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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
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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 (EU) 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 an overview of key measures undertaken in the reporting year.

2. THE BROADER POLITICAL CONTEXT IN 2014

The year 2014 was one of great political change in the EU. A new European Parliament was elected, a new Commission took office in November, and a new President – the first one from the new post-2004 Member States – took-up office in the European Council. In order to build on the progress already made by Member States in steering Europe back to economic recovery, the newly-elected Commission President Jean-Claude Juncker introduced an Agenda for Jobs, Growth, Fairness and Democratic Change. The agenda is based on three pillars of structural reforms, fiscal responsibility and investment and it sets out 10 clear priorities to get people back to work and the European economy growing. A new investment plan was proposed which aims to unlock public and private investment worth €315 billion over the next three years. A European Commission Proposal for a Regulation on the European Fund for Strategic Investments (EFSI) was launched in January 2015; its adoption by the EU Council of Ministers and the European Parliament is expected in summer 2015. Horizon 2020 is set to play a role in this by contributing to the EFSI guarantee fund. This will allow further investments to be made in the area of Research and Innovation.

Fiscal consolidation efforts have continued to be pursued during 2014 and in the majority of Member States have begun to pay off. The gradual recovery of Europe's economy which set in in the second quarter of 2013 has continued to gain momentum in 2014, and after hitting a soft patch last spring, GDP growth in the EU picked up again towards the end of 2014, rising, on a yearly base, by 1.4%.¹

3. IMPLEMENTING THE HORIZON 2020 CALLS

Horizon 2020, the largest EU research and innovation programme ever, with nearly €80 billion of funding for a seven year period, was launched in December 2013. This was immediately followed by the first Work Programme with a budget of €15 billion for 2014-2015, which included 12 so-called focus areas. The calls opened on time, and the user-

¹ [European Economic Forecast – Spring 2015](#)

friendly Horizon 2020 IT systems were functional from the beginning. The simplified two-year Work Programme implementing the new challenge-based approach was designed so that it integrates EU policy objectives through a strategic programming process, that fosters integration, incorporates key features and novelties, and generates more impact and value creation. A comprehensive information campaign was rolled-out across 34 countries attracting around 10,000 participants to the events. Further national and regional information activities were organised.

The first 100 calls were closed by 1 December 2014, attracting 37,000 proposals in total. Over 3,200 grants were signed by the end of April 2015 with a total requested funding of €5.4 billion. Proposals had an average success rate between 12 and 14%.

The implementation of the first calls, as well as the efficiency of the simplification measures were monitored by the European Commission. Member States, the research community, industry, and stakeholders were consulted in the monitoring exercise. The resulting lessons learned are summarised below.

Response to calls

The large response to the first calls confirmed the attractiveness of the challenge-based approach of Horizon 2020 and the demand for cross-border research and innovation cooperation. Most stakeholders, including SMEs, expressly welcomed the broad topics of the first calls. High subscription rates were noted in 2014 calls. This translated into a lower success rate compared to the previous Framework Programme. While on the one hand there was higher selectivity fostering excellence, on the other, it could render the programme less appealing in the long-term. Measures are, therefore, envisaged in future Work Programmes to manage the large demand while maintaining the challenge-base, non-prescriptive approach.

In spite of the many proposals received in the first calls of Horizon 2020 and the pressure on evaluation systems, the high standards in terms of expert selection and composition in evaluation process were maintained.

Simplification

The Participant Portal online system was highly appreciated by the stakeholder community². It works as a single gateway to Horizon 2020 for proposal submission, registration of participant's organisation and expert registration and payment. The Horizon 2020 new generation of IT systems for handling proposals and grants without lengthy paper circuits (electronic signatures), as well as the simplification of business processes have reduced red tape for applicants. According to first statistics the time-to-grant requirement of 8 months was met in the vast majority of cases (ca. 95%).

² Ecorys Study, 2014.

Research and Innovation Cycle

The share of private sector participation in the first calls amounts to 31% in signed grant agreements and 28% in terms of EU financial contribution. The corresponding FP7 rates are 30% and 25% respectively. The participation of the private sector is particularly high in both the Industrial Leadership and Societal Challenges pillars.

Small and Medium Enterprises (SMEs)

Horizon 2020 is attractive to SMEs. Results show that the EU is on track for allocating 20% of the combined budget for Societal Challenges and Leading and Enabling Technologies (LEITs) to SMEs. The new SME Instrument in Horizon 2020 was successfully launched and, with more than 8,100 applications (6,900 for phase 1 and 1,200 for phase 2), was the most popular scheme in 2014. It attracted newcomers and SMEs with promising innovation and economic potential. For example, around 50% of first beneficiaries in phase 1 (155 funded projects at the first cut-off date) were already active on European and/or global markets.

Social Sciences and Humanities (SSH)

Horizon 2020 has significantly enlarged the potential contributions of SSH through a systematic policy of integrating SSH in all societal challenges as well as in the LEIT parts of the Programme. On average 37% of the topics in the Societal Challenges, LEIT, Science with and for Society, Spreading Excellence and Widening Participation, and Research Infrastructures combined were flagged as SSH-relevant in the 2014 and 2015 calls. In addition, SSH played a major role in the Societal Challenge Inclusive, Innovative and Reflective Societies where 80% of topics were flagged as SSH. A total of € 212 million was awarded to SSH beneficiaries in 2014: €194 million under the Societal Challenges pillar and €18 million under the LEIT pillar.

There was also evidence that SSH expertise was well represented in the evaluation panels. Out of the 688 evaluators appointed for topics flagged as SSH-relevant, 10% had a background in one or more SSH disciplines while 42% had an interdisciplinary background in both SSH and non-SSH disciplines or in hybrid disciplines with an SSH component. Overall, 357 out of the 688 experts had some type of SSH expertise, which amounts to over 50% of the experts.

Human Resources and Mobility

This main focus of the Marie Skłodowska-Curie Actions (MSCA) in 2014 was promoting innovative approaches to research training, stimulating interdisciplinary and international as well as inter-sector mobility.

The MSCA has become the main EU instrument for fostering innovative doctoral training. In 2014, 137 research training networks were funded with a total budget of over € 400 million. This included industrial doctorates, whereby research enterprises and universities jointly develop a doctoral programme in which a large part of the PhD is undertaken in the

non-academic sector, and programmes leading to a double or joint doctoral degree. In total 600 companies took part in this. Furthermore, € 30 million was allocated to the co-funding of 12 doctoral programmes, in order to increase the leverage effect on regional, national and international funding programmes in Europe.

Climate Action and Sustainable Development

A target was set for at least 35 % of the Horizon 2020 budget to be invested in support of climate action and a 60% target for progress towards EU sustainability. While data available at this stage covers programmable actions only (i.e. LEIT and Societal Challenges), the latest estimate of progress on Sustainable Development indicates a figure of 50% and 32% for Climate Action. Biodiversity, with no target, is estimated at 3 %.

Gender Equality

In the Work Programme 2014-2015, gender issues were explicitly mentioned in more than 100 topics across almost all sections. These topics were flagged as gender-relevant on the participant portal to ease access for applicants. One of the objectives for achieving gender equality in Horizon 2020 includes ensuring that women make up at least 40% of experts in evaluation panels and experts group. This target was almost met and initial results show that women accounted for 35% of the evaluators.

International cooperation and agreements

Horizon 2020 is fully open to international participation and in addition targets strategic areas of cooperation with key international partner countries and regions. 20% of all topics in Work Programme 2014-2015 were flagged as being specifically relevant for international cooperation, with the intensity of targeted actions varying across the different parts. Support was proposed for international cooperation flagship initiatives such as the Global Research Collaboration for Infectious Disease Preparedness, the Global Alliance for Chronic Diseases, the International Rare Diseases Research Consortium³, and the EU-Japan cooperation in the area of critical networks and computing platforms. With the move to broader and less-prescriptive topics, there was a shift towards encouragement rather than the use of eligibility criteria to stimulate international cooperation. Nevertheless and given that entities from five large emerging economies (Brazil, Russia, India, China and Mexico) are no longer eligible for automatic funding from Horizon 2020, initial findings showed an overall reduction in participation from international partner countries.

In total, 12 countries became associated to Horizon 2020 through Association Agreements in the course of 2014. Norway and Iceland became associated in May 2014. The five Western Balkan countries (Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia), the Republic of Moldova, Turkey and Israel signed agreements with the European Union in summer 2014. In December 2014 the Association Agreement was signed with the Faroe Islands. The Association Agreements will allow research entities from these countries to take advantage of the funding opportunities offered by Horizon 2020.

³ Cf. topics under the Health Coordination Activities call with an indicative budget of around € 17 million.

An international agreement associating Switzerland to parts of Horizon 2020 was signed on 5 December 2014. Switzerland signed an agreement where it is associated to the "Excellent Science" pillar of Horizon 2020, containing the European Research Council, Future and Emerging Technologies, Research Infrastructures, and the Marie Skłodowska-Curie actions; the actions under the specific objective "Spreading excellence and widening participation"; and finally the Euratom Research and Training Programme and the activities carried out by the European Joint Undertaking for ITER and the Development of Fusion for Energy for 2014-2020. This Association Agreement is expected to last until 31 December 2016. At this stage, and depending on whether Switzerland ratifies the Protocol extending the Free Movement of Persons Agreement to Croatia, it would be followed by a full Association Agreement or Switzerland will remain with third country status.

Widening Participation

Horizon 2020 introduces specific measures for spreading excellence and widening participation in those Member States and regions with a relatively low research and innovation performance. Horizon 2020 funds the following lines of action: the 'Teaming' of research institutions (creating or upgrading centres of excellence), which received 167 eligible applications from all widening Member States; 'ERA Chairs' (which attract outstanding researchers to research institutions with a high potential for research excellence)' which received 85 eligible applications from almost all widening Member States; 'Twinning' (significantly strengthening a defined field of research through links with internationally-leading institutions), supported through a call open in 2014 but closing in 2015. Support is also provided for COST (European Cooperation in Science and Technology) which is among the oldest inter-governmental cooperation frameworks in Europe on science, technology and innovation. These actions have a budget of about 800 million euros for the seven year period.

4. Partnership with Industry

The Innovation Investment package⁴

In 2013 the European Commission published a series of proposals on public-private and public-public partnership initiatives. One year on, in May 2014, the Innovation Investment Package was officially adopted by the Member States.

This sets up a new generation of public and private partnerships, which will pool research and innovation investments of over €22 billion. The package includes nine Joint Technology Initiatives (JTIs) that organise their own research agenda and award funding for projects on the basis of open calls. Seven of these were already launched in July 2014 as were four public-public partnerships (Article 185 initiatives). The EU's contribution of €9 billion to the package will unlock a €10 billion investment from the private sector and €4 billion from Member States

⁴ [Innovation Investment Package](#)

Contractual Public Private Partnerships (cPPPs)

The European Commission launched in December 2013 eight contractual Public Private Partnerships of strategic importance for European industry. Contrary to JTIs the contractual PPPs do not organise their own calls but funding is awarded by the Commission through open calls under the Horizon 2020 Work Programme. Contractual arrangements setting up those eight cPPPs were signed by the Commission and chairpersons of specially-created industrial research and innovation associations, representing more than 1,000 large and small enterprises across Europe. A ninth cPPP was launched in October 2014. The nine contractual Public Private Partnerships were launched with an indicative Commission funding envelope in total of € 6.7 billion for the duration of the programme. In the 2014-2015 Work Programme the engagement of industry was fostered by, among other things, around €800 million in funding for contractual Public Private Partnerships (cPPPs).

5. EUROPEAN RESEARCH AREA (ERA)

In September 2014, the Commission presented its second ERA Progress Report ⁵ which provides an overall picture of progress made in implementing ERA in the Member States and a few of the Associated Countries. It shows that the ERA Partnership has proved to be successful and that the four ERA conditions for success are in place, namely:

- Member States increasingly adopt measures in support of ERA;
- Stakeholder organisations within the ERA Stakeholder Platform continue to work together in order to achieve a fully-functioning ERA.
- Policy-support measures are in place at EU level, and ERA is embedded in the European Semester;
- The ERA monitoring mechanism is operational and is progressively delivering robust data.

Coordination of national research programmes

In Horizon 2020 EU participation in joint calls implemented by Member States programmes via the new European Research Area -Networks (ERA-NET) instrument increased. At the same time, Horizon 2020 supports the ten Joint Programming Initiatives (JPIs) put in place by Council. JPIs align national programmes to EU-wide strategic research agendas. They are important vehicles for ensuring the completion of ERA.

6. POLICY FRAMEWORK

European Semester

Country-Specific Recommendations addressing Research and Innovation (R&I) were adopted in the context of the European Semester of economic policy coordination. In 2014, Country-Specific Recommendations were adopted in relation to improving framework

⁵ [ERA Progress Report 2014](#)

conditions for R&I business (Belgium and France), prioritising public investments in R&I (Germany, Italy and Spain), increasing the efficiency of these investments (Italy, Slovakia and Spain) and their leveraging effect on R&I business through smart specialisation and public-private cooperation (Portugal and Slovenia).

Communication on Research and Innovation as Sources of Renewed Growth⁶

The June 2014 Communication on 'Research and Innovation as Sources of Renewed Growth' provides a strong political narrative on the importance of the quality of investment in research and innovation for Europe. The Communication proposes putting forward three priorities for focus by Member States: The quality of strategy development and the policy making process; the quality of programmes, including focusing on resources and improved funding mechanisms; and the quality of research and innovation performing institutions.

Finally, the Annual Growth Survey 2015, stressed the need for reforms which would improve the quality and efficiency of public R&I investments, as well as foster an environment which is R&I business and investment friendly.

European Structural and Investment Funds (ESIF)

Horizon 2020 and the European Structural and Investment Funds are important tools for boosting research and innovation investment in the context of the EU budget and highlight the opportunities for synergies between the two policy frameworks in funding research and innovation projects. The ESIF will provide more than € 100 billion of grant funding during 2014-2020 for innovation in the broad sense, including support to core Research and Innovation of some € 40 billion.

European Institute for Innovation and Technology (EIT)

The European Institute of Innovation and Technology⁷ budget for the 2014 to 2020 period is EUR 2.38 billion as set out in the Horizon 2020 Framework Programme for Research and Innovation. In 2014 the first wave of EIT's Knowledge and Innovation Communities (KICs) have steadily grown both in terms of budget, activities, and results. The EIT Community was further enlarged through the creation of two new KICs in the areas of healthy living and active ageing (EIT Health) and sustainable exploration, extraction, processing, recycling and substitution of raw materials (EIT Raw Materials).

Financial Instruments

The Commission and the European Investment Bank (EIB) launched a new EU financial instrument in the Summer of 2014. InnovFin – EU Finance for Innovators will help SMEs, large companies and other innovative firms gain easier access to finance. InnovFin builds on the success of the Risk-Sharing Finance Facility, developed under FP7. InnovFin products will make available €24 billion of financing for research and innovation. InnovFin consists of a range of products from guarantees for intermediaries that lend to SMEs, to direct loans

⁶ [Communication on Research and Innovation as Sources of Renewed Growth](#)

⁷ EIT is under the responsibility of DG Education and Culture

to enterprises - helping support the smallest to the largest R&I projects in the EU and countries associated to Horizon 2020.

Innovation and Entrepreneurship

The Entrepreneurship 2020 Action Plan was launched in 2014 as a follow up to the review of the Small Business Act. The plan sets out measures to support, promote and monitor entrepreneurship in Europe (including digital entrepreneurship). The Start-up Europe initiative, part of this plan, aims to strengthen the business environment for web and Information and Communication Technologies (ICT) entrepreneurs so that their ideas and business can start and grow in the EU. The Innovation Radar is a pilot initiative, launched in 2014, which aims to identify high potential innovations and key innovators in FP7, Competitiveness and Innovation framework Programme (CIP)-ICT-Policy Support Programme (PSP) and Horizon 2020 projects.

Open Science

In the last couple of years, scientists have started to favour open access to scientific information, there have been more instances of involving citizens in research, and the advent of big data opens up new ways of doing research itself. In July 2014, the Commission launched a consultation on Science 2.0, in order to assess the degree of awareness among stakeholders of the trend towards Open Science, identify possible policy implications and actions to strengthen the competitiveness of the European science and research system. The results of the consultation will be made available online on Your Voice in Europe⁸.

Open access is one important aspect of the changing scientific system. In Horizon 2020, open access to scientific publications is mandatory for all beneficiaries. In what concerns research data, a flexible pilot for open access to research data is also underway. The pilot is based on a flexible "opt-in/opt-out system", which takes into account the need to balance openness and protection of scientific information, commercialisation and Intellectual Property Rights (IPR), privacy concerns, security as well as data management and preservation questions.

International Panel on Climate Change

The Intergovernmental Panel for Climate Change (IPCC) met in 2014 and published its Fifth Assessment Report (AR5) on 2 November 2014. Numerous EU research projects funded under FP6 and FP7 played a key role in the Report's conclusions.

The Report, entitled 'Climate Change 2014: Impacts, Adaptation, and Vulnerability'⁹, concludes that responding to climate change involves making choices about risks in a changing world. This report will be instrumental in the forthcoming negotiations on Climate Change.

⁸ [Your Voice In Europe](#)

⁹ [Climate Change 2014: Impacts, Adaptation, and Vulnerability](#)

The Ebola Outbreak

The outbreak of Ebola in West Africa constituted one of the most serious international health emergencies of 2014. The European Commission promptly supported urgent research on Ebola using for the first time (for research actions) the exceptional ground of the Financial Regulation for the duly substantiated emergency case and signing grant agreements within less than 2 months after having received proposals. € 24.4 million from Horizon 2020 were deployed for research on Ebola in line with the priorities identified by the World Health Organisation and in cooperation with other international funders. In addition the Commission, together with the pharmaceutical industry launched the IMI Ebola+ call through the Innovative Medicines Initiative (IMI) public-private partnership. €140 million were mobilised from Horizon 2020, which, in turn, leveraged a further €101 million from the pharmaceutical industry.

7. JOINT RESEARCH CENTRE (JRC)

In 2014 the JRC responded to a growing number of requests for scientific support to policy from the Commission policy services related to the EU's priorities, especially in the framework of the Europe 2020: Europe's growth strategy. The JRC provided direct scientific support to thematic policy areas such as: Economic and Monetary Union, Single Market, Innovation, Growth and Jobs, Low Carbon Economy and Resource Efficiency, Agriculture and Global Food Security, Public Health, Safety and Security, Nuclear Safety and Security (Euratom programme), and Better Regulation and Impact Evaluation.

8. DISSEMINATION AND EXPLOITATION

Seventh Framework Programme¹⁰

During seven years of FP7, 487 concluded calls received nearly 136,000 proposals – involving more than 601,000 applicants – out of which 97% were deemed eligible for the evaluation procedure. More than 25,000 proposals – involving more than 130,000 participants – were retained for negotiations. With a total requested EU funding of € 41,7 billion. Proposals had an average success rate of 19%. On the participation of Small and Medium Enterprises (SMEs), 18.6% of all participants in grant agreements signed in 2013 were SMEs.

FP7 projects have so far generated 32,461 publications since the launch of the programme in 2007. The cumulative number of patent applications, a good indicator of exploitable innovation potential, stood at 1,185 at the end of the year.¹¹

¹⁰ European Commission (2014): Seventh FP7 Monitoring Report

¹¹ The source of the figures shown here is SESAM (the European Commission online reporting tool for FP7 projects)/CORDA (Common Research Data Warehouse). The figures refer to the part of FP7 implemented by DG RTD. The 'People' Specific Programme has been excluded as, although it was initially managed by DG RTD, it is currently managed by DG EAC. The 'Ideas' Specific Programme has also been excluded, as it does not use SESAM. The part of FP7 implemented by DG CONNECT was also excluded, as it did not use SESAM.

Impact and added value of EU Programmes and Projects¹²

EU support for research and innovation has a single overriding objective: Achievement of impact. Through its support for research and innovation, the EU strives to achieve economic, social and environmental impact and to contribute to competitiveness, growth and job creation as well as the resolution of societal challenges. EU support to research and innovation is provided only when it can be more effective than national funding. Below are a few examples of successful projects financed under FP7 which demonstrate the European added value of the support provided, the concrete results and the impacts achieved:

- The EU-supported 'European Clinical Research Infrastructure Network' (ECRIN) has developed a single European area for clinical research as it integrates national clinical research facilities into an EU-wide network able to provide support in any medical field through specialised services and infrastructure. This has created or strengthened national infrastructures and will improve healthcare as well as Europe's scientific and industrial competitiveness.
- Addressing common European societal challenges is best done at EU level. The WeSenseIt project developed the concept of a citizen-based water observatory, where citizens - such as volunteer flood wardens in the UK or civil protection volunteers in Italy - via mobiles and social media can be active in capturing, evaluating and communicating information on water levels, creating cost efficiencies and acting as early warning systems for over-stretched local authorities.
- The EU-funded research project SOLAR-JET produced the world's first 'solar' jet fuel from just water and carbon dioxide, a promising technology that at the same time enhances energy security and fights climate change by turning a greenhouse gas into a useful resource. The project is still at the experimental stage, but the results, so far, show potential to provide secure, sustainable and scalable supplies of aviation fuel as well as diesel and gasoline, or even plastics. .

Dissemination of results in Horizon 2020

The effective use and dissemination of project results in Horizon 2020 is key and will maximise the added value and impact of the new Framework Programme. Specific measures targeting exploitation of results were already launched in Horizon 2020 through initiatives such as inducement prizes, the SME instrument, demonstration projects, and the InnovFin investment instruments.

9. OUTLOOK FOR 2015

The Commission remains committed to delivering the objectives of the Europe 2020 Strategy. Progress has been assessed on the flagship initiative 'Innovation Union'¹³, commitments. In particular, as to what concerns progress in the delivery of the actions that were put in place to fulfil the commitments, as well as examples of how these actions are being implemented.

¹² [DG RTD Annual Activity Report 2014](#)

¹³ [State of the Innovation Union. Taking stock 2010-2014](#)

In 2014, the Work Programme cycle 2016-2017 began taking on board President Juncker's political priorities. Horizon 2020 is set to play a role in this by contributing € 2.2 billion to the European Fund for Strategic Investments guarantee fund. The Work Programme 2016-2017 will take into account lessons learned from the first Horizon 2020 calls and that these continue to deliver topics with a challenge-based approach. Topics such as international cooperation, social sciences and humanities, gender dimension will be addressed more effectively in the Work Programme, and better use will be made of a whole range of funding instruments to promote innovation across Horizon 2020.

Finally, analysis of future Horizon 2020 calls will be undertaken to ensure that Horizon 2020 is better than its predecessors in generating scientific, social, environmental and economic impact.