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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

Annual Report on Research and Technological Development Activities of the European Union in 2012

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1. BACKGROUND TO THE ANNUAL REPORT ON RTD ACTIVITIES

The Annual Report on research and technological development activities of the European Union is prepared pursuant to Article 190 of the Treaty on the Functioning of the European Union (TFEU). The purpose of this report is to provide a concise overview of key measures in the reporting year without being exhaustive. Although formally not within the scope of this Report, some information related to the Euratom Treaty has been included.

2. THE BROADER POLITICAL CONTEXT IN 2012

The European Union's strategy for growth and jobs, Europe 2020, is the mainstay of the Union's approach in 2012 to structural reforms and improving competitiveness. The priorities for action in 2012 were highlighted in the Annual Growth Survey 2012[1].

The year started in difficult circumstances. There was declining confidence in the euro, economic growth was ebbing away and most importantly the belief of our citizens in Europe's capacity to fix its problems stood at an all-time low[2].

The European Union continued to combat the crisis. The Commission's proposal for a blueprint on how to complete economic and monetary union laid out a long-term vision as well as the concrete steps that need to be taken in the short and the medium term.

The Commission identified that a change was needed in how Europe's economy operates – a change that would release the many strengths Europe can bring to bear on tomorrow's economy of high innovation, knowledge and skills. This is why Europe 2020 places research, technology and innovation at the forefront of activities designed to help Europe exit the current economic crisis and build smart, sustainable and inclusive growth. There is untapped potential for the European economy to be more innovative, productive and competitive whilst using fewer resources and reducing environmental impact[3].

The Commission announced the final and biggest ever set of calls for proposals under its Seventh Framework Programme (FP7). The funding - which is open to organisations and businesses in all EU Member States and partner countries - makes up the lion's share of the EU's proposed EUR 10.8 billion research budget for 2013.

This announcement came just days after EU leaders emphasised the importance of research and innovation in the Compact for Growth and Jobs[4] as an integral part of the European Union's response to the economic and financial crisis

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1 COM(2011) 815 final of 23.11.2011

2 Standard Eurobarometer 78, Autumn 2012, Public Opinion in the EU

3 A Stronger European Industry for Growth and Economic Recovery - Industrial Policy Communication Update, COM(2012) 582 final

4 Adopted by the European Council on 27-28 June 2012

3. THE INNOVATION UNION

Launched by the Commission in October 2010, as part of the Europe 2020 strategy, the Innovation Union is about creating a vibrant, innovation-based economy fuelled by ideas and creativity, capable of linking into global value chains, seizing opportunities, capturing new markets and creating high-quality jobs.

3.1. Monitoring progress in innovation

Overall, progress towards setting up the policy framework for an Innovation Union has been very positive: more than 80% of the initiatives are on track including deepening the European Research Area (ERA) and Horizon 2020. The principle of 'smart fiscal consolidation' - i.e. protecting or, if possible, increasing growth-friendly expenditures, such as R&D - is now embedded in the European Semester. The business environment in Europe will become more innovation-friendly thanks to Single Market measures such as the unitary patent, faster standard setting, modernised EU procurement rules and a European passport for venture capital funds. European Innovation Partnerships are pooling resources and concentrating demand and supply-side measures on key societal challenges.

The global position of Europe is still relatively strong. The EU is one of the world's best-performers when it comes to producing high-quality scientific and innovative products. It still captures the largest share of income generated in global manufacturing value chains. Since 2008, the EU has improved its innovation performance and it closed almost half of the innovation gap with the US and Japan. The EU is also maintaining its strong innovation lead over Brazil, India, Russia, and China, although the latter is decidedly catching up. In addition, South Korea has almost tripled its innovation lead over the EU since 2008 and joined the US as an innovation leader.

Furthermore, while public R&D spending in the EU grew throughout the crisis as governments strived to keep up their R&D investments, and thus incentivise businesses to do likewise, recent data point to a potential reversal of this trend. In 2011, the total public R&D budget of the 27 EU Member States decreased slightly for the very first time since the beginning of the crisis. However, the exceptional length and harshness of the current crisis could begin to undermine the EU policy consensus that R&D investments need to be protected. It has also exposed structural weaknesses in Europe's innovation performance and reinforces the need for more comprehensive reforms to increase the efficiency and effectiveness of national R&I systems. Possible ways to achieve this include smart specialisation strategies, better linkages between public research and business innovation and improved framework conditions for business investments.

The 2013 Innovation Union Scoreboard[5] shows that the process of convergence in the innovation performance of Member States has come to a halt. As convergence was the dominant pattern since the introduction of the Scoreboard in 2001, this signals a clear risk of a growing innovation divide. As the crisis gets longer and deeper, and growth disparities between some European regions increase, there is an even stronger need to implement the Innovation Union swiftly and deepen it in areas crucial to innovation, such as higher education, innovation-based entrepreneurship and demand-side measures. Momentum in fields such as social innovation will also need to be maintained. In addition, preparatory work

[5] http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf

is on-going to maximise future synergies between Horizon 2020 and Structural Funds, in a context of Smart Specialisation.

3.2. Tackling societal challenges: European Innovation Partnerships

The European Innovation Partnership (EIP) approach to accelerate the development and uptake of innovations for societal challenges entered a new phase during 2012. The pilot partnership on Active and Healthy Ageing (AHA) moved from the planning to the implementation stage, and the approach was proposed for four more areas. There was an encouraging response to the AHA Partnership's invitation for commitments with 261 commitments to specific actions, more than 50 regions and municipalities offering themselves as reference sites, and hundreds of partners signing up to a web-based Marketplace for Innovative Ideas.

Following the endorsement of the Strategic Implementation Plan of the pilot, the Commission put forward proposals for new EIPs in the areas of 'Agricultural Productivity and Sustainability', 'Raw Materials', 'Water' and 'Smart Cities and Communities'. Following endorsements from the Council, the 'Water' EIP delivered its Strategic Implementation Plan (SIP) in December 2012, and expectations are that the 'Agriculture', the 'Raw Materials' and 'Smart Cities and Communities' SIPs will be delivered in 2013 so that implementation can start as early as possible.

4. DELIVERING THE EUROPEAN RESEARCH AREA

Further to the European Council conclusions on completing ERA, the Commission adopted a Communication on a Reinforced ERA Partnership for Excellence and Growth[6], proposing effective national research systems, optimal transnational cooperation and competition, an open labour market for researchers, gender equality and gender mainstreaming in research, and access to and circulation of scientific knowledge. It centres on a strenghtened partnership approach between Member States, the Commission and research stakeholder organisations. The approach was endorsed by the Council[7].

The ERA is part of the Innovation Union and Horizon 2020 supports its creation in many ways. It is one of the key structural reforms for driving growth in Europe – and is increasingly recognised as such. The combined effect of the EU reaching the 3% target of GDP dedicated to research, Horizon 2020 and an increased share of transnational funding (currently 0.8%), thanks to completing the ERA, could generate as much as EUR 445 billion of additional GDP and 7.2 million extra jobs by 2030[8].

An essential element of this partnership approach is the Joint Statement of 17 July 2012 by the Commission and five major research stakeholder organisations[9], in conjunction with written commitments set out in Memoranda of Understanding. These entail that the organisations will make seizable progress until the end of 2013.

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6 COM(2012) 392 final of 17.7.2012

7 Conclusions of the 3208th Competitiveness Council meeting of 11.12.2012

8 SWD(2012)212, Commission Staff Working Document – Impact Assessment accompanying Communication (2012)392 final

9 EARTO, EUA, LERU, NordForsk, and Science Europe

Implementation of the ERA Communication will be supported by the ERA Monitoring Mechanism (EMM), which aims to gather information to monitor progress at Member States and Associated Countries level. The Commission will play a key role in setting up and running the EMM for national authorities and research stakeholders. As a first step, the Commission carried out an ERA survey to establish progress in implementing the relevant actions identified in the ERA Communication within public research organisations.

4.1 Researchers

The implementation of the sixteen measures foreseen to promote researchers' mobility, training and career development was central to this process, with a focus on aspects such as: open, transparent and merit-based recruitment; launch of 'EURAXESS-Voice of the Researchers' to ensure direct communication with individual researchers; the setting up of a Task Force to propose solutions for a possible pan-European supplementary pension fund(s) for researchers; collaboration with research stakeholders to define and implement the principles for access and portability of national grants; and a specific procedure for admitting third country nationals for the purpose of scientific research.

The ERA Steering Group on Human Resources and Mobility helped to prepare and follow up corresponding initiatives, specially through: the delivery of the final report and recommendations of the Working Group on human resources issues, including the Human Resources Strategy for Researchers (HR4R); the setting up of new working groups on innovative doctoral training and on the professional development of researchers; and the delivery of the 2012 researchers' report, which monitored progress.

4.2 Joint programming

In order to support the Joint Programming process, in 2012 the Commission launched coordination and support actions that will support five of the six second wave Joint Programming Initiatives (JPIs): Connecting Climate Knowledge for Europe, Healthy and Productive Seas and Oceans, More Years, Better Lives – The Potential and Challenges of Demographic Change, The Microbial Challenge - An Emerging Threat to Human Health and Water Challenges for a Changing World. There was a further call to possibly support the 6th JPI, Urban Europe - Global Urban Challenges, Joint European Solutions in 2013.

In 2012, three of the four first wave JPIs - the pilot JPI on Neurodegenerative Diseases - including Alzheimer's disease; Agriculture, Food Security and Climate Change; and A Healthy Diet for a Healthy Life - adopted their Strategic Research Agendas (SRAs) defining activities to be undertaken in the next years. The JPI on Cultural Heritage and Global Change, a new challenge for Europe launched a pilot joint call and should adopt its SRA early in 2013.

To facilitate the ongoing joint programming process on cross-border research cooperation, the Commission proposed two new actions for Member States and stakeholders: the ERA–Mark and the synchronised call. The Commission initiated discussions with stakeholders to launch pilot activities by 2014.

4.3 Research Infrastructures

The European Commission continued to work closely together with the European Strategy Forum for Research Infrastructures (ESFRI) in order to complete or launch 60% of the ESFRI

Roadmap projects by 2015. In 2012, 15 national roadmaps were published and seven were still under preparation.

In 2012, efforts increased to use the Structural Funds for the construction of the ESFRI projects and were focused on the first two facilities including ELI (Extreme-Light-Infrastructure) to be implemented by 2016 in the Czech Republic (EUR 290 million), and Romania (EUR 180 million).

In 2012, the Commission proposed an amendment to the regulation setting up a legal framework for a European Research Infrastructure Consortium (ERIC), which was designed to facilitate the establishment and operation of large research infrastructures involving several European countries. Although uniform and timely implementation of this regulation in the various Member States remains a challenge, the Common Language Resources and Technology Infrastructure (CLARIN ERIC) has been established and the Commission has been examining the application of seven other projects (ECRIN, EURO-ARGO, ESS survey, BBMRI, EATRIS, DARIAH, C-ERIC).

On 11 December 2012, the Council[10] emphasised the need to renew and adapt the ESFRI's mandate to adequately address the existing challenges, as well as ensure that ESFRI projects already in progress are followed up after a comprehensive assessment, and that infrastructure projects listed in the ESFRI roadmap are given priority.

In order to assess progress of EU support under Horizon 2020, the Commission has also set up a high level Expert Group. The Commission has also launched a consultation for future research activities aiming at a wider and more efficient transnational use of existing research infrastructures.

4.4 Universities: Modernisation Agenda

A study to set up structured Innovative Doctoral Training programmes was carried out to provide guidance for structured programmes on a Europe-wide scale. A pilot call on 'ERA Chairs' for convergence regions was launched to facilitate structural changes in universities and other research organisations, with the aim of fostering excellence and thus improving their performance in competitive research funding. A feasibility study was also being prepared to assess the best way of setting up a European Accreditation mechanism for the 'Charter and Code'-based human resource management, in universities and in publicly-funded research institutions.

4.5 Open access, knowledge transfer and digital ERA

Open access has been embedded in Horizon 2020. Member States were asked to nominate a national Point of Reference to facilitate the exchange of information and enable mutual learning. The Commission intends to organise a first meeting of the National Points of Reference for exchange of lessons learned and best practices.

An expert group on knowledge transfer was set up in 2012 to deliver in-depth analyses and recommendations. The Commission launched a study to develop guidelines on the main issues that may be adressed by participants in their consortium agreements. The ERAC Working Group on Knowledge Transfer provided guidance and feedback for the study

[10] Conclusions of the 3208th Competitiveness Council

tracking progress in implementing the Commission's Intellectual Property Recommendation and Code of practice[11].

Digital ERA will support the provision of e-infrastructures, seamless cross-border access to digital research services and take-up of e-science and the development of related policies. In 2012, this collaboration started by integrating Digital ERA into the ERA follow-up structures and activities, including stakeholder platform interactions and systematic monitoring of the ERA Communication actions. E-infrastructures enable the creation, circulation and use of knowledge in Europe, and foster collaboration among scientists. In 2012 the focus has been on data-enabled science and engineering (EUDAT, OpenAIRE), computational infrastructure (PRACE, EGI, Helix Nebula), the research and education network GÉANT, virtual research communities and e-science. Highlights include the publication of the European strategy on High Performance Computing (Communication to Parliament and Council), the development of the infrastructure supporting Open Access and of the global Research Data Alliance (RDA); and the launch of Africa Connect linking Europe to Sub-Saharan Africa.

5. INTERNATIONAL COOPERATION

The major highlight of the year was the Communication on 'Enhancing and focusing EU international cooperation in research and innovation: a strategic approach'[12]. In this Communication, the Commission proposes a new strategy for international cooperation in research and innovation, in particular with a view to preparing for Horizon 2020.

International cooperation in research and innovation is not an end in itself - it is, rather, a mean for the Union to achieve its higher level objectives. In particular this means strengthening the Union's excellence and attractiveness in research and innovation and its economic and industrial competitiveness; tackling global societal challenges; and supporting the Union's external policies.

To achieve these objectives, the strategy defines a dual approach:

Horizon 2020 will be open to participation from entities from across the world, although the approach to providing funding from the Union budget to these entities will be revised. Through this general opening, European researchers will be free to cooperate with their third country counterparts on topics of their own choice.

Targeted activities will be developed where cooperation will be sought on particular topics and with identified countries or regions. These will be grouped into multi-annual roadmaps.

A number of cross-cutting issues will also be an integral part of the strategy:

- Partnership with Member States will be strengthened, building on the work of the Strategy Forum for International S&T Cooperation;

- Common principles for the conduct of international research and innovation activities will be developed and promoted with our international partners, with the aim of creating a global, level playing field. This will be facilitated by the recently

[11] COM(2008)1329

[12] COM(2012)497 of 14.15.2012

established Global Research Council, a voluntary forum set up to share best practice and establish common principles;

- There will be closer coordination with other Union policies with a strong external dimension as well as with the activities of international organisations and multilateral fora.

The implementation of the strategy will be closely aligned with Horizon 2020. To strengthen governance, the Commission has committed itself to publishing a progress report every two years starting in early 2014. Some 350 top-level scientists and policy-makers from more than 30 countries around the European Union and Mediterranean region met in Barcelona, Spain, in April 2012 to launch a new partnership in research and innovation. The new partnership was proposed by the European Commission as part of the Union's response to the political changes taking place in the southern Mediterranean area and in view of Horizon 2020. The Conference launched a process towards a common Euro-Mediterranean research and innovation agenda.

6. HORIZON 2020 - THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION (2014-2020)

Bringing together, for the first time, all EU research and innovation funding under a single programme, Horizon 2020 will focus on three key priorities: strengthen the EU's position as a world leader in science; strengthen industrial leadership in innovation; and help address major concerns shared by all Europeans, across a number of key societal challenges.

On 28 November 2012, the Industry, Transport and Research (ITRE) Committee of the European Parliament adopted, with an absolute majority, three of the four reports of the Horizon 2020 package. The Council of the EU reached a Partial General Approach on the Framework Programme Regulation (31 May 2012), on the Rules for Participation and Dissemination Regulation (10 October 2012) and on the Specific Programme Decision (11 December 2012).

This provides a very good basis for the trilateral negotiations among the EU institutions with a view to concluding the ordinary legislative procedure on the Horizon 2020 package in a first reading agreement by the end of 2013.

7. THE SEVENTH FRAMEWORK PROGRAMME

7.1 Implementation of the 2012 work programmes

53 calls for proposals were concluded in 2012 for a total indicative budget of EUR 4.4 billion. A total of 17 374 eligible proposals were received, of which 3 089 were retained for funding, resulting in a success rate of 17.78 % on a proposal basis.

A total of 70 059 applicants were involved in all eligible proposals, for total project costs of EUR 36.99 billion and a total requested EU contribution of EUR 30.78 billion. A total of 14 821 applicants were involved in the retained proposals, for total project costs of EUR 6.92 billion and a total requested EU contribution of EUR 4.98 billion. The overall success rate was 21.16 % in terms of applicants and 16.18 % in terms of EU contribution requested.

7.2 The 2013 work programmes

Adopted in July 2012, the 2013 calls for proposals, worth some EUR 8.1 billion, will support projects and ideas that will boost Europe's competitiveness and tackle issues such as human health, protecting the environment and finding new solutions to growing challenges linked to urbanisation and managing waste.

The work programmes include some of the following features:

– The calls target both innovation and a range of societal challenges, building a bridge to Horizon 2020.

– In total EUR 4.8 billion is dedicated to thematic research priorities. Industrial innovation will be supported through close-to-market activities such as piloting, demonstration, standardisation and technology transfer. The three public-private partnerships launched under the European Economic Recovery Plan are implemented through calls for proposals and matched by private investments. The calls are highly relevant to industry with more than 50% industrial participation and about 30% of the total EU funding going to SMEs.

– Special attention will be given to Small and Medium-sized Enterprises (SMEs) in a package worth up to EUR 1.2 billion. This includes measures of EUR 150 million for guarantees to leverage EUR 1 billion in loans for SMEs and mid-caps.

– Around EUR 2.7 billion will help cement Europe's place as a world class destination for researchers, mainly through individual grants from the European Research Council (EUR 1.75 billion), and Marie Skłodowska-Curie Actions (EUR 963 million) for research training and mobility.

– To help address the innovation divide, a new 'European Research Area Chairs' initiative has been launched. A EUR 12 million pilot call will select a total of five ERA Chairs, to be hosted by universities or other eligible research institutions in less developed regions in five different EU countries.

– Innovative thematic research priorities in these calls include: around EUR 155 million for 'Oceans of the future', to support sustainable growth in the marine and maritime sectors; around EUR 365 million for technologies that will transform urban areas into sustainable 'Smart Cities and Communities'; some EUR 147 million to combat the rise of drug-resistant bacteria; and nearly EUR 100 million dedicated to innovative solutions for managing fresh water resources.

– The calls also support the Digital Agenda's ICT research funding targets, with almost EUR 1.5 billion going to the thematic area of information and communication technologies.

– The EUR 8.1 billion worth of investment is expected to leverage an additional EUR 6 billion of public and private investment in research, and estimated to increase employment by some 210 000 in the short-term and generate, over a 15 year period, an additional EUR 75 billion in growth.

– The EU's total research budget of EUR 10.8 billion for 2013, the largest ever in the history of the European Union's Framework Programmes, includes funds outside the

work programmes, such as nuclear energy research (EUR 993 million) under the Euratom Treaty, Joint Technology Initiatives with industry (EUR 751 million) and public-public partnerships with Member States. The total budget also includes funding for the Commission's Joint Research Centre[13].

7.3 Highlights

7.3.1 Innovation

The 2013 FP7 Work Programme includes more activities that are closer to markets and users, as well as more support to transfer results from the lab to the market. More support is provided to innovative SMEs and small mid-caps in the field of access to risk finance with the launch of a new counter-guarantee scheme within the RSFF for SMEs (RSI), which complements the guarantee scheme launched successfully in 2012.

There is also wider support for public-private partnerships. More themes experiment with pre-commercial procurement, both for co-financing actual joint procurements and for supporting networking and preparatory work. Public sector innovation is becoming more important and includes support to innovative solutions both in public administrations and in public sector services. Social innovation is supported in different ways by a majority of themes, including both social innovation actions and socio-economic research.

An increasing number of themes also include specific support for the exploitation of promising existing research results, whatever their origin, both EU and non-EU funded. The actions include follow-up funding addressed directly to research project results, as well as support networks aimed at facilitating exploitation.

7.3.2 Dissemination

The dissemination of results of EU-funded research plays a pivotal role in delivering the European Research Area, promoting openness and capitalising on Europe's creative potential. The Commission supports the dissemination of research results by providing funding within the projects to actively disseminate the results. The Commission also actively raises public awareness of the funded research results and provides on-line access to the results via CORDIS[14], the Commission's Community R&D Information Service, and the Joint Research Centre's Publications Repository[15].

In addition, the Commission is investigating going beyond current activities and further improving the dissemination, communication and exploitation of EU-funded research results.

7.3.3 Simplification

Activities in 2012 built on the impetus given by the Communication on simplification[16] and the ensuing debate. A series of measures receiving overall support were implemented in practice.

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13 Information on the direct actions of FP7 for the year 2012 can be found in the annual report of the Commission's Joint Research Centre: http://ec.europa.eu/dgs/jrc/index.cfm?id=2530

14 http://cordis.europa.eu/

15 http://publications.jrc.ec.europa.eu/repository/

16 COM(2010)187

The Research and Innovation Participant Portal was developed further with the deployment of new services for participants and improvements in the user-friendliness of the system.

The outcome of the simplification debate also fed into the revised Financial Regulation and its Rules of Application which entered into force. Some highlights affecting framework programme grants include:

- revised rules related to the eligibility of VAT to simplify the financial management of research and innovation grants, e.g. for universities and other public research bodies.

- the abolition of the obligation to create and report interests. This obligation exists today, and has created considerable administrative effort and costs in terms of opening and managing separate accounts, and for managing a register of exceptions for organisations that cannot open interest-bearing accounts due to national legislation.

7.3.4 Reaching the SME Target

The participation of SMEs in the FP7 is closely monitored by the European Commission. Particular attention is given to funding for SMEs under the Cooperation Programme, in line with the target established in the legislative package. The aim is to ensure that at least 15% of the funding of the Cooperation Specific Programme goes to SMEs.

By the end of 2012 there were 18 589 SME participations in the entire FP7. The EU contribution going to SMEs reached approximately EUR 4.8 billion.

The 15% target was reached already at the end of 2011, when SMEs received 15.3% of the EU funding in the Cooperation Programme. In 2012 this figure increased. At the end of the year, the percentage of EU contributions going to SMEs in the Cooperation Programme was 16.6%.

The significant increase in the budget share going to SMEs can be attributed to the SME strengthening measures in the 2011 and 2012 work programmes. Further progress is expected with the 2013 work programme.

8. OUTLOOK FOR 2013

In 2013, the Commission will continue to deliver on the Innovation Union actions. It will present the 2012 State of the Innovation Union: Accelerating change. However, in the light of on-going crisis, Europe needs to do more to make the Innovation Union a reality. The EU and its Member States must accelerate their joint efforts and deepen the Innovation Union. In 2013, the Commission will launch a reflection to prepare the next steps for deepening the Innovation Union.

The Commission will prepare the first ERA Progress Report in 2013. It will consist of a comparison of the actions announced by Member States in their National Reform Programmes (NRPs) with the baseline from 2011. A full assessment of progress in implementing the ERA will be made from 2014 onwards.

The Commission intends to make proposals on a number of public-private and public-public partnership initiatives in July 2013.

The Horizon 2020 package is expected to be adopted by the end of 2013. The Commission will undertake all preparatory work and make the necessary arrangements to ensure a smooth start and implementation of the programme.