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# European Research Area

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## Cost of Non-Europe Report

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**European Added Value Unit**

PE 581.382



# European Research Area

## Cost of Non-Europe Report

In the last Parliament, on 12 February 2014, the Coordinators of the European Parliament's Committee for Industry, Energy and Research (ITRE) requested a Cost of Non-Europe report on an integrated EU Research Area. This request was reaffirmed by ITRE coordinators of the current legislature at 23 February 2015 and asked for an evaluation of the application and implementation of the policy framework of the European Research Area (ERA) to be carried out, as well as for an assessment of possible gains from future action in this area.

This paper has been drawn up by the **European Added Value Unit** of the Directorate for Impact Assessment and European Added Value, within the European Parliament's Directorate-General for Parliamentary Research Services. Its aim is to help improve understanding of the subject matter by providing evidence of the specific benefits that could be achieved through European action.

This assessment builds on expert research commissioned specifically for the purpose and provided by Dr Inga Ulnicane, Institute for European Integration/University of Vienna, Simon Broeck, Ockham IPS, and Laura de Haan and Paul Vroonhof, both Panteia. The commissioned research papers appear at Annexes I to III of this study.

### **Abstract**

This Cost of Non-Europe study examines the state of implementation of the current policy framework for the establishment of a European Research Area (ERA). The study combines a backward-looking (ex-post) and a forward-looking (ex-ante) evaluation. While the ex-post evaluation looks at the implementation of the ERA policy framework, the ex-ante assessment focuses on potential costs and benefits of possible further policy action. In doing so, it identifies shortcomings in the ERA policy framework and outlines costs due to the lack of further action on the issue. The study makes a cautious estimate that the costs linked with implementation shortcomings of the ERA policy framework could amount to €3 billion per year.

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## **Note on methodology**

Costs of Non-Europe (CoNE) reports are designed to study the possibilities for economic benefits and the achievement of a 'public good' through common action at EU level. They attempt to identify policy areas that can benefit from deeper EU integration, where the added value of action at EU level is potentially significant.

This Cost of Non-Europe report examines the state of implementation of the current policy framework for establishing a European Research Area (ERA). Furthermore, it identifies the cost of no European-action on that issue. The study combines a backward-looking (ex-post) and a forward-looking (ex-ante) evaluation. While the ex-post evaluation looks at the implementation of the ERA policy-framework, the ex-ante assessment focuses on potential costs and benefits of possible further policy action. Three external research papers, which are annexed to this report, were commissioned to provide input to the establishment of this Cost of Non-Europe study.

## 1. Introduction

In the view of the European Commission, the future of cooperation in the field of research and innovation in the European Union (EU) and the wider world is a positive one. A paper published by the Commission in 2015 describes a possible scenario for science in the year 2030 as follows:

‘Open science has become a reality and is offering a whole range of new, unlimited opportunities for research and discovery worldwide. Scientists, citizens, publishers, research institutions, public and private research funders, students and education professionals as well as companies and citizens from around the globe are sharing an open, virtual research environment, called the Lab. Open source communities and scientists, publishing companies and the high-tech industry have pushed the EU and UNESCO to develop common open research standards, establishing a virtual learning gateway, offering free public access to all scientific data as well as to all publicly funded research. The OECD (which now includes Brazil, India, China and Russia), as well as many countries from Africa, Asia and Latin America have adopted these new standards, allowing users to share a common platform to exchange knowledge at a global scale. High-tech start-ups and small public-private partnerships have spread across the globe to become the service providers of the new digital science learning network, empowering researchers, educators and students worldwide to share knowledge by using the best available technology. Free and open, high quality and crowdsource science, focusing on the grand challenges of our time, shape the daily life [of] a new generation of researchers.’<sup>1</sup>

As far as the EU is concerned, an important element for getting close to such an ideal situation for research and innovation is the concept of a European Research Area (ERA). Proposed by the European Commission in 2000, an ERA would help to put to best use scientific capacity and material resources in EU Member States and should lead to: 'A unified research area open to the world based on the Internal Market, in which researchers, scientific knowledge and technology circulate freely and through which the Union and its Member States strengthen their scientific and technological bases, their competitiveness and their capacity to collectively address grand challenges.'<sup>2</sup> In a more detailed manner, the Commission describes an ERA as a place 'where national and European policies can be implemented more coherently, and where people and knowledge can circulate more freely; an area attractive both to European researchers and to the best researchers from third countries and built on respect for the common social and ethical values of Europeans and

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<sup>1</sup> European Commission, Open Science 2030, A Day in the Life of Scientist, AD 2030, 2015. Although disclaiming that the document represents its official position, the European Commission published this paper which is based on a brainstorm with and feedback from a number of scientists, as well as representatives of publishing companies, funding agencies and research institutions.

<sup>2</sup> [Communication](#) from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, A Reinforced European Research Area Partnership for Excellence and Growth, COM(2012) 392 final, 17.7.2012, p. 3.

their diversity.<sup>3</sup> In fact, these objectives for research and innovation in the EU have also been included in the Treaty on the Functioning of the EU (TFEU), which states that 'The Union shall have the objective of strengthening its scientific and technological bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely, and encouraging it to become more competitive, including its industry, while promoting all the research activities deemed necessary by virtue of the Chapter of the Treaties.'<sup>4</sup> In other words, to ensure that new knowledge-intensive products and services are developed and contribute substantially to growth and jobs in Europe, there is a need for more coordinated research systems in Europe.

Going back to the Commission's 2007 Green Paper, today the framework for setting up an ERA is based on six priorities for implementing a European wide infrastructure for research. These are:

- (i) More effective national research systems;
- (ii) Optimal transnational co-operation and competition;
- (iii) An open labour market for researchers;
- (iv) Gender equality and gender mainstreaming in research;
- (v) Optimal circulation, access to and transfer of scientific knowledge;
- (vi) International cooperation.<sup>5</sup>

In fact, these six ERA priorities should pave the way for achieving the objective of creating a genuine single market for knowledge, research and innovation. According to a 2014 Commission Communication, research and innovation, in turn, should build a source of renewed growth.<sup>6</sup> Moreover, in the view of the Commission, the ERA's internal market dimension and its potential impact on investments in research and innovation contribute particularly to the priority 'Union of jobs, growth and competitiveness' outlined in the *Strategic Agenda for the Union in times of change*, agreed by the EU Member States at the European Council meeting of June 2014.<sup>7</sup>

According to a 2014 progress report by the European Commission, the ERA is already well implemented.<sup>8</sup> Looking, inter alia, at Member States reforms in all ERA priorities, the compliance of research performing organisations (RPOs), and the support from the Commission to national ERA policies, this report indicates that a total completion of 81 % of

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<sup>3</sup> [Communication](#) from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, Towards a European Research Area, COM(2000) 6 final, 18.1.2000.

<sup>4</sup> Consolidated Version (2012) of the [Treaty of the Functioning of the European Union](#), article 179, section 1.

<sup>5</sup> See, e.g., Vincent Reillon, The European Research Area. Evolving concept, implementation challenges, [In-Depth Analysis](#), European Parliamentary Research Service, European Parliament, March 2016, pp. 29 - 32.

<sup>6</sup> [Communication](#) from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Research and innovation as sources of renewed growth, COM(2014) 339 final, 10.6.2014.

<sup>7</sup> [Communication](#) from the Commission to the Council and the European Parliament, European Research Area. Progress Report, COM(2014) 575 final, 15.9.2014.

<sup>8</sup> European Commission, European Research Area. [Facts and Figures 2014](#), 2014, p. 54.



the ERA concept can be assumed up to 2014.<sup>9</sup> Viewed from another angle, the Commission's report implies that there is only a distance of 19 % to the target of a genuine single market for knowledge, research and innovation that would generate economic growth. Furthermore, in the light of these figures, the realisation of the scenario described above for the future of research and innovation in Europe and the wider world within only 16 years (from 2014 onwards), does not seem unrealistic given that the EU's contribution in form of achieving the ERA is allegedly well advanced.

This Cost of Non-Europe report, which challenges this understanding of the implementation and completion of the ERA, is structured in four main sections. The first section will describe from a historical perspective the political decisions which have led to today's concept of the ERA with its six priorities. The section also highlights the legal bases for the implementation of ERA and its development over time. In the second section, the latest developments regarding the implementation will be outlined, including a short description of the differing perceptions of ERA in some EU Member States. In the third section, remaining shortcomings for the successful implementation of the ERA will be discussed. The fourth section will address the economic dimension of ERA, including a look at potential costs due to shortcomings in the set-up of the ERA policy framework. Finally, the report will outline several options for future policy-making on ERA.

## 2. Historical Background

From the outset of European integration, research has been part of EU policy. However, its legal basis was limited in its scope to the European Atomic Energy Community (EURATOM), funded in 1957. The focus in EU research policy was thus put on the establishment and functioning of the Joint Research Centre (JRC), for example on the JRC's nuclear work in the framework of the EURATOM Research and Training Programme. Therefore, the wider European research policy was developed outside the framework of the then European Economic Community (EEC).<sup>10</sup> An intergovernmental collaboration of European countries called European Cooperation in the Field of Scientific and Technical Research (COST), which was established in 1971 and still exists today under the EU Framework Programme for Research and Technological Development (Framework Programme), contributed to fostering research at the European level.<sup>11</sup>

Subsequently, however, EU heads of state repeatedly stressed the importance of developing a common research policy within the Community framework in order to coordinate national research policies and replacing intergovernmental structures at later stages. As a reaction to this demand, inter alia, the European Committee for Research and Development (CREST) was established in 1974 and transformed into the European Research Area Committee (ERAC) in 2010. The ERAC consists of up to two representatives at an appropriate level of the

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<sup>9</sup> For more details regarding the approach on this quantification, see Laura de Haan, Paul Vroonhof, Simon Broek, Research Paper on the Implementation of an Integrated Research Area, pp. 83 - 85.

<sup>10</sup> See, Alvero de Elera, The European Research Area: On the Way Towards a European Scientific Community?, in: European Law Journal, Vol. 12, No. 5, pp. 559-574, here p. 560f.

<sup>11</sup> General [Resolution](#) adopted by the Conference of European Research Ministers, Brussels, 22 and 23 November 1971.

body responsible for research and innovation policies from each Member State, and the European Commission.<sup>12</sup> The Committee functions today as an advisory body for both the Council and the Commission on the establishment of a common research policy.<sup>13</sup> Nevertheless, only the introduction of the first Framework Programme of 1983 provided for more coherence between the national research policies within the Community. Crucially, there was no clear legal basis for a European approach under Community law for a research and innovation policy. Thus, European policy in this field remained a combined approach of the Council, the Commission and the Member States. The Council acknowledged the continuing lack of a legal basis for a coordinated research policy, resorting to Article 235 Treaty Establishing the European Community as a basis for legal action.<sup>14</sup>

The European Single Act (ESA), which came into force in 1987, aimed to resolve the legal shortfalls for developing a common European policy for research and innovation by providing the EU with the competence to define an appropriate policy. In fact, the ESA excluded harmonisation of this policy field and stressed the importance of coordination and cooperation between Member States and the Community. The Treaties of Maastricht and Amsterdam did not contribute any further to closing the legal lacuna for the development of a real EU research and innovation policy.<sup>15</sup>

In order to give new impetus to cooperation in the field of research, in 1999 the then EU Commissioner for Research, Philippe Busquin, introduced the concept of a European Research Area.<sup>16</sup> Yet, the Commission's accompanying Communication did not entail a concrete definition of ERA. However, in 2000, the European Council agreed to include the concept of the ERA in the new Lisbon Strategy, which aimed at turning the EU into the most competitive and dynamic knowledge based economy of the world. As regards the implementation of the ERA, the European Council demanded the use of the Open Method of Coordination (OMC) in order to ensure multilateral surveillance, building on the ERA dimension of National Reform Programmes, mutual learning and peer review.<sup>17</sup> The Community's sixth Framework Programme (FP) was to function as the main instrument for implementing the ERA, but remained mainly a tool for supporting national research policies.<sup>18</sup>

A strengthened legal basis for the implementation of the ERA was only introduced with the Lisbon Treaty of 2009. Article 182 (5) TFEU provides for a legal procedure for the adoption measures implementing the ERA. The competences of the EU in the areas of research,

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<sup>12</sup> Council of the European Union, Council conclusion on the [ERAC Mandate](#), Brussels 1.12.2015, 14875/15.

<sup>13</sup> Council [resolution](#) of 14 January 1974 on an initial programme of the European Communities in the field of science and technology, in Official Journal of the European Communities, No C 7/6, 29.1.74.

<sup>14</sup> Article 235 EC stipulated that: 'If action by the Community should prove necessary to attain, in the course of the operation of the common market, one of the objectives of the Community and this Treaty has not provided the necessary powers, the Council shall, acting unanimously on a proposal from the Commission and after consulting the European Parliament, take the appropriate measures.'

<sup>15</sup> See, de Elera, *The European Research Area*, p. 562.

<sup>16</sup> See, e.g., Reillon, *The European Research Area*, [In-Depth Analysis](#), p. 11f.

<sup>17</sup> Council of the European Union, Council [Conclusions](#) on The Launch of the "Ljubljana Process" towards full realisation of ERA (10231/08).

<sup>18</sup> See, de Elera, *The European Research Area*, p. 563.

technological development and space are included amongst the 'shared' competences between the EU and the Member States. Crucially, Article 4.3 TFEU specifically states that action by the Union in this field does not prevent the Member States from exercising their competences in all these three areas by carrying out activities, in particular to define and implement programmes. Article 180 TFEU, according to which the Union should complement the activities carried out in the Member States by carrying out activities such as implementation of research, technological development and demonstration programmes, also reflects this principle. Finally, an impact assessment by the European Commission considered the policy options for the completion of the ERA, including the following options for legislative action:<sup>19</sup>

- 1) Business as usual;
- 2) Reinforced partnership for the ERA;
- 3) Sectoral legal measures for the ERA;
- 4) ERA Framework Directive.

It was concluded that policy option 2 would ensure substantial progress towards complete compliance of the ERA aims in the form of the priorities leading to its completion.<sup>20</sup>

Despite the strengthened legal basis enshrined in the Lisbon Treaty, the implementation of the ERA remained a partnership approach based on the OMC. In fact, the ERA implementation exercise developed into a partnership between the Commission, the Member States and research stakeholders. Moreover, this partnership was institutionalised with the establishment of two bodies to support the ERA implementation: 1) the previously mentioned CREST, which later became the ERAC. The new mandate which transposed CREST into ERAC is expected to better reflect the shared competence between the Member States, the EU and research stakeholders<sup>21</sup>; 2) the ERA Stakeholder Platform established in 2012. This offers key stakeholders a forum for discussion on the development of the ERA and enables them to have a direct dialogue with the Commission.<sup>22</sup>

In 2011, the European Council assessed the implementation process of ERA. Based on its assessment, the Council demanded that the ERA should be completed by 2014.<sup>23</sup> The 2012 Commission communication on ERA reiterated this demand. Furthermore, this communication introduced the five priorities outlined above (a sixth priority was added in

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<sup>19</sup> European Commission, [Impact Assessment](#) accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: A Reinforced European Research Area Partnership for Excellence and Growth, COM(2012) 392 final, 17.7.2012, pp. 21-29.

<sup>20</sup> Ibid, p. 36.

<sup>21</sup> CREST was renamed as European Research Area Committee (ERAC) by the Council [Resolution](#) of 26 May 2010, set out in Council of the European Union, Outcomes of Proceedings, Subject: Developments in the governance of the European Research Area (ERA) - Council Conclusion, 28 May 2010, doc. 10255/10.

<sup>22</sup> European Commission, [Impact Assessment](#) accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: A Reinforced European Research Area Partnership for Excellence and Growth, COM(2012) 392 final, 17.7.2012, pp. 21-23.

<sup>23</sup> European Council [Conclusions](#), 4 February 2011, Brussels, doc EUCO 2/11.

2015) which constitute the main framework of ERA and are aimed to give more guidance for its implementation.<sup>24</sup>

### 3. State of Play

Today, the implementation of the ERA framework is still not complete. The latest (2014) Commission's ERA progress report stated that there have been advances in the implementation of the single ERA priorities.<sup>25</sup> The report presented updated and new measures used by RPOs and research funding organisations (RFOs) for the implementation of the ERA at the national levels. However, no official statistical sources were available for the performance of RPOs and RFOs. To compensate for this weakness of data, the Commission launched a so-called ERA survey. As the responses were not sufficiently representative, the survey's results, which were included in the progress report, only provided an indication of the situation of ERA implementation among RPOs and RFOs.<sup>26</sup> Nevertheless, the progress report provides an overview of the progress made by Member States in implementing the ERA priorities. Crucially, the report clearly demonstrates that the EU Member States have different systems and paces for the implementation processes. Four examples outline this: Austria aims to embed the ERA framework within all its research and development (R&D) activities and has developed an EU action plan (which covers not only the ERA framework, but also the latest FP, Horizon 2020, and other programmes). Although the Czech Republic has established an ERA Committee, which functions as an advisory body to the Ministry of Education and consists, inter alia, of representatives from universities and research institutes, there is reluctance in the wider Czech research community towards the ERA. For Finland, ERA provides an opportunity to look across borders and to learn from other Member States how to deal with issues of research and innovation. In the case of Portugal, budgetary constraints have negatively affected the involvement and commitment needed to implement the ERA framework. The four examples also show that the implementation of the ERA priorities in the Member States is sometimes directly driven by funders and RPOs (bottom up) and in other cases by national/regional policies (top-down).<sup>27</sup> Importantly, the progress report states that the completion of the ERA depends upon four conditions:

- 1) Member State reforms in all ERA priorities;
- 2) Speedy implementation of the priorities outlined in the Communication by research stakeholders;
- 3) Increased support from the Commission to national ERA policies;
- 4) Transparent ERA Monitoring System (EMM).

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<sup>24</sup> European Commission, [Impact Assessment](#) accompanying the Communication the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: A Reinforced European Research Area Partnership for Excellence and Growth, COM(2012) 392 final, 17.7.2012, p. 3.

<sup>25</sup> European Commission, European Research Area, Progress Report 2014, [Facts and Figures](#).

<sup>26</sup> For further details on the Commission survey, see Laura de Haan, Paul Vroonhof, Simon Broek, Research Paper on the Monitoring of the Integrated European Research Area, p. 105-107.

<sup>27</sup> For more details on the perception of ERA and the ERA implementation process in the four countries, see de Haan, Vroonhof, Broek, Research Paper on the Implementation of an Integrated Research Area, p. 65.

Based on various indicators and data gathering mechanisms, the EMM was developed with the aim of assessing progress in the compliance of the ERA framework at three levels: Firstly, at the policy level (national and regional policies); secondly, at the operational level (RFOs and RPOs); and thirdly and finally, at the European level. The EMM brings together the findings from all levels in order to provide a state of play of the implementation of ERA in Europe. At the moment, however, the EMM is in a phase of transition. In fact, this transition is closely connected to the ERA Roadmap 2015-2020 that was developed by the ERAC and endorsed by the European Council in May 2015.<sup>28</sup>

The Roadmap's purpose is to identify a limited number of key implementation priorities which are likely to have the biggest impact on Europe's science, research and innovations systems, if all Member States of the ERA partnership get them right. Moreover, the Roadmap has identified actions at the national and European level for the implementation of each of the six ERA priorities. Crucially, it is clearly emphasised that there are differences between national research systems, and thus in their capacity to implement the ERA framework. Therefore, the ERA Roadmap provides an outline for developing national roadmaps and the Member States are expected to produce their own national roadmaps by mid-2016.<sup>29</sup> In other words, with the roadmap approach, the Member States are in the lead to define action plans according to national priorities.<sup>30</sup> Furthermore, in the ERA Progress Report 2014, the Commission emphasised the role of the ERA Roadmap and national action plans for the implementation of ERA, adding that 'different options might be considered to foster the development of ERA, including the legislative option if needed be, based on the new ERA-related provisions in the TFEU'.<sup>31</sup>

Already in 2013, a group of eight Members of the European Parliament called for 'A Maastricht for Research', suggesting an ERA Framework Directive in order to lead all Member States.<sup>32</sup> In reaction to the ERA Roadmap, the League of the European Research Universities (LERU) also suggested starting legislative action for the implementation of ERA.<sup>33</sup> So far, however, the main legal measures within the field of EU research policy include research funding, the Scientific VISA Directive and a legal framework for the so-called European Research Infrastructure Consortia (EPIC).<sup>34</sup> Against this background, the following chapter will show both how the weak legislative base leads to obstacles for the implementation of the ERA and how its general framework consisting of the six priorities suffers from various shortcomings.

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<sup>28</sup> European Research Area and Innovation Committee, ERAC 1208/15, [ERAC Opinion](#) on the European Research Area Roadmap 2015-2020, 20 April 2015.

<sup>29</sup> Council of the European Union, [conclusions](#) on the European Research Area Roadmap 2015-2020, 19 May 2015.

<sup>30</sup> See also Reillon, *The European Research Area*, [In-Depth Analysis](#), p. 32.

<sup>31</sup> Communication from the Commission to the Council and the European Parliament, *European Research Area*, [Progress Report 2014](#), COM(2014) 575 final, 15.9.2014, p. 10.

<sup>32</sup> *A Maastricht for Research*, Amalia Sartori, Luigi Berlinguer, Christian Ehler, Maria Carvalho Da Graça, Teresa Riera Madurell, Catherine Trautmann, Patrizia Toia, Antonia Fernando Correia de Campos, Philippe Busquin, October 2013.

<sup>33</sup> LERU, *ERAC ERA Roadmap 2015-2020: Nothing New under the soon*, [Press release](#) 16.04.2015.

<sup>34</sup> See, e.g., Inga Ulnicane, *Research Paper on the European Research Area Initiative and the Free Circulation of Knowledge*, p. 28.

## 4. Shortcomings in the ERA framework and obstacles for implementation

The ERA priorities were first set in 2012. Based on the results of an ex-ante impact assessment on the ERA<sup>35</sup>, the Commission's ERA public consultation<sup>36</sup> and the written opinion of ERAC<sup>37</sup>, five priorities were established for setting the ERA framework: (i) more effective national research systems, (ii) optimal transnational co-operation and competition, (iii) an open labour market for researchers, (iv) gender equality and gender mainstreaming in research, and (iv) optimal circulation, access to and uptake of scientific knowledge. With the adoption of the ERA Roadmap in 2015, the sixth priority was introduced: (vi) international cooperation.<sup>38</sup> All six priorities are closely linked with one another. As the study by Inga Ulnicane rightly outlines, for example, open, transparent and merit-based recruitment (ERA priority 3) and gender equality (ERA priority 4) are essential elements of effective research systems (ERA priority 1).<sup>39</sup> Therefore, shortcomings in the implementation of one of the priorities can have effects on the implementation of one or more of the other priorities, and vice versa.

As will be shown in the following sections, looking at three selected examples of the priorities, there are various shortcomings in the ERA framework.

### Example 1: First ERA priority on more effective national research systems

Priority 1 is directed towards national research funding. It aims at increasing competition and sustaining or raising investment in research. In fact, an important characteristic of national research systems is the amount of funding spent on research and development (R&D). In 2002, the European Council adopted the Barcelona target, setting the aim that every EU Member State should invest 3 % of its Gross Domestic Product (GDP) in R&D (one third of funding from governments and two thirds from business). This target was intended to increase the level of R&D funding in the EU compared to the levels in the United States and Japan. While the European Commission and the European Council are emphasising the importance of increasing R&D funding, only slight progress has been made in the EU Member States from 1.81 % in 2002 to 2.01 % in 2013.

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<sup>35</sup> European Commission, [Impact Assessment](#) accompanying the Communication the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: A Reinforced European Research Area Partnership for Excellence and Growth, SWD(2012) 212 final, 17.7.2012.

<sup>36</sup> See, e.g., European Commission, Areas of untapped potential for the development of the European Research Area. [Analysis of the Response to the ERA framework public consultation](#), 2012.

<sup>37</sup> European Research Area Committee, ERAC 1215/11, [ERAC Opinion](#) on the development of an ERA Framework that has been approved by written procedure, 9.12.2011.

<sup>38</sup> See, e.g., Council of the European Union, Council conclusion on the ERAC, Permanent Representatives Committee, [Draft Council conclusions](#) on the European Research Area Roadmap 2015-2020, doc 8975/15, 29.5.2015, p. 4.

<sup>39</sup> Ulnicane, Research Paper on the European Research Area Initiative and the Free Circulation of Knowledge, p. 25.

Another important characteristic of contemporary research systems is their project-based funding. Along the same line, the share of project-based research funding is considered as an effective allocation mechanism for the best project and serves as a basis for the operational implementation. In other words, project-based funding has become one of the main drivers to establish effective national research systems. Although project-based funding might be an effective way to allocate research funding, the allocation can involve high costs for the RFOs and RPOs involved. Moreover, such funding might increase job insecurity for researchers given that many researchers work on fixed-term contracts bound to research projects with limited timeframes.

Finally, there are major differences across EU Member States in terms of reforming their national research and innovations systems, their research and innovation performance and their R&D expenditures. There is a long-standing divide between Northern/Western European countries and Southern/Eastern European countries; there are also noteworthy differences amongst Central and Eastern European countries, some of which having undertaken reforms according to the ERA framework, whilst others have not. A lack of reform and progress in a number of Member States limits also the possibilities to participate successfully in transnational cooperation (ERA priority 2) and in an open labour market for researchers (ERA priority 3).

#### **Example 2: ERA priority on optimal transnational cooperation and competition**

Priority 2 aims at promoting effective transnational cooperation in the field of research and at jointly addressing grand challenges such as demographic change, food security, clean and efficient energy, green transport, climate change and secure societies. These grand challenges should be faced by the alignment of national and international funding sources by defining and implementing common priorities and joint research agendas building on initiatives such as Joint Programming Initiatives (JPIs), for example. Since 2010, ten Joint Programming Initiatives have been launched to pool national research efforts in order to tackle common European grand challenges. According to the ERA Progress Report 2014, however, less than 1 % of national public R&D funding is spent on transnational research.<sup>40</sup>

Furthermore, as a result of the specific focus on addressing grand challenges and establishing and operating appropriate research infrastructures, it appears that insufficient attention has been given to bottom-up scientific collaboration across national borders within the EU. Bottom-up transnational collaborations are an increasingly important source of knowledge production, high quality research and highly specialised expertise and also trigger high impact outputs. The lack of funding has contributed in particular to hampering collaboration of this sort, there being an overly strong focus on top-down transnational research collaboration.

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<sup>40</sup> Science Europe has criticised this figure for not taking into account some key forms of coordinated spending such as FP and intergovernmental agreements on research infrastructures such as the European Organisation for Nuclear Research, usually known as CERN.

**Example 3: ERA priority on an open labour market for researchers**

Priority 3 aims to ensure the removal of barriers to researcher mobility (including international mobility within and from outside the EU as well as cross-sectoral academia-business mobility), training and attractive careers. It is a broad priority, comprising a number of targets and measures such as, for example, the removal of legal and other obstacles to open, transparent and merit-based recruitment, cross-border access to and portability of national grants, the so-called Retirements Savings Vehicle for European Research Institutions (RESAVER) and the creation of an enabling framework for the implementation of the Human Resource Strategy for Researchers incorporating the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers (Charter and Code).

The principles - such as research freedom, stability and permanence of employment, gender balance, career development and the value of mobility - of the Charter and the Code should ensure that researcher are provided with the same rights and obligations, wherever they work throughout the EU. However, even in some universities that have signed the Charter and the Code, awareness and implementation of the principles are limited. Of the approximately 1 500 organizations from 40 different countries supporting the Charter and the Code, only 250 organizations have received the Commission's 'HR Excellence in Research' for actually implementing the principles in their human resource policies. Moreover, there is also a lack of open, transparent and merit-based recruitment. A vast majority of EU national authorities consider their recruitment systems as largely open and transparent. In contrast, many researcher perceive recruitment procedures as not open and transparent, and as characterized by protectionism, nepotism and a lack of human resources strategy and information.

Likewise, RESAVER, offering researchers the possibility to preserve their supplementary pension benefits when they move between different countries, is restrained in its implementation and function. To date, 280 public and private research institutions from only nine EU Member States<sup>41</sup> have joined RESAVER as the domestic legislation of several EU Member States, amongst others Germany and France, prohibits their participation. In these countries, national legislations do not allow public employers to join the European pension arrangement.

Furthermore, there is a limited portability of and access to national research grants creating barriers for the mobility of researchers from one EU Member State to another. This is especially due to two barriers: (i) limited opportunities for the cross-border portability of national research grants and (ii) the residence and institutional affiliation requirements, which are among eligibility criteria for many national research grants. Thus, only a few national funding agencies allow grant portability based on agreements as is the case for Germany, Austria and Switzerland (D-A-CH agreement).

Finally, given the above mentioned existing differences between the research systems of the Member States, researchers still face a series of practical problems regarding mobility, social

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<sup>41</sup> Austria, Denmark, Czech Republic, Hungary, Ireland, Italy, Luxembourg, Spain and the Netherlands.



protection, gender equality and employment opportunities. As result, there is a one-way flow of researchers to Northern Europe where researchers can benefit from career opportunities and social security.<sup>42</sup>

Crucially, all demonstrated shortcomings of the ERA framework fit into a general obstacle to the implementation of the ERA: The ERA framework lacks well-defined baselines and target values. As a consequence, there are no clear objectives that form a base for measuring implementation achievements.<sup>43</sup> Without clear baselines and target values, however, the EMM has developed with the aim of monitoring the progress in compliance of the ERA at three levels - (i) policy level (national and regional policies), (ii) operational level (RFOs and RPOs) and (iii) European level - lacks references for an objective monitoring.<sup>44</sup>

Taking the example of the anticipated implementation of ERA priority 1: The EU Member States are expected to specifically address two areas, namely to allocate funding through open calls for proposals and to take the quality of RPOs and their outputs as a basis for funding decisions.<sup>45</sup> The assessment as to whether EU Member States fulfil these obligations depends on what is most appropriate given the national research system. Thus, the EU Member States' governments and other stakeholders can, for example, make different - and even opposing - choices regarding the assessment leading to different valuation of RPOs and grounds for funding. In addition, the different approaches per Member States make it difficult to compare the progress between Member States.

Moreover, this way of monitoring the implementation of ERA priority 1 does not include comparable indicators on how EU Member States allocate project-based funding. In fact, those indicators differ widely from one Member State to another. In addition, a more fine-tuned monitoring would need to take in to account whether appropriate infrastructures are in place and whether appropriate cultures and mentalities in RPO and RFO are established. As all these elements are missing in the monitoring, its outcome gives a widely incomplete picture of the implementation progress.<sup>46</sup>

Due to the lack of precise, well-defined baseline and target values, the ERA framework and its monitoring mechanisms are not giving objective guidance to the EU Member States, let alone outlining a desired end result. The fact that the ERA is missing a clear legal base, and that the driver for its implementation is the OMC, increases accordingly the obstacles for

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<sup>42</sup> All examples are taken from the research paper by Ulnicane, Research Paper on the European Research Area Initiative and the Free Circulation of Knowledge, where further details on the shortcomings of the ERA framework can be found.

<sup>43</sup> See also Reillon, The European Research Area, [In-Depth Analysis](#), The European Research Area, p. 36.

<sup>44</sup> On further shortcomings of the EMM, see the research paper by Laura de Haan, Paul Vroonhof, Simon Broek, Cost of Non-Europe in the European Research Area: Briefing Paper on the Monitoring Mechanisms of the Integrated European Research Area, p. 117.

<sup>45</sup> European Commission, Commission Staff Working Document, [Impact Assessment](#), Accompanying the document, Communication the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions. A Reinforced European Research Area Partnership for Excellence and Growth, 17.7.2012, COM(2012) 392 final, pp. 119-125.

<sup>46</sup> See, e.g., de Haan, Vroonhof, Broek, Cost of Non-Europe in the European Research Area: Briefing Paper on the Monitoring Mechanisms of the Integrated European Research Area, p. 117.

implementation. As various political scientists have argued, the use of the OMC for implementing agreed policy goals among EU governments is often ineffective since EU Member States do not honour commitments due to the absence of enforcement mechanisms for steering implementation.<sup>47</sup> As a result, the OMC enables EU Member States to take different approaches to the implementation of the ERA framework. In other words, the risk that the EU Member States would develop differing ERA policies and measures due to the use of the OMC was not effectively addressed when setting up the ERA policy framework.

A solution for this defective ERA implementation could have been, for example, the establishment of so-called SMART (Specific, Measurable, Achievable, Realistic, Time-bound) criteria for the ERA priorities accompanied by enforcement mechanisms, such as binding instructions in the country specific recommendations or financial incentives to guide the implementation. The lack of such criteria, however, has led to a heterogeneous implementation and a scattered research and innovation policy landscape in the EU. Although this uneven implementation was also recognized by the Competitiveness Council of May 2015, the adoption of the ERA Roadmap did not address all shortcomings in the implementation of the ERA policy as it was not combined with the introduction of clearly defined objectives or criteria.

## 5. Quantifying the Cost of Non-Europe

The concept of the Cost of Non-Europe, which was introduced a quarter of a century ago by the Italian economist Paolo Cecchini, estimated the economic cost of the absence of a completed single European market.<sup>48</sup> This concept of measuring the added value of European cooperation in policy fields, became the corner stone of EPRS Cost of Non-Europe studies. In order to quantify the added value of European coordination in a given policy area, however, the desired end-situation resulting from the envisaged implementation of the policy needs to be clearly defined.

The absence of well-defined baselines, objective criteria and end-goals is indeed a fundamental obstacle for the estimation of the Cost of Non-Europe for the issue of ERA. As demonstrated in the previous chapter, the six ERA priorities do not define concrete measurable end-goals. Therefore, the potential effects of their implementation cannot be reliably quantified.

In order to give an indication of the Cost of Non-Europe on the issue of the ERA, one could build upon on the estimations of the European Commission. The basis for this indicative measurement would be a *distance-to-target quantification* based on the Commission's ERA impact assessment from 2012 and the ERA progress report of 2014. In the impact assessment, the European Commission estimates the gain of a completed ERA at **€ 16 billion** annually.<sup>49</sup>

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<sup>47</sup> See, e.g., Simon Hix and Bjørn Høyland, *The Political System of the European Union*, Basingstoke: Palgrave, 2011, 3rd edition, pp. 201-202.

<sup>48</sup> Commission of the European Communities, [Europe 1992. The Overall Challenge](#), SEC(88) 524 final, 13.4.1998.

<sup>49</sup> European Commission Staff Working Document, [Impact Assessment](#), Accompanying the document, Communication the Commission to the European Parliament, the Council, the European Economic and

The ERA progress report of 2014 states that 81 % of the RPO is in compliance with ERA. Due to the absence of clearly defined end-goals in the ERA policy framework, however, these figures should be considered as rough estimations at best. Yet, they do provide an overall evaluation of the potential added value of the ERA. Using the Commission assumptions, therefore, the *distance-to-target quantification* would result in a remaining ERA implementation gap of 19 %. This amounts to **€ 3 billion** annually.

Finally, based on these estimations, the costs resulting from a vague monitoring system could be measured. More sound information on the ERA monitoring mechanism would certainly also help the EU Member States to take more concrete actions to increase the implementation of the ERA policy framework. In a scenario where effective monitoring would contribute to reducing by half the 19 % *distance-to-target*, the remaining ERA implementation gap could be considered to be **€ 1.5 billion**.

## 6. Conclusion: Barriers to be removed

The 2000 ERA initiative was the first attempt to create a European area for research. Closely linked to the Lisbon Strategy, the initiative aimed to turn the EU into the most competitive and dynamic knowledge based economy. From the outset of the ERA policy, the EU Member States made clear that binding legislation for harmonising research systems in the Union was not welcomed. The EU Member States preferred to implement the ERA policy framework by using the OMC. Nevertheless, completion of the ERA was not achieved. In 2012, the European Commission adopted a communication with the purpose of improving the guidance for implementation and of accelerating completion under the OMC. The adoption of the ERA priorities at that time was one of the major renewals. However, the deadline for completing the ERA in 2014/2015 was not met. In short, the six ERA priorities lacked clearly defined baselines and end goals for enabling its successful implementation. As a consequence, the EU Member States applied differing approaches when inserting the priorities into their national research systems. This triggered a heterogeneous implementation process of the ERA policy framework.

Against this background, this study concludes that the completion of an ERA within the next years might be less realistic than indicated in some EU documents.<sup>50</sup> The study considers that the ERA priorities function more as European standard-setters for research and research systems. Taking also into account that research and research systems are constantly developing social fields, the ERA should not be a static policy directed towards completion with fixed deadlines. This report thus argues that ERA should better be perceived as an open-ended process, facilitating research in Europe.

In fact, the European Commission and the Council of the EU have already acknowledged that the ERA implementation process has developed in a heterogeneous manner over the

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Social Committee and the Committee of Regions. A Reinforced European Research Area Partnership for Excellence and Growth, 17.7.2012, COM(2012) 392 final, pp. 29-30.

<sup>50</sup> E.g., Council of the European Union, [Draft Council conclusions](#) on the European Research Area Roadmap 2015-2020, Brussels, 19.5.2015, 8975/15.

years. Both reacted to this with the adoption of the ERA Roadmap and the introduction of the national ERA roadmaps. This approach might work for most ERA priorities. However, to be able to go beyond that approach, this study has identified two different legislative measures and one technical measure, which could facilitate the implementation of the ERA policy framework, namely, i) the adoption of a specific EU legislative measure on researcher mobility; ii) the adoption of legislative measures by the EU and/or EU Member States to allow the participation of all researchers in Europe in RESEVER, and iii) the adoption of technical measures for the ERA monitoring mechanism:

- i. In order to create an open European labour market for researchers, the barriers to researcher mobility have to be removed. The current policy-framework provides no effective instruments to remove those barriers and to ensure a level playing-field. To remove these barriers, the EU needs to introduce specific legislation to ensure open recruitment procedures, access to and portability of research grants and access to research infrastructures.
- ii. Uncertainty on pension entitlements when moving abroad remains a barrier for transnational mobility. The introduction of RESAVER by the European Commission aims at providing researchers with more security regarding their pensions. The instrument as such is fruitful. Nevertheless, the European Commission and the EU Member States have to ensure that the legal framework of RESAVER is compatible across all EU Member States in order to offer all researchers the same guaranties on their pensions.
- iii. In order to steer effectively the implementation of the ERA policy framework, there is a need for a more effective monitoring system. More specifically, five elements would need to be established to improve the EMM: (i) a focus beyond quantitative indicators on qualitative policy-related benchmarks, (ii) an ERA policy index consisting of key development areas (associated with the ERA priorities), (iii) the introduction of baseline and target values for specific monitoring indicators, (iv) a self-assessment system for the EU Member States allowing them to identify strength and weaknesses, and (v) Intensified efforts for country peer-reviewing and self-assessment as part of the Policy Support Facility, which is designed by the European Commission to provide policy-makers in the EU with a broad range of services in terms of formulation and implementation of research and innovation policies.<sup>51</sup> Finally, an improved monitoring system would increase possibilities for mutual learning in designing, developing, evaluating and implementing the ERA.

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<sup>51</sup> See also de Haan, Vroonhof, Broek, Research Paper on the Monitoring Mechanisms of the Integrated European Research Area, p. 120- 122.

## **Annex I**

### **Research Paper**

# **on the European Research Area Initiative and Free Circulation of Knowledge**

**by Dr. Inga Ulnicane**

#### **Abstract**

This research paper analyses the European Research Area initiative launched in 2000 to facilitate the free circulation of researchers, scientific knowledge and technology in the EU. In particular, the first three closely related ERA priorities are studied: more effective national research systems, transnational cooperation, and open labour market for researchers. The paper discusses the progress achieved during the past 15 years and identifies a number of remaining gaps and barriers, in particular for international mobility of researchers in the EU.

#### **AUTHOR**

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## **Executive summary**

The European Research Area (ERA) initiative, launched in 2000, aims to support the free circulation of researchers, scientific knowledge and technology in the EU. The ERA is an ambitious international initiative aiming to coordinate research which is one of the most international activities with long traditions in global collaboration, mobility and communication at the level of the scientific community. International research collaboration and mobility leads to higher impact research and is increasingly needed to address cross-border societal challenges. As international research collaboration intensifies, pressure on predominantly national research policies to adjust to internationalization increases.

The ERA initiative sets out an ambitious agenda for coordination of national research policies through partnership involving EU institutions, member states and research stakeholders. Realization of the ERA aims implies deep changes in established practices and traditions of allocating research funding and recruiting researchers. For many countries and institutions, it would mean not only changes in policies but also changes in academic cultures and mind-sets. The ERA as a multi-level initiative is highly complex due to subsidiarity of member states that decide on their national research policies and allocate a majority of public research funding, autonomy of research funding organizations and research performing organizations as well as academic freedom of researchers.

The paper analyses the progress achieved in the ERA initiative during the past 15 years and identifies remaining gaps and barriers. In particular, it focuses on the first three closely related ERA priorities: more effective national research systems, trans-national cooperation, and open labour market for researchers. Gradually an increasing number of voluntary, financial and legal instruments have been established to implement the ERA initiative. However, uneven progress across countries and organizations towards the ERA aims hampers free circulation of researchers and knowledge in the EU. Remaining gaps and barriers for international research mobility include lack of open, transparent and merit-based recruitment, portability of and access to research grants and dual career opportunities as well as language barriers.

A number of measures can be considered to further advance the ERA aims. These include, firstly, broadening of the ERA partnership of EU institutions, member states and researchers stakeholders with other relevant actors from business community and grassroots researchers' organizations; secondly, better integrating the ERA initiative with related policies such as innovation and education; and thirdly, exploring a mix of voluntary, awareness and funding instruments as a potentially efficient way for promoting practices and culture supportive of an open labour market for researchers.

## **Chapter 1 European Research Area initiative**

### **I – Development of the European Research Area**

The ERA initiative is an ambitious endeavour to coordinate research and innovation internationally. While research practices have been international for centuries with international collaboration and mobility playing an important role in knowledge production and circulation (Crawford et al 1993), the ERA is an important attempt to internationalize research policies and governance which is predominately national (Nedeva 2013). Thus, research is a very specific area of European integration with a long tradition of international



collaboration and with global peer-reviewed journals, scientific associations and conferences setting quality standards today. The scientific community has been ahead of politics by self-organizing and self-governing its international activities. Today, international scientific collaboration in a form of internationally co-authored scientific articles is increasing (Adams 2013; Wagner et al 2015) due to many reasons such as growing complexity of research, need to address global questions and access to large scale research infrastructures. Intensifying internationalization increases pressures on predominantly national research policies to address needs for global collaboration in research.

Building on the earlier steps in the integration of European research policies (Chou and Ulicane 2015a), the ERA initiative sets out a broad programme in reforming national research systems and facilitating transnational research cooperation and the circulation of researchers and knowledge. It is a very ambitious policy programme due to its breadth and complexity as it aims at deep changes in established norms, practices and traditions in activities such as distributing research funding and recruiting and evaluating researchers.

The success of the ERA would require not only changes in policies but also changes in academic cultures<sup>52</sup> that, for a long time, have governed the allocation of research funding and academic jobs in many countries, universities and research institutes. The diversity and high number of actors involved contributes to the complexity of the ERA initiative. Research policy is a shared competence between the EU and the member states. The member states allocate the majority of funding and make major decisions about research policy. Moreover, research funding organizations, universities and research institutes that have to implement many policy decisions often have considerable autonomy that can be beneficial in facilitating tailor-made reforms or in some cases it can be hindering change and allowing certain resistance or even continuation of culture based on nepotism, academic 'inbreeding' or cronyism. Furthermore, research is an area that is particularly challenging to govern due to its unpredictability and creativity.

Countries, research funders, universities and research institutes involved in the ERA are very diverse in terms of their organization and performance due to historical reasons and as a result of their recent policies and strategies. Diversity in the organization of research can be a great asset for ERA when different research and organizational profiles are complementary and enrich each other by producing and utilizing a wide variety of knowledge. However, differences in research and innovation performance, particularly when a considerable number of countries and research organizations are lagging behind, can limit these countries' and organizations' abilities to participate in and benefit from the free circulation of researchers, knowledge and technologies and thus make the full realization of the ERA problematic.

Moreover, the ERA initiative has evolved during the times when research policies are changing. These changes in many countries include shift from institutional funding to increased share of project-based funding, from a stable and permanent academic employment to growing use of fixed term contracts as well as trends towards more internationalization and quantitative evaluation of research. Effects of these policy changes on research have been contradictory. Increased efficiency, flexibility, transparency and excellence are intended positive effects but science policy researchers have also indicated shifts towards increasing short-termism, instability, less academic freedom and diversity of research, and decreasing capabilities to address complex long-term problems (e.g., Stephan 2012; Whitley 2011). Major debates about appropriate methods to evaluate research are

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<sup>52</sup> On the need for fundamental cultural change in accomplishing the ERA, see also European Commission 2013.

ongoing, as demonstrated by a recent publication of the Leiden Manifesto for research metrics (Hicks et al 2015). These research policy changes, their diverse effects and ongoing debates are highly relevant for the ERA priorities that cover topics such as efficiency of science funding, peer-review, research careers, and mobility. While the ERA documents mainly focus on the positive effects of changing research policies, broader analysis of diverse effects of project-based funding, peer review and mobility would be highly relevant for the ERA.<sup>53</sup>

Since the ERA initiative was launched in early 2000 by the Commission (European Commission 2000) and approved by the Lisbon Council (Lisbon European Council 2000), it has gradually developed via Commission initiatives and Council decisions (Ulnicane 2015a). The main steps in the development of the ERA initiative are set out in the Box 1.

### **Development of the ERA initiative**

- 2000 ERA and Lisbon strategy launched
- 2002 Barcelona target of R&D funding of 3% of GDP
- 2002 Communication ‘The European Research Area: providing a new momentum’
- 2005 Mid-term review and re-launch of the Lisbon strategy
- 2005 Researcher’s Charter and Code of Conduct for Recruitment launched
- 2007 ERA Green paper – public consultation
- 2007 European Research Council established
- 2008 European Institute of Innovation and Technology established
- 2008 Ljubljana process on ERA governance as enhanced partnership
- 2009 Lisbon Treaty enters into force providing treaty basis for ERA
- 2009 Lund declaration on Grand Challenges
- 2010 Europe 2020 and Innovation Union initiatives launched
- 2012 ERA reform agenda and ERA Stakeholder Platform launched
- 2013 First ERA Progress Report
- 2014 Deadline for completing ERA
- 2014 RESAVER consortium launched
- 2015 ERA roadmap approved
- 2016 National ERA roadmaps to be developed

#### **Box 1 Timeline of the ERA initiative with selected key developments (adapted from Ulnicane 2015a)**

The crucial steps in establishing the ERA initiative as it is known today were taken in 2012 when the Commission’s Communication on the reinforced ERA partnership (European

<sup>53</sup> Such a broader analysis of diverse effects of research policy changes in the context of the ERA is beyond the scope of this paper; that would need to be part of a longer term policy and analysis agenda.

Commission 2012a) set out a reform agenda<sup>54</sup>. The document provided an extended ERA definition as ‘a unified research area open to the world based on the Internal Market, in which researchers, scientific knowledge and technology circulate freely and through which the Union and its Member States strengthen their scientific and technological bases, their competitiveness and their capacity to collectively address grand challenges’ (Ibid: 3). It also established the five ERA priorities:

1. More effective national research systems
  2. Optimal transnational cooperation and competition
- Jointly addressing grand challenges
- Effective investment in and use of research infrastructures
3. An open labour market for researchers
  4. Gender equality and gender mainstreaming in research
  5. Optimal circulation, access to and transfer of scientific knowledge

In recent documents, a sixth crosscutting priority has been added, namely, international cooperation focusing on collaboration with countries outside the EU (ERAC 2015: 19-20; European Commission 2014b: 18-19; 58)<sup>55</sup>. This priority is important because research collaboration and mobility is not limited to the EU-28 and it is in the interests of the EU to collaborate with other major and emerging research powers as well as with developing countries (see also European Commission 2014a: 7). The six priorities are already broad but there have also been proposals to focus on additional topics such as including humanities and social sciences, promoting research integrity, and fostering science and society interactions (LERU 2014).

The six ERA priorities are closely related and interlinked: transnational cooperation (Priority 2) will be more successful among effective national research systems (Priority 1) and vice versa – national research systems can become more effective via transnational cooperation; open, transparent and merit-based recruitment (Priority 3) and gender equality (Priority 4) are essential elements of effective research systems (Priority 1). Large differences in the performance between highly effective and lagging national research systems (Priority 1) can hinder mutually beneficial transnational cooperation (Priority 2) and lead to asymmetric researcher mobility flows (Priority 3) resulting in ‘brain-drain’ and ‘brain gain’ rather than a ‘win-win’ situation of ‘brain circulation’. For an overview of the ERA priorities and corresponding actions for the first three priorities analysed in this paper, see Diagram 1.

The six priorities guide the ERA roadmap that was recently developed by the European Research and Innovation Area Committee ERAC (ERAC 2015) and adopted by the Council (Council of the European Union 2015). The ERA roadmap provides an outline for developing national ERA roadmaps until 2016. In 2014, Germany was the first member state to adopt its national ERA roadmap doing so even before the EU level roadmap was developed (Federal Government 2014). The development of national ERA roadmaps could be an opportunity to have one national ERA document that consolidates multiple national documents on different ERA priorities that have been previously requested and monitored by different EU policy documents (e.g. European Commission 2010b; European Commission 2014b) such as national strategies for research and innovation (ERA priority 1), national roadmaps for developments of research infrastructures (ERA priority 2b) and national strategies for training researchers (ERA priority 3).

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<sup>54</sup> This document builds on the ERA aims, dimensions and activities set out in the previous ERA documents (Ulnicane 2015a).

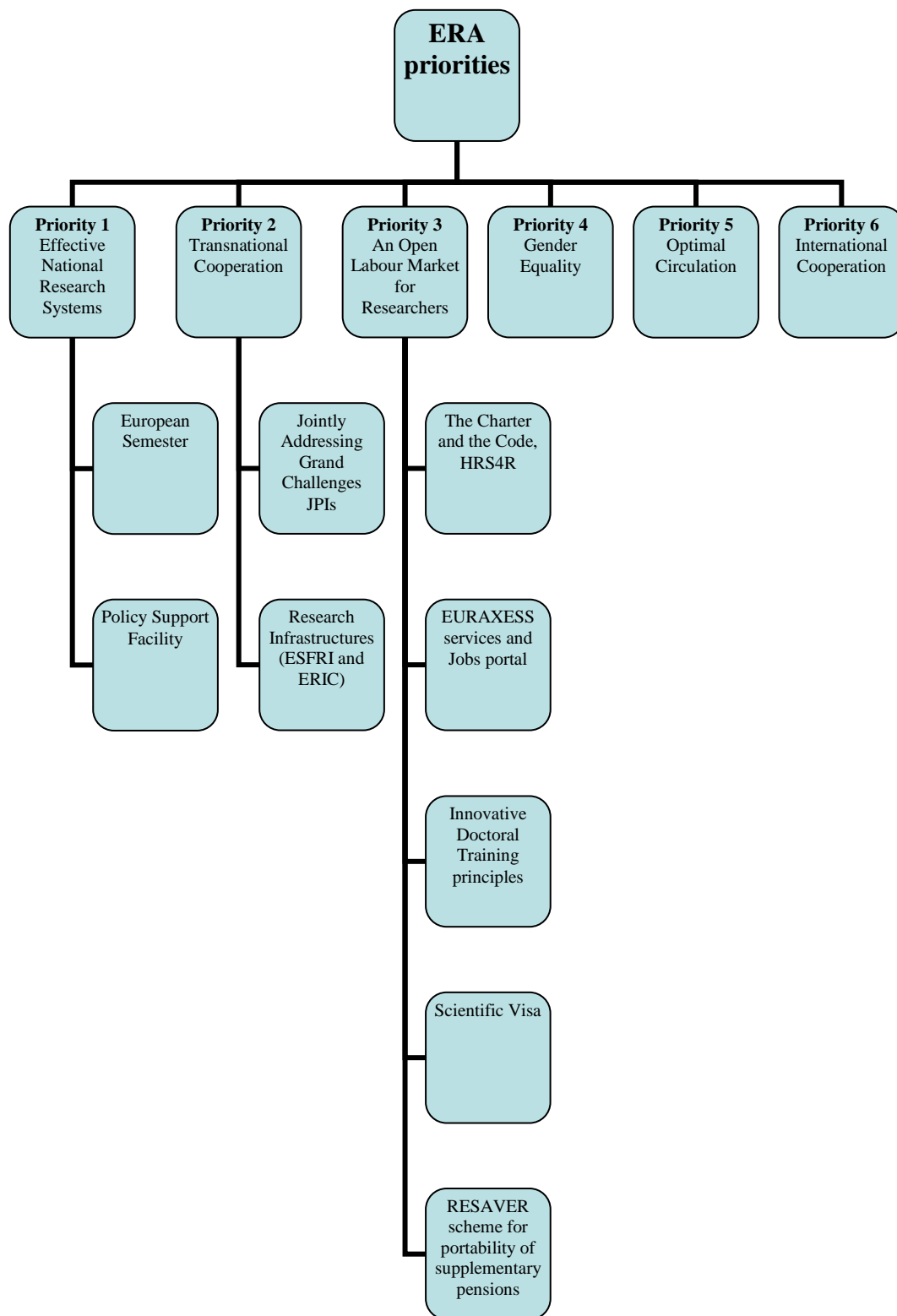


Diagram 1 ERA priorities and corresponding actions

Additionally, the ERA priorities form the basis of the ERA monitoring process started in 2013 in the annual ERA Progress Reports. Indicators of the ERA monitoring mechanism play an important role in the ERA initiative. As the six priorities are rather broad, the ERA indicators

operationalize and narrow them down. Recently, important changes and new developments have been taking place regarding the ERA monitoring mechanism and indicators. The European Commission has developed new indicators for the next ERA Progress Report in 2016 and the ERAC has developed indicators for monitoring the implementation of the ERA roadmap.<sup>56</sup> The ERA Progress Report 2014 (European Commission 2014a) concludes that the conditions for the completion of the ERA are now in place, although the completion of ERA remains a gradual process. The document states that 'more efforts are needed to make ERA fully operational and [...] it is now up to Member States and research stakeholders to implement necessary ERA reforms and make ERA work' (Ibid: 11).

Since the Ljubljana process in 2008, the ERA initiative has been developed as a partnership between the Commission, the member states and stakeholder organizations. The partnership approach, which is used also for other EU policy initiatives such as the Europe 2020 strategy, was further strengthened by the 2012 ERA Communication on reinforced ERA partnership. Following the 2012 ERA Communication, the ERA stakeholder platform was established. Since then the Commission regularly signs partnership agreements with five to six main research stakeholder organizations with a goal of working together towards the achievement of the ERA. While research stakeholders have traditionally been actively involved in the development of the EU Framework Programmes, the ERA stakeholder platform is an important initiative involving stakeholder organizations in broader ERA policy issues. Interviews undertaken within this study confirm that the partnership is appreciated by both the policymakers and stakeholder organizations<sup>57</sup> as a way to include stakeholders' views in the ERA policies and raise awareness about the ERA (see also European Commission 2014a).

The legal basis for the ERA was provided in the Lisbon Treaty that came into force in 2009. Article 179 of the treaty states 'The Union shall have the objective of strengthening its scientific bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely'. Article 182 (5) allows for the adoption of legal measures necessary for the implementation of the ERA. According to this clause, as a complement to the Framework Programme, 'the European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee, shall establish the measures necessary for the implementation of the European research area'<sup>58</sup>. The introduction of the legal basis for the legislation on the ERA is an important development in a long-standing debate about the possibility and feasibility of legal instruments in the ERA initiative.

The legal option was considered in 2012, when, in the impact assessment (European Commission 2012b) accompanying the 2012 ERA Communication, four options for completing the ERA by 2014 were analysed. The four options analysed were 1) Business as usual, 2) Reinforced partnership for the ERA, 3) Sectoral legal measures for the ERA, and 4) an ERA Framework Directive. It was concluded that 'Policy option 2 (Reinforced partnership for ERA) alone ensures a substantial level of progress towards compliance with the 2014 deadline imposed by the Council' (European Commission 2012b: 36), while the preparation, adoption and implementation of legislation would take a longer time.

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<sup>56</sup> These new developments were mentioned in the interviews undertaken during this study. Requests were made for the documents but they were not received during the time of writing because the documents were still being finalized.

<sup>57</sup> One of the previous members of the ERA stakeholder partnership – Nordic research cooperation organization NordForsk (signed partnerships in 2012 and 2013) did not join the most recent partnership in 2015. NordForsk declined interview request for this study.

<sup>58</sup> On interpretation problems of this norm, see Pilniok (2014: 12-13).

More recently a number of politicians and stakeholders have repeated the calls for ERA legislation. In 2013, two members of the European Parliament issued a call for 'A Maastricht for Research' suggesting the ERA Framework Directive (Sartori and Berlinguer 2013). A legislative approach to the ERA has also been suggested by the League of the European Research Universities LERU (LERU 2015). However, the Council, which would have to play a crucial role in adopting any legislation, has emphasised that 'the use of legislation at the European level to address obstacles to the ERA is currently not widely supported by the Member States and should occur only where a clear and significant need is agreed, i.e. only as a last resort' (Council of the European Union 2014). In the ERA Progress Report 2014, the Commission emphasised the role of the ERA Roadmap and national ERA action plans for the implementation of the ERA, adding that 'different options might be considered to foster the development of ERA, including the legislative options if need be, based on the new ERA-related provisions in the Treaty on the Functioning of the European Union' (European Commission 2014a: 10). A recent policy brief (Andrée 2015) suggests that at this stage no proposal for legislation for the implementation of the ERA should be recommended but that the potential for using legislation should be kept. So far, the main legal measures in the EU research policy include legislation for research funding, Scientific Visa Directive and a legal framework for European Research Infrastructure Consortia (ERIC) (Pilniok 2014). The pros and cons of addressing the remaining ERA gaps and barriers through legislative action will be discussed in the final chapter 6.

The main policy instrument used by the Commission and the ERAC for the implementation of the ERA is the open method of coordination (OMC). The OMC in the field of research and innovation policy was introduced in 2000 by the Lisbon European Council to facilitate mutual learning and flexible implementation of common targets in national policies. Additionally, over the past 15 years, a number of specific EU level initiatives have been launched, including the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers, EURAXESS information and support service for mobile researchers, the ERA monitoring mechanism and the RESAVER scheme for the portability of supplementary pensions. The implementation of the ERA has directly and indirectly been supported by EU level funding from the Framework Programmes and the Horizon 2020 program.

Since the launch of the Framework Programme in 1984, the funding allocated to it has gradually increased. Even in times of crisis when the overall EU budget for 2014-2020 was cut, the funding for Horizon 2020 was increased by 30% compared to the 7<sup>th</sup> Framework Programme (European Commission 2014d). 77 billion Euros initially allocated to the Horizon 2020 amounts to approximately 8% of the total EU budget of 960 billion euros, dominated by the European Structural and Investment Funds<sup>59</sup> and Common Agricultural Policy. According to some analysts, a paradigm shift in EU prioritization towards research and innovation would require a more radical re-allocation of funds towards growth policies such as research and innovation (Kaiser and Prange-Gstöhl 2010). However, since the adoption of the Horizon 2020 budget, 2.2 billion euros have already been moved to the new European Fund for Strategic Investments. Additionally, there have been difficulties in securing planned funding for Horizon 2020 during negotiations about annual EU budgets for 2015 and 2016 and the EU research and innovation programmes have experienced an accumulating lack of payment appropriations.

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<sup>59</sup> 83 billion euros from the European Structural and Investment Funds 2014-2020 are expected to be allocated to research, innovation, and small and medium sized enterprises (European Commission 2014d).

## II – Framework of the Study

By taking stock of the ERA initiative as it has developed over the past 15 years, this study identifies remaining gaps in and barriers to the realization of the European Research Area and develops recommendations for addressing them.

The study is structured around five questions defined by the European Parliament Research Service (NP1 – EPRS/EAVA/SER/15/211N). These questions are linked to the first three priorities of the ERA initiative (more information on the ERA priorities in previous section) with a particular focus on the third priority, namely, an open labour market for researchers:

**General question:** What are the gaps and barriers in the ERA initiative as established by the Commission?

**Question on ERA priority 1** (The establishment of more effective national research systems): How does the ERA facilitate the establishment of more effective national research systems supporting reforms at the national level and increasing the attractiveness and complementarities of national research systems?

**Question on ERA priority 2** (The realization of optimal transnational cooperation and competition): To what extent can the ERA initiative as established by the Commission lead to a better or optimal use of funds at EU level and improved cooperation between Member States on issues of common interest and importance (climate change, health, energy)?

**Question I on ERA priority 3** (Establishing an open labour market for researchers): What is the current state of the internal labour market for researchers? Which are the current possibilities for the mobility and social protection of researchers, gender equality and raising employment rates in research (especially among youth)? Are there large geographical differences throughout Europe?

**Question II on ERA priority 3** (Establishing an open labour market for researchers) What benefits can be expected, from the Member States' perspective, from the implementation of the ERA infrastructure in various specific initiatives such as mobility and social protection for researchers (RESAVER), gender equality measures, and raising employment rates in research (especially among youth)?

The study is structured according to these five questions. The first part of Chapter 1 outlined the development of the European Research Area to address the first question. Chapter 2 focuses on more effective national research systems to address the second question. Chapter 3 analyses transnational cooperation and competition tackled in the third question. Chapter 4 explores the open labour market for researchers to study the fourth and the fifth questions. Each chapter establishes the state of the art for the relevant ERA priority by analysing first of all the key recent ERA policy documents: the ERA 2012 communication (European Commission 2012a), the 2014 ERA Progress Report that outlines indicators used and results achieved (European Commission 2014a, 2014b), and the ERA roadmap (ERAC 2015). A wide range of other sources of information is also used. Chapter 5 presents gaps and barriers in the ERA initiative identified in this study. Conclusions and Recommendations derived from the analysis are presented in Chapter 6; the final chapter also addresses the question asked by the European Parliamentary Research Service about possibilities to address the gaps and barriers through legislative action or other forms of strengthened cooperation between Member States.

This study was prepared July-October 2015. The analysis draws on multiple data sources and research methods including expert interviews and analysis of policy documents, statistics and academic literature. While there are numerous policy documents, reports, studies and extensive academic literature on different aspects of the ERA, taking into account limited time and scope of this study, the main focus here is on key recent documents and studies. Additionally, 16 semi-structured expert interviews were undertaken with decision makers and stakeholders from August-October 2015. To obtain diverse expertise and perspectives on the ERA, interviewees were asked about their specific responsibilities and experiences regarding the ERA priorities analysed. Interviews were undertaken via phone and Skype. They lasted approximately 30 minutes - 1 hour, and were digitally recorded. In addition, the study draws on approximately 100 interviews with researchers, policy-makers and stakeholders across Europe undertaken within previous research projects of the author.

## **Chapter 2 More effective national research systems**

This chapter addresses the second question of this study: How the ERA facilitates the establishment of more effective national research systems supporting reforms at the national level and increasing the attractiveness and competitiveness of national research systems. This question is based on the ERA priority 1 - the establishment of more effective national research systems.

As established in the 2012 ERA communication, the first priority on more effective national research systems focuses on national research funding emphasizing increased competition and sustained or greater investment in research. To derive maximum value from public investments in research, the document outlines two approaches to research funding and evaluation: first, allocating funding through open calls for proposals which are evaluated by panels of leading domestic and non-domestic experts, and, second, assessing the quality of research-performing organizations and teams and their outputs as a basis for institutional funding decisions. The document claims that these approaches will motivate researchers to reach internationally-competitive levels of performance and will lead to organizational change.

In the ERA Progress Report 2014 (European Commission 2014a, 2014b), the four indicators used to monitor the progress towards this priority are 1) the share of national GBAORD (government budget appropriations or outlays on research and development) allocated as project-based funding, 2) the share of funders' budget allocated as project-based funding, 3) the share of project-based research and development budget allocated through peer-review, and 4) the share of institutional funding allocated based on institutional assessment and/or evaluation.

In the ERA roadmap, the top action priority for effective national research systems is 'strengthening the evaluation of research and innovation policies and seeking complementarities between, and rationalization of, instruments at EU and national levels'. To do so, the document envisages the use of national, EU (European Semester and Policy Support Facility) and OECD (Innovation Policy Platform) policy intelligence tools, some of which (e.g., European Semester) have already been in use for several years.

Data on research and innovation performance (European Commission 2015; OECD 2014) suggests that today there are major differences among the member states in the effectiveness of their national research systems. While some of the national research systems in the EU are among the world leaders on many research and innovation indicators, others considerably lag behind. The EU has used a variety of tools to facilitate reforms at the national level.



Mutual learning exercises have taken place at the ERAC. The member states have previously been requested to report on their progress in reforming their national research and innovation systems within the framework of the Lisbon agenda and are requested to do so today within the European Semester of the Europe 2020 Strategy.

Within the framework of the European Semester, the country specific recommendations prepared by the European Commission include suggestions on research funding and organization. The implementation of the country specific recommendations has been made an ex-ante condition for receiving the EU Structural Funds 2014-2020 (European Union 2013). While some national officials have found the pressure to implement country specific recommendations useful for promoting long needed changes<sup>60</sup>, some experts have criticised the recommendations as being rather ad hoc and lacking systematic evidence (Veugelers 2014). The ERAC review of reporting on research and innovation reforms within the European Semester found that effective dissemination and use of information from national reports is difficult due to differences in substance, level of detail, and structure (ERAC 2014). The ERAC also pointed out that reporting burden on national governments is increasing and suggested streamlining various research and innovation reporting exercises (e.g., for the EU and OECD).

In 2015, the Commission launched a new Policy Support Facility funded by Horizon 2020 to provide additional help for member states to reform their research and innovation policies. This new instrument, which has initially been utilized by Bulgaria, envisages a panel of senior experts and officials from other governments that conducts a peer review of national research and innovation policy and makes recommendations for improvements to public funding for research, research careers, and knowledge transfer between academia and business. Additionally, Spreading Excellence and Widening Participation activities funded by Horizon 2020 support a number of other activities such as Teaming, Twinning and ERA Chairs in low-performing member states<sup>61</sup>. Catching-up regions also use the European Structural and Investment Funds (ESIF) and related smart specialisation strategies outlining their priority sectors for ESIF investments to build up their research and innovation capacities.

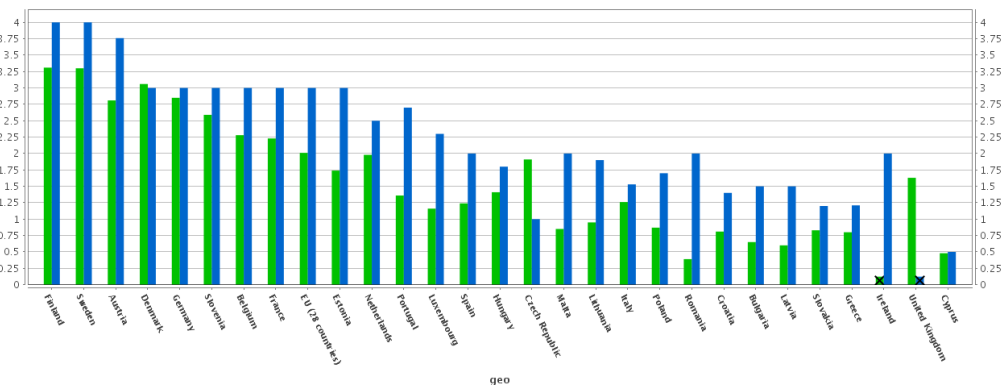
While the EU research and innovation funding is meant to complement member state own public investment in research and innovation, from 2007-2013 in some new member states the EU Structural Funds for research and innovation were of the same magnitude as national public research and innovation budget (Veugelers 2014: 6, 13). Additionally, in several new member states with low national public R&D funding the Framework Programme 7 from 2008-12 contributed approximately 15-25% of national public research and innovation funding, while the share of the FP 7 in a number of old member state was from around 5-10% (Ibid:13). The experts have pointed out the increasing role of EU funding both in terms of scale as they expect that in the coming years well over 20% of public funding for scientific research will come from Brussels as well as in terms of content implying internationalisation of scientific research and increasing role of scientific collaboration across borders (European Commission 2013: 11). Moreover, EU funding also plays an important influence on prioritization of certain research topics and choice of evaluation standards at the national level.

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<sup>60</sup> An interview with a national official 4.1.2015. (undertaken within a previous research project)

<sup>61</sup> According to a number of research performance indicators, 15 member states have been identified as low-performing countries: 13 most recent member states that joined in 2004 and afterwards, Portugal, and Luxembourg. Based on an interview with Dimitri Corpakis, Head of Unit B5 Spreading excellence and widening participation, DG Research and Innovation, European Commission 08.09.2015.

An important characteristic of national research systems is the amount of funding spent on research and development (R&D). The majority of R&D funding is allocated at the national level from public and private funding sources. In 2002, within the context of Lisbon agenda, the European Council set the so-called ‘Barcelona target’ of investing 3% of GDP in R&D, with one third of this funding coming from the government and two thirds from business (Barcelona European Council 2002). At that time, the aim was to increase the level of the R&D funding in Europe towards that of the United States and Japan. In 2010, the ‘3% target’ was taken from the Lisbon strategy into the new Europe 2020 strategy, stating that it ‘has succeeded in focusing attention on the need for both public and private sectors to invest in R&D’ (European Commission 2010a: 8). While recognising the importance of increasing R&D funding, the Council has also emphasised the significance of quality, efficiency and composition of funding (Council of European Union 2014). Since the initial announcement of the ‘3% target’ in 2002, only slight progress has been made in the EU-28 from 1.81% in 2002 to 2.01% in 2013<sup>62</sup>. However, there is considerable diversity among member states, with the Nordic countries Finland, Sweden and Denmark already investing more than 3% of their GDP in R&D in 2013, while in some member states R&D expenditures are below 1% of GDP. Within the Europe 2020 strategy, the member states have set their own national R&D expenditure targets for 2020, ranging from 4% in Finland and Sweden to above 1% in catching-up countries (See Graph 1).



Graph 1 Gross domestic expenditure on R&D 2013 (green) and target for 2020 (blue), % of GDP (Source: Eurostat)

Veugelers (2014) found that during the recent economic crisis, the gap in public expenditure for R&D in Europe has increased ‘with the innovation-lagging and fiscally weak countries cutting public R&I budgets, while the innovation-leading and fiscally stronger countries forge ahead with public R&I spending’ (Veugelers 2014: 8). Although the divide between innovation-leading and innovation-lagging countries is largely split between the North/West and South/East of Europe respectively, there are some exceptions - several new member states such as Slovenia, Estonia and Czech Republic have considerably increased their R&D expenditures to levels similar to old member states.

Nevertheless, a recent review of the Europe 2020 strategy suggests that ‘with a level of 2.06% in 2012, and limited progress over time, the 3% target for 2020 is unlikely to be met. Investment in R&D is forecast to increase to 2.2% by 2020. If member states meet their

<sup>62</sup> Here and afterwards Eurostat data. Available at <http://ec.europa.eu/eurostat> Last accessed on 19 October 2015.

national targets, this share could amount to 2.6%' (European Commission 2014c). Although the 3% target is not mentioned in the ERA roadmap (ERAC 2015), the Commissioner (Moedas 2014) and some stakeholders (LERU 2014) have reaffirmed its importance. While the initial rationale for the '3% target' was for Europe to catch up with the US and Japan, recent data demonstrate that the EU's level of R&D expenditure is still lagging behind that of the US, Japan and Korea and has recently been overtaken by China (see Figure 1).

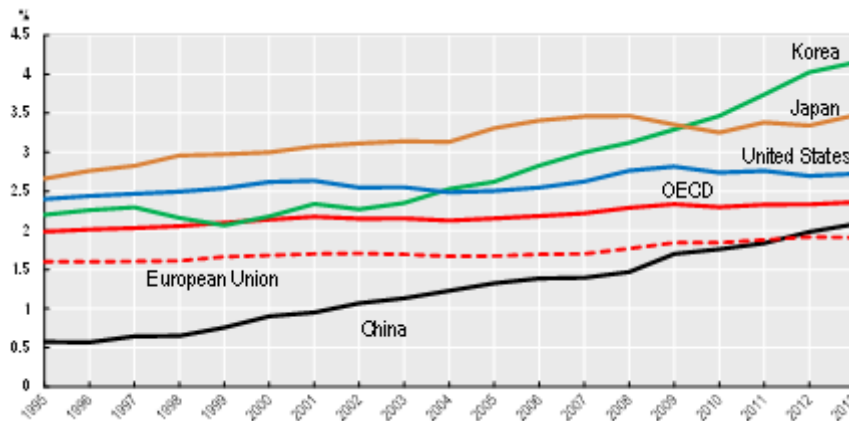


Figure 1. Total expenditure on R&D 1995-2013, % of GDP (Source: OECD 2015)

Establishment of more effective research systems is an important element for fully realizing benefits of the ERA and open circulation of researchers, knowledge and technologies. It is a long-term process that involves not only adequate and efficient funding but is also closely related to other priorities enabling more productive participation in transnational cooperation and mobility of researchers.

## Chapter 3 Transnational cooperation and competition

This chapter explores the third question of the study – To what extent can the ERA initiative, as established by the European Commission, lead to a better or optimal use of funds at EU level and improved cooperation between Member States on issues of common interest and importance (climate change, health, energy)? It relates to the ERA priority 2, namely, the realization of optimal transnational cooperation and competition. In particular, it looks on the first part of this priority - jointly addressing grand challenges<sup>63</sup>: the alignment of national and international funding sources by defining and implementing common priorities and joint research agendas building on initiatives such as Joint Programming Initiatives, ERA-NET calls and Public-Private Partnerships.

The ERA Progress Report 2014 lists a number of indicators for monitoring this aim, focusing on the share of national funding allocated for transnationally coordinated research, joint research agendas and projects that are peer-reviewed by non-national institutions. The main action priority set out in the ERA roadmap for this aim is improving alignment within and across the Joint Programming Process and the resulting Joint Programming Initiatives (JPIs) and speeding up their implementation.

<sup>63</sup> The second part of the Priority 2, i.e. effective investment in and use of research infrastructures is beyond the scope of the question addressed in this chapter.

The ERA Progress Report 2014 lists several common funding schemes of national funding agencies and Horizon 2020 such as ERA-NETs, Article 185 initiatives and Joint Programming Initiatives (European Commission 2014b: 16)<sup>64</sup>. Since 2010, ten Joint Programming Initiatives (JPIs) have been established to pool national research efforts to tackle common European challenges in areas such as water challenges, neurodegenerative diseases, and demographic changes. In total, their joint activities up to the end of 2013 amounted to more than 20 joint calls and joint actions for a total of more than 200 million euros (Ibid).

There are contradictory views on how much of national research funding has been coordinated so far. According to the ERA Progress Report 2014, less than 1% of national public R&D funding is spent on transnational research. This figure has been criticised by Science Europe (2015: 5) for not taking into account some key forms of coordinated spending such as Framework Programmes and intergovernmental agreements on research infrastructures like CERN. Science Europe (Ibid: 9) has also invited to discuss the alignment between JPIs and other initiatives aimed at similar challenges, but from different perspective, such as European Innovation Partnerships, Knowledge and Innovation Communities of the European Institute of Innovation and Technology, ERA-NETs and the Horizon 2020 Societal Challenges pillar. Relevant stakeholders from research and business communities have indicated their interest to be involved in discussions about JPIs.

Moreover, Science Europe (2014b) has suggested additional models for collaboration among national funding agencies, which have already been implemented by some of the Science Europe member organizations. The three suggested models are: first, 'Money follows Researcher' allowing researchers to take with them the remainder of a grant to another country; second, 'Money follows Cooperation Line' allowing part of a grant to be used to fund participation of a researcher from another country; and third, 'The Lead Agency Procedure' enabling bilateral or multilateral research cooperation through evaluation by a single Lead Agency.

Coordination of national research funding is a process that is gradually expanding. Important future steps in this process is evaluation of results of existing joint programmes and comparison of different models of funding coordination that could provide evidence for revising existing programmes and designing new ones.

## Chapter 4 Open labour market for researchers

This chapter analyses the fourth and the fifth questions of the study: What is the current state of the internal labour market for researchers? What are the current possibilities for the mobility and social protection of researchers, gender equality and raising employment rates in research (especially among youth)? Are there large geographical differences throughout Europe? What benefits can be expected from the implementation of the ERA infrastructure from the Member States' perspective on various specific initiatives such as the mobility and social protection of researchers (RESAVER), gender equality measures, and raising employment rates in research (especially among youth)? These questions address the third ERA priority of an open labour market for researchers, aiming to ensure the removal of barriers to researcher mobility, training and attractive careers.

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<sup>64</sup> More information on the coordination of national research programmes available here [http://ec.europa.eu/research/era/joint-programming\\_en.htm](http://ec.europa.eu/research/era/joint-programming_en.htm) Last accessed 26 October 2015.

The open labour market for researchers is a broad priority that includes the international mobility of researchers within the EU and from outside the EU as well as cross-sectoral academia-business mobility. The 2012 ERA Communication lists a number of aims addressed and measures undertaken during the last ten years to establish an open labour market for researchers. These include the removal of legal and other obstacles to open, transparent and merit-based recruitment, cross-border access to and portability of national grants, the provision of information to researchers through the EURAXESS network and portal, support for setting up and running structured innovative doctoral training, and the creation of an enabling framework for the implementation of the Human Resource Strategy for Researchers incorporating the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers ('the Charter and the Code'). Furthermore, initiatives to address the social security barriers for internationally mobile researchers and to further facilitate the entry and stay of third country national researchers are undertaken.

The ERA Progress Report 2014 outlines eleven indicators to monitor the implementation of this priority. These include the share of organizations that advertise researcher vacancies openly (including in the Commission's EURAXESS portal), the share of organizations implementing the Code and Charter principles, the share of funders supporting the uptake of Code and Charter principles, and the share of funders whose grants are accessible to foreign organizations and researchers and are portable abroad. Additional indicators focus on research performing organizations that expose PhD students to industry and other relevant employment sectors, the share of funders supporting the implementation of structured doctoral training, and the share of research performing organizations supporting researchers' mobility outside academia.

The top action priority for an open labour market for researchers set out in the ERA roadmap is 'using open, transparent and merit-based recruitment practices with regard to research positions'. In 2015, the Commission, together with the member states and stakeholders, developed guidance on open, transparent and merit-based recruitment of researchers including a checklist and toolkit for advertising positions as well as for the selection, evaluation and appointment of researchers.<sup>65</sup>

Efforts to improve the recruitment of and working conditions for researchers are also at the centre of the Commission's Human Resources Strategy for Researchers (HRS4R), which is a voluntary tool for supporting research institutions and funding organizations in the implementation of the Charter and the Code<sup>66</sup>. Principles of the Charter and the Code, such as research freedom, stability and permanence of employment, gender balance, career development and the value of mobility, should make research institutions and national research systems more attractive for researchers. However, during interviews several stakeholder representatives pointed out that even at some universities that have signed the Charter and the Code awareness and implementation of the principles is limited. While an increasing number of over 1500 organizations from 40 countries have expressed explicit support for the Code and Charter, only 250 have received the 'HR Excellence in Research' award for making progress in implementing the Code and Charter principles in their human resource policies<sup>67</sup>. A significant portion of these awards has gone to the UK, while a number of other member states are underrepresented or absent from the HRS4R (European

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<sup>65</sup> Available at <http://ec.europa.eu/euraxess/index.cfm/rights/singleNews/1851> Last accessed 26 October 2015.

<sup>66</sup> More information available at <http://ec.europa.eu/euraxess/index.cfm/rights/index> Last accessed 26 October 2015.

<sup>67</sup> Communication with Dr. Irmela Brach, Senior Policy Officer, European Commission 20 October 2015.

Commission 2014b: 24). To strengthen the implementation of the Code, the Horizon 2020 Model Grant Agreement (Article 32) obliges beneficiaries to take all necessary measures to implement the Code (Ibid: 23). This new policy within Horizon 2020 is designed to end sexism, nepotism, localism, and cronyism in academic recruitment; grant winners failing to comply might face penalties (Grove 2015).

The Commission's EURAXESS service provides information for mobile researchers online and in more than 200 service centres in 40 European countries, which have assisted with more than 900 000 queries in the past six years on topics such as funding opportunities, visas, accommodation and social security (European Commission 2014b: 26). The number of research vacancies posted on the EURAXESS Jobs Portal has grown from 7500 in 2010 to over 40 000 in 2013 (Ibid: 23). Some countries have made it mandatory for publically-funded institutions to advertise their positions on EURAXESS (e.g. Poland, Croatia, Italy) or internationally (e.g. Austria) (Ibid).

To prepare the next generation of researchers for cross-border and cross-sectoral mobility, seven Principles for Innovative Doctoral Training are being promoted: research excellence, an attractive institutional environment, interdisciplinary research options, exposure to industry and other relevant employment sectors, international networking, transferable skills training, and quality insurance. These principles are particularly relevant because with an increasing number of PhDs trained in Europe (from around 72 000 graduates in 2000 to 115 000 in 2011), it is expected that the majority of them will have careers outside academia (European Commission 2014b: 24).

To make the EU more attractive for researchers and students from the third countries, in 2013 the Commission proposed a new directive to replace the Scientific Visa Directive adopted in 2005 (European Commission 2014b: 26). In autumn 2015, the Council and the European Parliament agreed on a draft directive.<sup>68</sup> It has been estimated that the total number of non-EU researchers working in the EU is 70 000, constituting 5.6% of the total amount of researchers working in the EU (IDEA Consult 2013: 19). The largest share of them comes from China, India and the US and more than half of them works in the UK and Germany. Additionally, in 2010, about 20% of doctoral candidates in the EU came from non-EU countries, with China and Brazil being the most prominent countries of origin (Ibid). Almost two thirds of them were doing their PhDs in France or the UK.

One of the initiatives to increase the social security of internationally mobile researchers is the single European pension arrangement RESAVER (Retirement Savings Vehicle for European Research Institutions), which allows researchers to preserve their supplementary pension benefits when they move between different countries<sup>69</sup>. An initial RESAVER employer consortium supported by the European Commission was launched on 1 October 2014. It consists of seven employer organizations and more organizations have joined since then. It is planned that the RESAVER scheme will become operational in mid-2016 and over a hundred members that have internationally mobile researchers will contribute in three years time<sup>70</sup>. The members that have joined the consortium so far are mainly from a few countries: Italy, Spain, Austria, the Netherlands, Luxembourg, Hungary, Czech Republic,

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<sup>68</sup> Press release 'New rules for the third-country researchers and students : Council confirms deal with EP'. Press Office – General Secretariat of the Council 876/15. 26.11.2015.

<sup>69</sup> Based on RESAVER website <http://ec.europa.eu/euraxess/index.cfm/rights/resaver> Last accessed 19 October 2015. New RESAVER website launched in October 2015 available at <http://www.resaver.eu/> Last accessed 29 October 2015.

<sup>70</sup> Here and afterwards based on an interview with Andreas Dahlen, Policy Officer (RESAVER), DG Research and Innovation, European Commission 09.09.2015

Denmark and Ireland. The major concern is that in some of the leading European research systems, such as Germany and France, national legislation does not allow public employers to join the European pension arrangement. In Germany, a state agency administers pensions for all public employees and it is not possible to contribute to any other pension fund except the state agency. In France, university employees are civil servants whose pension is a collective benefit scheme. Changes in national legislation would be needed for public employers in Germany and France to join RESAVER. In the UK, universities contribute to a special university pension scheme; thus, universities themselves would have to change the rules of the scheme in the UK to be able to contribute to RESAVER. The establishment of RESAVER is seen as a gradual process with an increasing number of employers joining over the years, in particular after national rules in the main European research systems are changed to allow for contributing to a European scheme. Mobile researchers will be able to continuously accumulate their supplementary pensions when all research organizations with mobile staff will have joined RESAVER; absence of major research organizations with international staff in the UK, Germany and France from this scheme would be an obstacle for researchers moving to and from these organizations.

How mobile are researchers in the EU? Survey data present a mixed picture on the international mobility of researchers in the EU. While 31% of post-PhD researchers in the EU have worked abroad (EU or worldwide) for more than three months at least once during the last ten years, another 31% of EU researchers have never been internationally mobile in their post-PhD career stages (IDEA Consult 2013: 17-18). Post-doctoral researchers are more likely to be mobile than their counterparts in later career stages. 12% researchers (i.e. around 40% of all mobile researchers) have worked abroad for a new employer (Ibid: 17). Female researchers are less mobile than their male counterparts: for post-PhD male researchers, the share of mobility longer than 3 months amounts to 28% compared to 21% of female researchers (Ibid: 18). The main destinations for internationally mobile researchers are the USA (18%), United Kingdom (11%), Germany (11%) and France (8%), while the main mobility outflows are from Greece, Spain and Italy (Ibid: 23-24).

The main motives for international mobility are career progression (83%), working with leading experts (75%), available funds (70%), facilities and equipment (69%) and positions (69%) (Ibid: 25). The primary barriers to mobility for internationally mobile researchers are obtaining funding for mobility and research (43.4%), logistical problems (36.3%) and finding a suitable position (34.8%), while the main mobility barriers for non-mobile researchers are personal and family reasons (67.4%), obtaining funding for mobility and research (55.9%) and logistical problems (52%) (Ibid: 168-169). For more information on barriers for international mobility, see Table 1.

<i>Barriers</i>	<i>Importance of barrier for mobile researchers in post-PhD careers (Share of researchers)</i>	<i>Importance of barrier for non-mobile researchers in post-PhD careers (Share of researchers)</i>
Obtaining funding for your mobility/research	43.4%	55.9%
Logistical problems	36.3%	52%
Finding a suitable position	34.8%	49.9%
Facilities and equipment for your research	27.9%	21.4%
Other personal/family reasons	26.5%	67.4%

Potential loss of contact with your professional network	25.1%	28%
Language and/or culture	23.8%	24.9%
Quality of training and education	21.1%	21.7%
Transferring your research funding to another country	16.3%	26.4%

Table 1 Barriers to international mobility in the EU (IDEA Consult 2013: 168-9).

According to an OECD bibliometric study (OECD 2013: 1), ‘the research impact of scientists who change affiliations across national boundaries is nearly 20% higher than that of those who never move abroad’. Among the positive impacts of international mobility, researchers themselves mention the quality, quantity and impact of their publications, the advancement of research skills, and the development of international contacts and networks (IDEA Consult 2013: 29). However, 31% of researchers also see a decrease in career progression as a result of mobility, which might be due to ‘forced’ mobility (Ackers 2008) when there are no job opportunities in their home country (Ibid). Thus, while international mobility leads many benefits, it can also have more problematic reasons and effects.

## Chapter 5 Gaps and Barriers

This chapter presents gaps and barriers in the ERA initiative identified in this study. The presentation of gaps and barriers follows the overall structure of the study starting from general ERA governance issues and then moving to the three specific ERA priorities analysed in this study, namely, more effective national research systems, transnational cooperation, and open labour market for researchers.

Insufficient coordination with other policies and initiatives: The development and implementation of the ERA initiative still largely takes place within the field of research policy; coordination with other policies and initiatives is insufficient. Realization of the ERA priorities requires close coordination with other policies and initiatives such as innovation, entrepreneurship, higher education and regional policies, the Bologna process and European Higher Education Area, Horizon 2020, and European Structural and Investment Funds (the latter being an important source of funding for ERA related reforms in many catching-up research systems). Without this coordination it is not possible to achieve the ERA aims such as reforms of national research systems (including better university-business interaction and increasing investment from business sector), jointly addressing societal challenges that require involvement of diverse actors, and training researchers for inter-sectoral mobility between universities and private sector. To address this gap of insufficient integration of different policy fields, the LERU (2014) has recommended linking education, research and innovation in a European Education, Research and Innovation Area to ensure more coherence among these closely related policy areas.

Limited range of interests represented in the ERA stakeholder platform In 2015, the most recent ERA partnership was signed by the Commission and five stakeholder organizations: the European Association of Research and Technology Organizations (EARTO), the European University Association (EUA), the League of European Research Universities (LERU), Science Europe, and the Conference of European Schools for Advanced Engineering Education and Research (CESAER). These are the strongest research stakeholder



organizations representing the main research performing and funding organizations. However, other stakeholder organizations important for the ERA so far have been missing from the platform; these include grassroots researcher organizations with valuable information about the Open Labour Market for Researchers and business organizations which are important research funders and performers as well as employers of researchers. Involvement of additional stakeholders would help to avoid 'a danger that those stakeholders with stronger voices, more money and better organization are more present in the political debate than other communities' (Initiative for Science in Europe 2011: 3). Additional risk of involving only a limited range of stakeholders is that awareness and legitimacy of the ERA initiative among relevant stakeholder groups can remain low. The ERA Progress Report 2014 stated that the stakeholders' platform is a good instrument, contributing to ERA policy-making and implementation and that it could be expanded to include additional research players. A decision about the inclusion of new member organizations is expected by the end of 2015.

Uneven progress across member states: There are major differences across the member states in terms of reforming their national research and innovation systems (ERA priority 1 on more effective research systems), their research and innovation performance and their R&D expenditures. While partly these differences reflect long-standing divide between North/West and South/East of Europe, there are also differences between Central and East European countries which have recently undertaken reforms and those which have not. Lack of reform and progress in a number of member states is not only a problem for their future economic and social development; it is also a stumbling block for realising free circulation of knowledge and people in the ERA because lagging behind countries have limited possibilities to participate successfully in transnational cooperation (ERA priority 2) and in open labour market for researchers (ERA priority 3). Differences in research performance among the member states are not a new problem in the EU. Already in the early EU Framework Programmes in the 1980s and 1990s there was a divide between northern partners and cohesion countries (then including Greece, Spain, Ireland, and Portugal) (Sharp 1998). However, with recent EU enlargements the number of catching-up countries has increased and with the launch of the ERA the divide between innovation leading and catching-up countries hampers implementation of the ERA aims.

Narrow focus on project-based funding: While the establishment of more effective national research systems (ERA Priority 1) is a broad aim, the ERA initiative largely operationalizes this priority in terms of the share of project-based research funding as an effective allocation mechanism for the best projects. It is a rather narrow and one-sided focus on positive effects of project-based funding ignoring problematic ones identified by science policy experts and stakeholders. Although project-based funding is an important characteristic of contemporary research systems, constituting between a fourth to more than half of the total public research funding in the OECD countries (Steen 2012), it also has some problematic effects. The stakeholders have pointed out the lack of evidence on the effectiveness of project-based funding (Science Europe 2014a). Project-based funding allocation can involve high costs for research performing and funding organizations when preparing projects and administering their evaluation, in particular in oversubscribed funding schemes with low success rates. It has been pointed out that 'competition becomes inefficient when success rates are too low to support enough of the highest quality proposals' (European Commission 2013: 13). Moreover, high dependence on short-term project funding can be counter-productive for researching long-term complex problems (Ulnicane 2015b). Studies of institutional conditions facilitating scientific creativity and breakthroughs suggest the importance of availability of diverse funding sources including long-term institutional funding which provides some stability and allows for tackling risky and complex research problems (Heinze

et al. 2009; Hollingsworth 2008). More balanced evaluation of benefits and costs of project-funding is missing from the ERA initiative.

Lack of output evaluation of jointly addressing grand challenges: So far the ERA Priority 2 on transnational cooperation mainly focuses on inputs in transnational cooperation for jointly addressing grand challenges, namely on number joint funding initiatives among national funding agencies, number of joint calls and funding allocated. However, information about outcomes and outputs of joint programmes is missing and there is no systematic evidence about the scope and quality of their results e.g., new knowledge, publications, patents, and products (see also European Commission 2013: 18). Thus, it is not possible to assess if the joint programmes have lived up to expectations and delivered their stated aims of addressing societal challenges in a more efficient way. Science Europe (2015) has pointed out the need for a thorough assessment of existing Joint Programming Initiatives in terms of their quality and contribution to advancing their field of knowledge and addressing the societal challenges. That would help to assess the added value of JPIs. Assessment of joint programs is also needed in order to establish if any changes in this arrangement are needed and how to design further joint programmes.

Lack of support for bottom-up trans-national research collaboration: While the ERA Priority 2 on transnational cooperation focuses on supporting collaboration in the two important areas of addressing grand challenges and establishing and operating research infrastructures, it largely neglects support for bottom-up scientific collaborations. Data on the rapidly increasing share of internationally co-authored scientific articles (Adams 2013; Wagner et al 2015) suggest that bottom-up international collaborations are an increasingly important mode of knowledge production and lead to high impact and high quality research. Science policy scholars have recognized that 'it is important to enable and construct international approaches both top down-driven by social challenges and bottom up-driven by the needs of scientists and the initiative of funders' (Edler 2012: 332). However, support for bottom-up international research collaborations is largely neglected in the ERA initiative which focuses mainly on supporting top-down collaborations; additionally, stakeholders are concerned that support for such bottom-up international collaborations is increasingly neglected in Horizon 2020 as well (Nicholson 2015). Lack of funding opportunities for bottom-up international research collaboration can hamper collaborations that bring together high quality, highly specialized expertise and lead to high impact outputs. Funding models suggested by Science Europe (2014b) such as 'Money follows Cooperation Line' and 'The Lead Agency Agreement' can broaden opportunities to support international collaborations including bottom-up collaborations.

Unidirectional flows of researchers: A recent pilot study of doctorate holders suggests that talent mobility in Europe is largely unidirectional, with researchers from Southern and Eastern Europe moving to work in Northern Europe and thereby further increasing existing asymmetries in the ERA (European Science Foundation 2015). Additionally, an OECD bibliometric study (OECD 2013: 3) suggests that for some countries such as the UK the quality of incoming scientists exceeds that of outgoing, while for other countries such as Italy the opposite is true. These trends are not surprising in light of the differences in the performance and funding of national research systems discussed in chapter 2 and the motives for international mobility - career progression, working with leading experts, available funds, facilities and equipment, and positions - outlined in Chapter 4<sup>71</sup>. These

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<sup>71</sup> As one way to reverse the brain drain, new member states have suggested changes in Horizon 2020 salary payment system allowing to pay the same salaries for researchers working on Horizon 2020 projects across EU-28 (Maukola 2015). However, this small measure is unlikely to solve broader

trends indicate that instead of mutually beneficial circulation of knowledge and researchers envisaged by the ERA, there is a risk of a unidirectional brain drain taking place in Europe.

Lack of open, transparent and merit-based recruitment: According to survey results, 34-40% of researchers are dissatisfied with the levels of openness and transparency as well as the degree of merit-based recruitment of their institutions (IDEA Consult 2013: 32)<sup>72</sup>. There are big differences between countries in satisfaction with the highest share of satisfied researchers (around 80%) in the UK and the lowest share (between 30 and 45%) in Italy. The Researchers Report 2014 points out a sharp contrast in perceptions of the recruitment process of national authorities and researchers (European Commission 2014e: 43-51). While the vast majority of national authorities consider their national recruitment systems to be largely open and transparent, the perception of many researchers, in particular in some member states, is that recruitment procedures are neither open nor transparent and are characterized by protectionism, nepotism, and a lack of human resources strategy and information.

An interview with a main European research stakeholder organization revealed that they have reservations about open and transparent recruitment.<sup>73</sup> While they find open recruitment to be important at early career stages and as a tool to support gender equality, they see the request to follow open recruitment procedures as a hampering factor when a top university wants to hire a leading scientist who is already known for his/her high quality publications; in such cases, they see the need to organize an open competition as a waste of resources, a problem for university autonomy, and a burden for a leading scientist. While in the long-term, open recruitment can have many benefits in selecting the most productive and talented researchers and can make research institutions more attractive, an open selection procedure also has costs: according to the estimates, the costs for recruiting a single employee can vary between 5000 and 20 000 euros, which includes advertising, searching, processing the high number of applications, reading and assessing applications, attending meetings, and travel and relocation costs (European Commission 2012b: 80-81).

Survey results reveal that one of the main barriers for international mobility is difficulty to find a suitable position (see Table 1 above) indicating that further improvements in open, transparent and merit-based recruitment are needed for a well-functioning open labour market for researchers.

Low participation in EU initiatives establishing open labour market for researchers: While a number of crucial initiatives for the establishment of open labour market for researchers have been developed and promoted at the EU level, a relatively low number of research organizations are participating in some of them. It is expected that only over hundred research organizations will initially participate in the RESAVER scheme for portability of supplementary pensions. In the field of human resources policies, only 250 research organizations has received the 'HR Excellence in Research' award for making progress in implementing the Code and the Charter in their human resource policies. Research organizations from a number of member states are underrepresented or absent from these initiatives either due to legal (RESAVER) or other reasons. This low participation rate in some of the key initiatives for open labour market for researchers can be an important barrier

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differences in attractiveness of national research systems and respond to more complex motivations for mobility.

<sup>72</sup> These are perceptions of 'insiders' evaluating their own institution; to get a better understanding in the future, it would be useful to also have a survey of 'outsiders' who have applied for positions coming from other institutions and countries.

<sup>73</sup> An interview with a representative of a European research stakeholder organization 19.09.2014. (undertaken within a previous research project).

for free circulation of researchers, their social welfare and open, transparent and merit-based recruitment.

Limited portability of and access to national research grants: Internationally mobile researchers mention obtaining funding for mobility and research (43.3%) and transferring research funding to another country (16.3%) among mobility barriers. These results point to two barriers for international mobility of researchers: firstly, there are limited opportunities for the cross-border portability of national research grants; and secondly, the residence and institutional affiliation requirements are among eligibility criteria for many national research grants conditioning access to research grants for non-nationals (European Commission 2012c). When two or three years of prior residence in the country are requested, then researchers who have recently moved to work on short-term contracts cannot apply. While some grants such as the European Research Council grants are portable across organizational and national borders, only few national funding agencies allow grant portability to other countries (Ibid). One exception is the agreement between national research funding agencies of Germany, Austria and Switzerland (known as D-A-CH agreement) allowing for portability of research grants between the three countries. In 2014, Science Europe suggested national research funding organizations to implement 'Money follows Researcher' model allowing researchers to take with them the remainder of a grant to another country (Science Europe 2014b).

Limited dual career opportunities: The main mobility barrier mentioned by non-mobile researchers (67.4%) is personal and family reasons (IDEA Consult 2013: 169). Family reasons are often related to dual career pressures of finding suitable employment for both partners (European Science Foundation 2015). While existing dual career services mostly address senior researchers, the European Council of Doctoral Candidates and Junior Researchers (EURODOC) has suggested that more European countries and institutions need to introduce dual career services and that dual career opportunities need to be available at all stages of the research career including early stages (EURODOC 2014). As emphasised by the EURODOC, the availability of dual career services has important implications for a work-life balance, the diversity of the workplace, international mobility and career development, in particular for young female researchers.

Language barriers: While some have suggested that 'language barriers to movement for those with doctorate-level education are minimal given near universality of English language communication in the science community' (European Science Foundation 2015: 32), survey data demonstrate that 23.8% of internationally mobile researchers mention language and culture as barriers for international mobility (IDEA Consult 2013: 168). Although research and teaching activities in English at European universities are increasing, many academic posts (in particular those involving teaching) require proficiency in the national language. While some universities mention in their job advertisements that support for successful international candidates for learning the national language within the first two or three years of employment will be provided, other academic job advertisements requesting proficiency in the national language do not make any mention of either support or time given to learn it. It is important that requirements for knowledge of the national language are reasonable and are not used as a protectionist measure to favour local candidates.

Unclear demand for researchers: In 2011, there were 1.63 million researchers in the EU (European Commission 2014e: 17). The Innovation Union communication states that 'the EU will need at least one million new research jobs if it is to reach the R&D target of 3%' (European Commission 2010b: 9). However, as discussed in Chapter 2, it is not expected that the 3% R&D funding target will be reached by 2020. In the context of limited research

funding, question of lack of absorptive capacities in academic institutions of growing supply of doctorate holders has become increasingly relevant (European Science Foundation 2015: 11). Policy statements suggest that doctoral holders should have skills that would enable them to work in other sectors such as business. However, evidence about the absorptive capacities in business and other sectors of researchers is missing. Without evidence about demand for researchers in different sectors, it is not possible to evaluate if Europe has too little or too many researchers. Just comparing number of researchers in the EU with the US and Japan does not provide sufficient evidence due to differences in funding and business sectors; moreover, also in the US there is an ongoing discussion if the US has too little or too many researchers (Stephan 2012).

Job insecurity: Many researchers work on fixed-term contracts, particular in earlier career stages (IDEA Consult 2013). Job insecurity is seen as the most important barrier to pursuing a research career (Ibid: 11). In recent years, permanent contracts are awarded less often than before (Ibid: 76). A higher share of male researchers currently holds a permanent contract: 66% as opposed to 58% of the female researchers (Ibid: 77).

## Chapter 6 Conclusions and Recommendations

Since the establishment of the ERA initiative in 2000, important steps have been taken to provide treaty basis for the ERA, to define its priorities, to develop governance structures in form of a partnership between the Commission, the Member States and research stakeholder organizations as well as to establish a set of policy instruments to implement the ERA priorities. This study analysed the remained gaps and barriers in the ERA initiative and in particular in its first three priorities of more effective national research systems, transnational cooperation, and open labour market for researchers. How can these gaps be addressed?

A particular interest of the European Parliamentary Research Service has been about possibility to address the gaps and barriers through legislative action. As discussed in the Chapter 1, although some stakeholders and politicians have called for a legal route to ensure implementation of the ERA, there are important reservations in particular from the Council that would have to play a key role in adopting any potential legislation. Calls for ERA legislation have portrayed a legal option as more efficient way of the ERA implementation than current approach based on partnership and open method of coordination. However, such calls typically provide little detail and analysis on what the ERA legislation would entail and how it would work.

A legal study undertaken by Arne Pilniok and commissioned by the European Commission (Pilniok 2014) provides a thorough analysis of different legislative options, their pros and cons. After extensive analysis of different options of translating ERA into legislation – hard and soft law, framework directive and sector-specific regulations on different ERA priorities, he concludes regarding potential legislative measures for the ERA that ‘caution is advised, given both the competence structure between the EU and the Member States, and the protection of academic freedom as enshrined in the EU Charter of Fundamental Rights. [...] the role of (binding) law should not be overestimated as a steering mechanism for the research system’ (Ibid: 3). If political decision is made to proceed with legislative option, then Pilniok recommends to focus on removal of barriers to transnational mobility and research and to install reflexive governance structures for coordination and cooperation that would support continuous learning. According to him, removal of barriers to transnational mobility would encompass open recruitment procedures, access to and portability of research grants,

social security rules including pensions and access to research infrastructures. While such rules can promote transnational mobility, they can also encounter difficulties, for example, access to and portability of research grants can lead to cross-national imbalances due to the differences in attractiveness of national research systems<sup>74</sup> (Pilniok 2014).

**Based on the analysis of the ERA initiative undertaken within this study, it can be concluded that due to several reasons the legal option is unlikely to provide a quick and efficient measure for completing the ERA, as it is sometimes depicted in the ERA debates. Legally binding measures to facilitate the open labour market for researchers such as portability of research grants and open, transparent and merit-based recruitment can contradict with subsidiarity of member states and autonomy of research funding organizations and research performing organizations. Such measures can cause resistance, be difficult to adopt in the Council and to control their implementation by research funders and research performers. If political decision for legal measures is considered, then it is important that such measures are part of a broader long-term policy including a mix of policy instruments (also learning and awareness measures, national and EU funding instruments) supported and implemented by a broad partnership of EU and national institutions and stakeholders.**

Several of the gaps and barriers identified in this study are closely related indicating the need for systemic long-term solutions. Unidirectional flow of researchers from South/East to North/West of Europe is closely linked to uneven progress of reforming national research systems across the EU. To address these challenges, efficient implementation of measures reforming and making catching-up research systems more attractive is a key. Measures already launched include smart specialization strategies supported by the European Structural and Investment Funds and Spreading Excellence and Widening Participation measures funded by the Horizon 2020. It is important that these and other measures support long-term changes in catching-up research systems increasing their research capabilities, human resources, and national public and private R&D funding as well as ensuring open, transparent and merit-based recruitment. Additional measures can be considered such as scientific diaspora policies utilizing intellectual and social capital of nationals working abroad to support reforms, capability building and internationalization of research in their countries of origin. National ERA roadmaps to be developed in 2016 can be an opportunity to develop tailor-made reform programmes enabling all member states to fully participate, contribute to and benefit from cooperation and competition in the ERA initiative and open labour market for researchers.

A number of gaps and barriers identified in this study are closely related to other ERA priorities that are beyond the scope of this study. Analysis of the ERA priority 3 on Open Labour Market for Researchers revealed a gender gap of female researchers being less internationally mobile and having less job security than their male colleagues. The gender gap in research employment has to be addressed in the context of the ERA priority 4 on gender equality that is beyond the scope of this study.

Moreover, the realization of the ERA priorities of more efficient research systems, optimal transnational cooperation and open labour market for researchers is closely related to ongoing changes in research governance towards more project-funding, short-term employment and evaluation. In future assessments of the ERA initiative, a balanced review

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<sup>74</sup> Interview with a representative of a national research funding council for this study confirmed that differences in attractiveness of national research grants in different member states is a main obstacle for supporting cross-border portability of research grants.

of benefits and costs of project-funding, short-term employment and increased evaluation is needed.

A broadened partnership between EU institutions, member states and research stakeholders including additional actors and linking up to other relevant policy fields such as innovation and education can help to address the remaining related gaps in the ERA initiative such as limited reforms in a number of national research systems and barriers to free circulation of researchers. An enhanced mix of policy instruments when voluntary and awareness raising measures are increasingly linked to European and national research funding can be considered as an option for future ERA policy. In this context, a thorough assessment of the effects of recent policy that obliges Horizon 2020 beneficiaries to implement human resource principles set out in the Code of Conduct for the Recruitment of Researchers would be necessary. That would help to evaluate if a mix of voluntary, awareness and funding measures can be an efficient tool to promote academic practices and culture necessary for open labour market of researchers. Historically, the EU Framework Programme funding has played an important role in defining national research priorities, understanding of excellence, and evaluation criteria; it remains to be seen if Horizon 2020 (together with appropriate awareness raising and information measures) can promote changes in cultures and mind-sets towards truly open, transparent and merit-based academic recruitment and if a similar mix of funding and awareness raising measures can be used in the future to promote the ERA aims.

The ERA initiative is dynamic and continuously developing. Important processes in the initiative were going on but were not yet finalized during the preparation of this study in the second half of 2015 (adoption of new directive on the third-country researchers, finalization of new ERA indicators, expansion of the ERA stakeholder forum, etc.). Further important developments are scheduled to take place in 2016, for example, the ERA national roadmaps have to be developed and the European arrangement for supplementary pensions for mobile researchers RESAVER should become operational. Implementation of these recent and forthcoming measures will have important influence on the future realization of the ERA initiative and the Open Labour Market for Researchers.

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## Annex 1: List of experts interviewed<sup>75</sup>

1. Dr. Peter Tindemans, Secretary General, Euroscience, A European non-profit grass-roots association of researchers in Europe 25.08.2015.
2. Dan André, Senior Advisor, Vinnova, Swedish member at the ERAC, member of the RISE group 02.09.2015.
3. Richard Tuffs, Director, ERRIN European Regions Research and Innovation Network 02.09.2015.
4. Prof. Claudine Hermann, Vice-President of the EPWS European Platform of Women Scientists 03.09.2015.
5. Vanessa Ravagni, Chair of the ERA working group at EARMA European Associations of research Managers and Administrators 08.09.2015.
6. Dimitri Corpakis, Head of Unit B5 Spreading excellence and widening participation, DG Research and Innovation, European Commission 08.09.2015.
7. Dr. Wolfgang Eppenschwandtner, Executive Coordinator, ISE Initiative for Science in Europe 09.09.2015.
8. Andreas Dahlen, Policy Officer (RESAVER), DG Research and Innovation, European Commission 09.09.2015.
9. Dr. Gordon Dalton, Chair, ICORSA International Consortium of Research Staff Associations 11.09.2015.
10. Dr. Anjana Buckow, Programme Director Research Careers, DFG Deutsche Forschungsgemeinschaft, European Network on Research Careers, Member of the Science Europe Working Group on Research Careers 15.09.2015.
11. Manfred Horvat, Senior Advisor, CESAER Conference of European Schools for Advanced Engineering Education and Research. 02.10.2015.
12. Margaux Kerschot, President, EURODOC The European Council of Doctoral Candidates and Junior Researchers 02.10.2015.
13. Alea Lopez de San Roman, Policy Officer, LERU League of European Research Universities 02.10.2015.
14. Fabienne Gautier, Head of Unit B2 'ERA Policy and Reform', DG Research and Innovation, European Commission 02.10.2015.
15. Dr. Maria Bostenaru Dan, Administrative Board member, Marie Curie Fellows Association 19.10.2015.
16. Dr. Jan-Eric Sundgren, Chairman of Research and Technological Innovation Working Group, BUSINESS EUROPE. Senior Adviser, AB Volvo, 21.10.2015.

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<sup>75</sup> Interview requests were also sent to some more decision-makers and stakeholder organizations, who did not answer them during the time of study August-October 2015. Additionally, the study draws on an existing database of approximately 100 expert interviews.

## **Annex II**

### **Research Paper on the Implementation of an Integrated European Research Area**

**Research paper  
by Laura de Haan, Paul Vroonhof (Panteia), Simon  
Broek (Ockham IPS)**

#### **Abstract**

Based on a description of the European Research Area (ERA) implementation and assessment of progress, a quantification of the distance to target of the ERA implementation is provided. When looking merely at the quantitative information, the distance to target of 19% of the projected 16 billion euros revenue of full ERA implementation and can be considered as the costs due to incomplete implementation. This amounts to €3 billion annually. It should be clear that this is a simplified method of quantifying an area that is not quantified easily. Several key barriers are identified in relation to ERA implementation. Given these barriers, the Roadmap 2015-2020 approach is a positive development, able to overcome these barriers. In this approach, it is recommended to foster inclusiveness of all countries, and use knowledge exchange and self-assessment to provide directions for improvement.

#### **AUTHOR**

This paper has been written by **Laura de Haan and Paul Vroonhof of Panteia** and **Simon Broek of Ockham IPS**, at the request of the European Added Value Unit of the Directorate for Impact Assessment and European Added Value, within the Directorate General for Parliamentary Research Services (DG EPRS) of the General Secretariat of the European Parliament. It is part of a Cost of Non-Europe report produced for the European Parliament's Committee on Industry, Energy and Research.

#### **RESPONSIBLE ADMINISTRATORS**

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## Executive Summary

The focus of this report is on the implementation of an integrated European Research Area (ERA) from 2012 until now. The report aims to analyse the costs deriving from an incomplete implementation of the European Research Area. In order to do so, the report firstly describes the state of play of ERA implementation; secondly, assesses the ERA implementation progression; thirdly, provides a quantification of 'distance to target'; and lastly, identifies barriers for implementation and provides directions for improvement (recommendations). The summary is structured in the same way.

### State of play ERA implementation

A key milestone in the development of the ERA is the 2012 Communication, in which the Commission establishes the need for a reinforced ERA partnership between Member States, the Commission and research stakeholder organisations. Five ERA priorities were defined by the Commission: more effective national research systems; optimal transnational co-operation and; an open labour market for researchers; gender equality and gender mainstreaming in research; optimal circulation, access to and transfer of scientific knowledge (including via digital ERA). In December 2014, the Council of the European Union acknowledged that there was good progress and that the conditions for the ERA were now in place. However, the Progress Reports (2013 and 2014) were not able to show an overall ranking of countries on the implementation of the ERA, making it difficult to quantify and compare countries' good progress. As the Member States have different systems and pace, the road towards the ERA differs. In May 2015, the Council of the European Union endorsed the ERA Roadmap 2015-2020. The ERA Roadmap identifies top priority actions and explicitly recognises the different characteristics of national research and innovation systems across Europe. The ERA Roadmap approach better acknowledges the open-ended nature of the ERA, meaning that implementation is a continuous process not reaching a final stage of completion as new challenges and barriers arise on the way, as opposed to the 'completion' conception, as used in the 2012 Communication and underlying the 2012 Impact Assessment.

### Assessment of ERA implementation

As success of the ERA remains undefined, assessing the level of implementation is difficult. Yet, stakeholders consider the following benefits of the ERA: it opens a dialogue and provides an opportunity for knowledge exchange; it creates possibilities for cooperation across borders; for less developed countries, it helps in mainstreaming research into policy and to adopt policy lines. The Policy Support Facility is very important in this respect, and is expected by the stakeholders to have beneficial effects on using funding optimally as this initiative creates possibilities for mutual learning.

A common criticism, acknowledged with the ERA Roadmap, is that there has been too little room for heterogeneity: Differences in the ERA benefits can create a disincentive to continue; Actions and priorities that are too much 'one size fits all'; Becoming a uniform research area, shouldn't be the aim and is not beneficial. With the Roadmap, at European level, different perspectives on the ERA gain more space. At national level, the lack of funds to implement the ERA, creates a barrier in implementation and therefore, hampers the expected benefits. The research innovation policies are too fragmented and there is still



a lack of coordination. Coordinated efforts may lead to more effective cost sharing and may prevent fragmentation and duplication of efforts.

### **Distance to target: quantification**

When combining the proportion of completion for the different actors (Member States 81%, Research stakeholder organisations 81%, Commission 80%), we come to a total completion of 81%, which means the distance to target for the ERA implementation is 19%. In the 2012 Impact Assessment it was concluded that the integration of the European Research Area could result in a gain of 16 billion euros GDP annually from 2030 onwards. When looking merely at the quantitative information, the distance to target of 19% of the projected 16 billion revenue of the full ERA implementation, can be considered as the costs due to incomplete implementation. This amounts to € 3 billion annually. These figures have to be interpreted with caution, as there are several conceptual problems in quantifying the progress towards the ERA, the most important being that 'completing' the ERA does not do justice to the true nature of the ERA as an open-ended process.

### **Recommendations**

Several key barriers are identified in relation to the ERA implementation: differences in ERA benefits, resulting in a disincentive to continue; one-size-fits-all approach which does not fit with countries' heterogeneity in research systems; lack of political priority/insufficient funds. Given these barriers, the Roadmap 2015-2020 approach is a positive development, able to overcome them. In this approach it is recommended to foster inclusiveness of all countries, and use knowledge exchange and self-assessment to provide directions for improvement.

## Abbreviations

ANI	National Innovation Agency
CESAER	Conference of European Schools for Advanced Engineering Education and Research
EARTO	European Association of Research and Technology Organisations
EC	European Commission
EMM	ERA monitoring mechanism
ERA	European Research Area
ERAC	European Research Area and Innovation Committee
EU	European Union
EUA	European University Association
FP7	Framework Programme 7
GDP	Gross Domestic Product
LERU	League of European Research Universities
NG	National Government
R&D	Research & Development
RFO	Research Funding Organisations
RPO	Research Performing Organisations
RSO	Research Stakeholder Organisations

# 1. Background and Research questions

## 1.1 Introduction

The European Research Area (ERA) was introduced in 2000 to support the Lisbon Agenda, that contained the EU's strategic economic development goals. Research policy was then established as a shared competence between the European Commission and the Member States.<sup>76</sup> In 2007, the European Research Area (ERA) was formally taken up in the Treaty of Lisbon with the objective of resulting in a: *"unified research area open to the world, based on the Internal Market, in which researchers, scientific knowledge and technology circulate freely and through which the Union and its Member States strengthen their scientific and technological bases, their competitiveness and their capacity to collectively address grand challenges"*.<sup>77</sup> A more structured implementation of the ERA commenced in 2012 with the definition of five ERA priorities:

1. More effective national research systems.
2. Optimal transnational co-operation and competition
3. An open labour market for researchers
4. Gender equality and gender mainstreaming in research
5. Optimal circulation, access to and transfer of scientific knowledge (including via digital ERA).

The European Parliament closely monitors the progress of the ERA implementation. Currently, the question arises as to how far implementation has progressed. This report aims to analyse the costs of a non-European derivation from an incomplete implementation of the ERA.

## 1.2 Focus and research questions

The focus for this research paper lies with the implementation of three specific ERA priorities:

1. The establishment of more effective national research systems;
2. The realisation of optimal transnational co-operation and competition;
5. The realisation of optimal circulation and access to and transfer of scientific knowledge (including via digital ERA).

However, it should be noted that due to the complex and comprehensive nature of ERA, concentrating only on part of the priorities is analytically problematic. Therefore, the research paper takes into account all priorities, although its focus is on the above mentioned three.

The research paper will address the following questions:

### *Description*

- What is the state of play of the establishment of the ERA infrastructure (related to the three priorities)?

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<sup>76</sup> Article 182.5 of the Consolidated Version of the Treaty on the Functioning of the European Union, cited in ICF International (2015). Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation.

<sup>77</sup> European Commission, COM (2014) 575 final. Communication from the Commission to the Council and the European Parliament. European Research Area Progress Report 2014

*Assessment*

- What benefits can be expected from the implementation of the ERA infrastructure? <sup>78</sup>
- To what extent will the current ERA infrastructure, as established by the Commission, lead to a better or optimal use of funds at EU level and an improved cooperation between Member States on issues of common interest and importance (climate change, health, energy)?
- Which gaps and barriers can be distinguished with regards to the implementation of the ERA?
- What is the distance to the envisaged objectives (2012 action points<sup>79</sup>)?

*Conclusion*

- What are the non-European incurred costs, due to the incomplete implementation of the ERA?

*Recommendations*

- What recommendations can be made based on the previous steps of the study?

### **1.3 Approach of the study and important conceptual warnings**

The focus of this report is on the implementation of an integrated European Research Area (ERA) from 2012 until now. The 2012 communication on ERA<sup>80</sup> sets four conditions for success of ERA, in other words making progress from the 2012 situation to the full implementation of ERA. These serve as targets in the estimation of the distance to target. This in turn is used to calculate the cost of non-implementation of the ERA. For Condition 1, Member State reforms in all ERA priorities and the adoption of measures since 2012 were used<sup>81</sup>. For Condition 2, Speedy implementation of the priorities outlined in the Communication by research stakeholders and the ERA compliance of Research Performing Organisations (RPO) reported in the 2014 Progress Report were used as a proxy. Condition 3, Increased support from the Commission to national ERA priorities was assessed by using a self-assessment of DG Research and Innovation. Lastly, Condition 4, Transparent monitoring was not taken into account as this only has an indirect effect on the implementation of the ERA.

The study will first take stock; secondly, an assessment of the gaps and barriers leading to a certain distance to target (which is full implementation of the ERA), based on country studies and interviews with ERA stakeholders will be carried out. Thirdly, through taking stock and an assessment exercise, the paper will demonstrate the distance at which the ERA stands from the projected revenue. This 'distance to target' will be quantified using the Commission's impact assessment as a baseline. This impact assessment estimated that the integration of the European research area could result in a gain of €16 billion annual GDP from 2030 onwards<sup>82</sup>. The cost of non-Europe in the current study is the monetised distance to this target. The research paper furthermore aims to clarify if the approach proposed by the Commission is sufficient and which barriers or gaps in the ERA infrastructure hinder synchronisation and therefore, the implementation of the ERA. The Commission states in its 2014 report that Member States already started to take the

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<sup>78</sup> From the Member States' perspectives on various specific initiatives, such as construction costs of research infrastructures, knowledge sharing (digital ERA), and easier access to research funds at EU level.

<sup>79</sup> European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

<sup>80</sup> Identified in the 2014 Progress Report

<sup>81</sup> Included in the ERA country fiches, part of the ERA Progress Report 2014

<sup>82</sup> Impact Assessment report (SWD (2012) 212 final), accompanying the document European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

necessary preparations towards implementing the ERA priorities. The assessment of these actions by the Commission will be included in the analysis.

It should be clear that this is a simplified method of quantifying an area that is not quantified easily. Evidently, there are many assumptions and considerations to be taken into account when interpreting this figure (see annex). In order to better understand what the quantification says and what it does not say, below are a number of many shortcomings that have been reported:

Firstly, it needs to be noted that because the European Commission uses the concept of the ERA completion, the quantification of the costs relates to the idea of the ERA as something that can be completed and in relation to which a distance to target can be provided. This being said, when it comes to further progress, we find that ERA should be seen as an open-ended process, meaning that implementation is a continuous process not reaching a final stage of completion as new challenges and barriers arise on the way. **Characterising ERA as an open-ended process, discredits the idea of a 'distance to target'**, however, in this report thinking in terms of completion serves as a heuristic or diagnostic tool, based on the Commission's impact assessment, allowing stakeholders to see room for improvement. Although, we still use the term 'ERA implementation', this in fact should be seen as 'the implementation of actions aimed at ERA progress', following the same line of reasoning.

Secondly, securing robust information to support decision-making has proven to be difficult, as **availability of data is problematic**. This resulted in an unstable set of indicators used for monitoring progress. In addition to the EU-level monitoring system, only some countries also have national level monitoring systems, whereas, others have none.

Thirdly, the quantification does **not critically assess the result from the impact assessment** calculating the 16 billion euro annual benefit of ERA completion. It takes this calculation as a given. However, there are no baselines set against which developments can be monitored, nor targets set against which the progression can be tracked. The **ERA priorities and objectives are not translated in measurable targets** for which indicators are developed.

It remains questionable whether the envisaged actions<sup>83</sup> for stakeholders to take when implementing the ERA were indeed the right ones to 'complete' the ERA and whether other actions would have been more appropriate. For instance, ICF reports that Member States criticize the current system for Progress Reports, as they are not able to recognise the diversity of research systems and pathways towards achieving the ERA<sup>84</sup>. The Progress Report 2014, acknowledges that there is not just one pathway for the ERA completion: "There is no single path to achieve the ERA. The pace and level of the ERA implementation very much depends on the national context and is fostered by targeted policies at Member States level"<sup>85</sup> For instance, 'effective research infrastructures' involves the measure "to allocate funding through open calls for proposals, evaluated by panels of leading independent domestic and non-domestic experts (peer review) - this

<sup>83</sup> The term 'action' refers to the reforms and actions defined by the European Commission in 2012, to be implemented by 2014 for each priority by the Member States, the Commission and the research stakeholder organisations. Source: European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

<sup>84</sup> ICF International (2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation.

<sup>85</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014, p.7.

incites researchers to reach internationally-competitive levels of performance". As such, this is indeed recommendable, but the extent to which a MSs should apply project-based funding depends on many variables, such as the extent to which this is already good practice; whether the infrastructure is in place and whether the culture and mentality in research performing and research funding organisations is in place to further develop this. Increasing project-based funding can harm national research infrastructures, especially in the newer Member States. For instance, a European Commission study point towards higher administrative burdens<sup>86</sup> and also the OECD, indicates that there are important downsides to project-based funding<sup>87</sup>.

To assess the ERA implementation by research stakeholder organisation, it takes as a reference the **criticised 2014 progress report** presenting survey results under a limited number of research performing organisations.<sup>88</sup>

Lastly, the quantification **runs short in providing an overview on how countries compare**. This is not only presents a problem in this study, but runs throughout the entire ERA implementation: ranking, benchmarking, positioning countries remains a very challenging exercise, not the least hampered by the fact that countries might not share the same objectives for the ERA implementation.

## Methodology

This report is based upon desk research, EU level interviews and four country studies (Austria, Czech Republic, Finland, Portugal). Additional methodological details of the methodology and an overview of sources is included in the annex. As hard evidence in this research area is limited at best, the different instruments mentioned above are selected with an eye towards the triangulation of findings. Triangulation, simply put, means that if different sources of information give an indication of a certain conclusion, then this provides some sort of 'proof'. For the quantification of the distance to target a simple analytical model was used to compare the current situation with the envisaged situation as described in the 2012 Communication and Impact Assessment.

In order to make a selection of case studies as varied and relevant as possible, a classification from the 2014 Progress Report<sup>89</sup> was used to select countries. The classification identifies 4 categories: 1) top-down ERA proactive, 2) bottom-up ERA proactive, 3) limited implementation by stakeholders and 4) limited measures and no/limited implementation. The reasoning behind this classification is that there is no single path to the ERA: the implementation of the ERA is sometimes directly driven by funders and RPOs (bottom up) and in some cases by national/regional policies (top-down). Taking into account the categories, as well as geographical range, we came to the following selection of country studies:

- Austria (top-down)

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<sup>86</sup> European Commission — Directorate-General for Research (2008), Diversified Funding streams for University-based research: Impact of external project-based research funding on financial management in Universities: [http://ec.europa.eu/invest-in-research/pdf/download\\_en/external\\_funding\\_final\\_report.pdf](http://ec.europa.eu/invest-in-research/pdf/download_en/external_funding_final_report.pdf)

<sup>87</sup> OECD (2011), OECD Innovation Policy Platform ISSUE BRIEF: PUBLIC SECTOR RESEARCH FUNDING: [www.oecd.org/innovation/policyplatform](http://www.oecd.org/innovation/policyplatform)

<sup>88</sup> See for a critical account on this survey: ERAC (ERAC 1201/14).ERAC Opinion on the European Research Area Progress Report 2013. Brussels, 09-01-2014

<sup>89</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014

- Czech Republic (limited implementation by stakeholders)
- Finland (bottom-up)
- Portugal (limited measures and limited implementation)

## 2. The case studies consisted of desk research and semi-structured interviews with experts from each country by phone. State of play ERA implementation

### Key messages

- A key milestone in the development of the ERA is the 2012 Communication, in which the Commission establishes the need for a reinforced ERA partnership between Member States, the Commission and research stakeholder organisations. Five ERA priorities were defined by the Commission: more effective national research systems; optimal transnational co-operation and; an open labour market for researchers; gender equality and gender mainstreaming in research; optimal circulation, access to and transfer of scientific knowledge (including via digital ERA).
- In December 2014, the Council of the European Union acknowledged that there was good progress and that the conditions for the ERA were now in place. However, the Progress Reports (2013 and 2014) were not able to show an overall ranking of countries on the implementation of the ERA. As the Member States have different systems and pace, the road towards the ERA differs. In May 2015, the Council of the European Union endorsed the ERA Roadmap 2015-2020. The ERA Roadmap identifies top priority actions and explicitly recognises the different characteristics of national research and innovation systems across Europe.

This chapter presents the state of play of the implementation of the ERA, and provides an overview of the most prominent milestones up until now.

### 2.1 Background of the introduction of the European Research Area

This section briefly explains the ERA history, focussing on three milestones:

- The first introduction of the ERA in 2000
- The formal uptake of the ERA in the Lisbon Treaty in 2007
- The reinforcement of the ERA partnership in 2012.

#### First introduction of ERA

The value of an integrated European research system has long been recognised at EU policy level. This paragraph highlights some of the impetuses that lie at the basis of the ERA. In 2000, the ERA was introduced to support the Lisbon Agenda, that contained the

EU's strategic economic development goals. Research policy was then established as a shared competence between the European Commission and the Member States.<sup>90</sup>

At that time, the research excellence of the EU was acknowledged in comparison to the global context thereof. Europe produced a third of the world's scientific knowledge. It was in the forefront in areas, such as medical research and chemistry and it had notable success stories in technology, in sectors, such as aeronautics and telecommunications<sup>91</sup>. Despite this research excellence, in 2000 it was recognised that this research excellence was being spread too thin and that the European research system showed some very worrisome flaws:

Negative view of the European Research system in 2000:

- The average research effort in the Union (the differences being significant from one country to another) was only 1.8% of Europe's GDP, in comparison to 2.8% in the United States and 2.9% in Japan. The difference between total public and private expenditure on research in the US and Europe amounted to some €60 billion in 1998, in comparison to 12 billion in 1992.
- In terms of employment, researchers accounted for only 2.5 in every thousand (2,5‰) members of the industrial workforce in Europe, in comparison to 6.7‰ in the United States and 6‰ in Japan.
- The trade balance in high tech products has shown a deficit of €20 billion per year in Europe over the ten years prior to 2000, and this deficit seemed to be increasing.
- The number of degree-level European students in the United States was twice as high as the number of American students at that level in Europe, and 50% of Europeans studying for a doctorate in the United States stayed there for longer periods of time and some never left.
- However, research and technology accounted for 25 to 50% of economic growth and had a strong influence on competitiveness and employment and the quality of life of Europeans.
- If technological progress creates the jobs of tomorrow, it is research that creates the jobs of the day after tomorrow. The trends in research could therefore, have a negative influence on the development of employment in Europe in the years ahead.<sup>92</sup>

### Formal uptake of ERA in the Lisbon Treaty

In 2007, the European Research Area (ERA) was formally taken up in the Treaty of Lisbon with the objective of resulting in a: *"unified research area open to the world, based on the Internal Market, in which researchers, scientific knowledge and technology circulate freely and through which the Union and its Member States strengthen their scientific and technological bases, their competitiveness and their capacity to collectively address grand challenges"*.<sup>93</sup>

<sup>90</sup> Article 182.5 of the Consolidated Version of the Treaty on the Functioning of the European Union, cited in ICF International (2015). Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation.

<sup>91</sup> Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions of 18 January 2000: Towards a European research area [COM(2000) 6 final - Not published in the Official Journal].

<sup>92</sup> Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions of 18 January 2000: Towards a European research area [COM(2000) 6 final - Not published in the Official Journal], p. 4-5.

<sup>93</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014



The role of research for economic growth and innovation, and the urge for Europe to reinforce its research efforts were thus acknowledged. The main instrument the European Commission used to this end was the Framework Programme, the European Union's Research and innovation programme until 2013 (followed by the Horizon 2020 starting 2014).

### A reinforced partnership

The more structured implementation of the ERA commenced in 2012 with the Impact Assessment and the Communication on the ERA partnership<sup>94</sup>. In 2012, five ERA priorities were defined by the Commission:

- **More effective national research systems** – including increased competition within national borders and sustained or greater investment in research
- **Optimal transnational co-operation and competition** - defining and implementing common research agendas on grand-challenges, raising quality through Europe-wide open competition, and constructing and running effectively key research infrastructures on a pan-European basis
- **An open labour market for researchers** - to ensure the removal of barriers to researcher mobility, training and attractive careers
- **Gender equality and gender mainstreaming in research** – to end the waste of talent and to diversify views and approaches in research and foster excellence
- **Optimal circulation, access to and transfer of scientific knowledge including via digital ERA** - to guarantee access to and uptake of knowledge by all.

In order to give a boost to the ERA completion in relation to the five ERA priorities, the key message of the 2012 Communication<sup>95</sup> was the establishment of “*a reinforced ERA partnership - deeper, wider and more efficient than to date - between Member States, the Commission and research stakeholder organisations*”<sup>96</sup>. This means complementing the primary ERA partnership between the Member States and the Commission by systematically involving stakeholder organisations, such as Science Europe (which brings together research funding and performing organisations) where appropriate”. In other words, the Commission identified a new and important role for research stakeholder organisations.

Therefore, following this new reinforced ERA partnership, there are three groups of stakeholders within the ERA to be identified:

- European Commission
- Member States
- Research stakeholder organisations

The relationships between the European Commission, national governments and research stakeholder organisations are not hierarchical; each stakeholder has its own particular position and relationship with the other two stakeholders. This is illustrated by the following schematic overview:

<sup>94</sup> European Commission, COM (2012) 392 final A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

<sup>95</sup> European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

<sup>96</sup> Federative and representative bodies of public and private research actors (including researchers, universities, funding and performing organisations) and their members.

**Figure 1 Overview roles and relationships key stakeholders**

	Key role	Relationship others
1) European Commission (EC)	Coordinating ERA implementation; European funding schemes	NG: EC encourages NG to take action RSO: by designing the funding schemes, RSOs more and more comply with ERA principles
2) National Government (NG)	Develop national policies	EC: informing European policy makers; responding to invitations and communications. RSO: setting the legal rules and requirements for research funding and performance:
3) Research stakeholder organisations (RSOs)	Governing national funding schemes; conducting research	EC: complying with EC funding schemes; informing European policymakers. NG: implementing national policy changes; informing national policymakers.

Source: authors

In its 2012 Communication, the Commission identified accompanying communication actions for each of the three groups. These are reforms and actions [that were] to be implemented by 2014 for each priority, specified for each stakeholder<sup>97</sup>. Moreover, in the Progress Report 2014, it is concluded that “it is now up to Member States and research stakeholders to implement the necessary ERA reforms and make ERA work”. Therefore, the focus from 2012 onwards is on the Member States and RSOs, whereas the Commission fulfils a supporting role.

In order to improve the cooperation between the three main stakeholder groups and further support the ERA implementation, two bodies were established.

- The **ERA Stakeholder Platform** was set up to follow-up on the implementation of the undertakings and offer key stakeholders (Conference of European Schools for Advanced Engineering Education and Research (CESAER), European Association of Research and Technology Organisations (EARTO), European University Association (EUA), League of European Research Universities (LERU), Nordforsk and Science Europe) a forum for discussion for the development of the ERA policy. The Stakeholder Platform offers a forum for discussion where Stakeholder Organisations

<sup>97</sup> Eg. in relation to priority 1, amongst others, Member States are invited to “Ensure that all public bodies responsible for allocating research funds apply the core principles of international peer review. The Commission will ”support mutual learning and the exchange of good practice between Member States on the removal of national legal and other barriers to ERA (...)”.

interact, not only with the Commission but also amongst themselves, in order to find partnerships and enable consensus building.<sup>98</sup> **The ERA Stakeholders Platform is a means for direct contact between the research stakeholder organisations and the Commission.** It is appreciated by stakeholders.

In most countries, there is also a stakeholders' platform organised at national level.

- Another actor that should be mentioned is the **European Research Area and Innovation Committee (ERAC)**. ERAC members are the European Commission and Member States of the European Union and ERAC is chaired by the European Commission. The Vice-Chair is elected among Member States.<sup>99</sup> **ERAC is a strategic policy advisory committee that provides strategic input from European Commission and Member State experts to the Council of the European Union**, the Commission and Member States on research and innovation issues that are relevant to the development of the European Research Area, the European Semester and the Europe 2020 flagship initiative Innovation Union. The Secretariat of the Committee is provided by the General Secretariat of the Council.<sup>100</sup>

The ERA is at the heart of the Europe 2020 strategy and its Innovation Union policy flagship. In the 2012 Communication, the European Commission stated that the ERA should be completed by 2014<sup>101</sup>.

## 2.2 State of play of implementation in four countries

### Selection of countries

In order to make a selection of case studies that are as varied and relevant as possible, the following classification from the 2014 Progress Report was used to select countries:

**Figure 2 Classification of countries according to ERA policies and implementation of the ERA Actions**

	Specific measures in support of ERA	No specific measures in support of ERA
Implementation above EU average	Top-down ERA proactive	Bottom-up ERA proactive
Implementation below EU average	Limited implementation by stakeholders	Limited measures and limited implementation
		Limited measures and no implementation

Source: Directorate-General for Research & Innovation

In the Progress Report 2014, it is stated that the results of the classification (see figure A2 in the annex) imply that there is no single path to the ERA: the implementation of the ERA above the EU average is sometimes directly driven by funders and RPOs (bottom-up) and in some cases by national/regional policies (top-down).

<sup>98</sup> [http://ec.europa.eu/research/era/partnership\\_en.htm](http://ec.europa.eu/research/era/partnership_en.htm)

<sup>99</sup> <http://era.gv.at/directory/89>

<sup>100</sup> [http://ec.europa.eu/research/era/partnership\\_en.htm](http://ec.europa.eu/research/era/partnership_en.htm)

<sup>101</sup> European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

Taking into account the categories, as well as geographical range, we came to the following selection of country studies:

- Austria (top-down)
- Czech Republic (limited implementation by stakeholders)
- Finland (bottom-up)
- Portugal (limited measures and limited implementation)

For a more detailed description of the methodology, please refer to the Annex of this report.

## State of play

The table below presents a selection of initiatives and scores related to the three relevant priorities in this report. As such, the table provides an overview of the state of play in each country. However, the value of these indicators, in terms of determining progress, is limited<sup>102</sup>. The subsequent texts serve as an illustration of the developments, and are based on the conducted interviews for each country.

**Figure 3 : highlights state of play for relevant priorities**

	<i>Priority 1 The establishment of more effective national research systems</i>	<i>Priority 2 The realisation of optimal transnational co-operation and competition</i>	<i>Priority 5 The realisation of optimal circulation and access to and transfer of scientific knowledge including via digital ERA.</i>
<b>Austria</b>	<p><b>GBOARD:</b> € 294 per inhabitant in 2012 (1,6% of total government expenditures) (EU average: € 179 per inhabitant). The growth rate of the total GBOARD has been higher in Austria than in the EU as a whole.</p> <p>Share of responding funders' total budget allocated as <b>project based funding:</b> 49% (compared to 66,2% EU level)</p>	<p>Transnational and international priorities are included 'Becoming an Innovation Leader: Realising Potentials, Increasing Dynamics, Creating the Future', the <b>Federal Government strategy for research, technology and innovation.</b></p> <p>Share of responding funders' total budget allocated to <b>transnationally coordinated R&amp;D:</b> 2,1% (EU average: 4,1%).</p> <p><b>Joint programming initiatives:</b> participation in 8 out of 10 ongoing initiatives (coordinating 1).</p>	<p>Open access has been a priority in Austria, eg in the frame of <b>performance agreements with universities</b> and the '<b>Open Access Network Austria</b>', that coordinates open access activities and makes recommendations.</p> <p>At the same time, the share of research-performing organisations <b>making available online and free of charge publicly-funded scientific research data systematically</b> in the ERA-compliant cluster in Austria is lower than within the EU ERA compliant cluster.</p>

<sup>102</sup> See also the Briefing Paper on the Monitoring Mechanisms of the Integrated European Research Area drafted by Panteia for the European Parliament simultaneously to this report.

		Austria was involved in 5 <b>Article 185 initiatives</b> (programmes undertaken jointly by several MS) and furthermore participated in 87 ERA-NETs <sup>103</sup> (22 still running).	
<b>Czech Republic</b>	<p><b>GBOARD:</b> € 99 per inhabitant in 2012 (1,5% of total government expenditures) (EU average: € 179 per inhabitant). The growth rate of the total GBOARD has been higher in Czech Republic than in the EU as a whole.</p> <p>Share of responding funders' total budget allocated as <b>project based funding:</b> 53,2% (compared to 66,2% EU level)</p>	<p>The share of responding funders' total budget allocated to <b>transnationally coordinated R&amp;D</b> is lower than the EU average (1,8 compared to 4,1 at the EU level).</p> <p>The Czech Republic participates in 5 out of 10 ongoing initiatives, is involved in 2 <b>Article 185 initiatives</b> (programmes undertaken jointly by several MS) and finally has participated in 28 ERA-NETs, 4 still running.</p>	<p>There are <b>no specific obligatory measures in place at the national level</b> related to open access to publications or data.</p> <p>The share of research-performing organisations <b>making available online and free of charge publicly-funded scientific research data systematically</b> in the ERA-compliant cluster in Czech Republic is lower than within the EU ERA compliant cluster.</p>
<b>Finland</b>	<p><b>GBOARD:</b> € 382 per inhabitant in 2012 (1,9% of total government expenditures) (EU average: € 179 per inhabitant)</p> <p>Share of responding funders' total budget allocated as <b>project based funding:</b> 91,5% (compared to 66,2% EU level)</p>	<p><b>No overarching legislation</b> governing Finland's participation in joint initiatives.</p> <p>Share of responding funders' total budget allocated to <b>transnationally coordinated R&amp;D:</b> 6,9% (EU average: 4,1%).</p> <p>Finland participates in 9 out of 10 ongoing joint programming initiatives, and coordinates one.</p> <p>Finland was involved in 5 <b>Article 185 initiatives</b></p>	<p><b>Open Science and Research Project 2014-2017</b> launched by the Ministry of Education and Culture (however no overall legislative or policy provision supporting open access to scientific publications and data).</p> <p>The share of research-performing organisations <b>making available online and free of charge publicly-funded scientific research data systematically</b> in the ERA-compliant cluster in Finland is higher than within the EU ERA</p>

<sup>103</sup> The ERA-NET instrument under Horizon 2020 is designed to support public-public partnerships in their preparation, establishment of networking structures, design, implementation and coordination of joint activities as well as topping up of single joint calls and of actions of a transnational nature. Source: [http://ec.europa.eu/research/era/era-net-in-horizon-2020\\_en.html](http://ec.europa.eu/research/era/era-net-in-horizon-2020_en.html)

		(programmes undertaken jointly by several MS) and participated in 77 ERA-NETs (18 still running).	compliant cluster.  Regarding open innovation and knowledge transfer between public and private sectors, Finland has adopted several measures to support public-private linkages. One of the key instruments has been the <b>Strategic Centres for Science, Technology and Innovation (SHOKs)</b> . A 2013 internal evaluation indicated that progress could have been faster and that SHOKs should become more strategic.
<b>Portugal</b>	<p><b>GBOARD:</b> € 148 per inhabitant in 2012 (2% of total government expenditures) (EU average: € 179 per inhabitant)</p> <p>Share of responding funders' total budget allocated as <b>project based funding:</b> 79,7% (compared to 66,2% EU level)</p>	<p>Share of responding funders' total budget allocated to <b>transnationally coordinated R&amp;D:</b> 6,3% (EU average: 4,1%).</p> <p><b>Joint programming initiatives:</b> participation in 4 out of 10 ongoing initiatives.</p> <p>Portugal was involved in 5 <b>Article 185 initiatives</b> (programmes undertaken jointly by several MS) under FP6 and &amp; and in four existing initiatives, and furthermore participated in 59 ERA-NETs (29 still running).</p>	<p>Within the ERA-compliant cluster in Portugal, the share of <b>publicly funded scientific publications in open access</b> amongst research-performing organisations is higher than that within the EU's ERA compliant cluster.</p> <p>The share of research-performing organisations <b>making available online and free of charge publicly-funded scientific research data systematically</b> in the ERA-compliant cluster in Portugal <b>is</b> higher than within the EU ERA compliant cluster.</p> <p>Portugal has not developed a <b>knowledge transfer strategy</b> but GAIN (Global Innovation Acceleration Network) is a relevant initiative that is under preparation and aims at providing a national structure for technology transfer.</p>

Source: Authors, on the basis of country fiches 2014, available: [http://ec.europa.eu/research/era/eraprogress\\_en.htm](http://ec.europa.eu/research/era/eraprogress_en.htm)

In order to have a better understanding of how countries individually deal with the ERA implementation, we provide a number of illustrations below, based on the interviews for each Member State.

**Austria** aims to become an innovation leader and uses the ERA as a tool to improve national competitiveness, make the ERA instrumental for its own objectives and aims to embed the ERA within all R&D activities. The overall research innovation strategy<sup>104</sup> serves as an umbrella. In addition, an EU action plan was developed (which covers not only the ERA, but also Horizon 2020 and other programmes). The country wants to push forward an agenda for cultural change and has established knowledge transfer centres (to enhance business-science cooperation).

The **Czech Republic** has an ERA Committee, which is an advisory body to the Ministry of Education, consisting of representatives of universities, academies of sciences, and other ministries, etc.), with the aim of informing and consulting the wider research community. The research community in the Czech Republic is quite fragmented. Though no supporting evidence has been found in relevant documentation, according to one interviewee, the biggest barrier is the lack of communication, trust and cooperation between the research community and the policymakers. There is caution amongst the different types of organisations within the research community, which in turn leads to suspicion between the research community and other actors, such as the government. In addition, universities are relatively independent and do not always have an interest in changing. The government produces measures and strategies, but the implementation by RSOs is at a halt.

For **Finland**, the ERA is useful as it opens up a dialogue between MS<sup>105</sup>. The current dialogue supported by the EC is working well. Most helpful are the peer review reports on Member States. These provide the opportunity to look across borders and to see how other MS deal with similar issues (there have only been 5 or 6 reviews completed). The Progress Reports provide information on what has changed in Member States and provide the opportunity to align the Member States. This does not always do justice to reality, but it is an invitation to learn more and to study more in depth what the situation in the country is and offers the possibility to ask questions.

Over the last few years in **Portugal**, there has been an increased focus on participation in scientific infrastructures and attracting foreign experienced scholars to the country. Budgetary constraints negatively affect the involvement and commitment needed to implement the ERA<sup>106</sup>. There has been a stronger emphasis on gaining other sources of financing, including Horizon 2020. In addition to funding, the coordination between the different stakeholders is also mentioned as a challenge. Portugal does not have a national ERA council. The main body is the Science and Technology Council (which supports and provides advice to the Foundation for Science and Technology, the national funding agency). The National Innovation Agency (ANI) (under responsibility of the Ministry of Economy and the Ministry of Education and Science), is a platform that contributes towards increasing alignment of R&D policies.

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<sup>104</sup> Republik Österreich (2011), Realising potentials, increasing dynamics, creating the future: Becoming an Innovation Leader.

<sup>105</sup> Source: interviews

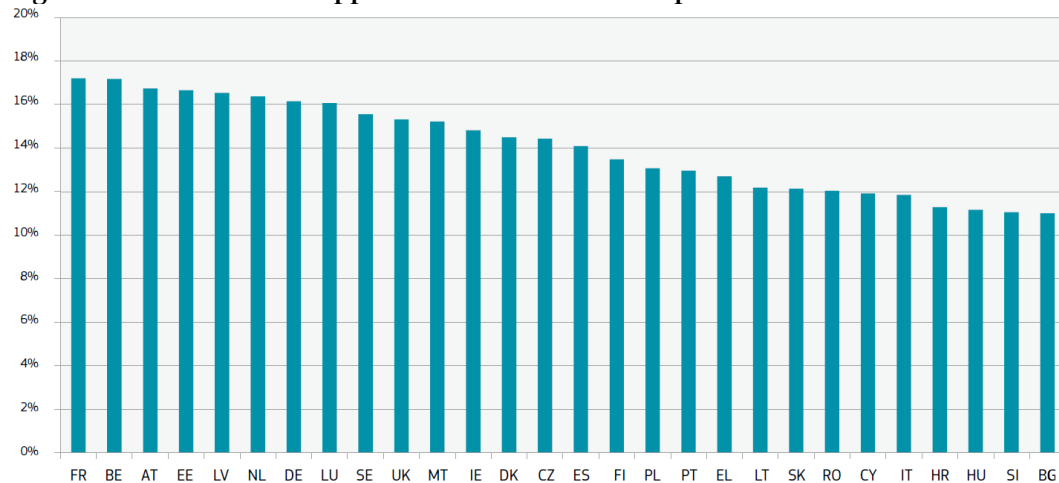
<sup>106</sup> Source: interviews

## 2.3 Success rates Horizon 2020

As the Member States have different systems and pace in the ERA implementation, it remains very difficult to provide a general ranking of countries' performance. Even the Progress Report 2014 does not provide an overall ranking of countries on the implementation of the ERA (see briefing paper on monitoring). The success rate for Horizon 2020 can be used as an indicator to assess the ERA implementation of countries, as the Horizon 2020 funding schemes demand ERA compliant research structures from its applicants (eg. transnational cooperation).

In total, 31,115 full proposals were submitted and these eligible proposals requested a total EU financial contribution of €80.3 billion. In total, 3,200 proposals have been awarded and supported with a total of €5.5 billion in EU funding. Taking all applications from all Member States into account, the overall success rate is approximately 16%.

**Figure 4 Success rates for applications to Horizon 2020 per EU Member State**



Source: European Commission, Directorate-General for Research and Innovation (2015). Horizon 2020: first results.

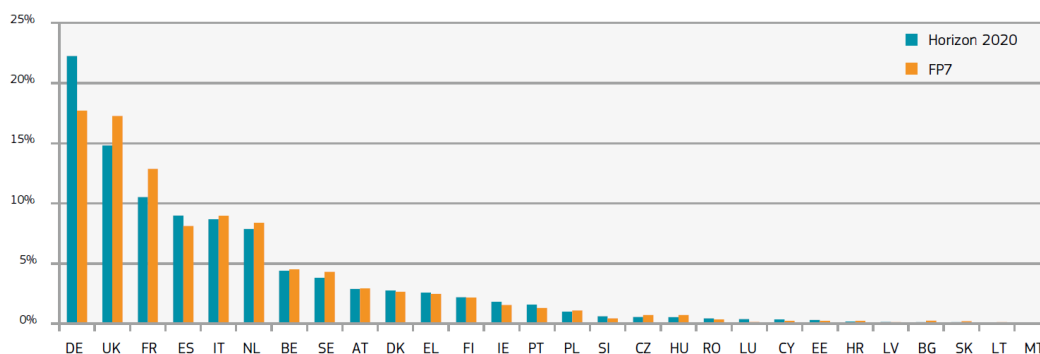
Figure 3 presents a ranking of the 28 Member States, and shows that countries' success rates vary considerably: from a success rate of 11% at the bottom (Bulgaria) to more than 17% (France and Belgium). As mentioned, the figures presented in the graph primarily show that some countries are more successful in obtaining Horizon 2020 funds than others. It was noted that the success rates for the Seventh Framework Programme for Research (FP7) was around 20%. For Horizon 2020 there were fewer funds available in the first year, compared to the last year of the Framework Programme 7 (FP7). Moreover, there was an increased interest by applicants (due to efforts on accessibility and attractiveness)<sup>107</sup>.

The success rates do not directly relate to the funding distribution in Horizon 2020. The following figure provides an overview of the Horizon 2020 funding distribution and FP7.

<sup>107</sup> European Commission, Directorate-General for Research and Innovation (2015). Horizon 2020: first results.



**Figure 5 Share of EU financial contribution to participants in signed grant agreements: Horizon 2020 compared with FP7**



Source: European Commission, Directorate-General for Research and Innovation (2015). *Horizon 2020: first results*.

The main receivers of Horizon 2020 funding are Germany, UK, France, Spain, Italy and the Netherlands, receiving in total more than 70% of the total budget. The EU financial contribution received is dependent on many factors, including the size of the selected project, the roles of national organisations in the project and the differing local costs associated with participating.<sup>108</sup>

## 2.4 Progression and need for further action: ERA Roadmap 2015-2020

The 2014 Progress Report provides an overview of the progress made in the ERA priorities in all EU Member States and some Associated Countries. The 2014 Progress Report states that completion of the ERA depends upon four conditions:

1. Member State reforms in all ERA priorities;
2. Speedy implementation of the priorities outlined in the Communication by research stakeholders;
3. Increased support from the Commission to national ERA policies;
4. Transparent monitoring (EMM)<sup>109</sup>.

In its conclusions of 5 December 2014, the Council of the European Union “Acknowledges that the ERA partnership has made good progress in delivering ERA and that the conditions for implementing a well-functioning ERA, set out in the Communication on a reinforced European Research Area Partnership for Excellence and Growth, are now in place. Although much has already been achieved, further efforts of the Commission, Member States and research stakeholders are needed to make the ERA fully operational, whilst recognising that the full completion of the ERA is a long term process and the paths, depending on the national contexts, can differ among Member States”<sup>110</sup>. In other words, the stakeholders have the means to implement the ERA

<sup>108</sup> European Commission, Directorate-General for Research and Innovation (2015). *Horizon 2020: first results*.

<sup>109</sup> The ERA monitoring mechanism (EMM) was developed with the aim of assessing progress in the implementation of ERA at three levels: national and regional policies, funders and research-performing organisations (RPOs). In the briefing paper by Panteia “Monitoring Mechanisms of an integrated European Research Area”, the EMM is further described and reflected upon.

<sup>110</sup> Council of the European Union (2014). *European Research Area Progress Report 2014 – Competitiveness Council Meeting*. Brussels, 05.12.2014, p. 2.

(in the sense that the actions defined in 2012 have been taken), but further actions have to be taken to fully implement the ERA and make it operational.

On May 19<sup>th</sup>, 2015 the Council of the European Union endorsed the ERA Roadmap 2015-2020<sup>111</sup>, adopted by the European Research Area and Innovation Committee (ERAC). The purpose of the Roadmap is to identify a limited number of key implementation priorities which are likely to have the largest impact on Europe's science, research and innovation systems if all the members of the ERA partnership get them right.

The ERA Roadmap explicitly recognises the different characteristics of national research and innovation systems across Europe and does not seek to prescribe actions to be implemented in a particular manner by every Member State, but rather, it points towards actions that are likely to have the largest impact and proposes actions that might be taken to implement these priorities (whilst acknowledging that these do not necessarily represent a priority for all Member States). This Roadmap identifies 'top action priorities' at national and European levels for each ERA priority. It furthermore, recognises a leading role for Member States, as well as their full autonomy in selecting the most appropriate approaches when it comes to implementing these actions. The table on the next page gives an overview of the main actions for the priorities that are relevant for this report<sup>112</sup>.

The next step is the translation of the ERA Roadmap into national roadmaps. The deadline set for this is May 2016. With the Roadmap, the Member States are in the lead to define action plans according to national priorities (objectives, actions, priorities, targets, deadlines). Finally, it should be mentioned that the Roadmap is a living document, to be kept under review, as research and innovation continue to rapidly evolve.

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<sup>111</sup> Council of the European Union (2015). Draft Council conclusions on the European Research Area Roadmap 2015-2020 – Adoption. Brussels, 19.05.2015. (8975/15).

<sup>112</sup> For the full overview, see Council of the European Union (2015). Draft Council conclusions on the European Research Area Roadmap 2015-2020 – Adoption. Brussels, 19.05.2015. (8975/15).

Figure 6 Top priority actions described in the ERA Roadmap 2015-2020

	<b>1 - EFFECTIVE NATIONAL RESEARCH SYSTEMS</b>	<b>2(A) - JOINTLY ADDRESSING GRAND CHALLENGES</b>	<b>2(B) - MAKE OPTIMAL USE OF PUBLIC INVESTMENTS IN RESEARCH INFRASTRUCTURES</b>	<b>5 – OPTIMAL CIRCULATION AND TRANSFER OF SCIENTIFIC KNOWLEDGE</b> <i>Fully implementing knowledge transfer policies at national level</i>	<b>5 – OPTIMAL CIRCULATION AND TRANSFER OF SCIENTIFIC KNOWLEDGE</b> <i>Promoting Open access to scientific publications</i>
<b>National level</b>	Member States should promote better alignment of national and European policies, with the goal of making optimal use of public investments in research and innovation.	Member States and Associated Countries should ensure that relevant ministries and Research Funding Organisations (RFOs) work more closely together so that national strategies are better aligned with the themes and priorities of the Scientific Research and Innovations Agendas (SRIAs) of the JPIs.	Member States and Associated Countries should ensure that the ESFRI roadmap and their national RIs roadmaps are compatible with each other.	Member States/Associated Countries should promote effective knowledge transfer mechanisms in their RPOs with suitable supporting measures to encourage this.	At <i>National</i> level Member States and Associated Countries should promote Gold and/or Green Open Access in line with the Commission's 2012 Recommendation on access to and preservation of scientific information (covering both scientific publications and research data).
<b>European level</b>	The European Commission should develop the planned Partnership Instrument (Policy Support Facility) taking into account existing tools such as OECD Innovation Policy Platform.	The Commission and Member States should work together to clarify the division of labour between the EU, Member States and transnational levels - including through the development of Horizon 2020 work programmes.	The use of the European Structural and Investment Funds for these purposes should wherever possible be encouraged.	The Intellectual Property Recommendation and Code of Practice should be reviewed.	The European Commission should continue to contribute to open access by including appropriate incentives in the rules, standards and priorities of Horizon 2020, including in the Model Grant Agreements.

<p><b>National and European level actions</b></p>		<p>Authorities should raise the profile of transnational cooperation initiatives (including macro-regional initiatives, inter-governmental organisations, such as COST and EUREKA!, JPIs etc.) with all relevant actors (including regional ones) and seek to raise their participation.</p>	<p>There should be a careful examination of the planned financial contributions, both to proposed new ESFRI projects and to existing ones, in order to ensure their sustainability.</p>		<p>The European Commission and Member States could consider adopting an Open Science approach on selected common societal challenges under Horizon 2020.</p>
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Source: authors, on the basis of Council of the European Union (2015). Draft Council conclusions on the European Research Area Roadmap 2015-2020 – Adoption. Brussels, 19.05.2015. (8975/15).

### 3. Assessment of ERA implementation: gaps and barriers

#### Key messages

- The ERA should be seen as an open-ended process, meaning that implementation is a continuous process not reaching a final stage of completion as new challenges and barriers arise on the way. This implies that the completion of the ERA is impossible. It may well explain the difficulties that have arisen while trying to define indicators and set targets.
- As success of the ERA remains undefined, assessing the level of implementation is difficult. Yet, stakeholders consider the following to be benefits of the ERA: it opens a dialogue and provides an opportunity for knowledge exchange; it creates possibilities for cooperation across borders; for less developed countries, it helps in mainstreaming research into policy and towards adopting policy lines. The Policy Support Facility is very important in this respect and is expected by the stakeholders, to have beneficial effects on using funding optimally as this initiative creates possibilities for mutual learning.
- A strong criticism, acknowledged in the ERA Roadmap, is that there has been too little room for heterogeneity:
  - Differences in the ERA benefits can create a disincentive to continue
  - Actions and priorities that are too much 'one size fits all'
  - Becoming a uniform research area, shouldn't be the aim and is not beneficial. With the Roadmap, different perspectives on the ERA gain more space.
- The insufficient funds related to a relative political priority to implement ERA actions, creates a barrier in implementation and therefore, hampers the expected benefits.
- The research innovation policies are too fragmented. There still is a lack of coordination. Coordinated efforts may lead to effective cost sharing and prevent fragmentation and duplication of efforts.

This chapter aims to give an assessment of dynamics regarding the level of implementation for the three types of stakeholders: Member States, research stakeholder organisations and the European Commission. The key roles have already been mentioned in chapter 2 (figure 1), this chapter goes in to further detail on the views and level of implementation of these stakeholders. This chapter is based on desk research and interviews with stakeholders. Both European level stakeholders and stakeholders in four Member States (Austria, Czech Republic, Finland and Portugal) were interviewed.

On the basis of this, the gaps in and barriers for implementation will be discussed in more detail, while taking the three types of stakeholders mentioned in the final section of this chapter, into consideration. It is important to note that the statements made in this chapter are largely based upon the interviews conducted with several stakeholders, and therefore, can be considered a collection of issues mentioned and experienced by stakeholders, rather than research results based upon solid empirical evidence.

### 3.1 Reflections on the role of Member States governments in the ERA implementation

National governments are the main stakeholders for the implementation of the ERA. In the 2012 Communication, the Member State governments were recommended to take a number of actions<sup>113</sup> related to the five priorities for ERA implementation. These principally concern removing legal and other barriers, such as for instance those regarding cross-border access to research infrastructures. Based on an assessment of the country fiches that accompany the 2014 Progress Report, we can conclude that a majority of countries took measures in relation to the priorities.<sup>114</sup>

The level of implementation in a country depends on many factors, such as the fragmentation of the research area within the country; trust and level of cooperation between key stakeholders; the political will, financial allocations to R&D, arrangements for ERA implementation infrastructures (such as a national ERA Council). In addition, there are a number of issues at national government level in relation to the ERA implementation:

- There are important disparities between countries on the importance of the ERA and these differences between the countries do not provide an incentive for Member States to act towards speeding up further ERA implementation. Several interviewees are under the impression that **some Member States' governments no longer consider the ERA a priority**. Some countries are so far behind, that respondents have their doubts whether they will ever catch up. This is considered to be very demotivating in the context of additional efforts. In relation to this, Member States do not always see the benefits for themselves in creating an internal market. The ERA priorities do not necessarily coincide with the national priorities and objectives. No further evidence has been found in the relevant documentation to support these views expressed during the interviews.
- An obstacle for implementation of the ERA is **lack of investments**<sup>115</sup>. Short-term issues are considered to win the battle for budget from a long-term public investment area, such as research, both at national and EU levels. The figure below shows the differences between Member States in terms of R&D expenditure. It also shows that overall R&D expenditure in the EU-28 increased in the 2003-2013 period, with a dip between 2004 and 2007, but is still well below the US and Japan.

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<sup>113</sup> Eg, Member States were invited to remove legal and other barriers to the application of open, transparent and merit based recruitment of researchers (in relation to priority 3). The term 'action' refers to the reforms and actions defined by the European Commission in 2012, to be implemented by 2014 for each priority by the Member States, the Commission and the research stakeholder organisations. Source: European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

<sup>114</sup> Chapter 4 and the annex provide more details on this exercise.

<sup>115</sup> Source: interviews

**Figure 7: Gross domestic expenditure on R&D, 2003–2013 (% of GDP)**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>EU-28</b>	1.80	1.76	1.76	1.78	1.78	1.85	1.94	1.93	1.97	2.01	2.01
<b>Euro area (EA-19)</b>	1.81	1.78	1.78	1.80	1.81	1.89	1.99	1.99	2.04	2.09	2.09
Belgium	1.83	1.81	1.78	1.81	1.84	1.92	1.97	2.05	2.15	2.24	2.28
Bulgaria	0.47	0.48	0.45	0.45	0.44	0.46	0.51	0.59	0.55	0.62	0.65
Czech Republic	1.15	1.15	1.17	1.23	1.31	1.24	1.30	1.34	1.56	1.79	1.91
Denmark (*)	2.51	2.42	2.39	2.40	2.51	2.78	3.07	2.94	2.97	3.02	3.06
Germany	2.46	2.42	2.43	2.48	2.45	2.60	2.73	2.72	2.80	2.88	2.85
Estonia	0.77	0.85	0.92	1.12	1.07	1.26	1.40	1.58	2.34	2.16	1.74
Ireland	1.13	1.18	1.20	1.21	1.24	1.39	1.63	1.62	1.53	1.58	...
Greece (*)	0.55	0.53	0.58	0.56	0.58	0.66	0.63	0.60	0.67	0.69	0.80
Spain	1.02	1.04	1.10	1.17	1.23	1.32	1.35	1.35	1.32	1.27	1.24
France (*)	2.11	2.09	2.04	2.05	2.02	2.06	2.21	2.18	2.19	2.23	2.23
Croatia	0.95	1.03	0.86	0.74	0.79	0.88	0.84	0.74	0.75	0.75	0.81
Italy	1.06	1.05	1.05	1.09	1.13	1.16	1.22	1.22	1.21	1.27	1.26
Cyprus	0.32	0.34	0.37	0.39	0.40	0.39	0.45	0.45	0.46	0.43	0.48
Latvia	0.36	0.40	0.53	0.65	0.56	0.58	0.45	0.60	0.70	0.66	0.60
Lithuania	...	0.75	0.75	0.79	0.80	0.79	0.83	0.78	0.90	0.90	0.95
Luxembourg	1.65	1.63	1.59	1.69	1.65	1.65	1.72	1.50	1.41	1.16	1.16
Hungary (*)	0.92	0.87	0.93	0.99	0.97	0.99	1.14	1.15	1.20	1.27	1.41
Malta (*)	0.24	0.49	0.53	0.58	0.55	0.53	0.52	0.54	0.70	0.86	0.85
Netherlands (*)	1.81	1.82	1.81	1.77	1.70	1.65	1.69	1.72	1.89	1.97	1.98
Austria	2.18	2.17	2.38	2.37	2.43	2.59	2.61	2.74	2.68	2.81	2.81
Poland	0.54	0.56	0.57	0.55	0.56	0.60	0.67	0.72	0.75	0.89	0.87
Portugal (*)	0.70	0.73	0.76	0.95	1.12	1.45	1.58	1.53	1.46	1.37	1.36
Romania (*)	0.38	0.38	0.41	0.45	0.52	0.57	0.45	0.45	0.49	0.48	0.39
Slovenia (*)	1.25	1.37	1.41	1.53	1.42	1.63	1.82	2.06	2.43	2.58	2.59
Slovakia	0.56	0.50	0.49	0.48	0.45	0.46	0.47	0.62	0.67	0.81	0.83
Finland	3.30	3.31	3.33	3.34	3.35	3.55	3.75	3.73	3.64	3.42	3.31
Sweden (*)	3.61	3.39	3.39	3.50	3.26	3.50	3.42	3.22	3.22	3.29	3.30
United Kingdom	1.67	1.61	1.63	1.65	1.69	1.69	1.73	1.69	1.69	1.63	1.63
Iceland (*)	2.73	...	2.69	2.91	2.56	2.53	2.66	...	2.49	...	...
Norway	1.68	1.55	1.48	1.46	1.56	1.56	1.72	1.65	1.63	1.62	1.66
Switzerland	...	2.68	...	...	...	2.73	...	...	...	2.96	...
Montenegro	...	...	...	...	...	...	...	...	0.32	...	0.38
Serbia	...	...	...	...	...	...	0.87	0.74	0.72	0.91	0.73
Turkey	0.48	0.52	0.59	0.58	0.72	0.73	0.85	0.94	0.86	0.92	0.95
China (except Hong Kong) (*)	1.13	1.23	1.32	1.39	1.40	1.47	1.70	1.76	1.84	1.98	...
Japan (*)	3.14	3.13	3.31	3.41	3.46	3.47	3.36	3.25	3.38	...	...
Russia	1.29	1.15	1.07	1.07	1.12	1.04	1.25	1.13	1.10	1.13	1.11
South Korea (*)	2.49	2.68	2.79	3.01	3.21	3.36	3.56	3.74	4.04	...	...
United States (*)	2.55	2.49	2.51	2.55	2.63	2.77	2.82	2.74	2.77	2.81	...

(\*) 2007: break in series.  
 (\*) 2008: break in series.  
 (\*) 2004 and 2010: break in series.  
 (\*) 2004: break in series.  
 (\*) 2003: definition differs.  
 (\*) 2011: break in series.  
 (\*) 2005: break in series.  
 (\*) 2009: break in series.  
 (\*) 2003–06: definition differs.  
 (\*) Definition differs.  
 Note: when definitions differ, see [http://epp.eurostat.ec.europa.eu/cache/ITY\\_SDDS/EN/ird\\_esms.htm](http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/EN/ird_esms.htm).  
 Source: Eurostat (online data codes: t2020\_20 and rd\_e\_perdot)

Source: Eurostat

### 3.2 Reflections on the role of Research stakeholder organisations in the ERA implementation

In the 2012 Communication, the research stakeholder organisations were recommended to take a number of actions<sup>116</sup>, in order to implement the ERA priorities and for instance, to agree on common funding principles.

The Progress Reports include survey data of Research Funding and Research Performing Organisations. The 2014 Progress Report concludes that 81% of the institutions are ERA compliant and 17% has limited compliance. The ERA is not applicable for the remaining 2%. It furthermore, shows for instance, that outputs (in terms of share of publications and share of patents) by RPOs in the ERA compliant cluster, are a lot higher than the share of those RPOs that are not ERA compliant.<sup>117</sup>

<sup>116</sup> Eg. research stakeholder organisations were invited to agree on common funding principles - eligible costs, reporting requirements, etc. to make national research programmes compatible, interoperable (cross-border) and simpler for researchers, with regards to priority 2.

<sup>117</sup> It should be noted that the voluntary nature of the RPO surveys, on which the 2014 Progress Report results are based, are problematic with regard to the results. Results were not representative and therefore, presented only an indication of the situation of those institutions which responded to the survey. Moreover, it was unclear at what level to respond (some targeted organisations were

Some EU level organisations representing the research stakeholder organisations note that the actions defined in the 2012 Communication are not necessarily those actions that research stakeholder organisations aim to achieve: **some RSOs have different perspectives on what the ERA is and what is needed to achieve it.** Moreover, the goal of integration in their eyes does not reflect the aim of achieving better science. Science Europe concludes that the current approach for priority 1 (more effective national research systems) does not necessarily help policymakers and RSOs to identify issues that matter in research policy. For example, in its position paper, Science Europe concludes that identifying project-based funding as the most important way to induce competition in research may prove counter-productive in some contexts, as it might cause researchers to spend a significant amount of their time writing or reviewing research proposals instead of doing research.<sup>118</sup>

Some RSOs at national level indicate that there are differences at national level between how the national government and the research stakeholders would like to implement the ERA. This sometimes concerns differences in the pace at which changes are suggested, but can also relate to more fundamental differences of opinions of what would work best for the research community within the country. In the case of the Czech Republic for instance, the RSO's are relatively influential and have vested interests that do not always coincide with the ERA. Setting up effective coordination between different stakeholders can be a barrier (both within governments and between government and non-governmental organisations)<sup>119</sup>.

### 3.3 Reflections on the role of the European Commission in the ERA implementation

In the 2012 Communication, the Commission defined a number of actions, in order to support the other stakeholders in completing the ERA by 2014. An example is the Support through the Smart Specialisation Platform Member States and regions in using Structural Funds to develop research capacity and smart specialisation strategies.<sup>120</sup>

Based on a self-assessment completed in the summer of 2015, the European Commission indicated that more than 80% of the actions have been taken. This was done by assigning 3 categories and levels of implementation to each action: not started (0%), ongoing process (75%), completed (100%). Naturally, a self-assessment has its limitations. Moreover, using only three categories and assigning 75% completion to actions is a simplification, which in some cases does not do justice to complex realities. In addition, the relative importance of actions is not taken into consideration.

The stakeholders that have been interviewed for this study generally have a **positive view on the role of the Commission** and appreciate the work done to push the ERA

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umbrella organisations, which implies they should speak on behalf of their members who were also consulted).

<sup>118</sup> Science Europe (2014). *Science Europe Position Statement on Priority One of the 2012 ERA Communication: More Effective National Research Systems.*

<sup>119</sup> Source: interviews

<sup>120</sup> The Smart Specialisation Platform was established by the European Commission to provide professional advice to EU countries and regions for the design of their research and innovation strategies for smart specialisation (RIS3). Services include: providing guidance material and good practice examples; organising information sessions for policymakers and participating in conferences; providing training to policymakers; facilitating peer-reviews, supporting access to relevant data; participating in high quality research projects to inform strategy formation and policy making. See <http://s3platform.jrc.ec.europa.eu/activities> for further information.



agenda. However, the different interpretation of the ERA in the Member States, research stakeholder organisations and the Commission seems challenging (see previous sections). Horizon2020 is the main vehicle for the EC, however, some note that the EC does not actively promote Horizon2020 as a tool for the ERA. In addition to the financial incentive, the EU provides a forum to exchange knowledge and experiences. Improvements can be made towards the better exchange of information. Reports (such as the national progress reports) could be used more effectively. Currently, these are not considered to be ‘owned’ by the MS. For countries that are lagging behind, it would be beneficial if the EC would give more **policy support**, for instance in the form of recommendations. The ERA is an opportunity to provide reviews, policy support, advice and could be used more frequently by the EC. A good example of policy support is the recently (March 2015) launched Policy Support Facility, an instrument to give EU Member State governments practical support to identify, implement and evaluate those reforms needed to enhance the quality of their public funding. It includes peer reviewing and provides access to independent high level expertise and analysis. It is funded under Horizon 2020, the EU research and innovation programme.<sup>121</sup>

A barrier mentioned in the interviews, is that the research innovation policies are **too fragmented**. There is still a lack of coordination that could be addressed at EU level. Establishing closer links between the national and EU R&D policy would be beneficial (particularly the coordination of national R&D programmes that emerge under the umbrella of Joint Programming Initiatives or ERA-NETS) for instance, in involving the Czech R&D system more within the ERA. In other words, coordinated efforts may lead to effective cost sharing and prevent fragmentation and duplication of efforts.

The IA and EC **communications are quite detailed** and are a product of their time. In that respect, it reflects what was considered to be important at ‘that moment’, instead of providing a framework in which the stakeholders can work for a longer period of time. Currently, a more macro-birds-eye perspective is chosen to communicate what ERA is within the Roadmap. According to some stakeholders, this is much more effective in recognizing the value of diversity. Having a more bird’s-eye view may be more difficult to steer, yet it is likely to be more effective and relevant to countries in their specific context.

### 3.4 Gaps and barriers

This section discusses the main gaps and barriers mentioned in the sections above, in more detail. We start with the observation that it remains unclear what a completed ERA entails. Indicators, targets and monitoring reports are much debated<sup>122</sup>. This becomes logical if one considers the ERA as an open-ended process rather than an ‘end-state’ that can be reached (meaning that implementation is a continuous process not reaching a final stage of completion as new challenges and barriers arise on the way). Characterising the ERA as an open-ended process is in line with expert views on the matter.<sup>123</sup> This characterisation also helps to further understand the findings from available literature. To avoid any misunderstanding: this finding does not disqualify the value of the ERA actions or the indicators specifically linked to such actions. It does however, imply that setting targets for the ERA as a whole, and quantifying the distance to such targets is impossible. In fact, although, this report remains using the term ‘ERA implementation’,

<sup>121</sup> <http://ec.europa.eu/research/index.cfm?pg=newsalert&year=2015&na=na-030315>

<sup>122</sup> Source: interviews

<sup>123</sup> See for an elaboration of this barrier the briefing paper by Panteia “Monitoring Mechanisms of an integrated European Research Area” for a more elaborate discussion of this argument.

this should be seen as the ‘implementation of actions aimed at ERA progress’. The open-ended ERA makes it very difficult to define gaps in absolute (quantifiable) terms.

Other and related gaps and barriers of the ERA implementation are as follows:

- **Heterogeneity is insufficiently incorporated** in the ERA. Policies related to the ERA are too much ‘one size fits all’ within this context. Differences in ERA benefits can become disincentive to continue efforts to further implement the ERA.
- **Lack of political priority/ insufficient funds:** In many countries, the ERA implementation was under pressure with national budgets being severely hit by the economic crisis. The lack of funds to implement the ERA, create a barrier in implementation and therefore, hamper the expected benefits.
- The **research innovation policies are too fragmented**. There still is a lack of coordination. Coordinated efforts may lead to effective cost sharing and prevent fragmentation and duplication of efforts.
- **Mutual learning is insufficiently institutionalised**, partly due to the limited usability of the monitoring system<sup>124</sup>.

### Heterogeneity

The differences between Member States (in terms of for instance national infrastructures, national resources for public funding, research systems, RFOs and RSOs) are substantial. For instance, not all countries benefit in the same way from the ERA.<sup>125</sup> Policies related to the ERA are within this context too much ‘one size fits all’. Differences in ERA benefits can become disincentive to continue efforts to further implement the ERA.

The difference between countries seems to be so great, that the countries that are behind cannot catch up. Although, over the years the stakeholders involved have made substantial progress and evidence from the European Commission shows that the **progress towards ERA has declined**, with convergence in research systems slowing. Disparities between different EU countries are becoming increasingly apparent and renewed efforts are required to boost progress towards an ERA<sup>126</sup>.

Another example is related to priority 1 ‘More effective national research systems’. The 2012 Recommendation indicates two areas for work, namely allocating funding through open calls for proposals; and assessing the quality of research-performing organisations and teams and their outputs, as a basis for institutional funding decisions. In addition, the Recommendation acknowledges that the balance between these two approaches may vary.<sup>127</sup> This depends on what is most appropriate given the national research system; in the two areas, Member States’ governments and other stakeholders can make different and even opposing choices. In relation to this, the different stakeholders, such as the national governments, research performing organisations and research funding organisations can have different interests and viewpoints on the ERA priorities and the direction they should take. For example, universities are regarded within EMM with the same indicators as any other research organisations, yet the academic nature of

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<sup>124</sup> See for an elaboration of this barrier the briefing paper by Panteia “Monitoring Mechanisms of an integrated European Research Area” for a more elaborate discussion of this argument.

<sup>125</sup> Source: interviews

<sup>126</sup> European Commission, COM (2014), 130 Final/2. Annexes To The Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions . Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth.

<sup>127</sup> European Commission, COM (2012) 392 final A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

universities' work suggests they should have separate indicators for performance as they also have to comply with other (education-related and society-related (valorisation)) objectives. The ICF report mentions that Member States criticize the current system for Progress Reports, as they are not able to recognise the diversity of research systems and pathways towards achieving the ERA<sup>128</sup>. The Progress Report 2014 acknowledges that there is not a single a pathway for ERA completion: "There is no single path to achieve ERA. The pace and level of ERA implementation very much depends on the national context and is fostered by targeted policies at Member States level"<sup>129</sup>.

Europe would not benefit from one unified research system, but should aim at a stratified, but integrated system **respecting national differences** and priorities to work together on common themes. This view is more and more shared and reflected in the ERA Roadmap 2015. National governments are currently preparing the national ERA roadmaps. Germany was the first to have published a roadmap in 2014. The fact that the ERA Roadmap is validated by the EU council, can be interpreted as a first time commitment from the Member States<sup>130</sup>.

### **Lack of political priority/ insufficient funds**

Public research funding is one of the major instruments for steering the science system. Policies affecting public research funding involve changes in funding volumes, and changes in the allocation of funds mainly via i) modifications in the portfolio of funding instruments, and/or ii) in the organisational structures responsible for the allocation of funds.<sup>131</sup>

This statement implies that additional funding would be required for implementation of the ERA, whilst maintaining current running research programs. However, in many countries, the ERA implementation has been under pressure with national budgets being severely hit by the economic crisis. The (relative) lack of political priority funds is reflected in the insufficient funding. This forms a barrier in implementation and therefore, hampers the expected benefits. This observation has been mentioned in several interviews. As illustrated above, overall R&D expenditure in the EU-28 increased in the 2003-2013 period, but is still well below the US and Japan.

More importantly, innovation-lagging and fiscally weak countries in the European Union cut their public research and innovation (R&I) budgets during the crisis, while innovation-leading and fiscally stronger countries forged ahead with public R&I spending. Therefore, an increasing research and innovation division in Europe can be seen.<sup>132</sup> It stands to be reasoned that this included the degree of ERA implementation.

### **Fragmented research innovation policies**

The research innovation policies are too fragmented. There is still a lack of coordination. Coordinated efforts may lead to effective cost sharing and prevent fragmentation and duplication of efforts. Though fragmentation and the resulting inefficient spending of

<sup>128</sup> ICF International (2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation.

<sup>129</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014, p.7.

<sup>130</sup> Source: interview

<sup>131</sup> OECD (2011), Issue brief: Public sector research funding.

<sup>132</sup> Veugelers, R. (2014), Undercutting the future? European research spending in times of fiscal consolidation.

funding has been one of the reasons to develop the ERA in the first place<sup>133</sup>, this is at the same time a major challenge for its development. In 2010, the Commission identified too much fragmentation and costly duplication as one of Europe's three principle weaknesses for innovation, besides underinvestment in our knowledge foundation and unsatisfactory framework conditions (eg. poor access to finance).<sup>134</sup>

In 2007, the EC concluded that fragmentation prevents Europe from fulfilling its potential on research and innovation, posing a huge cost to Europeans (as taxpayers, consumers and citizens): mobility for researchers is still curtailed by legal and practical barriers; businesses often find it difficult to cooperate with research institutions across counties; national and regional funding (programmes, infrastructures, core funding of research institutions) remains largely uncoordinated, which leads to dispersion of resources, duplication, unrealised benefits from spill overs, failure to play a role in major global challenges; reforms undertaken at the national level often lack a true European perspective and transnational coherence.<sup>135</sup>

This fragmentation also plays a role in the figures and data presented in the Progress Reports are fragmented: they provide detailed insight into, but no overall overview on the implementation of the ERA. The reports do not include a general ranking of countries for implementation of the ERA, as a consequence of the fact that the differences between countries are too great to make a useful comparison. The countries differ in their starting positions, priorities set for the research system, prioritisation allocated to ERA implementation, level of policy reforms and availability of monitoring data. The Progress Report 2014 classified countries on the basis of two indicators: "The first is the existence of specific measures in support of the ERA as identified by Commission services. The second is the level of implementation by funders and/or RPOs in comparison with the EU average." The classification therefore, does not provide an overview of the overall progression. The report continues by stating that "in the absence of targets or identified desirable levels of implementation, it is difficult to identify and assess an adequate level of ERA implementation for each of the actions."<sup>136</sup>

### **Few incentives for mutual learning**

The European Monitoring Mechanism (EMM) is designed, as both a benchmarking instrument and a tool for mutual learning. Stakeholders who were interviewed, but also the ERAC secretariat, indicated that there is certainly room for improvement. The current monitoring system is limited and only allows stakeholders to identify good practices in other countries, thereby offering only a **few incentives for mutual learning**<sup>137</sup>.

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<sup>133</sup> See for example European Commission (2012), ERA-NETs and the realisation of ERA; Increasing coordination and reducing fragmentation.

<sup>134</sup> European Commission (2010). Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions. *Europe 2020 Flagship Initiative Innovation Union*. Brussels, 6.10.2010; COM(2010) 546 final. [http://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication\\_en.pdf](http://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication_en.pdf)

<sup>135</sup> Commission Of The European Communities (2007). *Green Paper: The European Research Area: New Perspectives*. Brussels, 4.4.2007; COM(2007) 161 final. [http://ec.europa.eu/research/era/pdf/era\\_gp\\_final\\_en.pdf](http://ec.europa.eu/research/era/pdf/era_gp_final_en.pdf)

<sup>136</sup> European Commission, COM (2014) 575 Final Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014: [http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2014/era\\_progress-report\\_150521.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2014/era_progress-report_150521.pdf)

<sup>137</sup> See for an elaboration of this barrier the briefing paper by Panteia "Monitoring Mechanisms of an integrated European Research Area".

## 4. Distance to target: quantification

### Key messages

- The open-ended nature of ERA makes it impossible to define an ‘end-state’ and thus to quantify the distance to that situation. The quantification presented here is illustrative and serves to present current actions and contribute to further progress. For this purpose, the ‘end-state’ is considered to be defined in the 2012 Impact Assessment.
- When combining the proportion of completion for each actor (Member States 81%, Research stakeholder organisations 81%, Commission 80%), we come to a total completion of 81%, which means the distance to target for ERA implementation is 19%.
- In the 2012 Impact Assessment it was concluded that the integration of the European Research Area could result in a gain of 16 billion euros GDP annually. When looking merely at the quantitative information, the distance to target of 19% of the projected 16 billion revenue of full ERA implementation, can be considered as the costs due to incomplete implementation. This amounts to €3 billion annually.

This chapter focusses on the quantitative assessment of the distance towards the establishment of the ERA and presents a level of completion for the three actors of implementation: Member States, research stakeholder organisations and the European Commission<sup>138</sup>.

As discussed, this study finds the ERA to be an open-ended process rather than an ‘end-state’ that can be reached. This implies that setting targets for the ERA as a whole, and quantifying the distance to such targets, is impossible. However, further progress of the ERA remains important. Therefore, aiming towards contributing to improving this process, this chapter presents a quantification of the distance to target, with the target being the situation aimed at in the context of the 2012 Impact Assessment and being monitored by the Progress Report 2013 and 2014.

Three of the four conditions identified by the Commission in the 2014 Progress Report form the basis for the calculation of ‘distance to target’, presented for each type of stakeholder, namely:

1. Member State reforms in all ERA priorities;
2. Speedy implementation of the priorities outlined in the Communication by research stakeholders;
3. Increased support from the Commission to national ERA policies.

<sup>138</sup> As also explained in the introduction chapter of this report, all 5 priorities of ERA have been taken into account for this assessment. See annex for an explanation of the approach used for the calculations.

The fourth condition, ‘Transparent monitoring (EMM)’ is dealt with in a separate briefing paper.<sup>139</sup> In this research paper, the ‘distance to target’ on each of the conditions is related to the estimated annual benefit of ERA completion. The quantification is therefore, based on the building blocks, as outlined in the following schematic overview.

**Figure 8: Building blocks for quantification of costs of suboptimal implementation of ERA**

<b>Condition:</b>	<b>Member State reforms in all ERA priorities</b>	<b>Speedy implementation of the priorities outlined in the Communication by research stakeholders</b>	<b>Increased support from the Commission to national ERA policies</b>	<b>Annual benefit of ERA completion</b>
<b>Operationalisation:</b>	Adoption of measures in support of ERA implementation at MS level	Compliance of research performing organisations (RPOs)	Adoption of measures in support of ERA implementation at EU level	16 billion Euro
<b>Relevant barriers:</b>	Heterogeneity: Differences in ERA benefits as a disincentive to continue  Heterogeneity: One size fits all does not fit	Research innovation policies are too fragmented  Lack of funds	Heterogeneity: One size fits all does not fit	

Source: authors

A cautionary note with regard to the calculation should be made here. As was already stated in the introduction of this report, there are some inevitable shortcomings with regards to the adopted approach. The quantification does not critically assess the result from the impact assessment calculating the 16 billion euro annual benefit of the ERA completion.<sup>140</sup> It takes this calculation as a given. However, the concept of the ERA is volatile and qualitative in nature, and therefore, does not allow for a solid quantification of its progress. The figures adopted from the Impact Assessment that are used as a basis in this report, should therefore, be interpreted with caution.

<sup>139</sup> In the briefing paper by Panteia “Monitoring Mechanisms of an integrated European Research Area”, the EMM is further described and reflected upon (unpublished at the time of writing).

<sup>140</sup> There are indications in interviews that the approach taken in the Impact Assessment did not fully make use of the input potentially provided by the stakeholders. As indicated earlier, the selected actions are not always and in all situations, the best ones to take (see section 1.3). In addition, the difficulties identified for quantification lie at the heart of the Impact Assessment such as the lack of a baseline to compare progress.

A detailed description of the methodology for calculating the cost of non-implementation of the ERA, can be found in the annex.

#### **4.1 Member State reforms in all ERA priorities**

To assess the level of implementation by Member States, we take a look at the ERA condition 1: Member State reforms in all ERA priorities. The most recent available information is the country fiches<sup>141</sup> that accompany the 2014 Progress Report. These country fiches contain an overview of the measures taken for each ERA priority since 2012. A mapping exercise of the adoption of measures in support of ERA implementation in all Member States, shows an average level of implementation of around 81%. In other words, one can say that condition 1 has been 81% (which can be interpreted as a distance to target of 19%) completed.

#### **4.2 Speedy implementation of the priorities outlined in the Communication by research stakeholders**

The focus of the research stakeholder organisations is on condition 2: Speedy implementation of the priorities outlined in the Communication by research stakeholders. Looking at the compliance of research performing organisations (RPOs), the 2014 Progress Report shows that 81% is ERA compliant (organisations that are implementing some or all of the ERA actions with high intensity). The organisations that are ERA compliant are used in this report as a proxy for implementation by research stakeholder organisations. With this, we conclude that the level of implementation for RPOs is 81% and therefore, a distance to target of 19%. It is important to note that RFOs are not taken into account in this analysis.

#### **4.3 Increased support from the Commission to national ERA policies**

Condition 3 is focused on increased support from the Commission to national ERA policies. The points of departure are the actions assigned to the Commission in the 2012 Communication. To assess this condition and the distance to target, the Commission has provided information on the status of each action (not started, ongoing, and completed). This exercise shows that in total, the completion of this specific condition is 80% (distance to target: 20%).

#### **4.4 Conclusion**

When the figures presented in this chapter are added up, we come to a total completion of 81%, which means the distance to target for ERA implementation is 19%.

There are two conclusions that can be drawn. Firstly, a completion of 81% of the ERA shows that progress is 'on the right track'. As concluded before by the Council of the European Union, ERA stakeholders have made substantial progress, yet further efforts

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<sup>141</sup> [http://ec.europa.eu/research/era/eraprogress\\_en.htm](http://ec.europa.eu/research/era/eraprogress_en.htm)

are needed to complete the ERA. Secondly, calculations show that the distance to full implementation of the ERA, are very similar for the three actors (all around 80%). In the 2012 Impact Assessment it was concluded the integration of the European Research Area could result in a gain of 16 billion euros GDP annually. When looking only at the quantitative information, the distance to target of 19% of the projected 16 billion revenue of full ERA implementation, can be considered as the costs due to incomplete implementation. This amounts to €3 billion annually

## Recommendations: Towards further implementation of ERA

### Key messages

- The ERA implementation is quite advanced but could be further stimulated when policies better acknowledge the following key barriers that are identified in relation to ERA implementation (2012-2015): There are differences in ERA benefits, resulting in a disincentive to continue; A one size fits all approach does not fit with countries' heterogeneity in research systems; At country level there is a lack of priority and funds in ERA implementation; The research innovation policies are too fragmented; Mutual learning between stakeholders is insufficiently institutionalised.
- Given these barriers, the Roadmap 2015-2020 approach is a positive development, able to overcome these barriers. In this approach it is recommended to foster inclusiveness of all countries, and use knowledge exchange and self-assessment to provide directions for improvement.

From the quantitative assessment presented in this report, it can be concluded that the ERA implementation is quite advanced. However, it is important to note that in absence of a definition of 'success', it is problematic to assess the level of implementation of the ERA. The ERA should not be about completion, as it is an ongoing process, which cannot be achieved by carrying out certain activities<sup>142</sup>.

In addition to the quantifications, this report also identified a number of structural barriers for the ERA implementation since 2012 that require attention in order to strive to a further progressed ERA implementation. In this section some of these barriers are mentioned after which recommendations are provided in order to remove these barriers.

- **Heterogeneity leads to differences in ERA benefits as a disincentive to continue and to actions and priorities that are too much 'one size fits all':**
  - Not all countries benefit in the same way: some are drivers, while others lag behind<sup>143</sup>. The differences between countries and research systems seem to be so large, that it is doubtful if the countries that are behind will be able to catch up.
  - **One size fits all does not fit with countries heterogeneity in research systems:** A related criticism is that there has been too little room for national heterogeneity. Becoming a uniform research area should not be the aim and is not beneficial.
- **Lack of priority (and funds):** In many countries, the ERA implementation was under pressure with national budgets being severely hit by the economic crisis. The lack of funds to implement the ERA, create a barrier in implementation and therefore, hamper the expected benefits.

<sup>142</sup> Source: interviews

<sup>143</sup> Source: interviews



- The **research innovation policies are too fragmented**. There still is a lack of coordination. Coordinated efforts may lead to effective cost sharing and prevent fragmentation and duplication of efforts.
- **Mutual learning is insufficiently institutionalised**, partly due to the limited usability of the monitoring system<sup>144</sup>.

Based on these barriers, it is recommended to further develop the ERA Roadmap 2015-2020 approach as has been put forward in recent publications and discussions. This approach, based on nationally tailored policy plans and priorities, is a good step in the right direction to see the ERA as a complex and multi-faceted policy field in which heterogeneity of research systems needs to be fostered. In order to continue working on overcoming the barriers mentioned in the ERA Roadmap 2015-2020 approach, the authors of this report suggest to focus on the following issues:

- Despite the voluntary basis for Member States and stakeholders to develop a Roadmap, strive towards inclusiveness of all countries and all stakeholder groups through for instance, benchmarking, learning events, and peer review.
- Countries that are lagging behind need incentives to prioritise the ERA. For this, it could help to see ERA implementation not as something to complete, but as a mirror to assess the country's national research system and to provide directions for improvement.
- Further stimulate knowledge exchange on issues that are relevant for specific countries through the established and operational Policy Support Facility. In addition, an annual thematic report on a specific issue could be useful for Member States. At present, this mutual learning aspect is not being used to its full potential and more focus on this aspect will likely create increased benefits of the ERA.<sup>145</sup>

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<sup>144</sup> See for an elaboration of this barrier the briefing paper by Panteia “Monitoring Mechanisms of an integrated European Research Area”.

<sup>145</sup> See the briefing paper by Panteia “Monitoring Mechanisms of an integrated European Research Area” for a more elaborate discussion of this argument.

## **Annex: Methodology and sources**

### **Calculating distance to target**

In order to answer the central question of this report on the costs incurred due to gaps in the ERA infrastructure, a distance to completion of the ERA has to be estimated. Targets or desirable levels of implementation have not been identified for the ERA, which makes identification and assessment of adequate levels of ERA implementation for each of the actions very difficult<sup>146</sup>. Some considerations are presented in Chapter 4. This annex aims to describe the approach taken to assess the level of implementation.

The conditions for the ERA<sup>147</sup> serve as a starting point towards establishing the distance to target, in order to calculate the non- implementation costs of the ERA.

The following table summarises our approach to the calculation, broken down by the 4 conditions:

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<sup>146</sup> Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014, [COM (2014) 575 Final].

<sup>147</sup> Identified in the 2014 Progress Report

Condition	Source	Methodology and considerations
Condition 1: Member State reforms in all ERA priorities	Overview of adoption of measures since 2012 in support of ERA implementation, included in the country fiches (part of the ERA Progress Report 2014) <sup>148</sup>	<p>For all 5 priorities, the country fiches provide an overview of measures adopted by the Member States. On this information, it was assessed whether or not measures have been adopted by the Member States per priority. Therefore, there are two possible outcomes: positive (one or more measures taken since 2012) or negative (no measures taken since 2012). This was translated into a percentage: 0, 20, 40, 60, 80 or 100% (for 0-5 priorities in which measures were taken). For each priority, it was calculated which percentage of the 28 Member States had adopted measures. On the basis of this, the EU average was calculated (an aggregation of all priorities for all Member States).</p> <p><i>Considerations</i> If a country took measures, this entails that it has taken steps/reforms towards ERA. The difficulty is that 1 reform since 2012 would be calculated as 'target achieved', though the actual content and weight of measures is not taken into account. Moreover, it is important to note that 'no measures taken since 2012' could in practice mean that the necessary measures had already been taken prior to 2012.</p>
Condition 2: Speedy implementation of the priorities outlined in the Communication by research stakeholders	2014 Progress Report: ERA compliance of RPOs (p. 9)	<p>To establish the distance to target for condition 2, the share of institutions, weighted by number of researchers was used. Three clusters were identified: ERA compliant, limited compliance, ERA not applicable. The weighted share of organisations within the 'ERA compliant' cluster, were used as the proxy for the level of implementation for condition 2.</p> <p><i>Considerations</i> Due to the voluntary nature of the 2014 ERA Survey, the figures are not representative and only relate to research performing organisations that answered the Survey in 2014.<sup>149</sup></p>

<sup>148</sup> [http://ec.europa.eu/research/era/eraprogress\\_en.htm](http://ec.europa.eu/research/era/eraprogress_en.htm)

<sup>149</sup> This includes funders which manage 34% van GBOARD in the EU, performers which employ 32% of total staff and 20% of researchers in RPOs. The constituency in the survey gathers 20% of the most important RPOs as identified by Member States.

<p>Condition 3: Increased support from the Commission to national ERA policies</p>	<p>2012 Communication: actions defined (for each priority) and information provided by the Commission (DG Research and Innovation, Unit ERA policy) on actions taken.</p>	<p>DG research indicated which actions the EC has completed. The categories used were:                      1 = not started                      2 = ongoing process                      3 = completed                      On the basis of the information received from the Commission, the research team calculated the level of implementation by assigning a percentage to each category (1 = 0%, 2= 75%, 3 = 100%).</p> <p><i>Considerations</i>                      Using only three categories and assigning 75% completion to actions is of course a simplification, which in some cases does not do justice to complex realities. However, as the taken actions are often ongoing and in advanced stages, it is justified to give 75% to actions that are not completed yet. As with the first condition of Member States, relative importance of actions is not taken into consideration.</p>
<p>Condition 4: Transparent monitoring (EMM)</p>	<p>This condition is different from the others as it only has an indirect effect on the completion of the ERA: incomplete monitoring fulfilment does not necessarily relate directly to the fulfilment of the ERA. For this reason, a separate report has been dedicated to this condition.</p>	

Now that the approach has been described, we continue with the actual calculation. The table below shows that every condition weighs for one third (as the final condition is not taken into account here). It furthermore, details the sublevels (for condition 3) and the results of the calculation. All 5 priorities have been taken into account for the calculation.

	Weight	Sublevel weight	Result
<b>Condition 1</b>	33,3%		81,4%
<b>Condition 2</b>	33,3%		81%
<b>Condition 3</b>	33,3%	Priority 1: 20% Priority 2: 20% Priority 3: 20% Priority 4: 20% Priority 5: 20%	Priority 1: 75% Priority 2: 63,8% Priority 3: 85,7% Priority 4: 87,5% Priority 5: 90,6%  Total average: 80,5%
<b>Condition 4</b>	<i>Not taken into account</i>		
<b>Level of implementation of ERA</b>	100%		Total average condition 1, 2, 3: 81%
<b>Distance to target</b>			100- 81 = 19%

## Selection of countries

Country case studies are a key part of this study. In order to make a selection of countries that is as varied and relevant as possible, the classification from the 2014 Progress Report was used. Within the progress report, two criteria were used to classify the countries regarding the ERA implementation:

1. Existence of specific measures in support of ERA (as identified by Commission services)
2. The level of implementation by funders and/or RPOs (in comparison with EU average).

On this basis, four possible groups were identified:

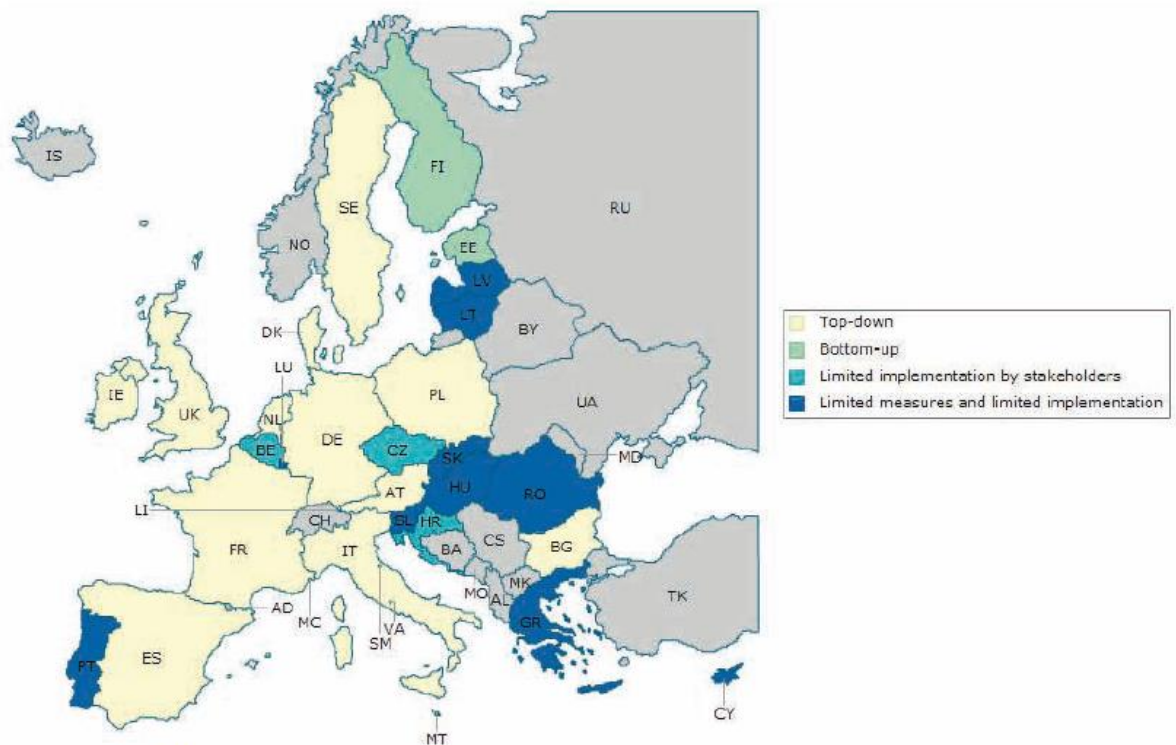
**Figure A1: Classification of countries according to ERA policies and implementation of the ERA Actions**

	Specific measures in support of ERA	No specific measures in support of ERA
Implementation above EU average	Top-down ERA proactive	Bottom-up ERA proactive
Implementation below EU average	Limited implementation by stakeholders	Limited measures and limited implementation
		Limited measures and no implementation

Source: Directorate-General for Research & Innovation

In the Progress Report 2014, it is stated that the results of the map imply that there is not a single path to the ERA: the implementation of the ERA above the EU average is sometimes directly driven by funders and RPOs (bottom-up) and in some cases by national/regional policies (top-down). The following map shows the classification of Member States:

**Figure A2: Classification of Member States according to their policies in support of ERA and their implementation**



Source: DG RTD

Taking into account the categories, as well as geographical range, we came to the following selection of country studies:

- Austria (top-down)
- Czech Republic (limited implementation by stakeholders)
- Finland (bottom-up)
- Portugal (limited measures and limited implementation)

## Interviews

As part of the study, interviews were carried out with key stakeholders at both EU and MS levels. Some interviews were conducted face-to-face or in writing, but most were conducted by telephone. An interview script was developed for the semi-structured interviews. All interviews were carried out between July 30<sup>th</sup>, 2015 and September 28<sup>th</sup>, 2015.

### List of interviewees:

#### *EU level*

Fabienne Gautier (DG Research and Innovation)  
Arie van der Zwan (DG Research and Innovation)  
Amanda Crowfoot (Science Europe)  
Stephan Kuster (Science Europe)  
Edward Ziarko (chair monitoring ERAC Working Group)  
Lidia Borrél (EUA)

#### *Austria*

Christian Naczinsky (Federal Ministry of Science, Research and Economy)  
Andrea Höglinger (Austrian Research Promotion Agency-FFG)

#### *Finland*

Riitta Maijala (Ministry of Education and Culture)

#### *Portugal*

Vítor Corado Simões (JRC correspondent Portugal)  
Ana Quartin (Foundation for Science and Technology, on behalf of ERAC delegation Portugal)

#### *Czech Republic*

Martin Srholec (JRC correspondent Czech Republic)  
Mikal Pazour (Technology Centre ASCR)  
Lukas Levák (Ministry of Education, Youth and Sports)



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Consulted websites:

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[http://ec.europa.eu/research/era/partnership\\_en.htm](http://ec.europa.eu/research/era/partnership_en.htm)

<http://ec.europa.eu/research/index.cfm?pg=newsalert&year=2015&na=na-030315>

[http://ec.europa.eu/research/era/era-net-in-horizon-2020\\_en.html](http://ec.europa.eu/research/era/era-net-in-horizon-2020_en.html)

<http://era.gv.at/directory/89>

## **Annex III**

### **Research Paper on the Monitoring Mechanisms of the Integrated European Research Area**

**Research paper  
by Laura de Haan, Paul Vroonhof (Panteia), Simon  
Broek (Ockham IPS)**

#### **Abstract**

The paper identifies some fundamental shortcomings - as well as technical shortcomings - related to the monitoring of ERA, such as the fact that the one set of indicators runs the risk of not capturing the high level of heterogeneity in terms of objectives and interests. In addition, there is a lack of entry points for mutual learning and a lack of incentives for governments to take action. Based on an indicative assessment, if the monitoring system allowed more effective policy learning, the ERA implementation would have been further developed. This difference in development is indicatively quantified as €1.5 billion. It should be noted that this estimation should be treated with caution. The following recommendations are made for a future ERA monitoring system: 1) Focus, besides the quantitative indicators, on qualitative policy-related benchmarks as the ERA implementation is first of all about removing barriers and creating favourable conditions. 2) Set up an ERA policy index. 3) Set baseline values and target values for specific indicators. 4) Set up a system of self-assessment. 5) Continue and intensify efforts for country peer reviewing and self-assessment as part of the Policy Support Facility.

#### **AUTHOR**

This paper has been written by **Laura de Haan and Paul Vroonhof of Panteia** and **Simon Broek of Ockham IPS**, at the request of the European Added Value Unit of the Directorate for Impact Assessment and European Added Value, within the Directorate General for Parliamentary Research Services (DG EPRS) of the General Secretariat of the European Parliament. It is part of a Cost of Non-Europe report produced for the European Parliament's Committee on Industry, Energy and Research.

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## **Executive Summary**

The concept of the European Research Area (ERA) was first launched at the Lisbon European Council in 2000. As originally defined, the concept promoted increased co-ordination and cooperation among national research policies and programmes. This briefing paper examines the ERA monitoring mechanisms and provides an answer to the following four questions: 1) What is the current state of the monitoring system and the criteria used? 2) To what extent are the current monitoring mechanisms and criteria in principal sufficient and detailed enough to assess the level of implementation of the ERA infrastructure with regard to the five ERA priorities? 3) What are the costs incurred due to gaps or barriers in the monitoring mechanisms as established by the Commission? 4) Which monitoring mechanisms and criteria should be introduced to improve the monitoring mechanism used by the Commission? As a summary, the key findings of the chapters, answering the four research questions, are presented here below.

## **State of play of monitoring**

The ERA monitoring mechanism (EMM) was developed with the aim of assessing progress in the compliance of ERA at three levels: Firstly, at the policy level information is gathered on some key indicators to provide an inventory of what national and regional policies have been developed and implemented. The data is gathered by consultants in consultation with the national stakeholders. Secondly, at the operational level the monitoring tries to assess the extent to which of the research funding organisations (RFOs) and research-performing organisations (RPOs) comply with a number of key criteria of ERA. The data is gathered through a survey launched by the European Commission. Finally, at European level, the EMM brings together the findings from the other levels to provide a state of play of the implementation of ERA in Europe. The gathered information forms the basis for the ERA Progress Reports. For the new period 2015-2020, acknowledging that ERA implementation is an ongoing process, the Council of the European Union endorsed the ERA Roadmap 2015-2020. The adoption of the ERA Roadmap also has consequences for the monitoring system of ERA. The Roadmap, more than the 2012 Communication, explicitly recognizes the differences between national research systems (whereas the Progress Reports were criticized for paying too little attention to national differences). This entails that the Roadmap will have to be situated in national contexts, translated into national roadmaps and hence the EMM will have to be adapted accordingly.

## **Assessment of ERA monitoring**

There are fundamental shortcomings related to the objective of monitoring: the heterogeneity of the countries' objectives in ERA implementation is not sufficiently taken into account, and there is a lack of entry points for mutual learning and as well as incentives for governments to take action. There are technical shortcomings concerning the data collection and presentation: availability of data is problematic and there are no baselines or objectives to serve as a reference. Figures and data presented in the Progress Reports are fragmented: they provide an insight on a detailed level, but no overall overview.

## Quantification of ineffectiveness of monitoring system

Based on an indicative assessment, if the monitoring system allowed more effective policy learning, the ERA implementation could have been further developed. This difference in development is indicatively quantified as being between 0 Euro and 3 billion Euro (mean of 1.5 billion Euro). It should be noted that the in the scenarios expressed estimations should be treated with caution due to the following reasons. Firstly, as argued earlier, it is perhaps not right to speak about the completion of ERA as ERA implementation is an ongoing process. Secondly, the contribution of ineffective monitoring to the suboptimal level of implementation is not quantifiable and hence the calculation relies on providing a bandwidth and a mean.

## Improving the monitoring mechanism

A future ERA monitoring system should acknowledge 1) that not one set of indicators could capture the high level of heterogeneity in terms of objectives and interests as expressed by different stakeholders; 2) the need for increased possibilities for mutual learning; 3) the need for more qualitative information about stages of development of policy development and implementation; 4) that monitoring should be in line with the Roadmap approach of creating ownership at national level; 5) the monitoring should create incentives for governments and other stakeholders to act. Based on this, the following recommendations are provided:

- Focus, besides the quantitative indicators, on qualitative policy-related benchmarks as the ERA implementation is first of all about removing barriers and creating favourable conditions.
- Set up an ERA policy index. This ERA policy index could consist of a small number of key policy development areas on which a level of maturity can be identified. For instance a five-level scoreboard<sup>150</sup>:
  - No system in place and developments are based on ad-hoc activities;
  - Dialogue between stakeholders is organised leading to first steps of policy planning;
  - Break-even point: dialogue between stakeholders leads to results: policy plans and programmes;
  - Implementation: policies and programmes are being implemented;
  - M&E, reviews, improvement: Results from independent evaluations or peer reviews are shared with key stakeholders and recommendations from evaluations and peer reviews feed back into further developments.
- Set baseline values and target values for specific indicators to allow becoming visible progression and direction towards the agreed objectives, related to the ERA policy index.
- Set up a system of self-assessment (associated with the Roadmap). This would allow countries to identify areas in which they are strong and areas where they might be weak.
- Continue and intensify efforts for country peer reviewing and self-assessment as part of the Policy Support Facility, which is designed to help EU Member States reform their research and innovation systems.

<sup>150</sup> A similar principle was suggested by ICF, labelled ‘a traffic light rating system’ that could assess the performance for ERA progress, and present it the form of three status categories. (ICF International,(2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation)

## Abbreviations

ANI	National Innovation Agency
CESAER	Conference of European Schools for Advanced Engineering Education and Research
EARTO	European Association of Research and Technology Organisations
EC	European Commission
EMM	ERA monitoring mechanism
ERA	European Research Area
ERAC	European Research Area and Innovation Committee
ESFRI	European Strategy Forum on Research Infrastructures
EU	European Union
EUA	European University Association
FP7	Framework Programme 7
GDP	Gross Domestic Product
GBAORD	Government Budget Appropriations or Outlays on Research and Development
GBARD	Government Budget Appropriations on Research and Development
GERD	Gross domestic expenditure on research and development
JPI	Joint Programming Initiative
LERU	League of European Research Universities
NG	National Government
NRP	National Reform Programme
OECD	Organisation for Economic Co-operation and Development
R&D	Research & Development
RI	Research Infrastructure
RFO	Research Funding Organisations
RPO	Research Performing Organisations
RSO	Research Stakeholder Organisations
SHO	Stakeholder Organisation



## 1. Introduction

The concept of the European Research Area (ERA) was first launched at the Lisbon European Council in 2000. Prior to that, the landscape of research in Europe was scattered, the EU involvement in other European programs was limited and national research policies were largely closed. The Lisbon Council called for a change in research and innovation governance at the EU level and proposed the concept of the European Research Area. This concept, as originally defined, promoted increased co-ordination and cooperation among national research policies and programmes<sup>151</sup>.

This briefing paper examines the ERA monitoring mechanisms. The monitoring system related to the implementation of an ERA is an area which has come under discussion as for instance expressed by ERAC (European Research Area and Innovation Committee)<sup>152</sup>, Science Europe<sup>153</sup> and a European Commission commissioned report on the indicators system by ICF<sup>154</sup>. Despite all efforts, there is no reliable data to monitor ERA compliance. 14 years after the European Council's call in 2001 for mapping excellence in R&D in all Member States, and six years after the EU Council called for reporting on R&D target progress in all National Reform Programmes (NRPs), still only 19 out of 28 Member States NRPs report on ERA implementation actions. It has proven difficult to establish a system that accounts for the complex nature of ERA and provides indicators for national context factors. Based on the available data, performance of countries with regards to innovation, research and development varies greatly. As a result, looking at the average EU progress in this area, some Member States are drivers whilst others lag behind.

The Commission<sup>155</sup> stated in 2014 that strengthening ERA monitoring is one of the key future challenges of ERA: *“The EMM [ERA Monitoring Mechanism] is based on indicators and data gathering mechanisms, agreed with the Member States. ERA monitoring has proved useful in measuring progress made on the ERA policy actions. However, the exercise has its limits [...]. Further work is needed to identify and fine-tune essential indicators of progress in ERA and potentially expand the scope of EMM”*.

This briefing paper first presents a description of the monitoring mechanisms (chapter 2). The paper then continues with an assessment on whether the monitoring mechanisms proposed by the Commission are sufficient to assess the functioning of the ERA and whether the monitoring provides encouragement to continue to work on the ERA implementation (through benchmarking and peer learning) (chapter 3). Subsequently, the result of this analysis will be compared with the Commission's impact assessment, which calculated that the integration of the European Research Area could result in a gain of 16 billion annual GDP<sup>156</sup>, to estimate to which extent the identified gaps and barriers will

<sup>151</sup> Tender Specifications

<sup>152</sup> The European Research Area and Innovation Committee (ERAC) is a strategic policy advisory committee whose principal mission is to provide timely strategic input to the Council, the Commission and Member States on research and innovation issues that are relevant to the development of the European Research Area, the European Semester and the Europe 2020 flagship initiative Innovation Union. The mandate of the Committee is set out in an annex to the Council resolution on the advisory work for the European Research Area of 31 May 2013 (doc. 10331/13). The Secretariat of the Committee is provided by the General Secretariat of the Council ([http://ec.europa.eu/research/era/partnership\\_en.htm](http://ec.europa.eu/research/era/partnership_en.htm))

<sup>153</sup> Science Europe is an association of European Research Funding Organisations (RFO) and Research Performing Organisations (RPO), based in Brussels. Its founding General Assembly took place in Berlin in October 2011 (<http://www.scienceurope.org/>).

<sup>154</sup> ERAC (ERAC 1201/14).ERAC Opinion on the European Research Area Progress Report 2013. Brussels, 09-01-2014; “ERAC Working Group to discuss ERA Roadmap indicators”. <http://era.gv.at/object/news/1842>; ICF International (2015). Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation; Science Europe (2012), Science Europe Statement on the European Research Area

<sup>155</sup> European Commission, COM (2014) 575 final. Communication from the Commission to the Council and the European Parliament. European Research Area Progress Report 2014,

<sup>156</sup> Impact Assessment report (SWD (2012) 212 final), accompanying the document European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

reduce this number (chapter 4). Finally, chapter 5 presents recommendations and suggestions to improve the monitoring system.

In particular, the briefing paper will address the following questions:

- *What is the current state of the monitoring system and the criteria used?*
- *To what extent are the current monitoring mechanisms and criteria in principal sufficient and detailed enough to assess the level of implementation of the ERA infrastructure with regard to the five ERA priorities (more effective national research systems, optimal transnational co-operation and competition, an open labour market for researchers, gender equality and gender mainstreaming in research and optimal circulation, access to and transfer of scientific knowledge including via digital ERA)?*
- *What are the costs incurred due to gaps or barriers in the monitoring mechanisms as established by the Commission?*
- *Which monitoring mechanisms and criteria should be introduced to improve the monitoring mechanism used by the Commission?*

It needs to be noted that because the European Commission uses the concept of ERA completion<sup>157</sup>, the quantification of the costs relates to the idea of ERA as something that can be completed and in relation to which a distance to target can be provided. This being said, when it comes to further improving the monitoring system, this report, based on an assessment of the available information, regards ERA implementation as an open-ended process.<sup>158</sup> Characterising ERA as an open-ended process, discredits the idea of a 'distance to target', however in this report thinking in terms of completion serves as a heuristic or diagnostic tool allowing stakeholders to see room for improvement.

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<sup>157</sup> European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012.

<sup>158</sup> "ERA is an ongoing process with many different stakeholders and decision-makers at multiple levels." ERAC (ERAC 1201/14).ERAC Opinion on the European Research Area Progress Report 2013. Brussels, 09-01-2014

## 2. State of play of monitoring

### Key messages

- The ERA monitoring mechanism (EMM) was developed with the aim of assessing progress in the compliance of ERA at three levels: firstly, at the policy level (national and regional policies); secondly, at the operational level (research funding organisations (RFOs) and research-performing organisations (RPOs)); and finally, at European level, the EMM brings together the findings from the other levels to provide a state of play of the implementation of ERA in Europe. The outcomes of the EMM form the basis for the ERA Progress Reports.
- For the new period 2015-2020, acknowledging that ERA implementation is an open-ended process, the Council of the European Union endorsed the ERA Roadmap 2015-2020. The adoption of the ERA Roadmap also has consequences for the monitoring system of ERA. The Roadmap, more than the 2012 Communication, explicitly recognizes the differences between national research systems (whereas the Progress Reports were criticized for paying too little attention to national differences). This entails that the Roadmap will have to be situated in national contexts, translated into national roadmaps and hence the EMM will have to be adapted accordingly.

In this chapter, the first research question is dealt with: What is the current state of the monitoring system and the criteria used? The nature of this chapter is descriptive, as it aims to present the ERA monitoring in the period from 2012 until now. As the monitoring system is in a phase of transition whereby the existing system is not (fully) replaced by a new system (the roadmaps are still under negotiation in many countries), the Chapter will in the first section (2.1) describe the monitoring mechanisms that have been used in the ERA Progress Reports published in 2013 and 2014. The second section (2.2) aims to describe the monitoring system and developments surrounding the recently launched ERA Roadmap 2015-2020. Describing the monitoring systems for both the 2012-2014 period and the 2015-2020 allows identifying fundamental and technical shortcomings in Chapter 3 (assessment).

### 2.1 ERA Progress Reports (2012-2014)

For the period 2012-2014, the guiding document for ERA has been the 2012 Communication<sup>159</sup>, which identified priorities as well as actions to be taken by the different stakeholders. This document envisaged that by 2014, when all actions are taken by the different stakeholders and the Commission, ERA would enter a phase of 'completion'.

The ERA monitoring mechanism (EMM) is based on indicators and data gathering mechanisms, agreed with the Member States<sup>160</sup>. The EMM was developed with the aim of assessing progress in the compliance of ERA at three levels:

<sup>159</sup> European Commission, COM (2012) 392 final A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

<sup>160</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014

- Firstly, at the policy level information is gathered on some key indicators to provide an inventory of what national and regional policies have been developed and implemented. The data is gathered by means of a number of activities including research prepared by ERAWATCH<sup>161</sup> in consultation with the national stakeholders.
- Secondly, at the operational level the monitoring tries to assess the extent to which of the research funding organisations (RFOs) and research-performing organisations (RPOs) comply with a number of key criteria of ERA. The data is gathered through a survey launched by the European Commission.<sup>162</sup>
- Finally, at European level, the EMM brings together the findings from the other levels to provide a state of play of the implementation of ERA in Europe.

The gathered information forms the basis for the ERA Progress Reports. At the time of writing of this report, two ERA Progress Reports have been published: 2013 and 2014<sup>163</sup>. The next Progress Report is planned for 2016, as it has been concluded that a two year interval is more appropriate for the dynamics of ERA.

The **2013 ERA Progress Report** presented an overview of the political context, steps taken and first achievements of Member States and selected Associated Countries. The report is accompanied by country fiches presenting the state of play for each ERA priority as identified so far, including new measures mentioned in the 2013 National Reform Programmes and/or identified during country visits. The ERA Facts and Figures 2013 is based on different sources of information:<sup>164</sup>

1. Contributions and comments by national authorities on the policy context and different measures identified by the Commission;
2. The 2013 National Reform Programmes submitted by the Member States in the context of the European Semester;
3. Country missions undertaken by the Commission's services to analyse EU Member States' programmes of economic and structural reforms;
4. Eurostat official statistics;
5. Specific analysis of the implementation at national level of the ERA Communication priorities carried out by the Joint Research Centre with the support of independent national experts;
6. Research Funding Organisations' (RFOs) and Research Performing Organisations' (RPOs) responses to the '2012 Survey on the State of Play of the implementation of ERA';
7. Contributions by Stakeholder Organisations (SHO) which participate in the ERA Platform (the European Association of Research and Technology Organisations

<sup>161</sup> ERAWATCH provides information on European, national and regional research and innovation systems, policies, and programmes in the EU and beyond. It supports evidence based policy making in Europe and contributes to the realisation of the European Research Area (ERA). ERAWATCH covers 61 countries: the 28 Member States of the European Union, 13 countries associated with the 7th European Community's Research Framework Programme and 20 third countries. It also provides an overview of the European Union. ERAWATCH information has been collected and presented by JRC-IPTS with the support of external experts. Since 2013 ERAWATCH content updates have been focused primarily on Annual Country Reports (ACR), Country Fiches and other relevant analytical reports. See: <http://erawatch.jrc.ec.europa.eu/>

<sup>162</sup> See: ERA survey 2012: [http://ec.europa.eu/research/era/survey2012\\_en.htm](http://ec.europa.eu/research/era/survey2012_en.htm) ; ERA survey 2014: [http://ec.europa.eu/research/era/era\\_survey2014\\_en.htm](http://ec.europa.eu/research/era/era_survey2014_en.htm)

<sup>163</sup> European Commission, COM(2013) 637 final. Report from the Commission to the Council and the European Parliament: European Research Area Progress Report 2013: [http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2013/era\\_progress\\_report2013.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2013/era_progress_report2013.pdf) ; European Commission, COM (2014) 575 Final Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014: [http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2014/era\\_progress-report\\_150521.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2014/era_progress-report_150521.pdf)

<sup>164</sup> European Commission, COM(2013) 637 final. Report from the Commission to the Council and the European Parliament: European Research Area Progress Report 2013.

(EARTO), European University Association (EUA), the League of European Research Universities (LERU), NordForsk and Science Europe (SE).

The **2014 ERA Progress Report** presents the new and update measures adopted at the national level, and different from 2013 presents and compares them with the implementation of ERA actions at the national level by research funding and research performing organisations. For the RFO and RPO levels, no official statistical sources were available. Therefore, the Commission launched the first ERA survey in 2012. However, the responses were not sufficiently representative<sup>165</sup> (this is also the case for the second ERA survey). Hence, the results presented in the Progress Report only provide an indication of the situation among those institutions which responded to the survey.<sup>166</sup>

In the annex of the 2014 Progress Report, a list is provided of 63 indicators that have been agreed with Member States. The list also includes an assessment of all indicators, which shows that a large part is not estimated and not included in the comparison of the Progress Report. 35 indicators out of that list are included in the country snapshots or in the country fiches<sup>167</sup> (hence available at country level).

## 2.2 ERA Roadmap 2015-2020

For the new period 2015-2020, acknowledging that ERA implementation is an open-ended process, meaning that implementation is a continuous process not reaching a final stage of completion as new challenges and barriers arise on the way, the Council of the European Union endorsed the ERA Roadmap 2015-2020 adopted by the European Research Area and Innovation Committee (ERAC) on May 19<sup>th</sup> 2015<sup>168</sup>. The purpose of the Roadmap is to identify a limited number of key implementation priorities which are likely to have the biggest impact on Europe's science, research and innovation systems if all the members of the ERA partnership get them right. This Roadmap identifies actions at the national and European level, for each ERA priority.

The adoption of the ERA Roadmap also has consequences for the monitoring system of ERA. The Roadmap, more than the 2012 Communication, explicitly recognizes the differences between national research systems (whereas the Progress Reports were criticized for having too little attention for national differences). This entails that the Roadmap will have to be situated in national contexts and translated into national roadmaps. The deadline for this voluntary commitment of Member States is May 2016. With the Roadmap, the Member States are in the lead to define action plans according to national priorities (in terms of objectives, actions, priorities, indicators, targets, deadlines).

In its Conclusions, the Council invites ERAC (European Research Area and Innovation Committee) to propose by the end of 2015 a set of core indicators and, where appropriate, qualitative methods allowing to monitor the implementation of the ERA Roadmap. It also stresses that the Commission should consider integration of the monitoring of the Roadmap into the 2016 Progress Report to avoid unnecessary administrative burdens.

<sup>165</sup> Due to the voluntary nature of the 2014 ERA Survey, the figures are not representative and only relate to research performing organisations that answered the Survey in 2014. This includes funders which manage 34% van GBOARD in the EU, performers which employ 32% of total staff and 20% of researchers in RPOs. The constituency in the survey gathers 20% of the most important RPOs as identified by Member States.

<sup>166</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014,

<sup>167</sup> The country fiches are available at [http://ec.europa.eu/research/era/eraprogress\\_en.htm](http://ec.europa.eu/research/era/eraprogress_en.htm)

<sup>168</sup> Council of the European Union (2015) (8975/15). Draft Council conclusions on the European Research Area Roadmap 2015-2020 – Adoption. Brussels, 19.05.2015.

Within ERAC, a Working Group has been set up mandated with the task of identifying a limited number of headline indicators. The set of indicators should show progress on addressing the top implementation priorities identified in the roadmap. The aim is to identify one indicator for each implementation priority (8 in total), as too many indicators risks losing focus. The Working Group states that there will also need to be a more detailed and sophisticated system for monitoring the full ERA agenda, which will underpin future ERA Progress Reports.<sup>169</sup>

In consultation with the European Commission and other experts, the Working Group has drafted a proposal for this set of indicators<sup>170</sup>. The proposed indicators serve as a basis for discussion. In their work the Working Group took into account the analysis and suggestions included in the recently finished ICF study commissioned by DG Research and Innovation<sup>171</sup>, which assesses the progress in achieving ERA in Member States and Associated Countries. The document drafted by the Working Group provides a first proposal of a set of detailed descriptions of indicators and the pros and cons for each indicator. In the table below the proposed indicators are presented.

**Table 1: Suggested Roadmap indicators ERA working group<sup>172</sup>**

Priority	Top Action Priority Roadmap	Indicator proposed	Source
<b>PRIORITY 1 (Effective national research systems)</b>	Strengthening the evaluation of research and innovation policies and seeking complementarities between, and rationalisation of, instruments at EU and national levels.	The proposed indicator is EU Framework Programme Funding per thousand Euro GERD <sup>173</sup> , expressed in percentage <sup>174</sup>	"Research and Innovation performance in the EU: Innovation Union progress at country level", European Commission,
<b>PRIORITY 2a (Jointly Addressing Grand Challenges)</b>	Improving alignments within and across the Joint Programming Process and the resulting initiatives (e.g. Joint Programming Initiatives (JPIs)) and speeding up their implementation.	Share of national GBARD <sup>175</sup> allocated to Europe-wide, bilateral or multilateral transnational public R&D programmes <sup>176</sup>	Eurostat
<b>PRIORITY 2b: Make optimal use of public investments in Research Infrastructures - RI's</b>	Making optimal use of public investments in RIs by setting national priorities compatible with the ESFRI priorities and criteria taking full account of long term sustainability	No indicator is proposed	

<sup>169</sup> "ERAC Working Group to discuss ERA Roadmap indicators". <http://era.gv.at/object/news/1842>

<sup>170</sup> Version 2 oct

<sup>171</sup> ICF International (2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation

<sup>172</sup> ERAC working Group on ERA Roadmap indicators, Vienna Fiches 2015: <https://era.gv.at/object/news/1842>

<sup>173</sup> GERD: Gross domestic expenditure on **research** and development

<sup>174</sup> The Framework Programmes for Research and Technological Development are the EU's main instruments for supporting collaborative research, development and innovation in science, engineering and technology. All member states participate. The funding is on a competitive base and depends on evaluations. Numerator: total EU Framework Programme funding in the country. Denominator: total GERD. The indicator does not prescribe an optimal percentage but suggests rather a corridor of a typical ratio between EU and national funding. This means that both extreme ends of the graph are to be avoided. Countries with a share of EU Framework Programme funding at the highest end might consider the potential of substitution effects or an increasing dependency on EU funding instruments. Countries with a share of EU Framework Programme funding at the lowest end might consider the better exploitation of unused national potential in EU competition.

<sup>175</sup> GBARD (Government Budget Appropriations on Research and Development) will be the new name of GBAORD (Government Budget Appropriations or Outlays on Research and Development) in the forthcoming new edition of the Frascati manual.

<sup>176</sup> National public funding to transnationally coordinated research is measured as the 'government budget appropriations or outlays for research and development (GBAORD)' directed towards three categories of research and development (R & D) performers and programmes: transnational public R&D performers located in Europe, Europe-wide transnational public R & D programmes and bilateral or multilateral public R & D programmes established between Member State governments or with EFTA and candidate countries. In the context of priority 2a it is most meaningful to include only the last two sub-classifications. Numerator: GBAORD allocated to transnationally coordinated research. Denominator: Total GBAORD

<b>PRIORITY 3 (Open Labour Market for Researchers)</b>	Using open, transparent and merit based recruitment (OTM-R) practices with regard to research positions	Proportion of doctoral candidates with citizenship of another EU Member State as a percentage of all doctoral candidates (possibly also the share of doctoral candidates from non EU countries) <sup>177</sup>	Eurostat data (the share of non-EU doctoral candidates is also included in the Innovation Union Scoreboard)
<b>ERA PRIORITY 4 (Gender Equality and Gender Mainstreaming in Research)</b>	Translating national equality legislation into effective action to address gender imbalances in research institutions and decision making bodies and integrating the gender dimension better into R&D policies, programmes and projects.	Proportion of women A grade in Higher Education Sector (HES) <sup>178</sup>	She Figures Study (managed by DG RTD)
<b>PRIORITY 5 a (Scientific knowledge transfer)</b>	Fully implement knowledge transfer policies at national level in order to maximize the exploitation of scientific results. RPOs and RFOs should make knowledge transfer second nature by integrating it in their everyday work.	Public-private co-publication per million of the population <sup>179</sup>	University of Leiden (CWTS/Reuters) and Eurostat
<b>PRIORITY 5b (Promoting Open Access to scientific publications)</b>	At National level Member States and Associated Countries should promote Gold and/or Green Open Access in line with the Commission's 2012 Recommendation on access to and preservation of scientific information (covering both scientific publications and research data). In particular, they should ensure the further implementation of open access to scientific publications by the most appropriate means in their own research environment.	Proportion of Open Access papers per country, 2008-2013 <sup>180</sup>	Science-Metrix
<b>PRIORITY 6 (International cooperation)</b>	Develop and implement joint strategic approaches and actions for international STI cooperation on the basis of Member States' national priorities.	International scientific co-publications with non-EU countries per million of the population <sup>181</sup>	This indicator is not available from Eurostat but can be produced through the existing bibliometric databases

These proposed indicators are meant to form the core system, embedded within a more comprehensive system that will feed the progress reports. The following chapter will go further into detail on this proposed system and its potential consequences.

<sup>177</sup> Fairly self-explanatory; dividing the number of doctoral candidates in each Member State by the number of doctoral candidates with citizenship of another MS

<sup>178</sup> This indicator is available from the She Figures 2015 (expected e-publication in December 2015) and previous releases. The She Figures 2018 should yield new data in 2018 (reference year 2016). Numerator: Number of women grade A in HES. Denominator: Sum of number of men and women grade A in HES.

<sup>179</sup> This indicator is published by Eurostat and is part of the Innovation Union Scoreboard (indicator 2.2.3.). It captures public-private research linkages and active collaboration activities between business sector researchers and public sector researchers which give rise to academic publications. Numerator: Number of public-private co-authored research publications. The definition of the "private sector" excludes the private medical and health sector. Publications are assigned to the country/countries in which the business companies or other private sector organisations are located. Denominator: Total population.

<sup>180</sup> The indicator shows the proportion of Open Access papers published in peer reviewed Journals at the European and World levels over the period 2008 -2013 based on data from the Scopus database. Also a Composite indicator has been developed to measure the growth of Open Access over the years 2011-2013 vs. 2008-2010. (based on a study by Science Metrix RTD B6-PP-2011-2: Study to develop a set of indicators to measure Open Access).

<sup>181</sup> International co-publications are an outcome of international STI cooperation. International scientific co-publications can also be a proxy for the quality of scientific research as collaboration tends to lead to higher quality research as measured in terms of citations. Numerator: Number of scientific publications with at least one co-author based outside of the EU. Denominator: Total population (in million).

### 3. Assessment of ERA monitoring

#### Key messages

- There are fundamental shortcomings related to the objective of monitoring: establishing one set of indicators runs the risk of not capturing the high level of heterogeneity in terms of objectives and interests; there is a lack of entry points for mutual learning as well as incentives for governments to take action.
- There are technical shortcomings concerning the data collection and presentation: availability of data is problematic and there are no baselines or objectives to serve as a reference. Figures and data presented in the Progress Reports are fragmented: they provide an insight on a detailed level, but no overall overview.

The previous chapter provided an overview of the state of play of monitoring of ERA. This chapter aims to critically reflect on the ERA monitoring mechanisms and deals with the second research question: to what extent are the current monitoring mechanisms and criteria in principal sufficient and detailed enough to assess the level of implementation of the ERA infrastructure with regard to the five ERA priorities (in the pre-roadmap period)? There are several reports and conclusions available that focus on the ERA monitoring system<sup>182</sup>. Based on our own findings as well as these reports, it can be concluded that the monitoring mechanism used for the 2013 and 2014 Progress Reports were not sufficient to monitor ERA implementation to the extent to provide a basis for national stakeholders to evaluate the progress in their country in relation to other countries. In 2015, the Commission is working on improvements for the next Progress Report, expected in 2016 (in the light of the ERA Roadmap).

The reasons for ineffective monitoring can be grouped as: 1) Fundamental shortcomings related to the objective of monitoring; and 2) Technical shortcomings concerning the data collection. These are discussed here below.

#### 3.1 Fundamental shortcomings related to the objective of monitoring

The ERA consists of a wide pallet of different objectives and priorities. Each priority entails again another spectrum of sub objectives and potential policy options. For instance in relation to priority 1 'More effective national research systems', the 2012 Recommendation indicates two areas for work, namely allocating funding through open calls for proposals; and assessing the quality of research-performing organisations and teams and their outputs as a basis for institutional funding decisions. In addition, the Recommendation acknowledges that the balance between these two approaches may vary.<sup>183</sup> This depends on what is most appropriate given the national research system; in the two areas, Member States' governments and other stakeholders can make different

<sup>182</sup> Eg. ICF International (2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation; ERAC (ERAC 1201/14).ERAC Opinion on the European Research Area Progress Report 2013. Brussels, 09-01-2014.

<sup>183</sup> European Commission, COM (2012) 392 final A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012



and even opposing choices. Related to this, the different stakeholders, such as the national governments, research performing organisations, research funding organisations can have different interests and viewpoints on the ERA priorities and the directions it should take. For example, universities are regarded within EMM with the same indicators as any other research organisations, yet the academic nature of universities' work suggests they should have separate indicators for performance as they have to comply with other (education-related and society-related (valorisation)) objectives as well. The ICF report mentions that Member States criticize the current system for Progress Reports, as they are not able to recognize the diversity of research systems and pathways to achieving ERA<sup>184</sup>. The Progress Report 2014 acknowledges that there is no one pathway for ERA completion: "There is no single path to achieve ERA. The pace and level of ERA implementation very much depends on the national context and is fostered by targeted policies at Member States level"<sup>185</sup> Establishing **one set of indicators**, as proposed in the light of the ERA Roadmap, **runs the risk of not capturing this high level of heterogeneity in terms of objectives and interests**.

In the Roadmap approach, MS have their own monitoring, this allows for a **more place specific measurement** of compliance. The ICF analysis suggests that national roadmaps can have added value to existing monitoring activities, if they have a common structure (whilst allowing Member States flexibility in pace and scope of action). It is concluded that any future integrated approach for the monitoring system should be built around a core set of indicators with individual roadmaps, to allow for specific features of national systems and national objectives.

The European Monitoring Mechanism (EMM) is designed, as both benchmarking instrument and a tool for mutual learning. Stakeholders interviewed, but also the ERAC secretariat, indicate that there is certainly room for improvement. The current monitoring system only limitedly allows stakeholders to identify good practices in other countries and hence it offers only **few incentives for mutual learning**. Self-assessment and comparison with other countries can lead to three types of learning (see Visser and Hemerijck 2001) namely, 1) learning through one's own experience by conducting a (self) assessment together with the national stakeholders; 2) learning from other country's experiences in how they have encountered challenging issues; 3) learning with others by voluntary exchange of information and positions in decisional situations. The latter proceeds on the assumption that frequent interaction can alter the preferences of member states and thus enable joint decisions to be taken.<sup>186</sup>

The second and third form of learning are especially needed in the ERA implementation. Based on the interviews, the current monitoring system is felt not to provide these policy learning forms in full: half of the respondents indicated that the monitoring system allows national policy makers to learn from other countries' solutions. The most common mentioned function of the monitoring system is that it provides 'an entry into another country's system', after which further study is needed to transform the first entry into policy learning. The Progress Report aims to provide a benchmark, yet, only partially

<sup>184</sup> ICF International (2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation.

<sup>185</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014, p.7.

<sup>186</sup> The concept of deliberative learning was developed with the aim of preventing bottle-necks in production and optimising processes at the plant level. By exchanging information, actors are able to check and adjust their own decisions with regard to anticipated changes in the behaviour of other actors (Sabel 1994: 158). This school of thought argues that these considerations can be transferred from business practice to governmental action ("democratic experimentalism", e.g. Dorf and Sabel 1998). Consulting, experimentation, the exchange and pooling of information enlarge the scope for action and enable policy learning in the sense of pursuing common goals.

succeeds due to the above mentioned issues. The mutual learning component gets very little attention.

Furthermore, the current indicators do not encourage governments to perform better, as they do not actually measure progress on an overall level. Some indicators are only relevant for top performing countries, for instance. Several interviewees have mentioned that there should be more focus on context, 'the story' and qualitative aspects, to get a grasp on the impact of ERA actions. The focus on finding appropriate indicators seems to have been too strong, whereas the contextual issues have gotten too little attention.

The ERA progress reports, in line with the 2012 Communication, speak about ERA completion and ERA compliant. Different stakeholders, for instance the ERAC, in its' Opinion on the 2014 ERA Progress Report, stipulates that **ERA is an ongoing process** with many different stakeholders and decision-makers at multiple levels.<sup>187</sup> Furthermore, Science Europe speaks already in 2012 about "the philosophy of ERA is that it is evolving, dynamic, flexible and creative; it is by nature something that will not, and should not, be 'completed'."<sup>188</sup> This viewpoint of ERA as an ongoing or open-ended process, whereby old problems are solved and new challenges arise is closer to the reality and puts more emphasis on the necessity to acknowledge heterogeneity of ERA implementation pathways and the need for effective policy learning between countries and with countries.

### 3.2 Technical shortcomings concerning the data collection and presentation

On top of the fundamental shortcomings related to the objective of monitoring, presented above, this section reveals certain technical shortcomings concerning the data collection and presentation.

Securing robust information to support decision-making has proven difficult, as **availability of data is problematic**. This resulted in an unstable set of indicators<sup>189</sup>. Besides EU-level monitoring system, only some countries also have national level monitoring systems, whereas others have none. For instance, Austria has a very comprehensive ERA dashboard, meant to keep track of all ERA development (not only based on indicators, but also on input of different actors)<sup>190</sup>. On the other hand, the Czech Republic has no specific system to monitor ERA actions at the national level. The biggest change the ERA Roadmap shows in comparison with the 2014 Report, is that **only existing data** (eg. from JRC, Eurostat) will be used. Collecting data has proven to be too difficult and costly. The ICF authors<sup>191</sup> suggest that the gaps in data availability show the need for a more complete and comprehensive data collection from existing sources (rather than entirely new data collection exercises).

In addition, and related to lack of available and reliable data, there are **no baselines set against which developments can be monitored, nor targets set against which the progression can be tracked**. The ERA priorities and objectives are not translated in measurable targets for which indicators are developed. For instance, 'effective research infrastructures' involves the measure "to allocate funding through open calls for proposals, evaluated by panels of leading independent domestic and non-domestic

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<sup>187</sup> ERAC (2014), ERAC Opinion on the 2014 ERA Progress Report 1213/14.

<sup>188</sup> Science Europe (2012), Science Europe Statement on the European Research Area

<sup>189</sup> ICF International,(2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation

<sup>190</sup> Part of the 'ERA Observatory': <http://era.gv.at/directory/166>

<sup>191</sup> ICF International,(2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation

experts (peer review) - this incites researchers to reach internationally-competitive levels of performance". As such this is indeed recommendable, but the extent to which a MS should apply project-based funding depends on many variables such as the extent to which this is already good practice; whether the infrastructure is in place, and whether the culture and mentality in research performing and research funding organisations is in place to further develop this. Increasing project based funding can harm national research infrastructures, especially in the newer Member States. For instance, a European Commission study point to higher administrative burdens<sup>192</sup> and also the OECD indicates that there are important downsides to project-based funding (see box below).

**OECD (2011), ISSUE BRIEF: PUBLIC SECTOR RESEARCH FUNDING**

"There is debate about whether the increasing reliance on competitive project or program funding at the expense of block grant and long-term institutional funding has pressured public sector research resulting in an emphasis on short-term, low-risk projects and away from longer term fundamental research. There are also concerns about whether this negatively affects an institutions' capacity to invest in infrastructure. It is difficult to balance performance-based funding approaches with giving autonomy and flexibility to public research institutions."<sup>193</sup>

As indicated, what would be a good outcome on an indicator depends on the country specific context: what is good in one context, might be counterproductive for the research system in another. This raises the question: what does it mean to complete ERA when no targets have been set (for instance a specific level of project-based funding)? One of the key conclusions of the ICF report on the current monitoring system is that success is undefined. Within the Progress Reports, this absence of objectives has led to the use of referencing Member State performance to an EU average. Yet, this approach doesn't show whether ERA has been completed.

This results as well in the assessment that the **figures and data presented in the Progress reports are fragmented: they provide an insight on a detailed level, but no overall overview on the implementation of ERA**. The reports do not include a general ranking of countries for implementation of ERA, as a consequence of the fact that the differences between countries are too big to make a useful comparison. The countries differ in their starting positions, priorities set for the research system, prioritisation allocated to ERA implementation, level of policy reforms and availability of monitoring data. The Progress report 2014 classified countries on the basis of two indicators: "The first is the existence of specific measures in support of ERA as identified by Commission services. The second is the level of implementation by funders and/or RPOs in comparison with the EU average." The classification hence does not provide an overview of the overall progression. The report continues by stating that "in the absence of targets or identified desirable levels of implementation, it is difficult to identify and assess an adequate level of ERA implementation for each of the actions."<sup>194</sup>

Related to the different contexts in which ERA is being implemented in the countries; the different policy choices made; and the need for collective learning on how to stimulate further development of the ERA at national level, the nature of ERA implementation is **inherently qualitative (what, how), which makes quantifying (how many) whether goals have been met difficult**. Opening up research systems entails in the first place

<sup>192</sup> European Commission — Directorate-General for Research (2008), Diversified Funding streams for University-based research: Impact of external project-based research funding on financial management in Universities: [http://ec.europa.eu/invest-in-research/pdf/download\\_en/external\\_funding\\_final\\_report.pdf](http://ec.europa.eu/invest-in-research/pdf/download_en/external_funding_final_report.pdf)

<sup>193</sup> OECD (2011), OECD Innovation Policy Platform ISSUE BRIEF: PUBLIC SECTOR RESEARCH FUNDING: [www.oecd.org/innovation/policyplatform](http://www.oecd.org/innovation/policyplatform)

<sup>194</sup> European Commission, COM (2014) 575 Final Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014: [http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2014/era\\_progress-report\\_150521.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2014/era_progress-report_150521.pdf)

removing barriers and providing incentives for research-performing organisations and researchers to operate across borders (taking into account national priorities as well). Although there is a call for more empirical data gathering by the ERAC secretariat, there is also a need to provide better accessible qualitative information on policy developments, policy initiatives, best practices at the level of research performing and funding organisations. Quantification of progress based on indicators that do not do justice to the complex reality of the ERA implementation could hide a lack of structural reforms as ad hoc interventions might focus more on reaching results in relation to the indicators than on reaching results in reality.

Moreover, **the 2014 Progress Report and the data collection received criticisms** by the stakeholders.<sup>195</sup> The survey conducted under funders and research-performing organisations entailed a large administrative burden. Moreover, it was unclear at what level to respond (some targeted organisations were umbrella organisations, which implies they should speak on behalf of their members who were also consulted). Another related key issue with respect to the Progress Reports is the voluntary nature of the RPO surveys. These were not representative and therefore the results presented only provide an indication of the situation of those institutions which responded to the survey<sup>196</sup>. Interviewed stakeholders indicated that before a next survey is launched, first a thorough evaluation of the methodology, questionnaire, and targeting organisations needs to be conducted.

The newly developed monitoring system for the ERA Roadmap, has some advantages over the previous one in terms of having an overview by using a limited number of indicators (importantly, only a limited number of indicators can be presented to ministers in the political debate). On the other hand, there are a number of downsides:

- **Indicators do not do justice to complex reality:** There is a substantial risk of drawing conclusions on the basis of few indicators. There is a risk of using a system what is not capable of giving an indication on overall progress as choosing 1 indicator may in certain cases be less than perfectly adapted to the Roadmap priority they relate to and are at best proxies for measuring policy developments<sup>197</sup>. ICF also concluded that this minimalist selection of indicators has its problems: it is difficult to represent in single, narrow indicators progress on very broad ambitions. It is suggested that composite indicators could provide a better view, yet issues with data availability suggest this is not feasible at present.
- **Two sets of indicator might create confusion:** The proposed dual system (with only eight indicators as the core message and a more comprehensive set of indicators as the basis for Progress Reports) entails the risk that there will be two separate monitoring mechanisms, making the exercise even more complex).

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<sup>195</sup> See: ERAC (ERAC 1201/14).ERAC Opinion on the European Research Area Progress Report 2013. Brussels, 09-01-2014

<sup>196</sup> European Commission, COM (2014) 575 final. Communication From The Commission To The Council And The European Parliament. European Research Area Progress Report 2014. (see footnote in chapter 2 for further explanation on representativeness)

<sup>197</sup> “ERAC Working Group to discuss ERA Roadmap indicators”. <http://era.gv.at/object/news/1842>

## 4. Quantification of ineffectiveness of monitoring system

### Key messages

- Based on an indicative assessment, if the monitoring system allowed more effective policy learning, the ERA implementation would have been further developed. This difference in development is indicatively quantified as being between 0 Euro and 3 billion Euro (mean of 1.5 billion Euro).
- It should be noted that the in the scenarios expressed estimations should be treated with caution due to the following reasons. Firstly, as argued earlier, it is perhaps not right to speak about the completion of ERA as ERA implementation is an ongoing process. Secondly, the contribution of ineffective monitoring to the suboptimal level of implementation is not quantifiable and hence the calculation replies on providing a bandwidth and a mean.

After describing the state of play (chapter 2) and providing an assessment (chapter 3), this chapter deals with the third research question: What are the costs incurred due to gaps or barriers in the monitoring mechanisms as established by the Commission?

ERA is a dynamic and complex policy field, balancing national and European priorities, involving different levels of stakeholders, combining different types and levels of funding schemes. For this reason, implementing ERA needs to be accompanied by developing new ideas, new ways to solve issues and alternatives to balance different priorities. This involves the need to obtain new perspectives, new views, and reflections on how things used to be arranged; in other words: policy learning. Policy learning is not an end in itself, it serves to implement political programmes or in general terms to attain goals<sup>198</sup>. In this, monitoring is used as a diagnostic tool to assist national actors in improving performance through learning.<sup>199</sup>

In this section, the research team tries to quantify the suboptimal implementation of the monitoring system on ERA. This is done in a two-step approach: firstly, to estimate the

<sup>198</sup> Hartlapp, M (2009), Learning About Policy Learning: Reflections on the European Employment Strategy; in: European Integration online Papers (EIoP), Special Issue 1, Vol. 13, No. 7, 2009, p. 3-4.

<sup>199</sup> Zeitlin, Jonathan (2009), The Open Method of Coordination and reform of national social and employment policies: influences, mechanisms, effects, in: Changing European Employment and Welfare Regimes: The Influence of the Open Method of Coordination on National Reforms; Edited by Martin Heidenreich, Jonathan Zeitlin. See as well a presentation by Zeitlin: <http://eucenter.wisc.edu/OMC/Papers/EUC/JZBamberg.pdf> Policy learning is one of the key mechanisms for change in the European governance model of Open Method of Coordination (OMC). A critical consideration of the research literature on the OMC and policy learning reveals no more than that changes have been taking place in Member States. And we know that there is a mode of governance at the European level that allegedly prompts or facilitates learning processes (Hartlapp, M (2009), Learning About Policy Learning: Reflections on the European Employment Strategy; in: European Integration online Papers (EIoP), Special Issue 1, Vol. 13, No. 7, 2009, p. 3-4.). One of the key difficulties with OMC and national impact is the under-specification of the mechanism underlying the change to be observed. In most studies on the OMC, the relationship between an OMC procedure and change in national policies resembles a black box (Many studies on the OMC assume implicitly or explicitly that the transfer mechanism in the black box' is learning (see López-Santana European Integration online Papers (EIoP), Special Issue 1, Vanhercke this issue). "Its [OMC] real effectiveness and influence nationally is part of a collective learning process" (De La Porte and Pochet 2002a: 13). Or "it organises a learning process in order to promote the exchange of experience and best practice" (Regent 2003: 191). Although assessment of learning processes in the OMC has become more sceptical over time, there is still a lack of systematic in-depth analysis showing that observable policy changes are due to learning by actors or the overall political system.).

overall distance to the completion of ERA; and secondly, to determine the contribution of the monitoring to the overall distance to the completion of ERA.

#### **4.1 Estimate the overall distance to the completion of ERA**

For estimating a distance to the completion of ERA, the only framework available is the 2012 Communication and the detailed Impact Assessment in which an annual benefit was calculated for the completion of ERA of 16 billion Euro.

On the basis of the implementation study, it is estimated<sup>200</sup> that the distance to target to the ERA completion is 19%. This means that the actions taken in the framework of the ERA implementation by different stakeholders<sup>201</sup> led to completing the ERA for 81%. When relating this to the estimated annual benefit of completing ERA from 2030 onwards, as stated in the Impact Assessment<sup>202</sup>, the lack of full completion results in a lack of annual benefit of roughly 3 billion (16 billion Euro \* 0.19).

For attributing part of this annual loss to the lack of effective monitoring, a closer look is given to how the monitoring system contributed to the ERA implementation. For this it takes as reference whether the monitoring tool stimulates to policy learning and, through this, leads to changes at national level. Our principal question hereby is whether progress (measured by implementing more changes in policies) could have been more pronounced if the ERA monitoring allowed a higher intensity of policy learning.

#### **4.2 Determine the contribution of the monitoring to the overall distance to the completion of ERA**

As indicated in chapter 3 Assessment of ERA monitoring, the implementation of ERA could have been more progressed if the monitoring system would allow more mutual policy learning and learning from other countries. How much is difficult to assess. In any case, the more effective monitoring would have affected each of the three conditions for ERA implementation:

- Condition 1: Member State reforms in all ERA priorities
- Condition 2: Speedy implementation of the priorities outlined in the Communication by research stakeholders
- Condition 3: Increased support from the Commission to national ERA policies

The amount by which an effective monitoring system would have contributed is difficult to assess on the basis of evidence and hence is prepared on the basis of a number of assumptions. Through effective monitoring:

- the level of policy learning between Member States would have been at a higher level (condition 1);
- sensible benchmarks would have encouraged Member States more to pursue the ERA objectives (condition 1);

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<sup>200</sup> See for the methodology annex and the report on implementation of ERA.

<sup>201</sup> Three conditions were taken into account (see annex): Condition 1: Member State reforms in all ERA priorities; Condition 2: Speedy implementation of the priorities outlined in the Communication by research stakeholders; Condition 3: Increased support from the Commission to national ERA policies.

<sup>202</sup> Impact Assessment report (SWD (2012) 212 final), accompanying the document European Commission, COM (2012) 392 final. A Reinforced European Research Area Partnership for Excellence and Growth. Brussels, 17.7.2012

- research stakeholders would through benchmarking have been encouraged to pursue the ERA priorities (condition 2);
- the European Commission would have been able to provide more tailored support and assistance to further develop national ERA policies (condition 3).

Based on these assumptions, it is assumed that the impact of an effective monitoring system on the implementation of ERA would have been considerable. With considerable it is meant that Member States could have developed or implemented an additional policy; more RPOs would have been ERA compliant and the European Commission would have been able to implement (a few) more interventions as planned in the Impact Assessment 2012. As the statement of 'considerable' is not quantifiable, three scenarios are developed in relation to the quantitative impact of improved monitoring on the calculated distance to target to the ERA completion which is 19%.

Scenarios	Quantification of the impact of an improved monitorings system
Scenario 1: The monitoring reduced the distance to target from 19% to 0%	0 Euro (16 billion Euro * 0.0).
Scenario 2: The monitoring reduced the distance to target of 19% by half, resulting in a distance to target of 9.5%)	1.5 billion Euro (16 billion Euro * 0.095).
Scenario 3: The monitoring had no impact on the distance to target and hence it remains at 19%	3 billion (16 billion Euro * 0.19).

### 4.3 Caution when using the quantification

It should be noted that the in the scenarios expressed estimations should be treated with caution due to the following reasons. First of all, as already stated at the beginning of this report, it is more realistic to speak about ERA as an open-ended process instead of 'ERA completion'. As the calculations are related ERA completion, this gives the whole exercise something superficial (This counts for the whole idea of completing ERA). Secondly, the contribution of ineffective monitoring to the suboptimal level of implementation is not quantifiable and hence the calculation replies on providing a bandwidth and a mean. Here also other factors play a role (policy priority, government changes, socio-economic situation, research infrastructures etc.). Again, be it shaky, it does provide a mirror to see potential benefits of focussing more on mutual learning.

## 5. Improving the monitoring mechanism

### Key messages

- A future ERA monitoring system should acknowledge 1) that not one set of indicators could capture the high level of heterogeneity in terms of objectives and interests as expressed by different stakeholders; 2) the need for increased possibilities for mutual learning; 3) the need for more qualitative information about stages of development of policy development and implementation; 4) that monitoring should be in line with the Roadmap approach of creating ownership at national level; 5) the monitoring should create incentives for governments and other stakeholders to act.
- Based on this, the following recommendations are provided:
  - Focus, besides the quantitative indicators, on qualitative policy-related benchmarks as the ERA implementation is first of all about removing barriers and creating favourable conditions.
  - Set up an ERA policy index.
  - Set baseline values and target values for specific indicators to allow becoming visible progression and direction towards the agreed objectives.
  - Set up a system of self-assessment (associated with the Roadmap).
  - Continue and intensify efforts for country peer reviewing and self-assessment as part of the Policy Support Facility.

In the current chapter, we address the final research question on how the monitoring system could be improved. In this, we refer to the challenges and shortcomings of the monitoring system identified in Chapter 3. Hereby, we follow the approach that ERA is an open-ended process instead of something that can be completed. In Chapter 3, the assessment identified a number of challenges. Based on these challenges, a future ERA monitoring system could have the following key characteristics; it acknowledges:

1. that not one set of indicators could capture the high level of heterogeneity in terms of objectives and interests as expressed by different stakeholders (MS governments, research performing organisations, research funding organisations, European Commission);
2. the need for increased possibilities for mutual learning in designing, developing, implementing and evaluating ERA related policies and mechanisms;
3. the need for more qualitative information about stages of development of policy development and implementation;
4. that monitoring should be in line with the Roadmap approach of creating ownership at national level, allowing differentiated approaches and priorities set;
5. the monitoring should create incentives for governments and other stakeholders to act, including making clear where conflicting interest lie that could hamper implementation.



It should be emphasised that the Roadmap approach already takes into account the majority of these key characteristics. However, to even better integrate these elements in a future monitoring system, the following recommendations are provided:

1. **Focus, besides the quantitative indicators, on qualitative policy-related benchmarks as the ERA implementation is first of all about removing barriers and creating favourable conditions.** Countries have heterogeneous objectives and purposes for working on ERA. The Roadmap approach is supportive in this direction, but the monitoring of the Roadmap might, if not accompanied by a more qualitative and process oriented approach benchmark countries against a limited number of indicators but portraying a realistic image of the country's true ERA implementation (in other words, more of a focus on the 'story' rather than the quantitative state of play).
2. **Set up an ERA policy index.** This ERA policy index could consist of a small number of key policy development areas, for instance associated with the ERA priorities, on which a level of maturity can be identified. For instance a five-level scoreboard<sup>203</sup>:
  - a. No system in place and developments are based on ad-hoc activities;
  - b. Dialogue between stakeholders is organised leading to first steps of policy planning;
  - c. Break-even point: dialogue between stakeholders leads to results: policy plans and programmes;
  - d. Implementation: policies and programmes are being implemented;
  - e. M&E, reviews, improvement: Results from independent evaluations or peer reviews are shared with key stakeholders and recommendations from evaluations and peer reviews feed back into further developments.
3. **Set baseline values and target values for specific indicators.** Setting these values is much easier to establish for the ERA policy index than for the indicator set established by the ERAC working group and in the ICF study. These indicators serve a purpose when it comes to comparing the outcomes of the system, but do very limitedly allow mapping progression. An ERA policy index on the other hand better allows to see progression and opens possibilities to learn from other countries' initiatives. For instance if a country is assessed as starting the dialogue (level 2) on 'Scientific knowledge transfer', it could learn from other countries that are at level 3 as these countries already took the hurdle to commence involving all relevant stakeholders in this area.
4. **Set up a system of self-assessment (associated with the Roadmap).** A key strength of the Roadmap approach is that it is based on the country's own initiative. The countries could be provided with a template to base a self-assessment on a number of key assessment criteria related to the ERA priorities' policy development, whereby stakeholders can score (based on evidence) the country's performance in terms of levels of maturity. This would allow countries to identify areas in which they are strong and areas where they might be weak.
5. **Continue and intensify efforts for country peer reviewing and self-assessment as part of the Policy Support Facility.** To further improve the mutual learning experience, one could intensify peer review of self-assessments. In addition, one could think of providing thematic evaluations, studies and conferences on particular issues related to the implementation.

<sup>203</sup> A similar principle was suggested by ICF, labelled 'a traffic light rating system' that could assess the performance for ERA progress, and present it the form of three status categories. (ICF International,(2015), Assessment of progress in achieving ERA in Member States and Associated Countries: final report to DG Research and Innovation)

## **Annex: Methodology and sources**

### **Calculating distance to target**

In order to answer the central question of this report, a distance to completion of ERA was estimated. This annex aims to describe the approach taken to assess the level of implementation, which is further presented in Panteia's Research Paper on the Implementation of an Integrated European Research Area.

The conditions for ERA<sup>204</sup> serve as a point of departure for establishing the distance to target, in order to calculate the cost of non-implementation and ineffectiveness of the monitoring system of ERA. The following table summarizes our approach for the calculation, broken down by the 4 conditions

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<sup>204</sup> Identified in the 2014 Progress Report

Condition	Source	Methodology and considerations
Condition 1: Member State reforms in all ERA priorities	Overview of adoption of measures since 2012 in support of ERA implementation, included in the country fiches (part of the ERA Progress Report 2014) <sup>205</sup>	<p>For all 5 priorities, it was assessed whether or not measures have been adopted by the Member States. Hence, there are two possible outcomes: positive (one or more measures taken since 2012) or negative (no measures taken since 2012). This was translated into a percentage: 0, 20, 40, 60, 80 or 100% (for 0-5 priorities in which measures were taken). For each priority, it was calculated which percentage of the 28 Member States had adopted measures. On the basis of this, the EU average was calculated (an aggregation of all priorities for all member states).</p> <p><i>Considerations</i> If a country took measures, this entails that it has taken steps/reforms towards ERA. The difficulty is that 1 reform since 2012 would be calculated as 'target achieved', though the actual content and weight of measures is not taken into account. Moreover, it is important to note that 'no measures taken since 2012' could in practice mean that the necessary measures had already been taken prior to 2012.</p>
Condition 2: Speedy implementation of the priorities outlined in the Communication by research stakeholders	2014 Progress Report: ERA compliance of RPOs (p. 9)	<p>For establishing the distance to target for condition 2, the share of institutions, weighted by number of researchers has been used. Three clusters are identified: ERA compliant, limited compliance, ERA not applicable. The weighted share of organisations within the 'ERA compliant' cluster, has been used as the proxy for the level of implementation for condition 2.</p> <p><i>Considerations</i> Due to the voluntary nature of the 2014 ERA Survey, the figures are not representative and only relate to research performing organisations that answered the Survey in 2014.<sup>206</sup></p>
Condition 3:	2012 Communication:	DG research has indicated which actions the EC has completed. The categories used are:

<sup>205</sup> [http://ec.europa.eu/research/era/eraprogress\\_en.htm](http://ec.europa.eu/research/era/eraprogress_en.htm)

<sup>206</sup> This includes funders which manage 34% van GBOARD in the EU, performers which employ 32% of total staff and 20% of researchers in RPOs. The constituency in the survey gathers 20% of the most important RPOs as identified by Member States.

Condition	Source	Methodology and considerations
Increased support from the Commission to national ERA policies	actions defined (for each priority) and information provided by the Commission (DG Research and Innovation, Unit ERA policy) on actions taken.	<p>1 = not started                      2 = ongoing process                      3 = completed</p> <p>On the basis of the information received from the Commission, the research team has calculated the level of implementation by assigning a percentage to each category (1 = 0%, 2= 75%, 3 = 100%).</p> <p><i>Considerations</i>                      Using only three categories and assigning 75% completion to actions is of course a simplification, which in some cases does not do justice to complex realities. However, as the taken actions are often ongoing and in advanced stages, it is justified to give 75% to actions that are not completed yet. As with the first condition of Member States, relative importance of actions is not taken into consideration.</p>
Condition 4: Transparent monitoring (EMM)	See next step – presented below.	

Now that the approach has been described, we continue with the actual calculation. The table below shows that every condition weighs for one third (as the final condition is not taken into account here). It furthermore details the sublevels (for condition 3) and the results of the calculation. All 5 priorities have been taken into account for the calculation.

	Weight	Sublevel weight	Result
<b>Condition 1</b>	33,3%		81,4%
<b>Condition 2</b>	33,3%		81%
<b>Condition 3</b>	33,3%	Priority 1: 20% Priority 2: 20% Priority 3: 20% Priority 4: 20% Priority 5: 20%	Priority 1: 75% Priority 2: 63,8% Priority 3: 85,7% Priority 4: 87,5% Priority 5: 90,6%  Total average: 80,5%
<b>Condition 4</b>	<i>See next step – presented below.</i>		
<b>Level of implementation of ERA</b>	100%		Total average condition 1, 2, 3: 81%
<b>Distance to target</b>			100- 81 = 19%

### Quantification of condition 4 (transparent monitoring)

The expected benefits from ERA amount to 16 billion annually<sup>207</sup> and provide a basis for calculating the missed annual benefits when combining it with the calculated distance to target of 19%:  $0.19 \times 16 \text{ billion} = \text{€ } 3 \text{ billion}$ .

Based on assumptions concerning potential impacts on the above mentioned conditions of more effective monitoring, it is assumed that the impact of an effective monitoring system on the implementation of ERA would have been considerable. In quantitative terms this is proposed to be translated to an increased implementation level of 10 percent point as estimated in the Study on the implementation of ERA (the implementation level would have been 91% instead of 81%). The distance to target would have been 9% instead of 19%. In monetary terms this is expressed as a reduced annual benefit of 1.6 billion Euro (10% of the 16 billion Euro as calculated in the Impact Assessment related to the completion of ERA).

### Selection of countries

Country case studies are a key part of this study. In order to make a selection of countries that is as varied and relevant as possible, the classification from the 2014 Progress Report was used. Within the progress report, two criteria were used to classify the countries regarding to ERA implementation:

<sup>207</sup> It should be noted the quantification does not critically assess the result from the impact assessment calculating the 16 billion Euro annual benefit of ERA completion. It takes this calculation as a given.

3. Existence of specific measures in support of ERA (as identified by Commission services)
4. The level of implementation by funders and/or RPOs (in comparison with EU average).

On this basis, four possible groups are identified:

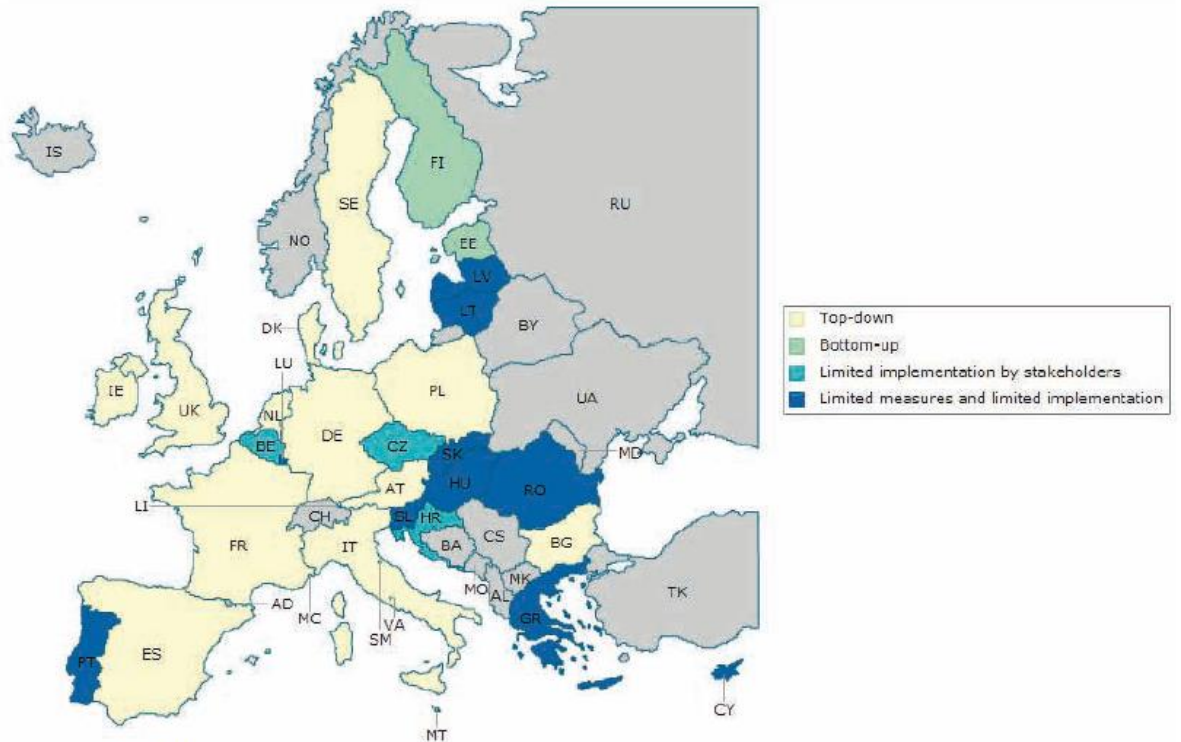
**Figure A1: Classification of countries according to ERA policies and implementation of the ERA Actions**

	Specific measures in support of ERA	No specific measures in support of ERA
Implementation above EU average	Top-down ERA proactive	Bottom-up ERA proactive
Implementation below EU average	Limited implementation by stakeholders	Limited measures and limited implementation
		Limited measures and no implementation

Source: DG RTD

In the Progress Report 2014, it is stated that the results of the map imply that there is not a single path to ERA: the implementation of ERA above the EU average is sometimes directly driven by funders and RPOs (bottom up) and in some cases by national/regional policies (top-down). The following map shows the classification of Member States:

**Figure A2: classification of Member States according to their policies in support of ERA and their implementation**



Taking into account the categories, as well as geographical range, we came to the following selection of country studies:

- Austria (top-down)
- Czech Republic (limited implementation by stakeholders)
- Finland (bottom-up)
- Portugal (limited measures and limited implementation)
-

## Interviews

As part of the study, interviews were carried out with key stakeholders on both the EU and MS level. Some interviews were done face-to-face or written, but most were telephonic interviews. An interview script was developed for the semi-structured interviews. All interviews were carried out between July 30<sup>th</sup>, 2015 and September 28<sup>th</sup>, 2015.

List of interviewees:

### *EU level*

Fabienne Gautier (DG Research and Innovation)  
Arie van der Zwan (DG Research and Innovation)  
Amanda Crowfoot (Science Europe)  
Stephan Kuster (Science Europe)  
Edward Ziarko (chair monitoring ERAC Working Group)  
Lidia Borrél (EUA)

### *Austria*

Christian Naczinsky (Federal Ministry of Science, Research and Economy)  
Andrea Höglinger (Austrian Research Promotion Agency-FFG)

### *Finland*

Riitta Maijala (Ministry of Education and Culture)

### *Portugal*

Vítor Corado Simões (JRC correspondent Portugal)  
Ana Quartin (Foundation for Science and Technology, on behalf of ERAC delegation Portugal)

### *Czech Republic*

Martin Srholec (JRC correspondent Czech Republic)  
Mikal Pazour (Technology Centre ASCR)  
Lukas Levák (Ministry of Education, Youth and Sports)



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<http://ec.europa.eu/research/index.cfm?pg=newsalert&year=2015&na=na-030315>



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This Cost of Non-Europe study examines the state of implementation of the current policy framework for the establishment of a European Research Area (ERA).

The study combines a backward-looking (ex-post) and a forward-looking (ex-ante) evaluation. While the ex-post evaluation looks at the implementation of the ERA policy framework, the ex-ante assessment focuses on potential costs and benefits of possible further policy action.

In doing so, it identifies shortcomings in the ERA policy framework and outlines costs due to the lack of further action on the issue. The study makes a cautious estimate that the costs linked with implementation shortcomings of the ERA policy framework could amount to €3 billion per year.

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