rectors Conference signed the ‘Charter & Code’ principles in 2008. By May 2014, 5 Slovenian organisations were involved in the Commission’s Human Resources Strategy for Researchers of which 3 had received the "HR Excellence in Research" logo for their progress in implementing the Charter & Code.

The Research and Innovation Strategy of Slovenia 2011-2020 sets out to achieve greater development of human resources by increasing funding. The Strategy aims to attract excellent research staff with new incentives in the fields of tax, labour and immigration inter alia, and including the mobility of researchers between public research organisations and business. The Strategy also provides for more funds to be available for areas designated as national priorities based on Slovenia's recognised competencies and competitive advantage in science and business. In addition, the Strategy calls for national efforts in support of the development of research careers comparable to international efforts, regardless of the area of research work, and primarily in conformity with the premises of the European common framework for the development of careers in scientific research.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 1.7 in 2011 compared with 1.6 among the Innovation Union reference group and an EU average of 1.7.

The main idea of the National Higher Education Programme 2011-2020 is that Slovenian higher education must be of quality and to enable excellent scientific and research development. Its goals included some which are also relevant to increasing the quality of doctoral training like the internationalisation of study programmes, students and professors as well as research staff. A very successful example of doctoral study is the Jožef Stefan International Postgraduate School (IPS) established by the Jožef Stefan Institute (JSI)in 2004 as an independent higher education institution. It is strongly supported by industry (Gorenje, Kolektor and Salonit) and an international network of cooperating universities and research institutes from the European Union, Japan, the USA, and a number of other countries.

One of the main instruments for funding doctoral candidates in Slovenia is the Young Researchers, programme. It has a long tradition and has contributed significantly to increasing the quality and scope of research and to new recruitment procedures for research teams. Through this programme, Slovenia strives to renew human resources in research and education organisations, increase the research capacity of research groups and raise human resource potential in both the private and public sectors. Young Researchers participate in basic or applied research projects during their postgraduate studies. They also sign regular, fixed-term employment contracts. They receive their salaries, social contributions, and material and non-material costs for research and postgraduate study.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU-27 Member State was 7.2% in Slovenia compared with 18.4 % among the Innovation Union reference group and an EU average of 7.7%. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 6.4% in Slovenia compared with 16.9% among the Innovation Union reference group and an EU average of 24.2%.

The Slovenian Research Agency annually runs a public call to co-finance renowned researchers from abroad. It co-finances an uninterrupted three-month working visit by a renowned foreign researcher to a Slovenian research group with the aim of improving the research performance of that group and preparing a joint paper for a top-ranking journal. During these three months, the foreign researcher must give at least two public lectures that are at least one month apart. The public call is launched yearly for up to eight renowned foreign researchers working in the fields of natural, technical, medical, biotechnical, social or human sciences. Insecure career prospects and low salaries are the main obstacles to inward mobility of Slovenian researchers. For foreign researchers, unattractive pay is the main obstacle to moving to Slovenia to work.

The Young Researchers Programme stimulates the international mobility of doctoral candidates.

The Young Researchers in the Economy programme is designed to introduce more highly educated staff into private companies and stimulate companies to hire young graduates to enhance their R&D and innovation activities. The support is mainly financial, providing co-financing for salaries and some materials costs for a young researcher who is employed in a

company while pursuing a PhD at the university. Through this support the young researcher engages in research work with mentoring by both the company and university. The programme was run by SPIRIT Slovenia in the 2007-2013 financial cycle and was co-financed by the European Social Fund. The beneficiaries are enterprises and technology centres − as employers of young researchers, and research organisations and universities – as providers of formal education.

5. GENDER

5.1. Foster cultural and institutional change on gender

The fifth priority of RISS 2011-2020 indicates that legal and other barriers should be removed for improving the recruitment, career progression and retention of women in science and to focus attention onto the role of gender in research. A consultative body Commission for women in Science organises debates, publishes some materials, opens discussions etc. However, the Action Plan for improving career opportunities for researchers in all career periods, which should detail the corresponding areas and activities, remains under preparation. Slovenia has set up a gender equality strategy in research institutions but the gap between men and women is not markedly large in research.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting gender equality in research	National level	100 %	2013	ERA survey 2014
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (national level)	6.1 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	Limited compliance to ERA cluster (national level)	4.7 %	2013	ERA survey 2014

The share of research funders in Slovenia who responded to the survey and support national policies on gender equality in public research is higher than the EU average.

Within the ERA-compliant cluster in Slovenia, the share of research-performing organisations that have adopted Gender Equality Plans is lower than that within the EU's ERA-compliant cluster.

Men and women are treated equally in all procedures, even after maternity leave, which can be divided between a man and a woman on the basis of their respective decision. The law guarantees that after the end of the maternity/paternity leave, both (men and women) will return to the same positions.

The Slovenian Scientific Foundation participates in conducting with the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and L'Oréal programme 'For Women in Science' which grants scholarships for female researchers (up to three per year).

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	6.1 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	49.2 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovenia, the share of research-performing organisations implementing recruitment and promotion policies for female researchers is lower than that within the EU's ERA-compliant cluster. However, the share of research performing organisations implementing recruitment and promotion policies for female researchers in the limited compliance cluster is high.

There seems to be no national policies fostering gender as criteria in research programmes.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting the inclusion of gender dimension in research content	National level	0 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	0.6 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	45.1 %	2013	ERA survey 2014

The research funders in Slovenia who responded to the survey did not indicate support for the inclusion of gender dimension in research content/programmes.

Within the ERA compliant cluster in Slovenia, the share of research performing organisations which include the gender dimension in research content is lower than within the EU ERA compliant cluster. However, the share of research performing organisations which include the gender dimension in research content in the limited compliance cluster is high.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision-making, the Ministry of Education, Science and Sport (MESS) is committed to complying with the principle of gender-balanced representation in the composition of all bodies appointed in the field of science, in accordance with the Resolution on the National Programme for Equal Opportunities for Women and Men for 2010-2011. There is no positive action, for example in the inclusion of quotas.

The Slovenian government has set national targets on the gender composition of expert bodies, public research institutions and agencies, requiring those bodies to be composed of a minimum of one-third of both sexes. Within the Slovenian Research Agency (ARRS) there is a Regulation on the operation of permanent and temporary expert bodies for research, stating that such bodies should be composed of at least one-third of either gender – one-fifth in technical sciences.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (EU level)	33.6 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	17.8 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	11.1 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	75 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovenia, the share of gender-balanced recruitment committees for leading researchers in research-performing organisations is lower than that within the EU's ERA-compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in Slovenia is higher than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access (OA), the Slovenian Research Infrastructure Roadmap 2011-2020 indicates that results from publicly funded research must be available to the public. It also points out that digitalisation and public access of digitalised materials should be systematically regulated and upgraded.

Related to open access to publications, there is still no national policy. However, there are some measures supporting green open access.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting open access to publications	National level	32.8 %	2013	ERA survey 2014
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	17.3 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	16.2 %	2013	ERA survey 2014

The share of research funders in Slovenia who responded to the survey and support open access to publications is lower than the EU average.

Within the ERA-compliant cluster in Slovenia, the share of publicly funded scientific publications in OA amongst research performing organisations is similar to that within the EU's ERA-compliant cluster.

Concerning open access to data, no specific policy has been identified.

Indicator	Level/cluste	Value	Year	Source

	r			
Share of responding funders supporting open access to data	National level	0 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (EU level)	54.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national level)	6.1 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	Limited compliance to ERA cluster (national level)	28.1 %	2013	ERA survey 2014

Research funders in Slovenia who responded to the survey indicated that they do not have measures to support open access to data.

Within the ERA-compliant cluster in Slovenia, the share of research performing organisations making publicly funded scientific research data available online and free of charge is lower than that within the EU's ERA-compliant cluster. However, the share of research-performing organisations making scientific research data available online and free of charge in the limited compliance cluster is high.

With respect to repositories, the RIR exposes the fact that a national repository of scientific data should be established, stating that storage and access to scientific data (a national repository) must be provided. Such a central national repository system, which must have the ability to connect to the Slovenian current research information system (SICRIS), will connect to EU repositories, thus increasing the visibility and value (citation) of Slovenian science worldwide. The national library (NUK), known as the 'NUK network' presents an entry point for access to national and international sources and databases. Some universities' libraries (Dikul, Dkum, University of Primorska library) focus more on specific topics and are a deposit for some research papers, research reports, etc. being produced at their faculties (member of each university). The Institute of Information Science (IZUM) is a public

institution that is an information infrastructural service for Slovenian science, culture and education.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to open innovation and knowledge transfer (KT) between public and private sectors, the Research and Innovation Strategy of Slovenia (RISS) proposes co-financing, until 2020, activities in the business sector for strengthening education and training the employed in the R&D area, and making organisational improvements in this area. It also proposes the following measures: the regulation of intellectual property rights among stakeholders for the commercialisation of research results and the establishment of support for patenting by public research organisations (PROs). The current legislation makes it very difficult for PROs or higher educational institutions (HEIs) to establish a spin-off, since it requires special permission to be issued by the government. Funding organisations are not supporting the professionalisation of knowledge transfer activities.

Strategic partnership and/or the definition of joint collaborative research agendas between academia and industry are supported in Slovenia. The establishment of centres of excellence and centres of competence seek to bridge the gap between academia and industry. The eight centres of excellence are high-quality multidisciplinary groups of researchers from both academic and business spheres, combining critical mass of knowledge and adequate research infrastructure for a potential breakthrough to top-level science and/or for inclusion in international networks of excellence. They contribute to the efficient flow of knowledge and applications into products and services.

Seven competence centres are defined as research development centres, run by industrial partners, which connect partners from the economic and public research sectors, and aim at strengthening development capability and the use of new technologies for the development of new competitive products, services and processes in the priority areas of technological development. Also, the Research Voucher programme helps enterprises to commission research at R&D institutes and HEIs for a period of three years. Funding is allocated on a first come, first served basis. Furthermore, there is support for the implementation of research training agreements with private sector organisations and to structured programmes for placements in the private sector for researchers.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	100 %	2013	ERA survey 2014
Share of responding funders supporting the implementation of	EU level	82.9 %	2013	ERA survey

knowledge transfer as part of its institutional and/or project-based funding				2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	0.4 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	9.6 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	13.3 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	Limited compliance to ERA cluster (national level)	42 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research	ERA	13.3 %	2013	ERA survey

performing organisations having dedicated staff employed in knowledge transfer activities	compliant cluster (national level)			2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	Limited compliance to ERA cluster (national level)	42 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	1.2 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	1.3 %	2013	ERA survey 2014

The share of research funders in Slovenia who responded to the survey and support KT and OI, TTOs and Private Public interaction is higher than the EU average.

Within the ERA-compliant cluster in Slovenia, the share of research performing organisations having funding originating from the private sector is lower than that within the EU's ERA-compliant cluster. However, the share of research performing organisations having funding originating from the private sector in the limited compliance cluster is high.

Within the ERA-compliant cluster in Slovenia, the share of research-performing organisations having or using a structure for knowledge transfer activities is lower than that within the EU's ERA-compliant cluster. However, the share of research performing organisations having or using a structure for knowledge transfer activities in the limited compliance cluster is high.

Within the ERA-compliant cluster in Slovenia, the share of research-performing organisations having dedicated staff employed in knowledge transfer activities is lower than that within the

EU's ERA-compliant cluster. However, the share of research performing organisations having dedicated staff employed in knowledge transfer activities in the limited compliance cluster is high.

Within the ERA-compliant cluster in Slovenia, the share of research personnel whose primary occupation is in the private sector (in full-time equivalents) is lower than that within the EU's ERA-compliant cluster, but it is quite important in the case of the limited compliance to ERA cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

As regards the implementation of Digital ERA, the country has implemented a research and education network, essential to make digital services possible. ARNES is the Slovenian National Research and Education Network (NREN), a specialised internet service provider dedicated to supporting the needs of the research and education communities within the country. Concerning the development of e-infrastructures, the Slovenian Research Agency channels the funding for the development of digitalisation and knowledge access for all Slovenian libraries and the interested public (COBISS), notably through its infrastructural financing. Because it is funded by public funds, COBISS is available for all internet users.

Concerning digital services, the country provides federated services, cloud services, and premium services, such as consultancy services.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	13.9 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	38.4 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovenia, the share of research-performing organisations providing digital research services (i.e. cloud services, a research collaboration platform, etc.) is lower than that within the EU's ERA-compliant cluster. However, the share of research performing organisations providing digital research services in the limited compliance cluster is high.

6.4. Uptake of federated electronic identities

Slovenia was a member of an identity federation in 2011. The country is also a member of eduGAIN, a service intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) partners' federations.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	13.9 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	62.6 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovenia, the share of research-performing organisations providing federated electronic identities for their researchers is lower than that within the EU's ERA-compliant cluster. However, the share of research performing organisations providing federated electronic identities to their researchers in the limited compliance cluster is high.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 19 research performing organisations in Slovenia answered the 2014 ERA survey, which represents 17.1% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in Slovenia shows that 15.8 % of them are in the 'ERA compliant' cluster, 68.4 % can be classified in the 'limited compliance to ERA' cluster and 15.8 % of organisations in the 'ERA principles are not applicable' cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of 'weighted' organisations are 13.9 % for the 'ERA compliant' cluster, 80.5 % for the 'ERA limited compliant' cluster and 5.6 % for those organisations where ERA principles are not applicable.

However, it should be highlighted that two major RPOs did not respond to the survey. Also, the high share of institutions in the limited ERA compliant cluster may reflect the fact that one tool to foster ERA is performance based institutional funding, which is non existant in Slovenia.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013
Research and innovation system			
National smart specialisation strategy	2014	X	X
Project-based funding applying the core principles of international peer review			
Research and Innovation Strategy of Slovenia	2011		
Methodology for evaluating applications, adopted by the Slovenian Research Agency to calls for proposals	2008		
Law on Research and Development	2011		
Institutional funding based on institutional assessment			
Research and Innovation Strategy of Slovenia	2011		
Implementing joint research agendas			

Research and Innovation Strategy of Slovenia	2011		
Interoperability, mutual recognition of evaluation results and other schemes			
Memorandum of Understanding on the unilateral administration and mutual recognition of evaluation procedures with the Austrian Science Fund (FWF)	2010		
Memorandum of Understanding with the Hungarian Scientific Research Fund, OTKA	2014	X	X
Lead agency agreement with Flemish Research Foundation	2012	X	
Research and Innovation Strategy of Slovenia	2011		
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
Research and Innovation Strategy of Slovenia and the Research Infrastructure Roadmap	2011		
Access to research infrastructures of pan-European interest			
Research and Innovation Strategy of Slovenia	2011		
Attractive careers			
Euraxess SI			
Gender balance in the decision-making process			
GENDER-NET (ERA-NET project)	2013	X	X
Research and Innovation Strategy of Slovenia	2011		
Normative act of Slovenian Research Agency (SRA)	2008		
Principle of Equal Treatment Act	2004		
Open innovation and knowledge transfer between public and private sectors			

Slovenian tax guide 2013	2013	X	X
Development centres Centres of excellence Competence centres	2010		
Co-financing of PhD training programme	2010		
Harmonise policies for public e-infrastructures and associated digital research services			
Research and Innovation Strategy of Slovenia and the Research Infrastructure Roadmap	2011		
Uptake of federated electronic identities			
eduGAIN			

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

Research and innovation policies are the responsibility of the Ministry of Economy (ME) and the Ministry of Education, Science, Research and Sports (MESRS). The latter is the highest governmental body responsible for policy- and decision-making in the field of science and technology.

The national science and technology policy is prepared and coordinated by the MESRS in cooperation with other ministries, the Slovak Academy of Sciences (SAS), higher education institutions (HEIs), associations of employers, and industrial research organisations. The Slovak Government Council for Science, Technology and Innovations (SGCI) is the most important body for the coordination of science and technology (S&T) policies and coordinates central government agencies involved in the development of the knowledge-based economy.

The main public bodies responsible for allocating research funds are the Ministry of Education, Science, Research and Sports (MESRS) and the Slovak Academy of Science (SAS). Both the MESRS and SAS have their own chapters in the State Budget Laws. The MESRS directly funds the HEIs, the Research and Development Agency (RDA) and the VEGA (Scientific Grant Agency, Grantová agentúra) and KEGA (Cultural and Educational Grant Agency) grant agencies (addressing higher education as well as the Academy of Sciences; and humanities, respectively). The MESRS also manages the Structural Fund Agency (ASFEU). The ASFEU is the implementing agency for the Operational Programme 'Research Development', a major source of European funding for the Slovak research system. The RDA provides for tendering and funding grants to public and private research bodies. The agency has become an increasingly important source of finance for many Research and development (R&D) activities, in particular applied research. The SAS consists of 69 research organisations, of which 48 are budgetary and 21 are subsidised.

At the end of 2013, the country adopted the Research and Innovation Strategy for Smart Specialisation of the Slovak Republic (RIS3) of Slovakia. It presents several far-reaching reforms: (i) merging eight incumbent research, development and innovation (RDI) government agencies into two: the Science Agency and the Technology Agency; (ii) changing the proportion of support to basic and applied research from the current ratio of 2:1 to 1:2 by 2020; (iii) introducing a ‘mandatory indicator of the state support to R&D as a percentage of GDP [gross domestic product] in the State Budget Law’, and (iv) re-organising HEIs and transforming the Slovak Academy of Sciences.

In June 2014, the Council recommended that Slovakia Improves the quality and relevance of the science base.

In terms of research and innovation (R&I) funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in Slovakia represented EUR 55 per inhabitant in 2012 (compared to an average of EUR 179 in the EU-28). In 2013, the

GBAORD per inhabitant declined to EUR 49. In 2012, the total GBAORD corresponded to 1.1 % of total government expenditures and 0.4 % of gross domestic product (Eurostat).

The analysis of the evolution of the GBAORD in the period during the economic crisis (2007-2012) shows that in nominal terms, the growth rate of total GBAORD in Slovakia has been higher than the growth rate of total EU GBAORD. The GBAORD as a share of GDP has evolved positively in Slovakia, even when it regressed at the EU-28 level.

The 2013 National Reform Programme indicated that overall expenditures on science, research and innovation should amount to 1.2 % of GDP in 2020. Amendments to the Act on Research and Development Incentives and the Act on the Organisation of State Support for Research and Development should ensure ‘clear, predictable and equal criteria’ for the funding of R&D in public research organisations (PROs) and private companies. According to the NRP, the PROs will be better motivated to ‘improve cooperation with the private sector and recruit high-quality researchers’.

1.2. Project-based funding applying the core principles of international peer review

Public HEIs can apply for three types of national research grants. These are provided by the VEGA Grant Agency, the KEGA Grant Agency and the Research and Development Agency (RDA). The VEGA grants supporting basic research in HEIs and the Slovak Academy of Sciences (SAS) are traditionally labelled as institutional funding (in terms of being designed solely for public HEIs and the SAS) but are allocated on a competitive basis. The KEGA grants supported pedagogic innovations in HEIs. The competitive RDA grants fund basic and applied research in all HEIs, the SAS and private research bodies. In 2012, the SAS allocated around 15.9 % of its budget as project-based (not accounting structural and investment funding, Seventh Framework Programme projects and other sources of income). Slovak HEIs and the SAS also participated in projects funded from the structural and investment funds (the Operational Programme 'Research and Development' (OPRD) and the Operational Programme 'Education' (OPE). The projects were channelled via the Structural Fund Agency of the Ministry of Education, Science, Research and Sports.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	100 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in Slovakia who responded to the survey and support project-based funding is higher than the EU average.

The core principles of international peer review are used to evaluate all national public competitive funding. The rules for the VEGA, KEGA and the Research and Development Agency (RDA) grants are that applications are peer-reviewed. One peer reviewer should be foreign researcher. These agencies and accreditation commissions mostly engage experts from the Czech Republic (for reason of language and cultural proximity) or Slovak citizens employed with foreign higher education and research institutions. The structural and investment fund projects are evaluated by the domestic evaluators only.

1.3. Institutional funding based on institutional assessment

Funding to RPOs is partly allocated based on institutional assessment.

For HEI, the MESRS while defining the amount of subsidy for research, development or artistic activities, the research, development or artistic capacity of the public higher education institution, the achieved results in the field of science, technology or art, evaluation of research, development, artistic and other creative activity of the public higher education institution by Accreditation Commission within the framework of complex accreditation and classification of the public higher education institution among research universities, university-type higher education institutions or non-university type higher education institutions, are decisive, Other criteria for funding allocation includes: share of a HEI in total foreign R&D grants for Slovak HEIs; share of a HEI in total domestic R&D grants for Slovak HEIs; share of a HEI in total number of Doctor of Philosophy (PhD) students in Slovakia; share of a HEI in total scientific publications in Slovakia; and share of a HEI in total art output in Slovakia. The Accreditation Commission of the Slovak Government evaluates the higher education institutions every six years.

The organisations of the SAS have been evaluated regularly by their own Accreditation Commission since 1992. The scientometric indicators prepared by the independent Academic Ranking and Rating Agency were used to assist the work of the Accreditation Commission for the first time. There is a limited link between the evaluation results and support to particular institutes in the SAS. In 2013, the SAS could re-distribute 5 % of the total wage budget based on evaluation results.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	0 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not allocate institutional funding.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It supports also bilateral and multilateral initiatives.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	0 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	National level	0 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not have measures to support transnational cooperation.

The share of responding funders’ research and development budget in Slovakia dedicated to jointly defined research agendas with other EU organisations is zero.

Cooperation between institutions of Member States, Associated Countries and Third Countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of Slovakia's participation in the total participation is 0.4 % and the country received 0.2 % of total European Commission contribution. FP7 funding represents EUR 13 per inhabitant (the EU average is EUR 72 per capita) for the 2007-2013 period and 4 % of the gross domestic expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average is 3 % of GERD for the same period).

Concerning Joint Programming Initiatives (JPIs), the country participates in three of the ten ongoing initiatives. These initiatives are Neurodegenerative diseases (Alzheimer), Cultural heritage and global change: a new challenge for Europe and Healthy diet for healthy life.

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in two programmes in FP7. In Horizon 2020, the country is already involved in two of the four existing initiatives.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 14 ERA-Nets, of which five are currently still running. The country has also participated in three ERA-Net Plus actions - of which one is still running - in areas with high European added value and additional EU financial support topping up their joint call for proposals.

Concerning research agreements with EU Member States and/or Associated Countries, the 2010 New Model of Financing Science and Technology in Slovakia makes the MESRS responsible for the country's participation in cross-border initiatives and it is allocated a budget of EUR 1 million for its activities. Fifteen multilateral schemes support joint research agendas, both with ERA countries and outside the ERA. Slovakia has concluded bilateral agreements on scientific and technological cooperation with the following countries: Austria, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Italy, Poland, Portugal, Serbia, Slovenia, and Spain. In 2012, bilateral schemes supported 135 projects (EUR 0.3 million) with seven ERA countries (Austria, Bulgaria, Romania, the Czech Republic, France, Portugal and Slovenia) and 15 projects (EUR 35 000) with Serbia. Support to mobility schemes did not aim at specific joint research agendas. Additionally, the country participates in the EU Strategy for the Danube Region (EUSDR), a multilateral (and macro-regional) strategy that has been developed by the Commission in cooperation with 11 countries in the Danube region (Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine). It comprises science and technology cooperation across the region and, by the end of 2013, six scientific clusters had been launched, for example a cluster on energy and sustainability research.

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the most important agreements outside the ERA referred to Slovakia’s participation in the Joint Institute for Nuclear Research in Dubna (Russia). There are also bilateral agreements on scientific and technological cooperation with the following countries: China, Egypt, India, the Republic of South Africa, the Russian Federation, South Korea, Ukraine and the United States of America.

Indicator	Level/cluste	Value	Year	Source

	r			
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	0 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (national level)	0.5 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not have measures to support international cooperation with third countries.

Within the ERA-compliant cluster in Slovenia, the share of research and development budget originating from third countries amongst research performing organisations which answered the survey is higher within the EU's ERA-compliant cluster.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

The Slovak 172/2005 Law on the Organisation of the State Support to Research and Development does not allow for interoperability of national R&D programmes, with the exception of bilateral and multilateral cooperation programmes outside joint programming initiatives.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	0 %	2013	ERA survey 2014
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	0 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not have measures to support the allocation of project-based funding on peer- reviewed decisions made by non-national institutions.

Research funders in Slovakia who responded to the survey indicated that they do not allocate project-based funding based on peer-reviewed decisions made by non-national institutions.

3. RESEARCH INFRASTRUCTURES

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

Slovakia participates in the following large international research infrastructures: European Space Agency (ESA), Conseil Européen pour la Recherche Nucléaire (CERN), European Fusion Development Agreement (EFDA), European Synchrotron Radiation Facility (ESRF), European x-ray free election laser (EU.XFEL) and Institute Laue-Langevin (ILL). In 2012, the country contributed 1.9 % of the GBAORD to the activities carried out by CERN, the ESRF, the ILL and the European Commission’s Joint Research Centre (JRC) (Eurostat).

In terms of participation in the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of three (6 %) of them. The "Action plan for building R&D in Slovakia" announces the continued support to the Slovak participation in the ESFRI Roadmap projects in which the country is involved: European XFEL, ESRF, ILL 20/20, ESSurvey, FAIR and PRACE. In terms of financial commitments to the development of these research infrastructures, Slovakia is currently committed to funding one of them: European XFEL.

With regard to participation in the European Research Infrastructure Consortium (ERIC), Slovakia is not involved in any of the consortia that adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest involving several European countries.

In terms of support to the development and implementation of research infrastructures, Slovakia is preparing the Action plan for building R&D in Slovakia. It will propose to build infrastructures that are linked to priority areas for research and development, concentrating on a critical mass of human potential, the necessary technical infrastructure and the necessary competencies of coordination and management. It is expected that the action plan will be connected with the research infrastructures mentioned in the ESFRI roadmap.

3.2. Access to research infrastructures of pan-European interest

In terms of access to research infrastructures, access is provided for foreign researchers under bilateral and multilateral schemes in S&T cooperation.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for Slovakia in the Researchers' Report 2014 [http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Slovakia_Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

There were 15326 FTE researchers in Slovakia in 2011. This represents 5.7 researchers per 1000 labour force compared with 5.3 among the Innovation Union reference group (Moderate Innovators) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 0.2 in Slovakia compared with 39.9 among the Innovation Union reference group and an EU average of 43.7

In 2012, 52 % of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (More2 survey, 2012).

In the Slovak Republic, institutions generally implement their own recruitment policy. The autonomy of the institutions cannot be influenced by the State.

4.3. Attractive careers

The Rector's Conference as well as the Slovak Academy of Sciences have adopted and are implementing the 'Charter & Code' principles.

By May 2014, 2 Slovak organisations were involved in the Commission's Human Resources Strategy for Researchers.

There are several measures to increase researchers' funding opportunities in Slovakia. The VEGA – the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences – offers scientific grants in the fields of basic research in all fields of science. Created in 1996, VEGA is one of the basic financial tools of project-based funding, with a budget of approximately EUR 10 million each year.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 1.9 in 2011 compared with 1.2 among the Innovation Union reference group and an EU average of 1.7.

In 2007, the Ministry of Education, Science, Research and Sport of the Slovak Republic established the Agency of the Slovak Republic for the Structural Funds of EU (ASFEÚ). Its main objective is to ensure the continuous process of acceptance, assessment, financial management and monitoring of projects funded under the EU Structural Funds for the period 2007–13. It carries out activities as the managing authority for the Operational Programme Education and Operational Programme Research and Development. One of the priority axes under the Operational Programme Education is Axis 2 'Life-long Learning as the Basic Principle of a Knowledge Society' with the aim of supporting life-long learning in different R&D sectors and increasing the quality of education. In addition, the update of the Long-Term Plan of the State Science and Technology Policy by 2015 (Phoenix Strategy) promotes life-long learning activities by supporting joint doctoral programmes in English, developing lifelong learning training courses at a post-doc level and encouraging international cooperation schemes between Slovak and foreign institutions.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU-27 Member State was 6.7% in Slovakia compared with 4.2% among the Innovation Union reference group and an EU average of 7.7%. The percentage of non-EU doctoral candidates as a percentage of

all doctoral candidates was 1.4% in Slovakia compared with 5.2% among the Innovation Union reference group and an EU average of 24.2%.

The Slovak Research and Development Agency under the "Programme for Human Potential Support in R&D and Science Popularisation" promotes projects oriented towards the reintegration of citizens of the Slovak Republic with a PhD who had spent more than two years continuously working at research and development institutions abroad. The Ministry of Education, Science, Research and Sport of the Slovak Republic is promoting bilateral cooperation programmes with twelve EU and non-EU countries, thus encouraging scientific collaboration and mobility of researchers. The bilateral calls for cooperation are managed by the Slovak Research and Development Agency (SRDA) and involve the following countries: Austria, Bulgaria, Czech Republic, China, France, Greece, Hungary, Italy, Poland, Portugal, Romania, Russian Federation, Slovenia, Serbia, South Africa, and Ukraine.

The update of The Long-term Plan of the State Science and Technology Policy by 2015 (Phoenix Strategy) encourages researchers to move from the public to the business sector. The SIEA (the Slovak Innovation and Energy Agency) was established under the Ministry of Economy to boost business sector innovation and to support innovation. The Agency aims to strengthen the links between industry and research through the creation of regional innovation structures involving municipalities, universities, academy institutes and firms.

5. GENDER

5.1. Foster cultural and institutional change on gender

Slovakia adopted a number of legislative measures to ensure gender equality in general: the Slovak Constitution (2001), Labour Code Law (2011) and the 365/2004 Antidiscrimination Law pronounce on gender equality. There are no specific actions in support of gender equality in science. This may be explained by the fact that Slovakia accounted for above-average rates of female researcher employment in the R&D sector (42.6 % in Slovakia in 2003-2011, 32.4 % in the EU-27 in 2003-2009). The Slovak Academy of Sciences (SAS) started monitoring gender balance in science in 2000.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014

The share of research funders in Slovakia who responded to the survey did not declare any support to gender equality in public research. No RPO seem to have adopted Gender Equality Plans.

All women in Slovakia are entitled up to the three years maternity leave. The Labour Code (Law No 311/2001) guarantees their return to the same type of work. The only exception to this rule is the fixed-term contract, which does not guarantee the right for returning to the same type of work after maternity leave.

SAS established the Gender Equality Commission in 2005. The cultural change policies are fostered via the Central Information Portal for Science and Technology (2013) which publishes information on Slovak female scientists: the success stories, interviews and profiles of excellent female Slovak researchers. The information is part of the strategy on the 'popularisation of science'.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	9.2 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovakia, the share of research-performing organisations implementing recruitment and promotion policies for female researchers is lower than that within the EU's ERA-compliant cluster.

Some public sector bodies collect evidence on gender issues in science. In 2005, the SAS started to follow gender-mainstreaming policies and established the Commission on Gender Equality to collect statistics on women's participation in doctoral studies, academic funding and evaluation bodies, and managerial posts.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting the inclusion of gender	National level	0 %	2013	ERA survey 2014

dimension in research content				
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	3.4 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	5.9 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not have measures to support the inclusion of gender dimension in research content/programmes.

Within the ERA-compliant cluster in Slovakia, the share of research-performing organisations that include the gender dimension in research content is lower than that within the EU's ERA-compliant cluster.

5.2. Gender balance in the decision-making process

Concerning gender balance in decision-making, no legal provisions are in place to improve gender representation in academic and research committees, boards and governing bodies.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (EU level)	33.6 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers	ERA compliant	2.4 %	2013	ERA survey

amongst responding research performing organisations	cluster (national level)			2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	0.2 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	0 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovakia, the share of gender-balanced recruitment committees for leading researchers in research-performing organisations is lower than that within the EU's ERA-compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in Slovakia is equal to 0.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access, the Long-term Objective of the State S&T Policy up to 2015 supports modernising the infrastructure and improving access to scientific information by Slovak scientists and the business sector. Two national projects promoting the access to and the preservation of scientific information to the scientific community, university students and businesses were carried out by the Slovak Centre of Scientific and Technical Information (SCST), the national information centre and the specialised scientific library of Slovakia. However, there does not seem to be an explicit policy existing on open access (OA).

With regard to open access to publications, no specific policy has been identified.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014

Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	62.6 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	0.9 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not have measures to support OA to publications.

Within the ERA-compliant cluster in Slovakia, the share of publicly funded scientific publications in OA amongst research performing organisations is higher than that within the EU's ERA-compliant cluster.

Concerning open access to data, no specific policy has been identified.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to data	National level	0 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (EU level)	54.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national	36 %	2013	ERA survey 2014

	level)			
Share of responding research performing organisations making scientific research data available on-line and free of charge	Limited compliance to ERA cluster (national level)	36.1 %	2013	ERA survey 2014

Research funders in Slovakia who responded to the survey indicated that they do not have measures to support open access to data.

Within the ERA-compliant cluster in Slovakia, the share of research-performing organisations making scientific research data systematically available online and free of charge publicly funded is lower than that within the EU's ERA-compliant cluster.

With regard to repositories, Slovakia is the project 'Infrastructure for research and development – the data centre for research and development', with the aim of building a data centre that will store, process, and provide access to information that is needed by Slovak scientific organisations while carrying out their R&D activities.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to open innovation (OI) and knowledge transfer (KT) between public and private sectors, Slovakia has embedded knowledge transfer in its RIS3, which fosters the open circulation of knowledge between companies and research organisations. The strategy implementation will be accompanied by a monitoring system. One of the specific measures mentioned in the strategy is the development of innovative capacities through cooperation between enterprises and research institutions in key sectors of the Slovak economy, which is accompanied by specific funding.

The Centre of Patent Information in Slovakia is a contact point of the Industrial Property Office of Slovakia and its main mission is to provide researchers and the public with basic information about the possibilities of industrial and legal protection of technological solutions, inventions, trademarks and designs in the country and abroad. The Technology Transfer Centre (SCSTI) participates in building and operating on the national system of technology transfer support and is responsible for the administration and operation of the national technology transfer portal. It supports the establishment and development of local technology transfer offices (TTOs) and provides information and professional support to research and scientific organisations in the technology transfer processes, starting with intellectual property (IP) protection and ending with its commercialisation.

The project called National infrastructure for supporting technology transfer in Slovakia, which is partly funded by the European Regional Development Fund, supports R&D activities that reflect the real needs of the entrepreneurial sector. At the same time, it supports the

creation of long-term partnerships between academy and industry. This project will end in 2014.

In June 2014, the Council of the European Union recommended that Slovakia implements plans to foster effective knowledge transfer and co-operation between academia, research and business. Strategic partnership in the form of support to the creation of consortia for solving multidisciplinary problems and embedding sectors through clusters and other forms of networking will be supported through the implementation of the RIS3.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	1.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	0.5 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	39.4 %	2013	ERA survey 2014

Share of responding research performing organisations having or using a structure for knowledge transfer activities	Limited compliance to ERA cluster (national level)	20.7 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (EU level)	66.3 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	32.4 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	Limited compliance to ERA cluster (national level)	16.7 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	1.2 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	2 %	2013	ERA survey 2014

The research funders in Slovakia who responded to the survey did not indicated support to KT and OI, TTOs and Private Public interaction.

Within the ERA-compliant cluster in Slovakia, the share of research performing organisations having funding originating from the private sector is lower than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in Slovakia, the share of research-performing organisations having or using a structure for knowledge transfer activities is lower than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in Slovakia, the share of research performing organisations having dedicated staff employed in knowledge transfer activities is lower than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in Slovakia, the share of research personnel whose primary occupation is in the private sector (in full-time equivalents) is lower than that within the EU's ERA-compliant cluster, but quite high in the limited compliance to ERA cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

In relation to the implementation of Digital ERA, the country has implemented a research and education network, which is essential to make digital services possible. The policies for research and education-related public e-infrastructures and for associated digital research services are implemented by the Slovak Academic Network (SANET), which is a member of GÉANT. The SANET is an independent civil association (non-profit body), whose members agreed with the conditions to provide each other with Internet services. By 2013, the SANET had 322 members (including all Slovak universities, institutes of the Slovak Academy of Sciences, scientific libraries, primary and secondary schools and several state institutions and municipalities). In 2013, Slovakia reported backbone capacities of 100 GBps (Gigabytes per second).

Concerning digital services, several institutions are members of the Trans-European Research and Education Networking Association, which offers a forum to collaborate, innovate and share knowledge in order to foster the development of Internet technology, infrastructure and services to be used by the research and education community. In 2013, there were 38 HEIs, 20 research institutes, seven institutes of further education and six libraries connected to TERENA in Slovakia. This represents between 60 % and 80 % of the universities and less than half of the other institutions.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations providing digital research services (i.e. cloud	ERA compliant cluster (EU	80.8 %	2013	ERA survey 2014

services, research collaboration platform, etc.)	level)			
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	36 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	Limited compliance to ERA cluster (national level)	21.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in Slovakia, the share of research-performing organisations providing digital research services (i.e. cloud services, a research collaboration platform, etc.) is lower than that within the EU's ERA-compliant cluster.

6.4. Uptake of federated electronic identities

Slovakia has not joined an identity federation and the country is not a member of eduGAIN, a service intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) partners' federations.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	35.8 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national	4.8 %	2013	ERA survey 2014

	level)			

Within the ERA-compliant cluster in Slovakia, the share of research-performing organisations providing federated electronic identities for their researchers is similar to that within the EU's ERA-compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 24 research performing organisations in Slovakia answered the 2014 ERA survey, which represents 7.9% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in Slovakia shows that 16.7 % of them are in the 'ERA compliant' cluster, 54.2 % can be classified in the 'limited compliance to ERA' cluster and 29.2 % of organisations in the 'ERA principles are not applicable' cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of 'weighted' organisations are 40.6 % for the 'ERA compliant' cluster, 41.2 % for the 'ERA limited compliant' cluster and 18.2 % for those organisations where ERA principles are not applicable.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013
Research and innovation system			
Research and Innovation Strategy for Smart Specialisation of the Slovak Republic	2013	X	X
Project-based funding applying the core principles of international peer review			
The 172/2005 Law on Organisation of State support to R&D	2005		
The Fenix Strategy: Update of the Long-Term Objective of the State Science and Technology Policy up to 2015 (adopted by Government Resolution 461/2011) Minerva 2.0 for the knowledge-based economy	2011		

New Model of Financing Science and Technology in the Slovak Republic	2010		
Amendment of Act 131/2002 on Higher Education Institutions (HEIs)	2012	X	
Evaluation procedures and criteria for the 2010-2012 general call	2010		
Act 131/2002 on Higher Education Institutions (HEIs) Act 133/2002 on the Slovak Acedemy of Sciences (SAS)	2002		
Competitive grants	2000		
Rules of evaluation by the Accreditation Commission for the HEIs and the Slovak Academy of Sciences Act 131/2002 on Higher Education Institutions (HEIs)	2007		
Institutional funding			
Institutional funding based on institutional assessment			
Strategy for excellent science, research and development	2013	X	X
Implementing joint research agendas			
Information on International Co-operation in Science and Technology in 2011 (MESRS 2012)	2012	X	
Interoperability, mutual recognition of evaluation results and other schemes			
Joint Programming Initiatives, Article 185, COST, EUREKA	2010		
Bilateral co-operation in science and technology	1980		
Visegrad fund	2000		
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			

Infrastructure of Research and Development - strategy and draft roadmap	2011		
The Cyclotron Centre	1999		
Participation in ESFRI Activities Participation in infrastructures of European interest			
Centre of Excellence Programme	2007		
Access to research infrastructures of pan-European interest			
Bilateral and multilateral co-operation in science and technology			
Attractive careers			
General labour market measures The 404/2001 Law on Residence by Foreigners The Decree of the Government of the Slovak Republic No. 391/2004 Draft amendment of Law on Qualification Degree Documents	2011		
The European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers	2011		
EURAXESS Slovakia	2004		
Human Resources in Research and Development and Popularisation (2006-2010)	2006		
Gender balance in the decision-making process			
Central Information Portal for Science and Technology	2004		
The Slovak Constitution (2001) The Labour Code Law (Law No.	2004		

311/2001) The 365/2004 Antidiscrimination Law			
Open access to publications and data resulting from publicly funded research			
Infrastructure for research and development - Data centre for research and development	2007		
Operational Programme Research and Development projects: National information system supporting research and development in Slovakia Infrastructure for research and development - Data centre for research and development	2009		
Open innovation and knowledge transfer between public and private sectors			
National infrastructure for supporting technology transfer in Slovakia	2010		
Technology transfer centre SCSTI			
Centre of Patent Information in Slovakia	2011		
MESRS call supporting five clusters initiatives	2012	X	
Operational Programme Research and Development projects: Transfer of knowledge and technology from research and development into practice	2008		
Strategy to create a national technology transfer system	2013	X	X
Establishment conditions to foster cooperation between academy and industry Reassessment of IP rules	2013	X	X
Harmonise policies for public e-infrastructures and associated digital research services			

Slovak Academic Network (SANET).	1992		
Uptake of federated electronic identities			
Membership of the TERENA network TLS/SSL server certificates via SANET TCS Server	2011		

1. MORE EFFECTIVE NATIONAL SYSTEMS

1.1. Research and innovation system

Research and innovation policies are the responsibility of the Department for Business, Innovation and Skills (BIS) which plays the lead executive role in research issues. It has oversight for the majority of research and development (R&D) policy formulation, and is the main author of strategic policies for R&D and innovation. The Department for Business, Innovation and Skills (BIS) provides funds for the seven Research Councils, each organised on a broad disciplinary basis, which in turn support R&D both in higher education institutions (HEIs) and in their own institutions. Research Councils develop their specific R&D policies.

The country adopted the Innovation and Research Strategy for Growth in 2011. It sets out the government's approach to boosting business investment in innovation and ensuring the United Kingdom's success in the global economy. It indicates that investments will focus on critical areas that only government can fund. The National Reform Programme (NRP) 2014 announces the adoption of a new strategy for research and innovation before the end of 2014. It also indicates that actions in support of the eight great technologies have been developed in partnership with the United Kingdoms's Research Councils, Technology Strategy Board and Foresight projects conducted by the Government Office for Science. The Welsh Government’s strategy, Science for Wales, adopted in 2012, seeks to attract world-class scientific talent to Wales and to generate critical mass in key areas of scientific research through the creation of three new national research networks in the grand challenge areas.

In terms of research and innovation (R&I) funding, the Government Budget Appropriations or Outlays for Research and Development (GBAORD) in the United Kingdom represented EUR 174 per inhabitant in 2012, slightly below the EU-28 average (EUR 179.2). In 2012, the total GBAORD corresponded to 1.2 % of total government expenditures and 0.57% of gross domestic product (GDP) (Eurostat).

The analysis of the evolution of GBAORD in the period during the economic crisis (2007-2012) shows that in nominal terms, the growth rate of the total GBAORD in the United Kingdom has been higher than the growth rate of the total EU GBAORD. However, the GBAORD as a share of GDP has regressed more in the United Kingdom than the regression observed in the EU-28.

However, government support is also provided for business in the form of R&D tax credits. In the financial year ending March 2012, R&D tax credits provided almost GBP 1.2 billion of relief to over 12 000 companies, supporting around GBP 11.9 billion of expenditure (NRP2014).

In the 'Spending Round 2013' publication, the government announced it would maintain resource funding for science in nominal terms at GBP 4.6 billion in 2015-2016 and increase capital funding in real terms from GBP 0.6 billion in 2012-2013 to GBP 1.1 billion in 2015-2016. The government also set a long-term capital budget for science in the next Parliament, which will grow in line with inflation through to 2020-2021 (NRP 2014).

1.2. Project-based funding applying the core principles of international peer review

As regards project-based funding, public funding is allocated via a process that is firmly based on open calls for proposals with independent evaluations and peer reviews using national and international reviewers.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as project-based funding	National level	80 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as project-based funding	EU level	66.2 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support project-based funding is higher than the EU average.

The core principles of international peer review prevail in the assessment of proposals for research funding. Proposals are assessed for scientific quality by a number of senior academics or peers, from the United Kingdom and overseas, who work within relevant areas of research. This assessment or "review" provides the basis of the funding decision. The peer review processes employed are designed to be sensitive to the different needs and cultures that exist within the academic community and also reflect the variety of mechanisms employed to support different types of research e.g. basic or strategic research, or the need to encourage adventurous or multidisciplinary research.

1.3. Institutional funding based on institutional assessment

Institutional funding is almost always allocated based on institutional assessment. The government allocates block institutional funding (for research) via the Higher Education Funding Councils and their equivalents. The vast majority of the money is divided between institutions using formulae to determine each one’s share. These formulae take into account certain factors for each institution, including the number and type of students, the subjects taught and the amount and quality of research. Funding allocation is linked to the volume of research (using research-active staff numbers), the relative costs (reflecting, for example, that laboratory-based research is more expensive than library-based research), any government policy priorities for particular subjects and the quality of research as measured in the Research Assessment Exercise (RAE). The Research Excellence Framework (REF), a process of expert review, is the new system for assessing the quality of research in the United Kingdom's (HEIs) higher education institutions (HEIs). It will replace the Research Assessment Exercise (RAE) and will be completed in 2014. The primary purpose of the REF is to produce assessment outcomes for each submission made by institutions which the funding bodies

intend to use to inform the selective allocation of their research funding to HEIs, with effect from 2015-2016. The assessment outcomes provide benchmarking information and establish reputational yardsticks. The criteria used in REFs are quality of outputs: - ‘originality, significance and rigour’-, impacts: - ‘reach’ and ‘significance’ -; and research environment: - ‘vitality and sustainability’ -.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	National level	20 %	2013	ERA survey 2014
Share of responding funders' total budget allocated as institutional funding based on institutional assessment and/or evaluation	EU level	24 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support institutional assessment for the allocation of institutional funding is lower than the EU average.

2. TRANSNATIONAL COOPERATION

2.1. Implementing joint research agendas

The country is involved in transnational cooperation. It also strongly supports bilateral and multilateral initiatives.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' total budget allocated to transnationally coordinated R&D	National level	2.8 %	2013	ERA survey 2014
Share of responding funders' total budget allocated to transnationally coordinated R&D	EU level	4.1 %	2013	ERA survey 2014
Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	National level	0.9 %	2013	ERA survey 2014

Share of responding funders' research and development budget dedicated to jointly defined research agendas with non-national EU organisations	EU level	1.7 %	2013	ERA survey 2014

The share of responding funders' total budget in the United Kingdom allocated to transnationally coordinated R&D is lower than the EU average.

The share of responding funders' research and development budget in the United Kingdom dedicated to jointly defined research agendas with other EU organisations is lower than the EU average.

Cooperation between institutions of Member States, Associated Countries and Third Countries is fostered by the Framework Programme. In the Seventh Framework Programme (FP7), the share of the United Kingdom's participation in the total participation is 14.7 % and the country received 16.1 % of the total European Commission contribution. FP7 funding represents EUR 92 per inhabitant (the EU average is EUR 72 per capita) for the period 2007-2013 and 3.7 % of the gross domestic expenditures on R&D (GERD) for the period 2007-2011 (last available data) (the EU average is 3% of GERD for the same period). Scottish EU Research and Innovation Steering Group was established in 2010 to help support the increased participation in European research and innovation programmes. One of the aims of the Steering Group is to ensure that businesses, the academic community and those in the public sector and research and technology organisations are fully informed about and able to respond to the opportunities within Horizon 2020 (NRP 2014).

As regards Joint Programming Initiatives, the country participates in all ten of the ongoing initiatives and is coordinating one of them. These initiatives are Neurodegenerative diseases (Alzheimer), Food security, Agriculture and climate change, Cultural heritage and global change: a new challenge for Europe, Healthy Diet for Healthy Life, The demographic change (More years, better life), Antimicrobial resistance - An emerging threat to human health, Connecting climate knowledge for Europe, Water challenges for a changing world, Healthy and productive seas and oceans", and Urban Europe - Global Challenges, Local Solutions.

In terms of programmes undertaken jointly by several Member States (so called Article 185 initiatives), the country was involved in five programmes in FP7. In Horizon 2020, the country is already involved in the four ongoing initiatives.

ERA-Nets facilitate the coordination and collaboration of national and regional research programmes, in particular the preparation and implementation of joint calls for transnational research proposals between national and/or regional programmes. The country has participated in a total of 102 ERA-Nets, of which 26 are currently still running. The country has also participated in 11 ERA-Net Plus actions - of which seven are still running - in areas with high European added value and additional EU financial support topping up their joint call for proposals.

The Economic and Social Research Council is a partner in the Open Research Area in Europe for the Social Sciences (ORA), which currently involves four European Member States (the United Kingdom, France, Germany and the Netherlands).

2.2. Openness for international cooperation with third countries and regions

In terms of international cooperation with third countries and regions, the country has developed a suite of routes for engagement which are presented in the 2010 Research Councils United Kingdom (RCUK) International Strategy. It outlines the ways in which RCUK helps the best researchers work together, wherever they are in the world. In terms of implementation, specific agreements have been notably signed with the United States of America (USA), China, India and Brazil. Recently the United Kingdom and China signed an agreement of STR 50 million to carry out joint innovative research programmes to tackle global issues like climate change, long-term renewable energy supplies and human diseases.

In addition, the United Kingdom has several bilateral science and technology agreements with third countries. The Open Research Area in Europe for the Social Sciences (ORA) is bringing in third country participants (India and the United States of America). In the third and most recent joint call, the programme will fund integrated projects realised by researchers from three or more of the five participating countries, in any combination. In addition, the Belmont Forum is a high-level group of the world's major and emerging funders of global environmental change research and international science councils. It was co-founded by the United Kingdom Natural Environment Research Council and the National Science Foundation (USA) in 2009.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	National level	1.9 %	2013	ERA survey 2014
Share of responding funders' research and development budget allocated to collaboration programmes carried out with third countries	EU level	2.4 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	ERA compliant cluster (EU level)	0.8 %	2013	ERA survey 2014
Share of organisations' research and development budget amongst	ERA compliant	2.9 %	2013	ERA survey 2014

responding research performing organisations originating from third countries	cluster (national level)			
Share of organisations' research and development budget amongst responding research performing organisations originating from third countries	Limited compliance to ERA cluster (national level)	0.1 %	2013	ERA survey 2014

The share of responding funders' research and development budget in the United Kingdom allocated to collaboration programmes carried out with third countries is lower than the EU average.

Within the ERA compliant cluster in the United Kingdom, the share of organisations' research and development budget originating from third countries is higher than that within the EU's ERA compliant cluster.

2.3. Interoperability, mutual recognition of evaluation results and other schemes

Mutual recognition of evaluations that conform to international peer-review standards is supported where conditions are appropriate by the RCUK. In these circumstances the lead agency procedure can be applied, where the participating funding authorities accept the results of the evaluation of international projects done by the ‘lead agency’ and fund the parts of the project that are being performed in their respective countries. RCUK has signed Memoranda of Understanding providing for a lead agency agreement with the State of São Paulo Research Foundation (FAPESP), the United States National Science Foundation (NSF) and in 2013 with Fonds National de la Recherche (FNR) in Luxembourg.

The RCUK is also working with Science Europe to develop a better evidence base for the perceived barriers to cross-border interoperability of national programmes and to consider options for the removal of such barriers where necessary. All seven of the United Kingdom's Research Councils are members of Science Europe. The President of Science Europe, currently Professor Paul Boyle (ESRC CEO), is a member of the Governing Board of the Global Research Council, a voluntary, informal organisation of heads of research councils from around the world, with the remit to find mutually acceptable paths to greater international research collaboration. Some high-level principles were signed off at the first meeting of the Global Research Council policy forum in May 2012. Work is underway at a global level, and based on recent policy activity between European research funding and performing organisations, to develop a set of commonly agreed criteria for peer reviews.

In RCUK Lead Agency arrangements the UK is usually the lead agency, due to the internationally renowned peer review and reputation for funding excellence. RCUK work in close collaboration with international funding partners and build capacity wherever possible.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	National level	0.4 %	2013	ERA survey 2014
Share of responding funders which can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions	EU level	38.5 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	National level	7.1 %	2013	ERA survey 2014
Share of responding funders' project-based research and development budget allocated through peer review carried out by institutions outside the country	EU level	0.8 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and can base their project-based research and development funding decisions on peer reviews carried out by non-national institutions is lower than the EU average.

The share of responding funders' project-based research and development budget in the United Kingdom allocated through peer review carried out by institutions outside the country is higher than the EU average.

3. RESEARCH INFRASTRUCTURES

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

In 2012, the United Kingdom contributed 1.9 % of the GBAORD to the activities carried out by Conseil Européen pour la Recherche Nucléaire (CERN), the European Molecular Biology Laboratory (EMBL), the European Southern Observatory (ESO), the European Synchrotron Radiation Facility (ESRF), the Institut Laue-Langevin (ILL) and the European Commission’s

Joint Research Centre (JRC) in 2012. The country also participates in the European Space Agency (ESA) and the European Fusion Development Agreement (EFDA) (Eurostat).

In terms of participation in the development of research infrastructures included in the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, the country participates in the preparatory phase of 15 of them (i.e. 30 %). The country coordinates six of them: ESSurvey, HIPER, ELIXIR,INSTRUCT, ISBE and SKA. In terms of financial commitments to the development of these research infrastructures, the United Kingdom is so far committed to fund nine of them: ESSurvey, HIPER, ELIXIR, EMBRC, INFRAFRONTIER, INSTRUCT, ESRF UPGRADE, ILL 20/20 and SKA. So far, UKRC has dedicated GBP 66.6 M (EUR 83.9 M) in the preparatory and/or construction phasis of the research infrastructures included in the ESFRI roadmap.

With regard to participation in the European Research Infrastructure Consortiums (ERIC), the United Kingdom (UK) hosts ESS ERIC and is a member of EURO-ARGO ERIC, two of the six consortiums that adopted the legal framework designed by the Commission to facilitate the establishment and operation of research infrastructures of European interest involving several European countries.

In terms of support to the development and implementation of research infrastructures (RIs), the United Kingdom's national roadmap on research infrastructures was replaced in 2012 by the RCUK's document "Investing for Growth: Capital Infrastructure for the 21st Century". It reflects changes to the United Kingdom's capital funding allocations. Funding for large facilities and infrastructure is available from the Research Councils, government departments, Regional Development Agencies, devolved administrations, charities, the private sector, the European Commission and other international bodies. A particular source of funding is the Large Facilities Capital Fund, which is administered by central government. A number of the facilities that appear in the ESFRI Roadmap also featured in the RCUK's Large Facilities Roadmap.

The 2012 RCUK Strategic Framework for Capital Investment outlines where capital investment is important so as to ensure sustainability of the research base in the medium to long term, including large facilities as previously described in the Large Facilities Roadmap and other significant capital priorities. In 2013, GBP 600 million was earmarked for funding the development of infrastructures and facilities. Finally, the Research Partnerships Investment Fund 2012-2015 supports large-scale projects that are able to leverage substantial co-investment from private sources in order to enhance the research facilities of higher education institutions undertaking world-leading research. It will secure GBP 1 billion investment in university research infrastructure. It has been extended until 2016-2017, providing at least GBP 100 million (circa EUR 125 million) of matched funding each year to leverage private investment in science infrastructure.

3.2. Access to research infrastructures of pan-European interest

Access to the United Kingdom's research infrastructures is open to all UK and non-UK nationals who are registered as UK academics (in a UK HEI or Research Council Institute);

postdoctoral researchers from UK universities; those applying via EU transnational access arrangements (the level of access is in accordance with agreed EU funding levels); overseas organisations that have contractual access agreements with the relevant facilities. In addition, applications from overseas (non-EU or without prior contractual access arrangement) are also considered.

4. OPEN LABOUR MARKET FOR RESEARCHERS

4.1. Introduction to open labour market for researchers

A detailed report can be found in the country profile for United Kingdom in the Researchers' Report 2014 [http://ec.europa.eu/euraxess/pdf/research_policies/country_files/United Kingdom_Country_Profile_RR2014_FINAL.pdf].

The following text provides an overview of the current situation and recent progress made in several key areas.

There were 251,358 full-time equivalent (FTE) researchers in the United Kingdom in 2011. This represents 8.0 researchers per 1000 labour force compared with 7.6 among the Innovation Union reference group (Innovation Followers) and an EU average of 6.7.

4.2. Open, transparent and merit-based recruitment of researchers

In 2013, the number of researcher posts advertised through the EURAXESS jobs portal per thousand researchers in the public sector was 54.8 in the United Kingdom, compared with 72.3 among the Innovation Union reference group and an EU average of 43.7.

In 2012, 78 % of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (More2 survey, 2012).

Higher education institutions in the United Kingdom are fully autonomous in designing and implementing their recruitment policy. They are required to publish all relevant policies on their websites. The procedure is time-consuming and costly, and as a result the advertising of posts is sometimes avoided. The United Kingdom's higher education (HE) funding bodies have encouraged action to face this challenge. For instance, the Higher Education Funding Council for England (HEFCE) encourages the institutions to have formal human resources strategies and provides funding to support these strategies under the Rewarding and Developing Staff in HE initiative. HEFCE also encourages institutions to develop recruitment and retention schemes.

4.3. Attractive careers

The European Charter & Code for Researchers is being implemented through both the Quality Assurance Agency and the Concordat to Support the Career Development of Researchers. Vitae, which champions world-class support for researchers and research staff, leads in the implementation of the Concordat and assists higher institutions in the United Kingdom to

exchange knowledge and good practices. Vitae also supports them in gaining the European Commission's Human Resources (HR) Excellence in Research Award.

By May 2014, 89 UK organisations had received the "HR Excellence in Research" logo for their progress in implementing the Charter & Code. The implementation of the Concordat is reviewed annually by the Concordat Strategy Group, and a report is also submitted to government.

4.4. Supporting structured innovative doctoral training programmes

The number of new doctoral graduates per thousand population aged 25-34 was 2.4 in 2011, compared with 1.6 among the Innovation Union reference group and an EU average of 1.7.

All Research Councils in the United Kingdom concentrate their funding for doctoral training on the basis of quality. This is a result of funding constraints and the policy objective of improving the quality of doctoral training in the United Kingdom and striving for excellence. RCUK have developed a Statement of Expectations for Doctoral Training which lays out common principles for the support of all Research Council students. They are aligned with the seven principles for Innovative Doctoral Training.

Vitae, set up in 2008, works with the higher education sector to provide professional and career development for researchers and build international competitiveness through research, innovation and knowledge exchange. Vitae leads improvements in the employability and impact of researchers, so as to ensure that researchers are equipped to address research challenges and enhance the United Kingdom's economic, social and cultural capital. The Vitae programme provides national leadership and strategic development, and works with higher education institutions, policy-makers, stakeholders, employers and individual researchers.

4.5. International and inter-sectoral mobility

In 2011, the percentage of doctoral candidates with citizenship of another EU Member State was 16.2 % in UK compared with 18.4 % among the Innovation Union reference group and an EU average of 7.7 %. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 30.6 % in UK compared with 16.9 % among the Innovation Union reference group and an EU average of 24.2 %.

The UK National Action Plan on researcher mobility and careers within the European Research Area (ERA) (2009) points out that the United Kingdom's research base is already one of the most open in the world, both as regards recruitment of researchers and scientific collaborations (over 40 % of UK scientific papers now have one or more non-UK co-authors), and the UK government funds a number of dedicated fellowship schemes (Dorothy Hodgkin Fellowships, Newton International Fellowships) which seek to attract the best early-career researchers from around the world to UK institutions. Many Research Council fellowships have a strong international element because international collaboration is actively encouraged as part of the process of building an international reputation.

In the United Kingdom, there are many examples of partnerships between universities/research institutions and the business sector. The partnership could range from collaboration in co-design and co-delivery of postgraduate courses to co-funding, and joint supervision and mentoring of students. For example, the Collaborative Awards in Science and Engineering (CASE), sponsored by the Natural Environment Research Council (NERC) promote collaboration between the research community and the end-users of research. The award allows a Doctor of Philosophy (PhD) student to spend 3-18 months with an industrial partner in a workplace outside the academic environment. The UK Research Councils Delivery Plan has as a national target the exchange of skills in the research base and encouraging movement of highly skilled people between the research base and user communities at all career stages.

5. GENDER

5.1. Foster cultural and institutional change on gender

The UK has a clear legal framework on equality in place. Gender equality is enshrined in the Equality Act 2010, which provides a legislative framework to advance equality of opportunity for all. In addition to this, the Children and Families Act has created a system of flexible parental leave. The Athena Swan Charter is an incentive that fosters cultural changes to advance the representation of women in research performing organisations. The country has through the implementation of the Concordat to support the career development of researchers, set out a principle that diversity and equality must be promoted in all respects of the recruitment and career management of researchers. The RCUK's Statement of Expectations for Equality and Diversity places expectations on universities receiving Research Council funding. The statement promotes and leads cultural change in relation to equalities and diversities, to engage staff at all levels, ensure researchers are trained and supported to address inequalities and to provide evidence of this.

Indicator	Level/cluster	Value	Year	Source
Share of responding funders supporting gender equality in research	National level	99.3 %	2013	ERA survey 2014
Share of responding funders supporting gender equality in research	EU level	82.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	ERA compliant cluster (EU level)	64 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample which have adopted Gender Equality	ERA compliant cluster	82.5 %	2013	ERA survey 2014

Plans	(national level)			
Share of responding research performing organisations in the sample which have adopted Gender Equality Plans	Limited compliance to ERA cluster (national level)	7.2 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support national policies on gender equality in public research is higher than the EU average.

Within the ERA compliant cluster in the United Kingdom, the share of research performing organisations that have adopted Gender Equality Plans is higher than that within the EU's ERA compliant cluster.

Employees in the United Kingdom have the right to return to the same job after maternity leave on the same terms and conditions or a similar job on terms and conditions at least as good. If the role has become redundant, employees should be offered a suitable alternative vacancy, otherwise, they may be entitled to redundancy pay. Cultural and institutional change is promoted by several measures. Research Council-funded students enjoy the right to receive six months' maternity leave on full stipend and a further six months' unpaid maternity leave; Research Council grants may be extended for up to 12 months to cover periods of maternity leave. Research Council fellowships cover maternity leave (as well as paternity leave, adoption leave, parental leave, extended jury service or paid sick leave) for a Research Fellow in line with the terms and conditions of the Fellow's employment. The joint programme of the Royal Society and the Royal Academy of Engineering is aimed at understanding and addressing issues of diversity in the science, technology, engineering and mathematics workforce. The country supports the L'Oréal and United Nations Educational, Scientific and Cultural Organisation (UNESCO) 'For Women in Science programme' and co-funds the L'Oréal national fellowship programme. The Daphne Jackson Trust offers flexible paid fellowships with mentoring and retraining that help women and men to return to research after a career break of two or more years; this is sponsored by the Research Councils and many universities and other organisations. In May 2014, the United Kingdom government announced a call to action to get educators, industry and government to commit to boosting women's participation in technology and engineering. In addition, a new publicity drive led by successful British entrepreneurs will be launched in September 2014 to change the way 14 to 16-year-olds think about science and technology, and to encourage more to pursue it as a career.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**

Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (EU level)	53.5 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	ERA compliant cluster (national level)	77.7 %	2013	ERA survey 2014
Share of responding research performing organisations implementing recruitment and promotion policies for female researchers	Limited compliance to ERA cluster (national level)	8.1 %	2013	ERA survey 2014

Within the ERA compliant cluster in the United Kingdom, the share of research-performing organisations implementing recruitment and promotion policies for female researchers is higher than that within the EU's ERA-compliant cluster.

The Research Councils do not, at present, explicitly ask about the gender dimension in research content. However, peer review would consider the methodologies and appropriate ‘users’ of the research which may include the gender dimension in its decision making. This may explain the low values observed below at the funders level.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the inclusion of gender dimension in research content	National level	0.1 %	2013	ERA survey 2014
Share of responding funders supporting the inclusion of gender dimension in research content	EU level	48.5 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (EU level)	44 %	2013	ERA survey 2014

Share of responding research performing organisations which include the gender dimension in research content	ERA compliant cluster (national level)	20.7 %	2013	ERA survey 2014
Share of responding research performing organisations which include the gender dimension in research content	Limited compliance to ERA cluster (national level)	0.4 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support gender dimension in research content/programmes is lower than the EU average.

Within the ERA compliant cluster in the United Kingdom, the share of research-performing organisations that include the gender dimension in research content is lower than that within the EU's ERA-compliant cluster.

5.2. Gender balance in the decision-making process

With regard to gender balance in decision-making, one of the key principles of the Concordat to Support the Career Development of Researchers is that diversity and equality must be promoted in all aspects of the recruitment and careers management of researchers. Any university or research institute that is committed to the advancement and promotion of the careers of women in science, engineering and technology can apply for an Athena SWAN award. Recently the United Kingdom launched POWERful Women (PfW) – a new, professional initiative to showcase female leadership potential in the United Kingdom's energy sector.

Various research institutions run mentoring schemes that are specially tailored towards the requirements of women in academia. In some cases, institution-wide networks of female academics and researchers have been set up. RCUK has reported that around 25 % of the Research Councils' funding panel members are women.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (EU level)	33.6 %	2013	ERA survey 2014

Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	ERA compliant cluster (national level)	9.4 %	2013	ERA survey 2014
Share of gender-balanced recruitment committees for leading researchers amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	0.4 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	National level	17.7 %	2013	ERA survey 2014
Share of gender-balanced research evaluation panels amongst responding research funding organisations	EU level	35.8 %	2013	ERA survey 2014

Within the ERA-compliant cluster in the United Kingdom, the share of gender-balanced recruitment committees for leading researchers in research-performing organisations is lower than that within the EU ERA-compliant cluster.

The share of gender-balanced research evaluation panels amongst responding research funding organisations in the United Kingdom is lower than the EU average.

6. KNOWLEDGE CIRCULATION

6.1. Open access to publications and data resulting from publicly funded research

In terms of support to open access (OA), the government, in line with its overarching commitment to transparency and open data, is committed to ensuring that publicly funded research outcomes should be freely accessible. The United Kingdom's vision is for all users to be able to read published research papers in an electronic format and to search for and re-use (including download) the content of published research papers, both manually and using automated tools (such as those for text and data mining), provided that any such re-use is subject to full and proper attribution. In order to help the implementation of the policy, the Research Councils introduced in April 2013 a new funding mechanism: a block grant to universities and eligible research organisations to cover the cost of article processing charges (APCs).

Related to open access to publications, the United Kingdom is well advanced in its implementation, notably in relation to the governement’s preference for gold open access and

acceptance of green open access with the appropriate embargo periods. The UK has an Open Access policy for both its grants based funding (research councils) and its institutional assessment based funding (the next Research Excellence Framework via HEFCE).

Compliance with the RCUK policy will be assessed as part of the first annual return that the university have to provide RCUK as part of the evidence that will be submitted to the independent review, who will report back in early 2015. A recent article in ResearchFortnight presented the finding that for universities who had received an RCUK OA Block grant and for those who did have some data, the compliance was in the 30 to 50% bracket. The MRC has had a OA mandate since 2006, and compliance even before the introduction of the RCUK policy was around 49%. The Wellcome Trust reports a compliance of around 67% in 2013. HEFCE funded research publications do not have a mandate for Open Access.

However, there are currently no way of reporting how many articles issued from UK research are available in Open Access. There is no data available for a comprehensive analysis to be made. The report for BIS "International comparative performance of the UK research base" (Elsevier, 2013) acknowledges that relevant data is not available.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to publications	National level	99.8 %	2013	ERA survey 2014
Share of responding funders supporting open access to publications	EU level	51 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (EU level)	18 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	ERA compliant cluster (national level)	16.6 %	2013	ERA survey 2014
Share of publicly funded scientific publications in OA amongst responding research performing organisations	Limited compliance to ERA cluster (national level)	2.5 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support open access to publications is higher than the EU average.

Within the ERA compliant cluster in the United Kingdom, the share of publicly funded scientific publications in OA amongst research performing organisations is similar to that within the EU's ERA compliant cluster.

Concerning open access to data, the government has adopted the open data strategy (‘Open data by default’) and BIS has just updated its open data strategy. The “Research Sector Transparency Board”, chaired by the Minister, specifically addresses how to increase access to research data. The UK is also a signatory of the G8 Open Data Charter.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting open access to data	National level	96.9 %	2013	ERA survey 2014
Share of responding funders supporting open access to data	EU level	33.5 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (EU level)	54.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	ERA compliant cluster (national level)	74.2 %	2013	ERA survey 2014
Share of responding research performing organisations making scientific research data available on-line and free of charge	Limited compliance to ERA cluster (national level)	8.5 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support open access to data is higher than the EU average.

Within the ERA compliant cluster in United Kingdom, the share of research performing organisations making scientific research data systematically available online and free of charge publicly funded is higher than that within the EU's ERA compliant cluster.

In addition to institutional and subject repositories, the Gateway to research initiative provides information on Research Councils and Technology Strategy Board funded projects and, where available, links to research outputs such as publications.

6.2. Open innovation and knowledge transfer between public and private sectors

In relation to open innovation (OI) and knowledge transfer (KT) between public and private sectors, the Technology Strategy Board facilitates networking between the public and private sectors. For example, the Board supports the Knowledge Transfer Network, the Knowledge Transfer Partnerships, the nine Catapult Centres and the Biomedical Catalyst, the Innovative Vouchers, etc. Scotland launched in October 2013 the Single Knowledge Exchange Organisation (SKEO) under the banner 'Innovation Scotland'. It continued supporting Interface, the free, national service which match-makes businesses with research resources in Scotland's universities and research centres supporting the establishment of a number of Innovation Centres where businesses and universities can work together to drive innovation in and across Scotland's key sectors (NRP 2014).

The UK's Intellectual Property Office (IPO) is responsible for the intellectual property (IP) framework in the United Kingdom for patents, trademarks, designs and copyright. An effective and fair IP framework is essential to support the translation of the results of research into innovative products, processes and services. In addition, the Lambert toolkit for IP offers guidelines for universities and companies that wish to undertake collaborative research projects.

The National Centre for Universities and Business (NCUB) replaced the Council for Industry and Higher Education in 2013. It develops, promotes and supports world-class collaboration between universities and business across the United Kingdom. Research Councils operate Cooperative Awards for Science and Engineering which promote jointly supervised studentships between academic and private or other public sector actors. The UK Research Partnership Investment Fund is designed to support investment in higher education research facilities. The fund was originally set up in 2012. It is dedicated to supporting large-scale capital projects from HEIs with significant track records of research excellence, provided that they secure co-investment from businesses, charities or endowments (individual philanthropy). Northern Ireland has been developing Competence Centres. Scotland has launched the new framework for entrepreneurship and innovation in November 2013 called Scotland Can Do (NRP 2014).

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	National level	99.5 %	2013	ERA survey 2014

Share of responding funders supporting the implementation of knowledge transfer as part of its institutional and/or project-based funding	EU level	82.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (EU level)	6.8 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	ERA compliant cluster (national level)	4.9 %	2013	ERA survey 2014
Share of responding research performing organisations' research and development budget financed by the private sector	Limited compliance to ERA cluster (national level)	0.6 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (EU level)	75 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	ERA compliant cluster (national level)	89.5 %	2013	ERA survey 2014
Share of responding research performing organisations having or using a structure for knowledge transfer activities	Limited compliance to ERA cluster (national level)	2.1 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge	ERA compliant cluster (EU	66.3 %	2013	ERA survey 2014

transfer activities	level)			
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	ERA compliant cluster (national level)	81.9 %	2013	ERA survey 2014
Share of responding research performing organisations having dedicated staff employed in knowledge transfer activities	Limited compliance to ERA cluster (national level)	2 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (EU level)	2.9 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	ERA compliant cluster (national level)	1.3 %	2013	ERA survey 2014
Share of research personnel whose primary occupation is in the private sector (in headcount)	Limited compliance to ERA cluster (national level)	0.2 %	2013	ERA survey 2014

The share of research funders in the United Kingdom who responded to the survey and support KT and OI, TTOs and Private Public interaction is higher than the EU average.

Within the ERA-compliant cluster in the United Kingdom, the share of research performing organisations having funding originating from the private sector is lower than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in the United Kingdom, the share of research-performing organisations having or using a structure for knowledge transfer activities is higher than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in the United Kingdom, the share of research-performing organisations having dedicated staff employed in knowledge transfer activities is higher than that within the EU's ERA-compliant cluster.

Within the ERA-compliant cluster in the United Kingdom, the share of research personnel whose primary occupation is in the private sector (in full time equivalents) is lower than that within the EU's ERA-compliant cluster.

6.3. Harmonise policies for public e-infrastructures and associated digital research services

In relation to the implementation of Digital ERA, the United Kingdom has set up a strategy for its implementation, the Strategic Vision for UK e-Infrastructure, and allocated GBP 165 million in 2011, supported by an additional GBP 189 million in 2012 to strengthen the United Kingdom's e-infrastructure in collaboration with industry. The country has implemented a research and education network, essential for making digital services possible. The UK National Research and Education Network, Janet, is a specialised Internet service provider dedicated to supporting the needs of the research and education communities within the country. The UK government has set up the E-infrastructure Leadership Council (ELC) to advise on all aspects of e-infrastructure, including networks, data stores, computers, software and skills.

Concerning digital services, RCUK is developing its own complementary integrated set of priorities for e-infrastructure for research, and will work closely with the ELC to ensure linkage. Six areas are being tackled: Computer systems, software, data, skills, authentication and security, and networks.

Indicator	Level/cluster	Value	Year	Source
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (EU level)	80.8 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.)	ERA compliant cluster (national level)	89.5 %	2013	ERA survey 2014
Share of responding research performing organisations providing digital research services (i.e. cloud services, research collaboration	Limited compliance to ERA cluster	5 %	2013	ERA survey 2014

platform, etc.)	(national level)			

Within the ERA-compliant cluster in United Kingdom, the share of research-performing organisations providing digital research services (i.e. cloud services, a research collaboration platform, etc.) is higher than that within the EU ERA-compliant cluster.

6.4. Uptake of federated electronic identities

The United Kingdom is a member of eduGAIN, which it joined in May 2013. Jisc, representing UK universities, has launched the UK Access Management Federation for Education and Research, which provides a single solution to accessing online resources and services for education and research. RCUK is exploring the implications of electronic identity for researchers and is actively planning how to integrate the Open Researcher and Contributor Identifier (ORCID) with the RCUK grant systems.

Indicator	**Level/cluster**	**Value**	**Year**	**Source**
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (EU level)	38.5 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	ERA compliant cluster (national level)	24.2 %	2013	ERA survey 2014
Share of responding research performing organisations in the sample providing federated electronic identities for their researchers	Limited compliance to ERA cluster (national level)	0.9 %	2013	ERA survey 2014

Within the ERA-compliant cluster in the United Kingdom, the share of research-performing organisations providing federated electronic identities for their researchers is lower than that within the EU's ERA-compliant cluster.

7. NOTES ON THE 2014 ERA SURVEY RESULTS

7.1. Comments

A total of 44 research performing organisations in United Kingdom answered the 2014 ERA survey, which represents 4.4% of the total number of researchers in the country (total number of researchers in the country as of 2011).

The principal component and clustering analysis of research performing organisations in United Kingdom shows that 51.3 % of them are in the ‘ERA compliant’ cluster, 35.9 % can be classified in the ‘limited compliance to ERA’ cluster and 12.8 % of organisations in the ‘ERA principles are not applicable’ cluster. However, when the organisations are weighted by the number of researchers in each organisation, the results significantly vary. Indeed, the shares of ‘weighted’ organisations are 91.8 % for the ‘ERA compliant’ cluster, 7.1 % for the ‘ERA limited compliant’ cluster and 1.0 % for those organisations where ERA principles are not applicable.

However, the results should be considered with caution, as a limited number of research performing organisations provided answers to the ERA survey, which did not include several important research performing organisations (large numbers of major universities and Research Council institutes) did not participate in the survey.

The relatively low results in terms of 'Share of research performing organisations which include the gender dimension in research content' in comparison with the EU average could reflect the fact that it is/may be taken into consideration in the design of the projects or as part of the peer review process and not as part of the organisation’s policy. Almost half of the respondents (notably directors and research managers) indicated that they do not know whether their programmes included the gender dimension or that it is not applicable to their cases.

The low 'share of publicly funded scientific publication in Open Access amongst research performing organisations' is possibly due to the absence of major research performing organisations among the respondents to the survey.

The low figures estimated for the indicators 'Share of funders which can base their project based research and development funding decisions on peer reviews carried out by non-national institutions' and 'Share of project based research and development budget allocated through peer review carried out by institutions outside the country' are explained by the fact that UKRC act as lead agencies and thus agencies in some other Member States use the results of the evaluations carried out by UKRC due to their quality and performance.

It should also be noted though that several important national funders and charities did not participate in the survey. Results presented for indicators reflecting the implementation of ERA by funders represent 27 % of total GBAORD in the UK.

Policy measures in support of ERA implementation

Initiative	Adopted in	Adopted since 2012	New measure since 2013

Research and innovation system			
New strategy for research and innovation	2014	X	X
Project-based funding applying the core principles of international peer review			
Research Councils grants and support			
UK Higher Education Funding Bodies Research Councils			
Institutional funding based on institutional assessment			
Innovation and Research Strategy for Growth	2011		
UK Higher Education Funding Bodies			
Implementing joint research agendas			
Joint Programming Initiatives	2008		
ERA-nets			
Open Research Area in Europe for the Social Sciences (ORA)	2009		
Several bi-lateral science and technology agreements with third countries			
Interoperability, mutual recognition of evaluation results and other schemes			
Money follows Researcher scheme			
Financial commitments for the construction and operation of ESFRI, national and regional research infrastructures of pan-European interest			
Extension of the Research Partnership Investment Fund	2013	X	X
Investing for Growth: Capital Infrastructure for the 21st Century	2012	X	
Research Partnerships Investment Fund 2012-2015	2012	X	
Budget 2013	2013	X	X
Large Facilities Capital Fund	2002		

RCUK Strategic Framework for Capital Investment	2012	X	
Access to research infrastructures of pan-European interest			
UK research infrastructures			
Attractive careers			
The Concordat to Support the Career development of Researchers	2008		
EURAXESS-UK	2011		
Terms and Conditions of Research Council Training Grants			
Private pension agreements for researchers			
Tier 5 (Temporary worker - government authorised exchange)	2013	X	X
Foster cultural and institutional change on gender			
Athena Swan Charter	2005		
Gender balance in the decision-making process			
Royal Society and Royal Academy of engineering joint programme to tackle diversity in science, technology, engineering and mathematics (STEM) National academies and their academic fellowships RCUK PhD and fellowship awards STEMNET and STEM Ambassadors			
RCUK Statement of Expectations for Equality and Diversity	2013	X	X
Equality Act 2010	2010		
Children and Families Bill	2013	X	X
Public Sector Equality Duty			

Research Excellence Framework Equality and Diversity Panel	2010		
Open access to publications and data resulting from publicly funded research			
RCUK Policy on Open Access	2013	X	X
National Reform Programme	2013	X	X
Gateway to Research	2012	X	
Research Councils Repositories			
UK Open Data Policy	2012	X	
BIS Open Data Policy	2014	X	X
Research Sector Transparency Board	2013	X	X
HEFCE Open Access Policy	2013	X	X
Open innovation and knowledge transfer between public and private sectors			
UK Intellectual Property Office initiative			
National Centre for Universities and Business (NCUB)	2013	X	X
Higher Education Innovation Fund UK Research Partnership Investment Fund National Centre for Universities and Business			
Smart Cymru: R&D and innovation grant support to business	2012	X	
Catapult Centres	2011		
Cooperative Awards for Science and Engineering (CASE)	1994		
Knowledge Transfer Partnerships	1975		
Knowledge Transfer Networks	2004		
Technology Strategy Board	2011		

Concept to Commercialisation			
TSB/Research Council Catalyst Funds	2011		
Collaborative R&D	2011		
Harmonise policies for public e-infrastructures and associated digital research services			
E-infrastructure Leadership Council	2012	X	
UK e-Science Programme	2002		
Uptake of federated electronic identities			
Open Researcher and Contributor Identifier (ORCID)	2012	X	
eduGAIN			