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PART 3/10

COMMISSION STAFF WORKING DOCUMENT

EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

European Research Area Progress Report 2014

{COM(2014) 575 final}

Facts and Figures accompanying the ERA Progress Report 2014

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IN TERMS OF CIRCULATION OF AND ACCESS TO SCIENTIFIC KNOWLEDGE

3.5.1. Open access

- *Open access for publications resulting from publicly funded research is becoming the standard. In Horizon 2020 open-access to peer-reviewed publications is the default setting*
- *Open access to data may require more frequent financial support from funders - as well as more proactive action by research performers - to increase their importance*

Open access (OA) means unrestricted online access to peer-reviewed scholarly research. Most Member States (23) have a similar understanding of the scope and objectives of open access, in line with the Commission's definition (AT, BE, CZ, DE, DK, EE, EL, ES, FI, FR, HR, IE, IT, LT, LU, MT, NL, PL, PT, RO, SE, SI, UK). The objective of promoting open access is included in national laws in PL, ES, SE, EE, LT and HU.

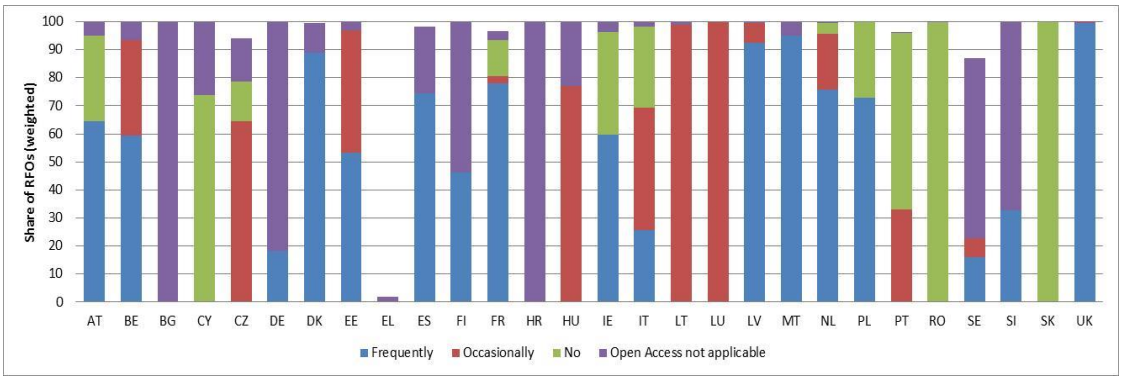
The Commission could identify that open access to publications is supported in AT, BE, BG, CY, DE, DK, EE, EL, ES, FI, IE, IT, LT, MT, NL, PL, PT, RO, SE and the UK, and the implementation is supported by a working group in BE, BG, DE, DK, EL, ES, FI and IT. In terms of modalities, both green and gold open access[1] are supported by AT, DK, EE, EL, FR, HR, IT, PL, PT, SE, UK, green open access is the main modality in CY, IE, LT and LU, and gold open access in NL and RO.

The Commission is concerned with open access in its capacities as a policy maker (proposing legislation), a funding agency (the FP7 and Horizon 2020 framework programmes for research and innovation) and a capacity builder (through funding of specific projects for open access infrastructure and policy support actions). The file is shared between the Directorate-General for Research and Innovation and the Directorate-General for Communications Networks, Content and Technology. In Horizon 2020 the Commission has made open access to peer-reviewed scientific publications the default setting.

According to the ERA survey 2014 results, different attitudes by funders in Member States are observed. In those situations where open access is supported, the average share of funders supporting it frequently is 44.6% (see Graph 1). It should be recalled that these figures concern funders who answered the ERA survey in 2014, which represent 34% of total EU GBAORD.

Graph 1: Share of funders funding open access to publications, 2013

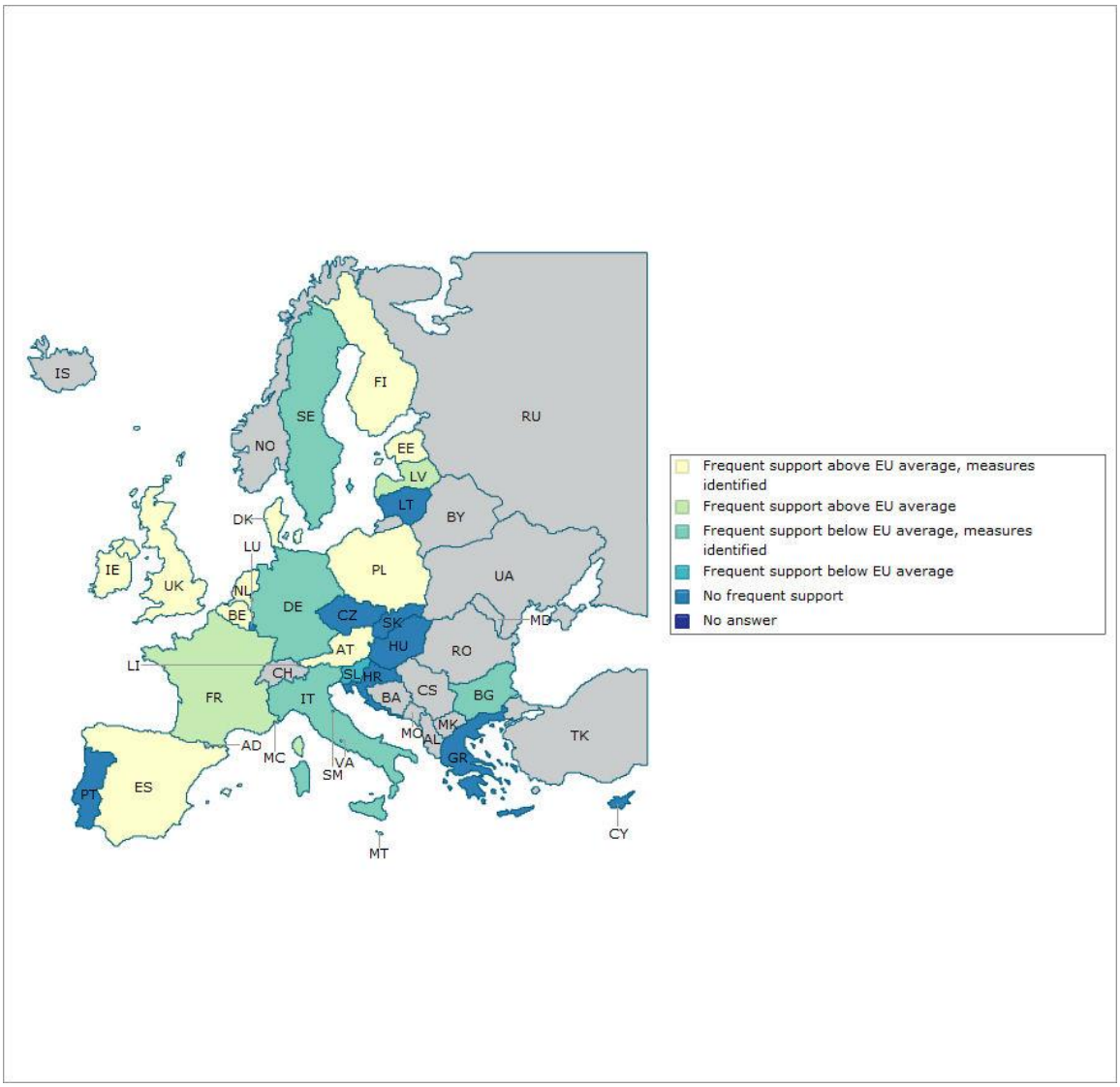
[1] Open access publishing (also referred to as 'gold' open access) means that an article is immediately provided in open access mode as published. In this model, the payment of publication costs is shifted away from readers, paying access via subscriptions. The business model most often encountered is based on one-off payments by authors. These costs (often referred to as Author Processing Charges, APCs) can usually be borne by the university or research institute to which the researcher is affiliated, or to the funding agency supporting the research. In other cases, the costs of open access publishing are covered by subsidies or other funding models. Green open access implies that the acceptance of a time lag before making the article available to potential users.



Source: ERA survey 2014

In comparative terms (see Map 1), according to survey results in 13 Member States the share of funders **frequently** supporting open access to publications is above the average.

Map 1: Classification of EU Member States according to the support open access to publications and frequent support provided by research funding organisations, 2013

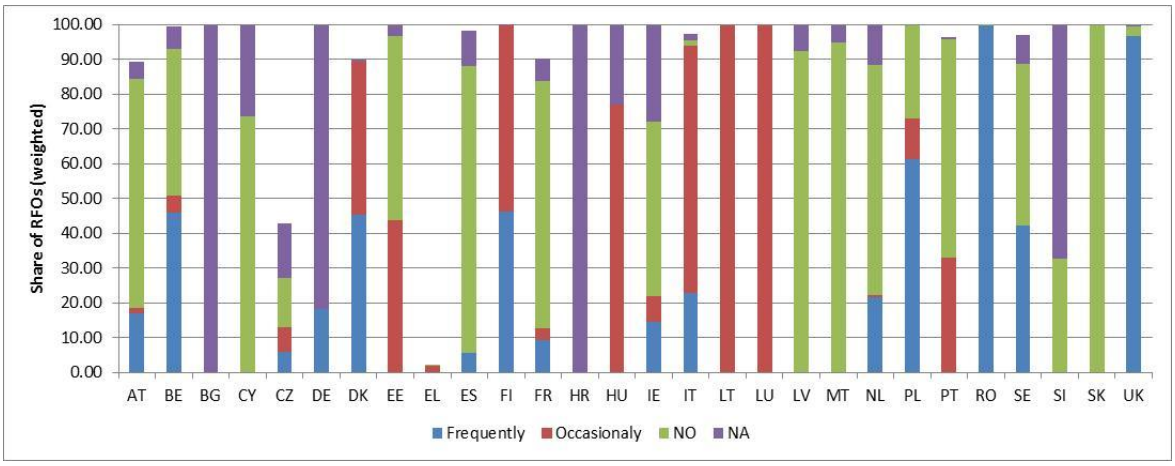


In the other countries the situation varies: in four Member States (BG, DE, IT, SE) the Commission could identify measures in support of open access, in one case (SI) the Commission could not identify policy support. In four cases (CY, HR, RO, SK), the funders which answered the survey did not declare any support to open access.

Concerning open access to data, the Commission could identify support in DE, EL, ES, IE, IT, PL, PT, RO and the UK.

According to the results of the ERA survey 2014, funding open access to data is not a common practice in funding organisations from several Member States[2] (see Graph 2). Among those Member States whose funders support it, the average share of funding organisations **frequently** supporting it is 28.1%.

Graph 2: Share of funders systematically funding open access to data, 2013

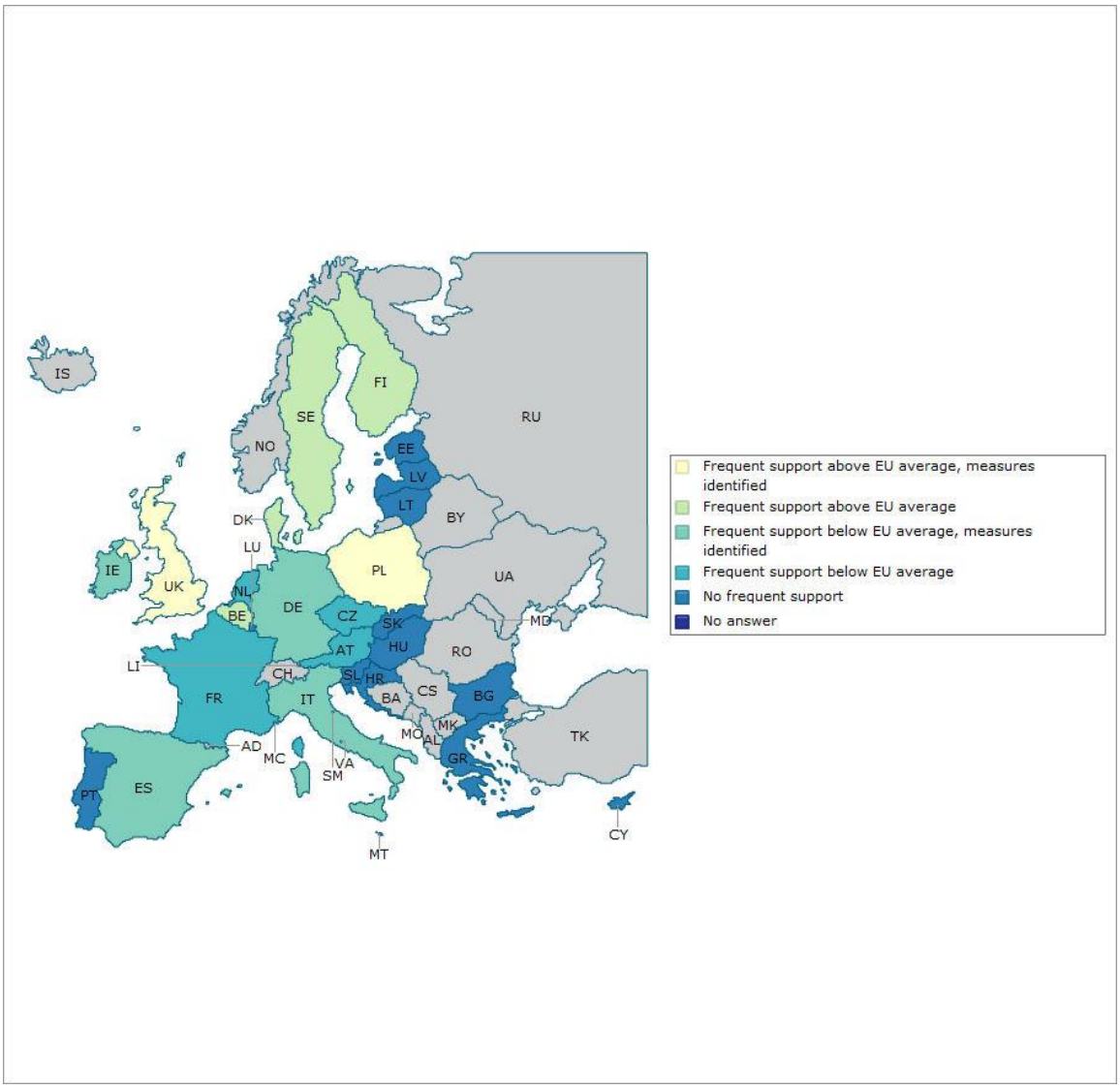


Source: ERA survey 2014

In comparative terms (see Map 2), according to survey results in seven Member States the share of funders **frequently** supporting open access to data is above the average.

Map 2: Classification of EU Member States according to the support of open access to data and frequent support provided by research funding organisations, 2013

[2] It should be mentioned that these figures concern funders who answered the ERA survey in 2014, which represent 34% of total EU GBAORD.

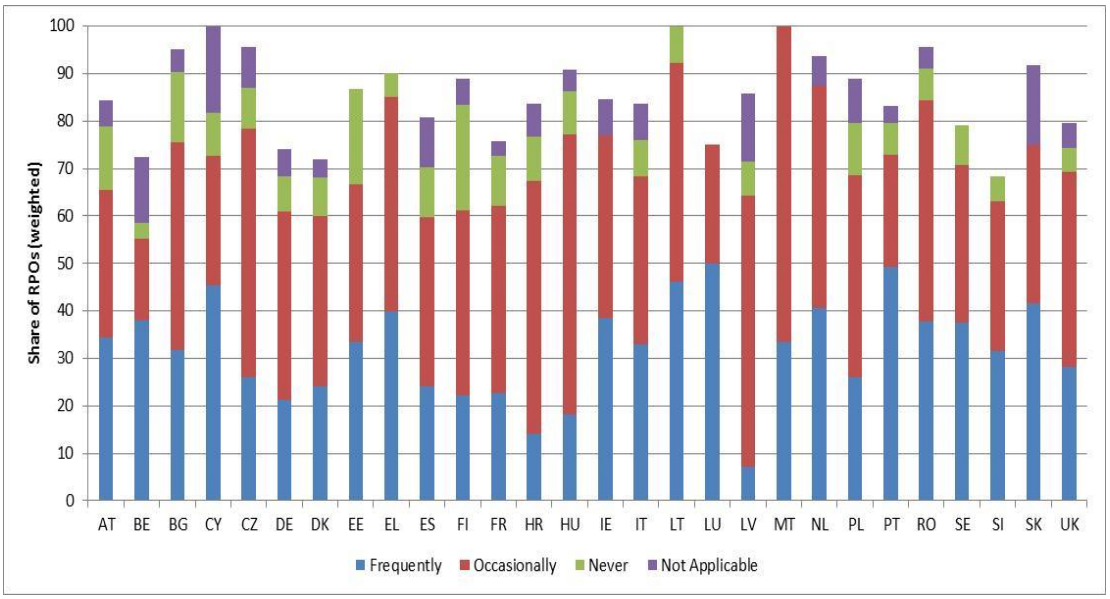


In the other countries where no frequent support is provided, the situation varies: in four Member States (DE, ES, IE, IT) the Commission could identify measures in support of open access to data; in three cases (AT, CZ, FR) the Commission could not identify policy support, and in six cases (CY, HR, LV, MT, SI, SK) funders which responded to the survey declared that they are not providing any support to open access to data.

According to the ERA survey 2014 results RPOs in all Member States declared that they make scientific research data available on-line and free of charge[3] (see Graph 3). The average share of organisations which do this **frequently** is approximately 19.4%.

Graph 3: Share of research performing organisations systematically making available on-line and free of charge [publicly funded] scientific research data, 2013

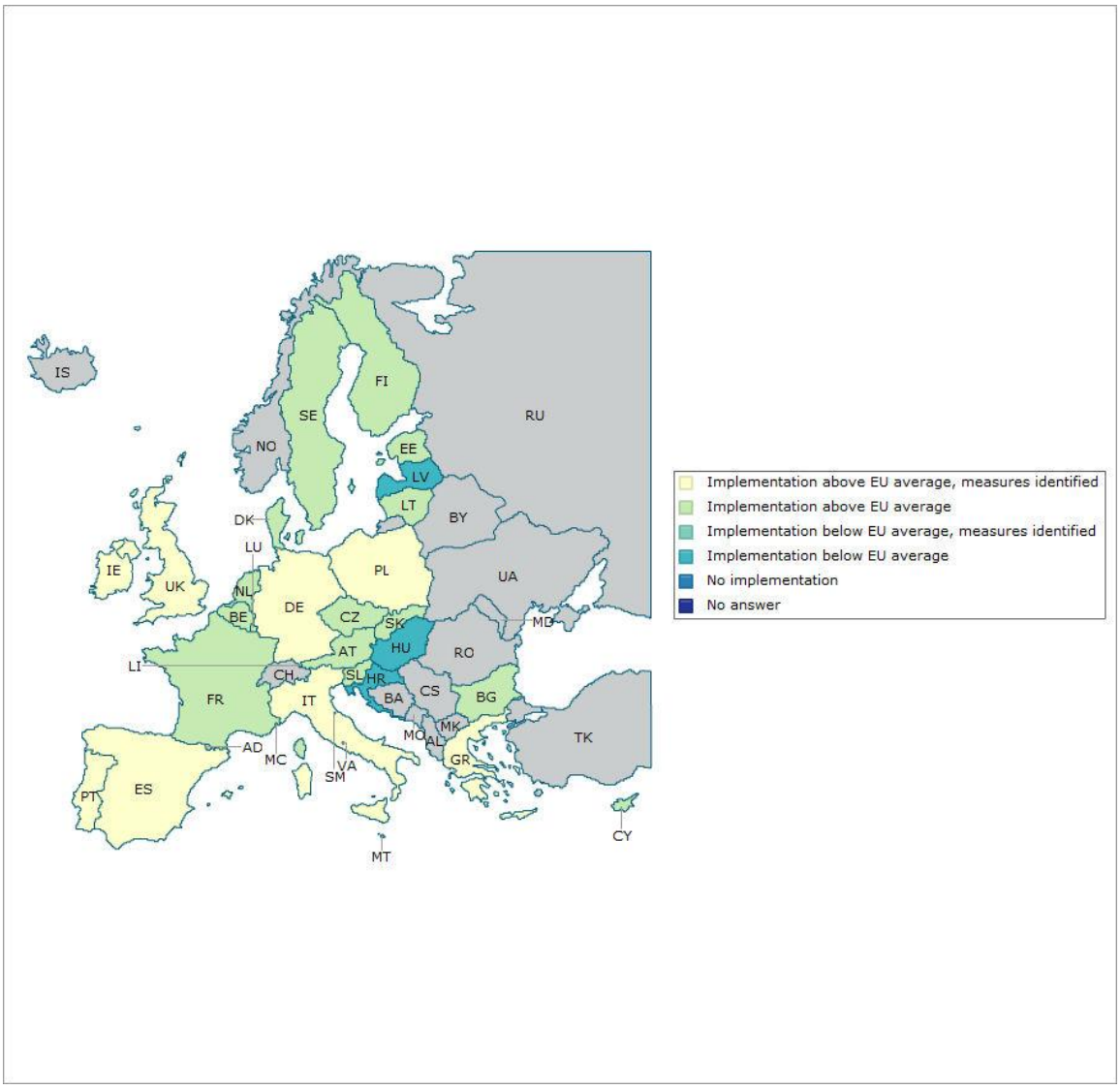
[3] It should be mentioned that these figures concern research performing organisations who answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).



Source: ERA survey 2014

In comparative terms (see Map 3), survey results show that a combination of policies and willingness by research performing organisations has induced that in most Member States the share of organisations making their data available is above the (low) EU share average (19.4%).

Map 3: Classification of EU Member States according to the support of open access to data and the implementation by research performing organisations, 2013



The Commission committed itself to running a pilot on open access to research data in Horizon 2020, taking into account the need to balance openness and protection of scientific information, commercialisation and Intellectual Property Rights (IPR), privacy concerns, security as well as data management and preservation questions. This open access to research data pilot concerns selected areas of Horizon 2020 ('core areas'). Projects not covered by the scope of the pilot can participate on an individual and voluntary project-by-project basis ('opt-in'). Projects may also decide not to participate in the pilot for several specific reasons ('opt-out'). First results of the uptake of the pilot in the proposals submitted in the first calls of Horizon 2020 appear promising.

The Commission also funds several projects to support and provide further insights into open access and related issues, such as RECODE (recommendations on open access to research data), FOSTER (training and awareness raising), PASTEUR4OA (networking OA actors) and of course OpenAIRE (infrastructure and national helpdesks). Specific support for projects participating in the Horizon 2020 pilot on open access to research data is provided through projects funded in the e-Infrastructure calls of the Horizon 2020 Research Infrastructures Work Programme 2014-15.

In terms of repositories for open access, the Commission could identify several modalities in Member States. National repositories are preferred in EE, FI, FR, HU, IT, LT, MT, NL, SI, SK and the UK. The preferred option is institutional repositories in BE,

BG, FI, HR, LT, MT, PL, SI. In two Member States (HR, IT) the regional repositories are preferred.

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

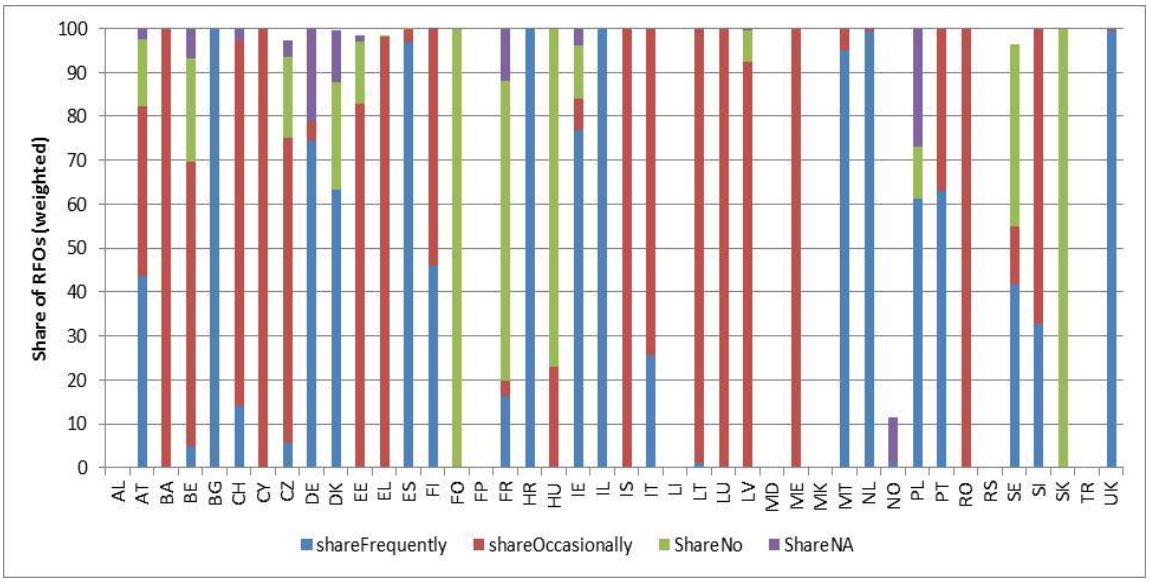
- *Strong policy support (strategies, networking, etc.) in most Member States to Open innovation (OI) and knowledge transfer (KT) but no frequent financial support by funders in half of Member States*
- *Knowledge transfer offices are present in a (weighted) majority of research performing organisations*
- *Most Member States encourage strategic partnership with the private sector. However, the share of funding of public institutions by the private sector is limited*
- *The Commission has committed to developing a comprehensive policy approach on open innovation and knowledge transfer. The Commission is continuously facilitating and supporting the development and cross-border networking of national knowledge transfer office networks and the work of existing pan-European networks*

Knowledge transfer of research results contributes to innovation. This explains that most Member States are supporting knowledge transfer through strategies, incentives, etc. The Commission identified that supporting modalities vary. In 16 Member States a national strategy on knowledge transfer is implemented (AT, BE, BG, CZ, DE, DK, EE, FR, HR, IE, LT, LU, LV, NL, PL, SE). In most cases, the strategy is accompanied by specific funding. A national network of knowledge transfer is in place in AT, LV, NL, PL and UK. The professionalization of knowledge transfer activities is supported by BE, DE, DK, EE, FR, LU, LV, MT, NL, RO and SE.

According to the ERA Survey 2014 results, funders in almost all Member States support the implementation of knowledge transfer in their programmes and/or projects[4] (see Graph 4). The average share of funders **frequently** supporting it in the EU is 69.3%.

Graph 4: Share of funders systematically supporting the implementation of knowledge transfer as part of their institutional and/or project based funding, 2013

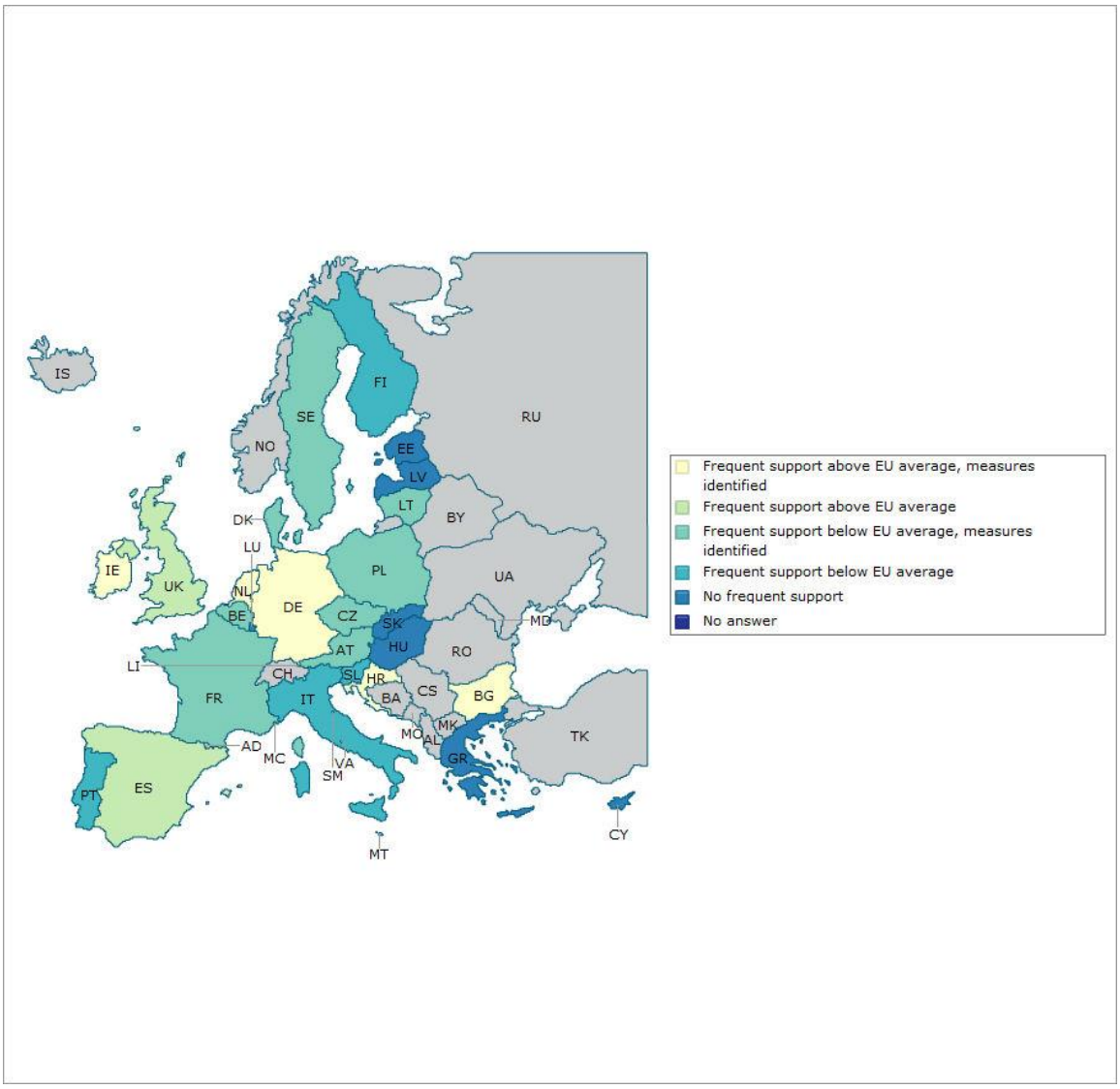
[4] It should be reminded that these figures concern funders who answered the ERA survey in 2014, which represent 34% of total EU GBAORD.



Source: ERA survey 2014

In comparative terms (see Map 4), according to survey results the share of funders frequently supporting knowledge transfer is above the EU average in eight Member States.

Map 4: Classification of EU Member States according to the existance of a knowledge transfer strategy and and the support provided by research funding organisations, 2013



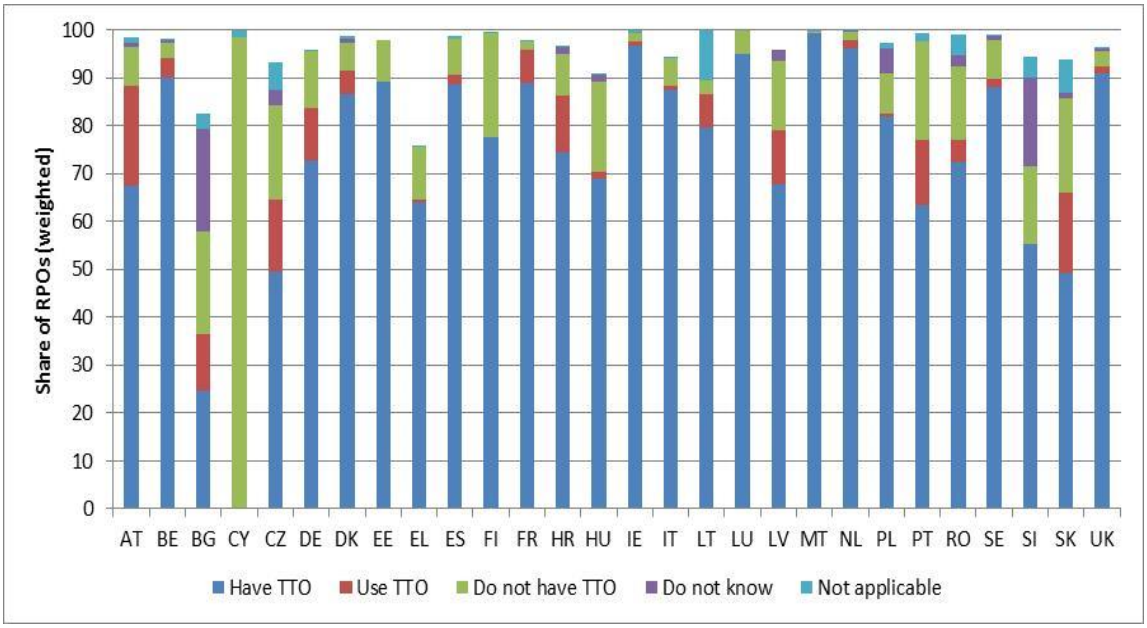
Among those countries where the share of funders frequently supporting knowledge transfer is below the average, eight Member States (AT, BE, CZ, DK, FR, LT, PL, SE) have set a strategy whilst in FI, IT PT and SI the Commission could not identify a strategy. In SK the funders who responded to the survey did not indicate any support.

The Commission has committed to developing a comprehensive policy approach on open innovation and knowledge transfer. For this purpose, the Commission established an Expert Group to assess what can be done to improve knowledge sharing and utilisation. The Expert Group has delivered a report which offers a new, advanced open innovation paradigm: it sets out to describe how to build and fund ecosystems for co-creation.

The Commission also carries out studies with findings contributing to the development of a comprehensive policy approach to KT and OI. An on-going study is providing support to the development and implementation of commitment n° 21 of the Innovation Union addressing collaboration and knowledge transfer. An additional study was recently launched, with an overall objective to consolidate an EU wide information base on OI and KT. The results of the studies will help to determine which additional measures might be needed to ensure an optimal flow of knowledge between the public research organisations and business, thereby contributing to the development of the knowledge based economy.

An indicator that can be used to assess the degree of attention to knowledge transfer in RPOs is the existence of a knowledge transfer office. According to the results of the ERA survey 2014 most research performing organisations (70% on average) have a technology transfer office[5] (see Graph 5).

Graph 5: Share of research performing organisations having or using a structure for knowledge transfer activities, 2013

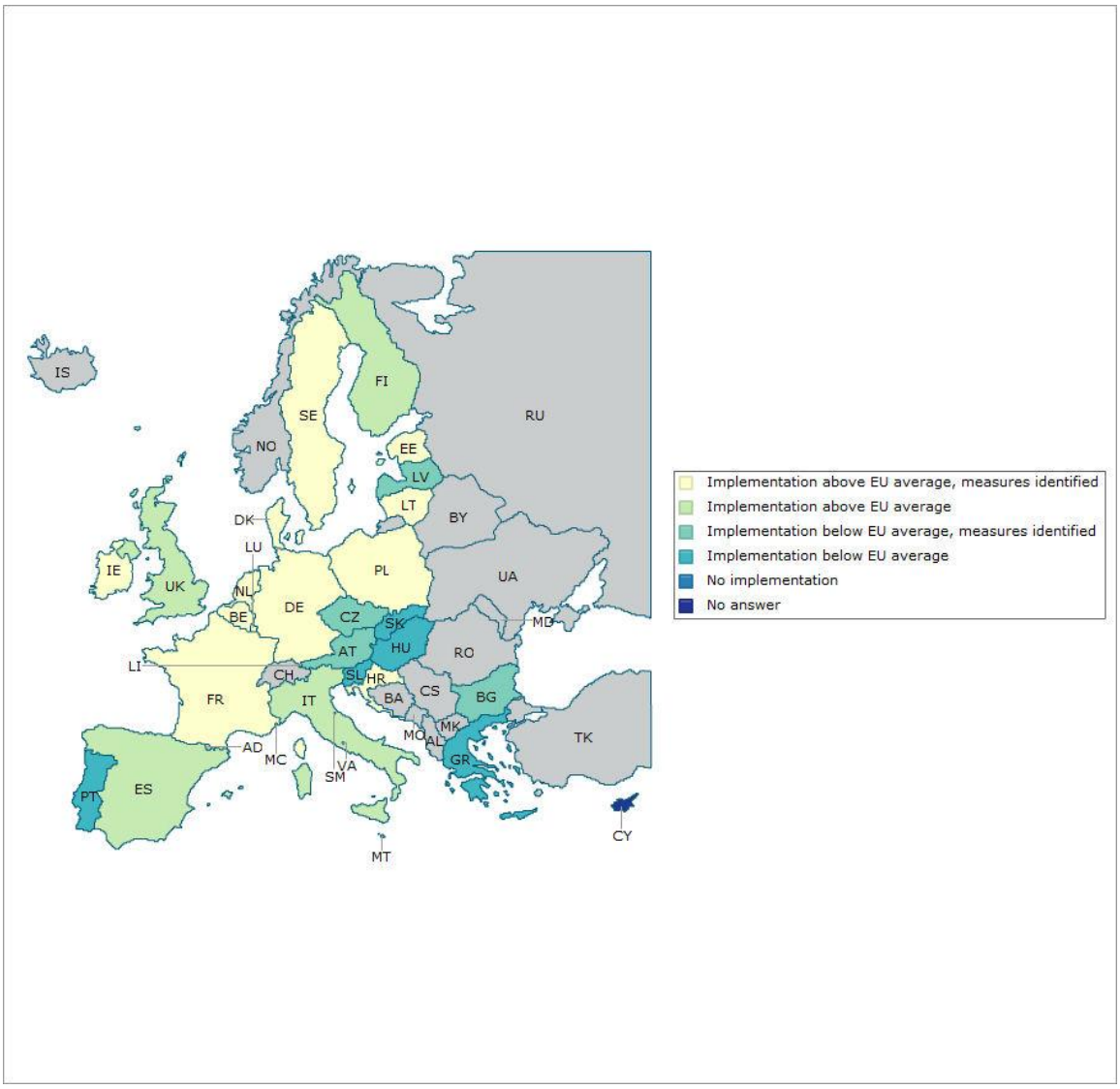


Source: ERA survey 2014

In comparative terms (see Map 5), in eight Member States there is a knowledge transfer strategy and the share of RPOs which have Technology Transfer Offices (TTOs) is above the EU average.

Map 5: Classification of EU Member States according to the existance of a knowledge transfer strategy and the existance of Technology Transfer Offices in research performing organisations, 2013

[5] It should be mentioned that these figures concern research performing organisations who answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).

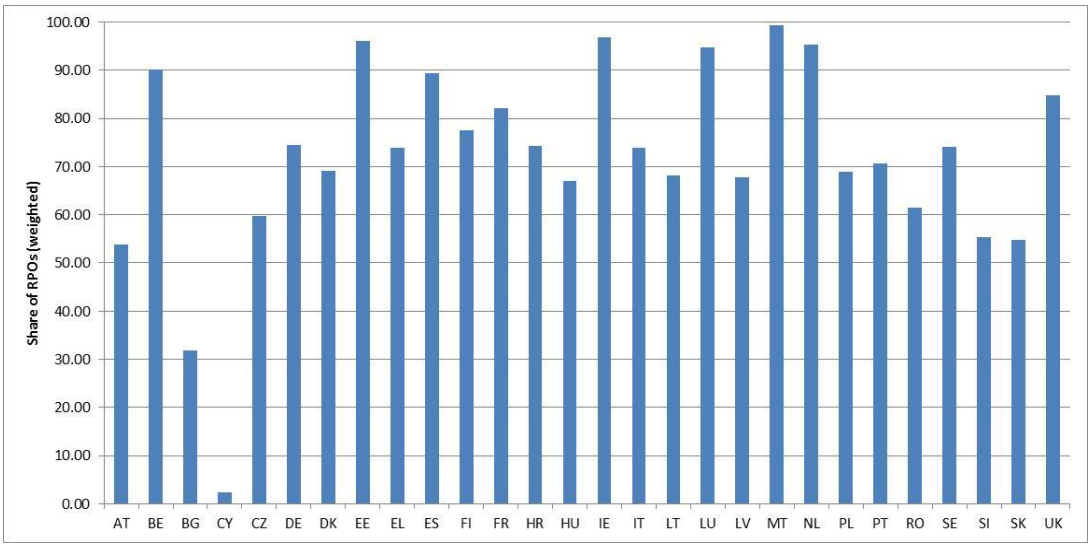


Among the other cases, in eight countries (AT, BE, CZ, DK, FR, LT, PL, SE), the Commission could identify the adoption of a knowledge transfer strategy whilst in FI, IT, PT and SI the Commission could not identify a knowledge transfer strategy.

Another indicator linked with knowledge transfer is the presence of dedicated staff to knowledge transfer RPOs. According to the ERA survey 2014 results, in most Member States more than 50% of the RPOs have knowledge transfer staff[6] (see Graph 6).

Graph 6: Share of research performing organisations having dedicated staff employed in knowledge transfer activities, 2013

[6] It should be mentioned that these figures concern research performing organisations who answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).

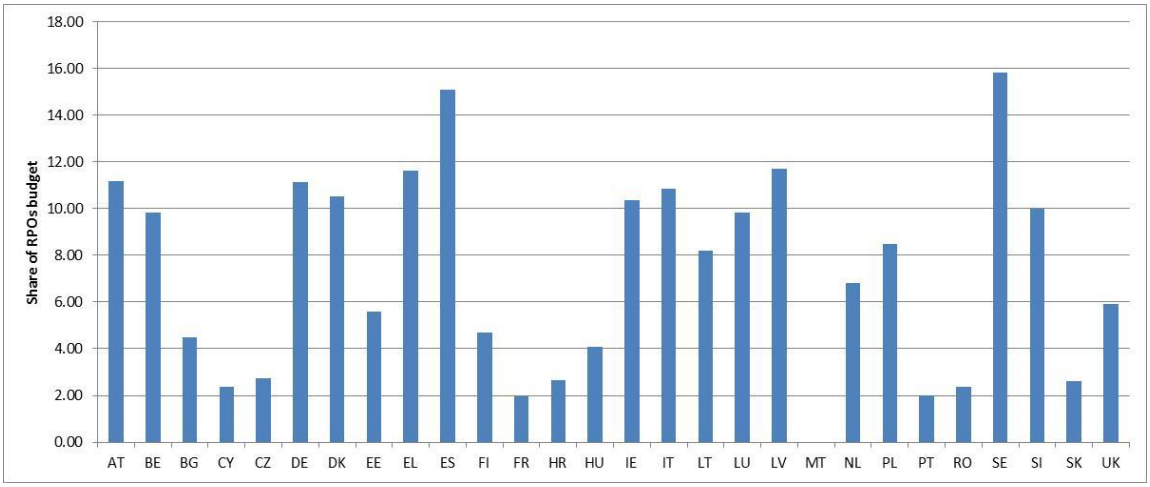


Source: ERA survey 2014

Partnership of academia with the private sector is another important factor which contributes to innovation. In 17 Member States, the Commission could identify specific support to strategic partnership with the private sector (AT, BE, CZ, DE, FI, FR, HR, IT, LT, LU, MT, NL, PL, RO, SI, SK, UK).

A proxy to measure attractiveness of public research organisations is the share of research and development budget financed by the private sector. According to the ERA survey 2014 results, on average, 7.8% of the budget of RPOs originate in the private sector[7] (see Graph 7). The variation across countries is quite important; half of Member States are below the average.

Graph 7: Share of research and development budget financed by private sector, 2013

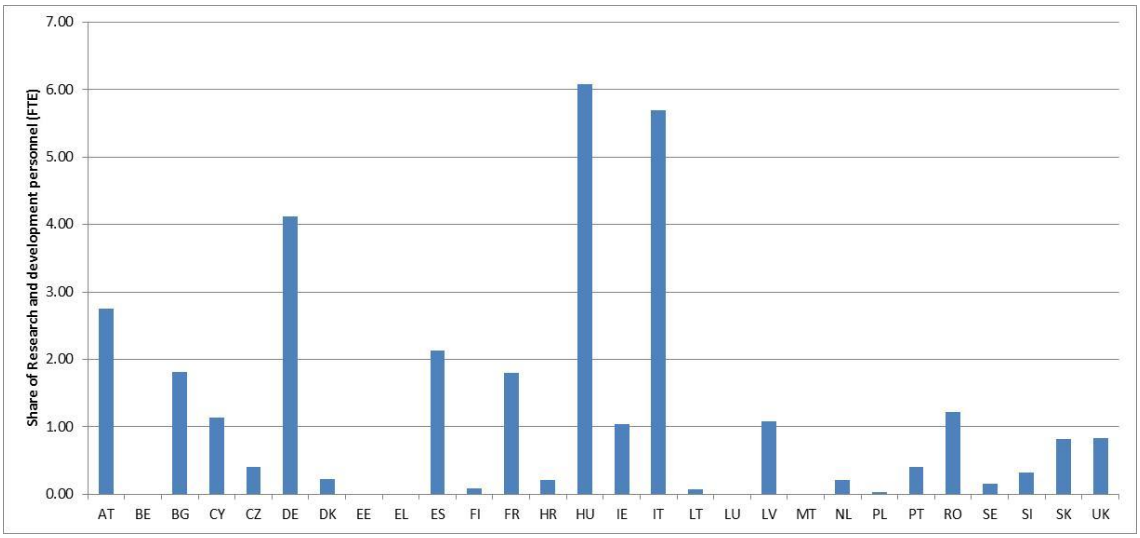


Source: ERA survey 2014

[7] It should be mentioned that these figures concern research performing organisations which answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).

Also, according to the ERA survey 2014 results a strong variation is observed in terms of staff employed by RPOs whose primary occupation is in the private sector[8] (see Graph 8). The average share of researchers in this category (in FTE) is 2.1%.

Graph 8: Share of staff employed by RPOs whose primary occupation is in the private sector (in Full Time Equivalents), 2013



Source: ERA survey 2014

In general the Commission is committed to a modern and efficient IP infrastructure that supports innovation in all its stages. In the case of patents, the implementation of the Unitary Patent System is a clear example in this sense. It will provide innovators and creators – and hence researchers - with access to broader territorial protection at lower costs, trigger a reduction of red tape and make it easier for inventors to access the single market and internationalise their activities. It will fosters technological transfer, as it will not be necessary anymore to register a patent transfer in each country in which the transaction needs to have legal effect. In addition, the centralised registration and publication of unitary patents will make it easier to access patent literature.

In order to gather insight on how to address some IP related barriers, the Commission set up two Expert Groups. Expert Group on IP valuation was created to address the difficulty in assessing value and in access to funding. To do this, the group looked at which improvements could be done regarding the evaluation of the economic value of IP in order to foster IP related transactions and IP based finance. In addition, an Expert Group on Patent valorisation was created and will look at how to increase transparency of the IP market, increase awareness of business opportunities around IP and decrease transaction costs linked to IP transactions.

The Commission is continuously working with relevant stakeholder groups to facilitate and support the development and cross-border networking of national knowledge transfer office networks and the work of existing pan-European networks. In addition, Horizon 2020 pilots a Technology Transfer Financing Facility which will co-finance investments

[8] It should be mentioned that these figures concern research performing organisations who answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).

made by existing technology transfer (TT) funds and vehicles. It will focus on TT undertaken via the creation of new companies and the licensing of intellectual property, and concentrates on the proof-of-concept, development and early commercialisation stages of the TT process. Specific calls are also foreseen in Horizon 2020, for instance on capacity-building on TT encouraging and - where appropriate - incentivising the more established and experienced funds and TT offices (TTOs) to share their expertise and best practices with their less experienced counterparts. The latter will complement Horizon 2020 Technology Transfer Financing Facility pilot.

3.5.2. Policies for public e-infrastructures and associated digital research services

- *Strong support by the European Commission to enable world-class science based on High Performance Computing, wifi infrastructure and grid infrastructure, federating national initiatives*
- *More effort is needed to ensure the provision of federated identities*

Europe's National Research and Education Networks are specialised Internet service providers dedicated to supporting the needs of the research and education communities within their own country. The Commission could identify such national networks in 26 Member States: AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FR, HR, HU, IE, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK and the UK. These networks facilitate the integration of researchers in the countries in the Digital ERA.

PRACE (Partnership for Advanced Computing in Europe) has been a key enabler for world-class science based on High Performance Computing (HPC), awarding, since 2010, more than 8 billion computing core hours of Tier-0 systems to 303 scientific projects from 38 countries. PRACE has provided training in HPC to 2,700 people in 360 full days through its PATCs (Advanced Training Centres days) and has held more than 180 events for community building in HPC. Finally, PRACE has also allowed access to HPC infrastructures to 20 industries (including SMEs) in the first year of its industrial access programme.

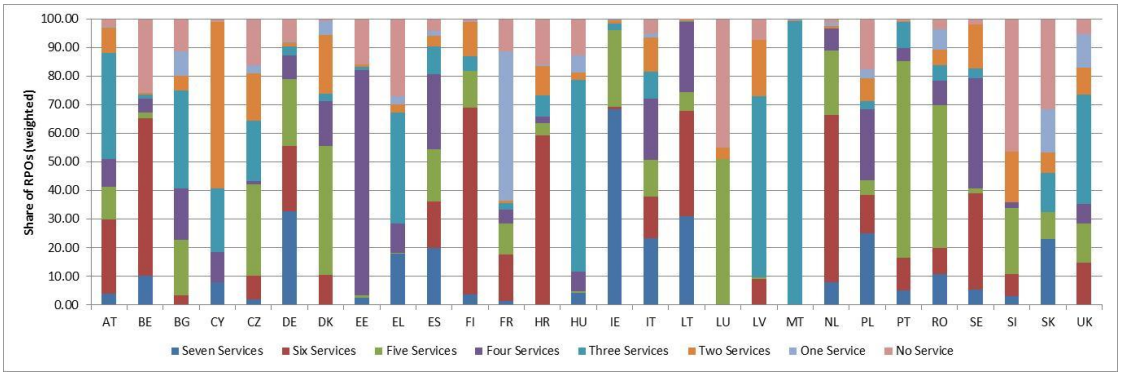
Universities' and research organisation's wifi infrastructure can be accessed through a federated technology called "eduroam" whose development is supported by GÉANT project (funded by the EC). This technology allows students and researchers to seamlessly access their IT infrastructure through wifi using their home organisation's credentials even in situations of mobility. This technology is deployed in all MS and AC with an estimated 200,000 wifi base stations equipped and 21 million accesses per week (100% growth year/year) including 12% across border access (as of April 2014). This technology is a key integrator of wifi infrastructures and ensures IT mobility not only between countries but also inside countries and regions.

The European Grid Infrastructure (EGI) is a crucial provider of IT resources for science in Europe. Driven by the needs of the scientific community, it enables sharing of computing power for scientific purposes between Member States. The EGI federates the National Grid Initiatives (NGIs), which operate grid infrastructures at country-level. In 2013 the EGI provided more than 3.7 billion computing core hours (kSI2K) linking 53 countries with more than 300 resource centres and around 430,000 cores.

In terms of provision of digital services for research and education, TERENA, the Trans-European Research and Education Networking Association, has identified three main kinds of services: support to collaboration, cloud services and premium services (these include consultancy services, security audits, etc.). According to TERENA, the degree of provision of Digital services varies among Member States: the three kinds of services are provided by CZ, EE, ES, FR, HU, IE, LT, LU, NL and SI; cloud and collaboration support by EL, Cloud and premium services by BE and PL, Cloud services in LV, collaboration support in SE and finally premium services by: DE, DK and PT.

In the survey, RPOs were requested to indicate the provision of seven types of services. As the combination of possibilities is quite high, the results of the ERA survey are presented according to the number of services provided to researchers. According to the results the share of institutions not providing any digital services is quite high in many cases ("No services" in more than 10% of the institutions in BE, BG, CZ, EE, EL, FR, HR, HU, LU, PL, SI, SK)[9] (see Graph 9).

Graph 9: Share of research performing organisations providing digital research services (i.e. cloud services, research collaboration platform, etc.), 2013



Source: ERA survey 2014

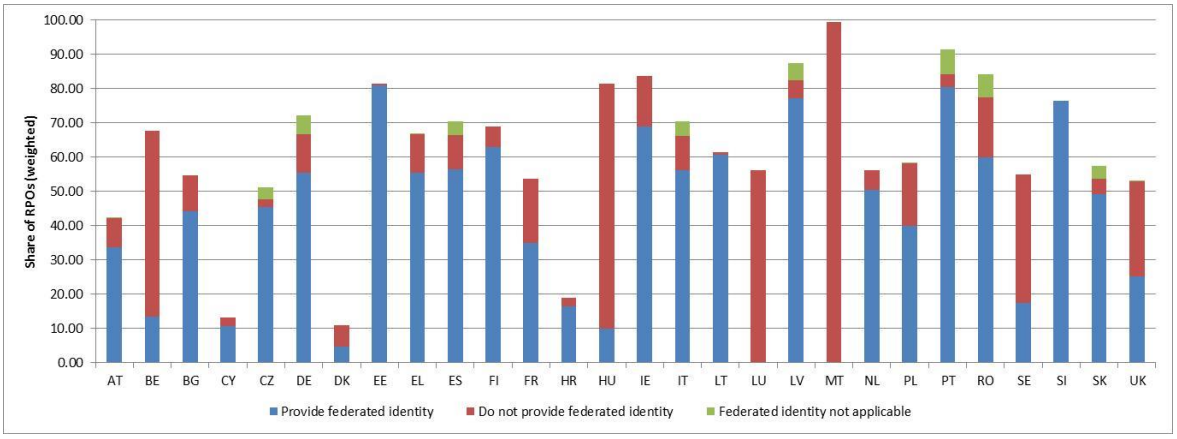
The provision of federated electronic identities facilitates the access to digital services by researchers. The Commission could identify that more than half of Member States are members of an identity federation: AT, BE, BG, CZ, DE, DK, EE, FR, HR, IE, LU, NL, PL, SE, SI and the UK of which BE and LU in 2013 and that 18 countries are members of the eduGAIN service, which is intended to enable the trustworthy exchange of information related to identity, authentication and authorisation between the GÉANT (GN3plus) Partners' federations: AT, BE, CZ, DE, DK, EE, EL, ES, FR, HR, HU, IE, LV, NL, PL, SE, SI and the UK, of which EE and AT in 2013.

According to the ERA survey 2014 results, on average around 43% of the RPOs provide federated identities to their researchers[10] (see Graph 10).

[9] It should be mentioned that these figures concern research performing organisations who answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).

[10] It should be mentioned that these figures concern research performing organisations who answered the ERA survey in 2014, which employ 515 000 researchers (around 20% of total EU researchers).

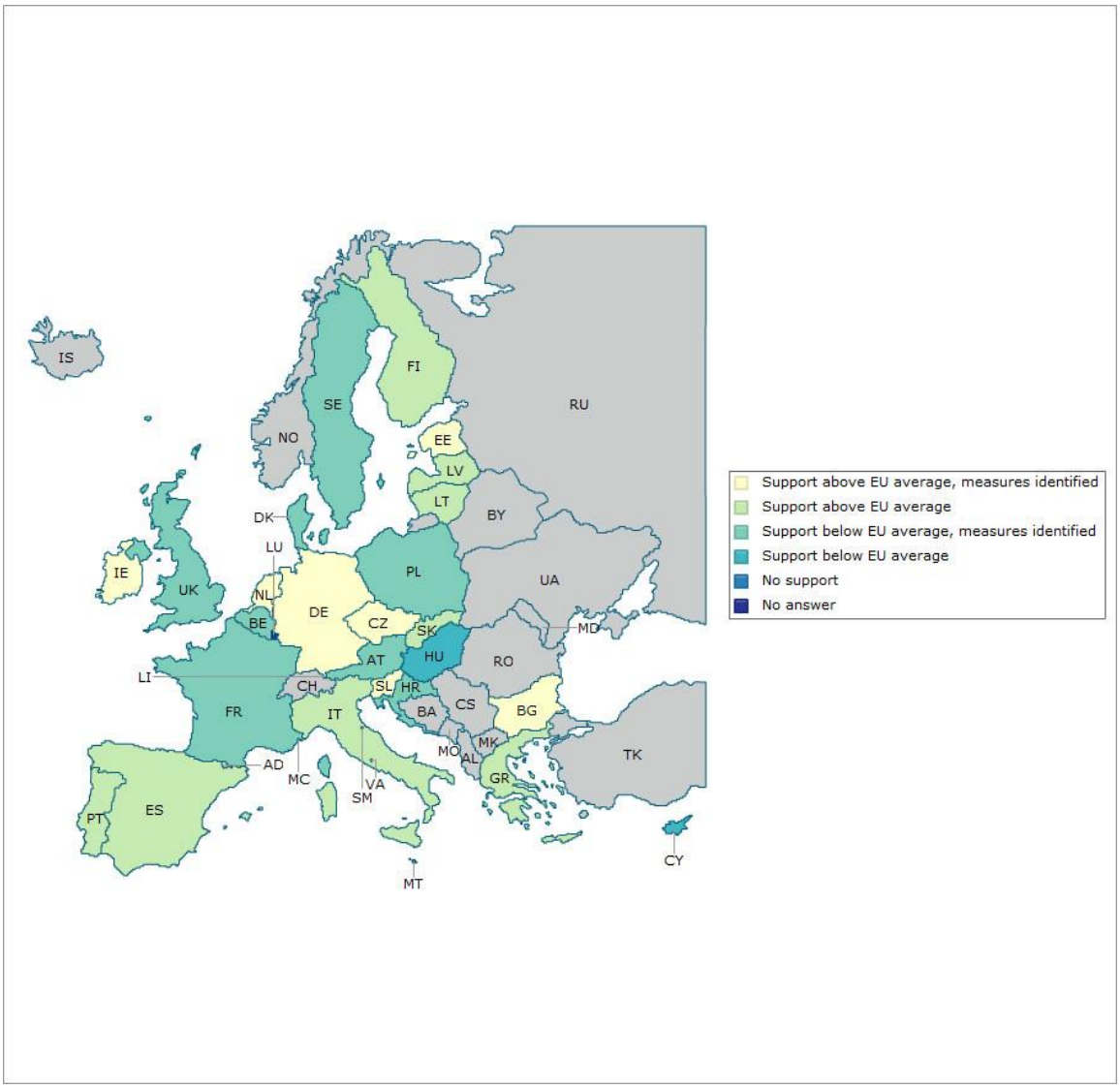
Graph 10: Share of research performing organisations providing federated electronic identities for their researchers, 2013



Source: ERA survey 2014

In comparative terms (see Map 6), according to survey results RPOs in more than half (16) of Member States are providing federated identities above the EU average.

Map 6: Classification of EU Member States according to the support provided to federated identities and their provision by research performing organisations, 2013



Among the rest of the countries, six Member States (CY, HR, HU, LU, MT, RO) are not yet members of an identity federation nor of eduGAIN.