



European Research Area

Progress Report 2016

Country Snapshot
Germany



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Country profile: Germany

Progress of Germany towards ERA Roadmap

	Indicator	Performance				Growth					
	Name	Reference year	Score	Cluster	Lead/Gap (Δ %)	EU-28	Reference Period	CAGR	Trend (2005–2015)	Lead/Gap (Δ % pt)	EU-28
Across Priorities	1 – Adjusted Research Excellence	2013	49.9	2	12	44.4	2010–2013	6.0%		-0.3	6.4%
	2A – GBARD to transnatl coop (EUR/researcher)	2014	4,686	2	87	2,507	2010–2014	-1.1%		-8.9	7.8%
	2B – Roadmap for ESFRI projects	National roadmap implemented in 2013, ESFRI projects identified, investment needs identified									
	3 – EURAXESS job ads per 1 000 researchers	2014	5.5	3	-88	47.0	2012–2014	8.5%		0.7	7.8%
	4 – Share of women among Grade A HES	2014	17.9%	3	-24	23.5%	2007–2014	5.9%		2.6	3.4%
	5A – Research institute–private collaboration	2012	5.9%	3	-19	7.3%	2008–2012	:			3.5%
	5A – Higher education–private collaboration	2012	13.9%	2	15	12.0%	2008–2012	:			1.3%
	5B – Share of papers in Open Access (Total)	2014	49.8%	4	-5	52.2%	Not computed				
	6 – Collab papers w/non-ERA per 1 000 researchers	2014	49.6	2	-2	50.7	2005–2014	0.0%		-4.2	4.1%
Headline Composite	2016	47	3	-6	50	Not computed					
Priority 1	Adjusted Research Excellence ^(c)	2013	49.9	2	12	44.4	2010–2013	6.0%		-0.3	6.4%
	GBARD as share of GDP ^(c)	2014	0.870%	1	30	0.671%	2008–2014	2.1%		2.6	-0.5%
	European Innovation Scoreboard	2015	0.632	1	21	0.521	2008–2015	0.2%		-0.6	0.7%
	<i>GBARD as share of government expenditures</i>	2014	1.96%	1	41	1.39%	2005–2014	2.2%		3.0	-0.8%
	<i>R&D tax incentives as share of GBARD</i>	2013	0.0%	3	-100	11.4%	Not computed				
	<i>Share of GBARD allocated on project basis</i>	2014	36.3%	Not computed			2009–2014	-0.9%		Not computed	
	<i>Patent applications per 1 000 researchers</i>	2013	49.7	1	67	29.8	2005–2013	-2.7%		-1.5	-1.2%
	Researchers per 1 000 active population ^(c)	2014	8.62	2	16	7.40	2005–2014	3%		0.4	2.4%
	Publications per 1 000 researchers ^(c)	2014	455	3	-5	481	2005–2014	-1.8%		-3.4	1.6%
Priority 1 Composite	2016	58	2	16	50	Not computed					
Priority 2	A – GBARD to transnatl coop (EUR/researcher) ^(c)	2014	4,686	2	87	2,507	2010–2014	-1.1%		-8.9	7.8%
	A – Collab papers w/ERA per 1 000 researchers ^(c)	2014	59.7	3	-9	65.7	2005–2014	0.4%		-3.2	3.6%
	A – Public-to-public partnerships (EUR/researcher) ^(c)	2014	571	3	12	512	2012–2014	21.4%		-20.7	42.1%
	A – Co-invention rate w/ERA partners ^(c)	2011–13 ^(R)	10.2%	3	-21	13.0%	2007–2013 ^(R)	-0.6%		-0.1	-0.5%
	B – Roadmap for ESFRI projects	National roadmap implemented in 2013, ESFRI projects identified, investment needs identified									
	B – Participation in developing ESFRI projects	2016	28.6%	2	38	20.7%	Not computed				
	B – Participation in operational ESFRI landmarks ^(c)	2016	69.0%	1	129	30.2%	Not computed				
Priority 2 Composite	2016	59	2	18	50	Not computed					

Country profile: Germany

	Indicator	Performance				Growth					
		Name	Reference year	Score	Cluster	Lead/Gap (Δ %)	EU-28	Reference Period	CAGR	Trend (2005-2015)	Lead/Gap (Δ % pt)
Priority 3	EURAXESS job ads per 1 000 researchers ^(c)	2014	5.5	3	-88	47.0	2012-2014	8.5%		0.7	7.8%
	Open, transparent, merit-based hiring process ^(c)	2012	44.3%	2	-9	49.0%			Not computed		
	Share of doctoral students from EU countries ^(c)	2013	3.8%	3	-49	7.4%			Not computed		
	Priority 3 Composite	2016	43	3	-32	63			Not computed		
Priority 4	Share of women among Grade A in HES ^(c)	2014	17.9%	3	-24	23.5%	2007-2014	5.9%		2.6	3.4%
	Gender dimension in research content ^(c)	2011-15 (R)	0.76	3	-22	0.97	2005-2015 (R)	4.0%		4.5	-0.5%
	Share of women among heads of HES institutions ^(c)	2014	16.5%	3	-18	20.1%			Not computed		
	Share of women researchers ^(c)	2013	27.9%	4	-16	33.2%	2005-2013	3.4%		2.6	0.8%
	Share of women among PhD graduates ^(c)	2012	45.4%	3	-4	47.3%	2005-2012	2.0%		0.8	1.2%
Priority 4 Composite	2016	32	4	-30	46			Not computed			
Priority 5	A - Research institute-private collaboration ^(c)	2012	5.9%	3	-19	7.3%	2008-2012	:			3.5%
	A - Higher education-private collaboration ^(c)	2012	13.9%	2	15	12.0%	2008-2012	:			1.3%
	A - Share of public R&D funded privately ^(c)	2013	12.3%	1	51	8.1%	2009-2013	0.2%		-0.8	0.9%
	A - Public-private collab papers per capita ^(c)	2014	53.0	2	56	33.9	2008-2014	1.6%		1.8	-0.1%
	B - Share of papers in Open Access (Total) ^(c)	2014	49.8%	4	-5	52.2%			Not computed		
	B - Share of papers in Open Access (Green)	2014	43.0%	3	-4	44.7%			Not computed		
	B - Share of papers in Open Access (Gold)	2014	20.5%	3	-2	21.0%			Not computed		
	B - National Open Access policies adopted										
Priority 5 Composite	2016	40	3	-2	41			Not computed			
Priority 6	Collab papers w/non-ERA per 1 000 researchers ^(c)	2014	49.6	2	-2	50.7	2005-2014	0.0%		-4.2	4.1%
	Share of doctoral students from outside EU ^(c)	2012	11.3%	3	-56	25.5%	2005-2012	0.1%		-3.4	3.5%
	Licence & patent rev. from abroad, share of GDP ^(c)	2013	0.77%	2	21	0.64%	2006-2013	19%		9.0	9.6%
	Co-invention rate w/non-ERA partners ^(c)	2011-13 (R)	7.4%	3	-25	9.8%	2007-2013 (R)	1.9%		-0.4	2.3%
Priority 6 Composite	2016	50	2	-9	55			Not computed			

COUNTRY SNAPSHOT

Germany's overall performance towards achieving the European Research Area (ERA) falls into Cluster 3 slightly below the EU-28 average with a deviation of 6 % on the headline composite indicator. Note that this composite score relies on the core high level indicators that were selected as being the most relevant in monitoring progress in achieving the ERA by the European Research Area and Innovation Committee (ERAC Secretariat, 2015). As such, it provides only a partial view of all the relevant and complementary dimensions captured by the indicators listed in the above table. The reader should be careful in extracting conclusions on overall performance, acknowledging the presence of variability across all the dimensions within and between priorities.

COUNTRY NARRATIVE

1. More effective national research systems

Priority 1 is a relatively strong area for Germany, with a Cluster 2 ranking and 12 % lead over the EU-28 average on the headline 'adjusted research excellence' indicator. The country also falls into Cluster 2 for the priority composite indicator with a similar lead compared to the EU-28.

The German research system is structured to effectively integrate public and private research organisations along the innovation chain, including universities, companies, institutes and universities of applied science. The new High-Tech Strategy enacted by the Federal Government in September 2014 (which will remain valid until 2017) is the central policy document (BMBF, 2014a). Its structure is well aligned with the ERA priorities and reinforces the national R&I strategy process initiated in 2006.

The federal research system places the main funding responsibilities for universities and tertiary education on the Länder (the individual states), whereas the funding of non-university institutions is shared between the Federal Government and the Länder. This makes the decision-making and funding landscape quite complex at the national level. However, the Excellence Initiative launched in 2006 successfully triggered a new dynamism in the German science system which the Federal Government and the Länder want to maintain and enhance by sharing responsibility and providing joint funding. A constitutional reform in December 2014 has provided new opportunities for the Federal Government to become a permanent partner in the financing of universities, jointly with the Länder. In June 2016 the Federal Government and the Länder launched the Excellence Strategy to continue the impetus set by the Excellence Initiative: a sum of €533 million per year (75% federal government, 25% Länder) is available for cutting-edge research at universities. Moreover, the High-Tech Forum composed of 20 members from academia, industry and civil society was formed in 2015 as advisory body to further develop and implement the national High-Tech Strategy (Sofka & Sprutacz, 2016).

Germany has heavily invested in its research system. The country falls into Cluster 1 or 2 across all indicators related to investment (except for research and development [R&D] tax incentives), and also performs well above the EU-28 average (in 2015 or 2014) in addition to having exhibited stronger growth than the EU-28 average (since 2005 or 2008 depending on the indicator).

Reforms in competition-based funding have been enacted across the country and the competitive funding share has risen from 19 % in 2003 to 28 % in 2013. Financial awards for high-performing institutions have also been put in place. Over the last decade, federal and EU funding has increased as well as research funding provided by the private sector. However, the relative share of private funding has slightly decreased due to the high increase in public investments in research and innovation (GWK, 2015).

In terms of scientific performance, the public investment in the research and innovation (R&I) system translates more strongly in terms of patents than publications: in 2013, Germany produced 49.7 patents per 1 000 researchers with a lead of 67 % above the EU-28 average of 29.8. In 2014, the country registered 455 publications per 1 000 researchers, falling 5 % below the EU-28 average of 481. Patent- and publication-related indicators decreased slightly between 2005 and 2014, reducing the country's lead for the former and increasing the gap for the latter compared to the EU-28

2. Optimal transnational co-operation and competition

Germany is performing well for Priority 2 overall as the composite indicator falls into Cluster 2 and sits 17 % above the EU-28 average. The country is performing notably better in Priority 2b than Priority 2a: for the former it falls into Cluster 1 or 2 depending on the indicator to be considered, while for the latter it falls into Cluster 3 (as well as below the EU-28 average) across all indicators.

a. Jointly addressing grand challenges

The *Strategy of the Federal Government on the European Research Area* addresses issues related to Priority 2a together with the *Action Plan for International Cooperation*, both issued in 2014. The national strategy aligns with the jointly defined research agenda elaborated through the Joint Programming Initiatives (JPIs), and supports other transnational cooperation initiatives such as European Innovation Partnerships (EIPs), public-public-partnerships (P2Ps), and public-private partnerships (PPPs). Germany is involved in 9 of the 10 JPIs (BMBF, 2014b, 2014c).

Compared to 2009, Germany has largely increased its funding for international projects, reaching EUR 109 million in 2013 (+47 %) for projects with EU partners and EUR 235 million in 2013 (+96 %) for projects with non-EU partners (BMBF, 2014c). Nonetheless, the share of government budget appropriations or outlays for R&D (GBARD) dedicated to transnational cooperation has decreased by 1.1 % annually to reach 3.89 % of GBARD in 2014 while the EU-28 average has increased by 3.2 % annually to reach 4.87 % of GBARD. A main factor is the considerable increase of German overall GBARD (10 % between 2010 and 2014 compared to an increase of 5,3% in GBARD dedicated to transnational cooperation).

In 2014, Germany produced 59.7 collaborative papers with ERA partners per 1 000 researchers, which is 9 % below the EU-28 average; public-to-public partnerships also remain just above the EU-28 average having exhibited a positive annual growth rate in the 2012-2015 period. The strong national performance in terms of patenting does not translate directly into a strong co-invention rate with other ERA partners, as the country score (10.2 %) is 21 % below the EU-28 average (13.0%). Transnational scientific production should nevertheless increase in the coming years, given that dedicated strategies and actions are in place and that collaboration and synergies with EU partners are part of the major R&I policy initiatives..

In terms of research funding organisations' (RFO) procedures alignment, Germany, together with Austria and Switzerland, has established a successful mutual recognition mechanism that enables a researcher moving from one country to another to transfer a grant from one agency to another without any additional evaluation from the host agency (Sofka & Sprutacz, 2016).

b. Make optimal use of public investments in research infrastructures

Germany invested EUR 459 million in research infrastructures between 2011 and 2013 (Sofka & Sprutacz, 2016). The *Strategy of the Federal Government on the European Research Area* published in 2014 put the commitment to the European Strategy Forum on Research Infrastructures (ESFRI) in a central position and is complemented by the *Action Plan for International Collaboration* (BMBF, 2014b, 2014c). The BMBF continues its active involvement in the Member State-driven ESFRI process and ensures a functional interplay between the National Roadmap Process and ESFRI.

In 2016, Germany continued its strong contribution to ESFRI research infrastructures. This was particularly evident for projects in the implementation 'landmark' phase (where continued financial support is required for operation) and, to a smaller extent, in the early development phase: Indeed, the country participated in 75,9 % of the landmark projects and 28.6 % of the (early) projects while the EU-28 average participation was 30.2 % and 20.7 % respectively.

3. An open labour market for researchers

Germany is a modest performer for Priority 3 considering it falls into Cluster 3 both in terms of EURAXESS job advertisements (the headline indicator) and the priority composite indicator. Nonetheless, other more qualitative dimensions have to be taken into consideration to assess German performance in this priority.

Germany's number of advertisements on the EURAXESS job portal is much lower than the EU-28 average, with respectively 5.5 and 47.0 job offers posted on this portal per 1 000 researchers in

2014. Nonetheless, the country already had domestic advertising platforms in place that were used by research performing organisations (RPOs) in their recruitment process in order to openly advertise the country's available positions (Deloitte, 2014). On behalf of the Federal Ministry of Education and Research, EURAXESS Germany conducted in 2014 a promotional campaign for EURAXESS Jobs aimed at German higher education and research institutions. As a consequence, the number of German job advertisements on EURAXESS has increased significantly. Compared to the period May to July 2014, in May to July 2016 the average increase amounts to +161%. Furthermore, unlike many other countries, the recruitment of university staff has continued growing despite the 2009 economic crisis. Thus, a larger volume of job advertisements would need to be transferred from the domestic advertisement system to the European job portal compared to other countries for which the volume of recruitment has decreased. In order to further improve its measured performance, Germany could, for example, implement a systematic transfer mechanism from the domestic advertisement system to the EURAXESS job portal, as has been done elsewhere in Europe. Nonetheless, good practices in terms of transparent advertising are in place in the country – for instance, German universities are very unlikely hire their own former PhD students after their graduation (Sofka & Sprutacz, 2016).

The 'Action Plan for International Cooperation', mentioned above, also aims to lower the barriers to mobility by integrating measures that facilitate foreign researchers' arrival in Germany, including the provision of information through EURAXESS (BMBF, 2014c).

Researchers' mobility is influenced by attractive working conditions in the host country. In September 2015, Germany reformed the legislation on temporary employment in science in order to counterbalance the inflation of short-term contracts generated by the previous law, which was preventing young researchers from being able to plan their career progression. More broadly, the federal government has worked closely with the Länder to improve local legislation in order to introduce a tenure track system for junior researchers (Sofka & Sprutacz, 2016). These measures may have improved the attractiveness of the German research system, especially for young researchers. Additionally, the German Research Foundation (DFG) has long been implementing the 'money follows researcher' principle and many programmes allow international recipients to benefit from scholarships (DFG, 2015; Sofka & Sprutacz, 2016).

4. Gender equality and gender mainstreaming in research

Priority 4 is the area in which German performance has the most room for improvement compared to its ERA and EU-28 counterparts, as the country falls into Cluster 3 or 4 across all indicators. This is also the priority in which important progress has been achieved in recent.

Women accounted for 45.4 % of PhD graduates (in 2012), 27.9 % of researchers (in 2013), 17.9 % of Grade A position-holders in the higher education sector (in 2014), and 16.5 % of the heads of higher education institutions (in 2014). The different indicators place Germany's performance around 20 % below their respective EU-28 averages, except for the share of PhD graduates, where the gap with EU-28 average is only 4 %. Nonetheless, the trends over 2005-2014 show that the gap with the EU-28 average is closing for almost all dimensions, as the mean annual growth observed for Germany is higher than for the EU-28 average.

It is worth noting that there is a full monitoring system in place to monitor gender balance along all the relevant dimensions identified by the Helsinki Group. The trend of improvement observed through the quantitative indicators above confirms a longer trend uncovered by the monitoring mechanism put in place by the Joint Science Conference (GWK). This mechanism reports improvement at all levels of the career path between 2003 and 2012, in leadership positions as well as in the recruitment process (the increase of gender balance in candidates being an important condition to improving the balance in the actual recruitment) (GWK, 2014). RFOs are also participating in this monitoring effort by making the reporting of team composition in terms of gender at all levels a proposal requirement (EFI, 2014). The German Research Foundation (DFG) also requires that universities report on gender equity annually. The share of female reviewers also increased slightly from 2011 to 2014 (Sofka & Sprutacz, 2016).

Since 2008, the DFG has had a *Research-Oriented Standards on Gender Equality* in place, which established gender balance targets at each level of the career path (DFG, 2008). Significant financial incentives have been put in place by the Federal Ministry of Education and Research such as, for example, the Programme for Female Professors, which has been extended until 2017

after a successful first phase. The basic set of family-work balance measures is in place as well (Sofka & Sprutacz, 2016).

5. Optimal circulation, access to and transfer of scientific knowledge including via digital ERA

Germany falls below the ERA average for performance in Priority 5 as evidenced by a Cluster 3 assignment on the priority composite indicator. However, performance is tied with the EU-28 average.

a. Knowledge transfer

Germany generally performs above the ERA and EU-28 averages in Priority 5a, falling into Cluster 2 for both public-private collaboration papers per capita and collaboration between the higher education sector and private firms, with respective leads of 56 % and 15 % to the EU-28 average. However, Germany's performance fell 19 % below the EU-28 average on the degree of collaboration between research institutes and the private sector.

Germany has a long tradition of science–industry linkage, which is supported by a variety of tools like clusters, networks and public-private partnerships (see e.g. "The new High-Tech Strategy", BMBF, 2014a). The large majority of German universities have a technology transfer office. Patent marketing agencies and technology transfer agencies are connected through the national 'TechnologieAllianz' network. Additionally, in November 2015, the Fraunhofer Institute launched the new 'Fraunhofer Innovations forum' portal to develop the ties between industry and academia. Innovative entrepreneurs are also supported by incubators or entrepreneurship advisors (Sofka & Sprutacz, 2016).

In 2008, the BMBF and the federal government launched the 'Leading-Edge Clusters Competition', which supports clusters including RPOs and private firms that jointly innovate in a given technology field or a given region. The 'Initiative Twenty 20 – Partnership for Innovation Competition' also supports joint innovation strategies in entrepreneurial regions. Germany's smart specialisation strategy is also a great enabler for developing innovation in the regions (Sofka & Sprutacz, 2016). The funding measure "Innovative Hochschule", launched in 2016, supports third mission activities at German universities to boost knowledge transfer and innovation. It is aimed in particular at small and mid-size universities and universities of applied sciences. It reinforces the strategic development and intensification of collaboration with corporations and other societal stakeholders, thereby strengthening the strategic role of universities in the regional innovation system.

b. Open access

Germany has shown a strong commitment toward open access for publications and data. The 'Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities' was introduced by the Max Planck Society in 2003 and was signed by 480 institutions, and has given impetus to a number of open access initiatives (Sofka & Sprutacz, 2016). The federal government has included open access as a priority in its Digital Agenda 2014-2017 (BMWi, 2014). In December 2015 the participants of the 12th Berlin Open Access Conference organized by the Max Planck Society have initiated 'Open Access 2020' - an initiative that aims to accelerate the transition to open access by transforming the existing corpus of scientific journals from their current subscription system to open access. A key reference is the 'Expression of Interest in the Large-scale Implementation of Open Access to Scholarly Journals' which was already signed by 65 scholarly organizations worldwide. In order to remove the legal barriers against open access to publications, the copyright law was changed with effect from January 2014 to introduce a 'Secondary Exploitation Right' after an embargo period of 12 months. The impact of this legislative change may remain limited as it applies only to research that is at least 50 % publicly funded (Sofka & Sprutacz, 2016).

These initiative do not appear to have fully translated into results to date, however. In terms of publications, the total share of papers in open access fell into Cluster 4 relative to the ERA average and trailed the EU-28 average by 5 %. The share of papers in green and gold open access also fell below average.

In September 2016 the Federal Ministry of Education and Research published its open access strategy. One main measure is the introduction of an open access clause in its own funding guidelines. Papers that are results from projects funded by the Ministry of Education and Research shall be published open access (green or golden road).

6. International cooperation

German collaboration with third countries is well developed with the United States (US) and Canada (more than 50 bilateral agreements with these two countries), Israel (German-Israeli Foundation), Japan, Australia (521 university agreements) and South Korea (30 collaborations between the Fraunhofer and Max Planck institutes and Korean equivalents). The country is also developing cooperation with BRICS countries (i.e. Brazil, Russia, India, China and South Africa). In 2012, for example, BMBF invested in cooperation schemes with a number of these countries: EUR 18.5 million to China, EUR 10.1 million to Russia, EUR 8.7 million to India and EUR 2.5 million to South Africa (BMBF, 2015a). 'German Houses for Science and Innovation' have been established in New York, Sao Paulo, New Delhi, Cairo and Moscow to develop international cooperation in those countries. Cooperation with other countries in South America, Africa and Asia have also been developed but to a smaller extent. The website 'Research in Germany' is the centralised information point for foreign researchers willing to move to Germany to perform their research (Sofka & Sprutacz, 2016). The Federal Government also established an Association for Research Marketing as a dialogue between science, business and politics to foster visibility of German science abroad.

Germany's performance on the publication of papers with non-ERA collaborators falls into Cluster 2 and comes very close to the EU-28 average. Their most notable strength in this priority is in the licence and patent revenue obtained from abroad as a share of GDP, which also earned a Cluster 2 assignment but exceeded the EU-28 average by 21 %. This strong performance was preceded by a mean annual growth rate of 19 % over the 2006-2013 period, with a notable increase occurring in 2013. Performance was weaker in the share of doctoral students from outside the EU, as well as the co-invention rate with non-ERA partners, with both falling into Cluster 3 and trailing the EU-28 average.

Summary

Germany's overall performance based on the headline composite indicator is strongly penalised by the low usage of the EURAXESS job portal (Priority 3), by its lower performance in the share of women in Grade A positions in the higher education sector (Priority 4), and the low score on the indicator for collaboration between research institutes and private firms (Priority 5a). The important financial investments made in R&I, combined with the great emphasis on applied science, translate strongly in terms of technology applications such as patents (Priority 1). Furthermore, as described above, Germany is a leader in Europe in terms of industry-academia integration, and an important part of the R&I system relies on the private sector (although this is not exhaustively accounted for in the current monitoring exercise). For example, the very systematic integration of RTOs underlines that Germany is in a better position than single indicators suggest.

Germany published a complete and detailed Strategy of the Federal Government on the European Research Area in 2014 (including a National Roadmap on the European Research Area), which sets out the main objectives, measures and implementation instruments for all priorities. For instance, in regard to Priority 4 (in which Germany has more room for improvement), objectives outlined are as follows: (a) 'to further increase the proportion of women and to achieve a proportion of women in scientific executive committees of at least 30%' and (b) 'to increasingly entrench the gender dimension in national research and innovation programmes in future' (BMBF, 2014b).

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ANNEX: METHODOLOGICAL NOTES

	Indicator	Data availability	Flag								
			Exception to ref. year	Exception to ref. period	Break in time series	Definition differs	Estimated	Provisional	Potential outlier	Revised	Eurostat estimate
Priority 1	Adjusted Research Excellence	Available									
	GBARD as share of GDP	Available									
	European Innovation Scoreboard	Available									
	<i>GBARD as share of government expenditures</i>	Available									
	<i>R&D tax incentives as share of GBARD</i>	Available									
	<i>Share of GBARD allocated on project basis</i>	Available		2011-2014							
	<i>Patent applications per 1 000 researchers</i>	Available					2008, 2010				
	Researchers per 1 000 active population	Available			2005, 2010, 2011		2008, 2010, 2014	2014			
Publications per 1 000 researchers	Available			2006		2014	2014				
Priority 2	A - GBARD to transnatl coop (EUR/researcher)	Available	2013	2011-2013							
	A - Collab papers w/ERA per 1 000 researchers	Available			2006		2014	2014			
	A - Public-to-public partnerships (EUR/researcher)	Available					2014	2014			
	A - Co-invention rate w/ERA partners	Available									
	B - Roadmap for ESFRI projects	Available									
	B - Participation in developing ESFRI projects	Available									
B - Participation in operational ESFRI landmarks	Available										
Priority 3	EURAXESS job ads per 1 000 researchers	Available					2014	2014			
	Open, transparent, merit-based hiring process	Available									
Priority 4	Share of doctoral students from EU countries	Available									
	Share of women among Grade A HES	Available									
	Gender dimension in research content	Available									
	Share of women among PhD graduates	Available									
	Share of women among heads of HEI	Available									
Share of women researchers	Available										
Priority 5	A - Research institute-private collaboration	Available	2010	No CAGR		2012					2012
	A - Higher education-private collaboration	Available	2010	No CAGR							
	A - Share of public R&D funded privately	Available									
	A - Public-private collab papers per capita	Available									
	B - Share of papers in Open Access (Total)	Available									
	B - Share of papers in Open Access (Green)	Available									
	B - Share of papers in Open Access (Gold)	Available									
B - National Open Access policies adopted	Available										
Priority 6	Collab papers w/non-ERA per 1 000 researchers	Available			2006		2014	2014			
	Share of doctoral students from outside EU	Available									
	Licence & patent rev. from abroad, share of GDP	Available							2013	2013	
	Co-invention rate w/non-ERA partners	Available									

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The European Research Area (ERA) Progress Report 2016 shows the state of play in ERA. A lot has happened in the European research landscape since the last edition in 2014. The ERA Roadmap at EU level was endorsed by the Council in early 2015. This called for top action priorities that will have the biggest impact on Europe's science and innovation systems. Member States were invited to draw up national action plans based on this approach. Last year almost all Member States and a number of Associated Countries have published their National Action Plans on ERA showing clear political ownership of ERA.

This analysis carried out in 2016 shows strong progress in all ERA priorities across the EU. This was possible because of a true partnership among the Member States and Associated Countries, the Commission and research stakeholder organisations. But we cannot be complacent. European strength in the field of Research and Innovation is needed more than ever to reinforce competitiveness but is also increasingly challenged to deliver on impacts. The Commission's policy agenda on Open Science, Open Innovation and Open to the World will open up ERA to future challenges, like digitalisation and global networks. There are new barriers to break down to create more wealth and security for our citizens.

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