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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 2010**

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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).

Although formally not within the scope of this Report, some information on research activities carried out under the Euratom Treaty has been included.

2. THE BROADER CONTEXT IN 2010

In June 2010, the European Council¹ endorsed the Europe 2020 strategy as the EU's agenda for growth and jobs for the next decade. It sets out how Europe can emerge from the crisis by focusing on smart, sustainable and inclusive growth. The strategy is supported by seven flagship initiatives to catalyse progress under each priority theme. Five headline targets were defined to serve as landmarks of success.

One of the cornerstones of the strategy is the need for Europe to enhance the excellence of its research and its capacity to innovate. A key objective was set 'to improve the conditions for research and development, in particular with the aim of raising the R&D intensity to 3%'.

While the EU as a whole did not progress significantly towards the 3% target over the past decade², the target did focus attention throughout the EU on the need for both the public and private sectors to invest more in R&D. As a result R&D investment has increased in real terms across EU-27³. Nevertheless, the overall R&D intensity in Europe is only at 2% (Eurostat 2009).

In October 2010 the Commission adopted its communication 'Europe 2020 Flagship Initiative Innovation Union'⁴ which sets a strategic and integrated approach to research and innovation. In November the Council⁵ (and subsequently the February 2011 European Council) supported this initiative, emphasising in particular the need to create the right conditions for a globally competitive innovation environment in Europe.

In the EU Budget Review⁶, the Commission presented its ideas on the architecture and purpose of the Union's future budget and set the scene for the forthcoming proposal on the next Multi-annual Financial Framework. Focusing on smart fiscal consolidation, the aim is to achieve a budget for the future designed to help deliver Europe 2020 and based on key principles such as delivering key policy priorities, EU added value, and driven by results. Being at the centre of economic policy and delivering growth and jobs, research and innovation were recognised as one of the most sustainable engines for delivering progress.

Most importantly, the Budget Review proposed to develop a Common Strategic Framework for all future EU research and innovation funding. The aim, as subsequently set out in a Green

¹ http://ec.europa.eu/europe2020/index_en.htm

² The European Council set in 2002 the target to increase the EU R&D intensity to approach 3% by 2010.

³ An EU-27 increase by 25% between 2000 and 2009

⁴ http://ec.europa.eu/research/innovation-union/index_en.cfm

⁵ http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/118028.pdf

⁶ http://ec.europa.eu/budget/reform/index_en.htm

Paper, would be to develop a coherent set of instruments providing seamless funding across the whole innovation chain, from research to technological development, to demonstration and market uptake.

3. THE INNOVATION UNION, INCLUDING ERA POLICY ACHIEVEMENTS

Through Innovation Union, Europe has adopted a strategic and integrated approach to innovation whereby the objectives of increasing competitiveness and addressing societal challenges reinforce each other and the pursuit of innovation determines policy formulation and implementation in all areas.

A key implementation feature are European Innovation Partnerships which will bring together all the actors of the innovation cycle and integrate European efforts to address urgent societal challenges whilst accelerating the market take up of new technologies and products in Europe.

3.1. Monitoring progress in innovation

Following the request of the European Council in June 2010 to develop a new indicator for monitoring progress in innovation, a High Level Panel of leading business innovators and economists examined the availability and quality of possible indicators and their technical feasibility. The panel took into account the need to avoid duplication with the 3% R&D intensity target, to focus on outputs and impacts and to ensure international comparability.

Following the panel's work and after consultation of Member States, an indicator based on the share of fast-growing innovative firms in the economy was proposed in Innovation Union, as a means to focus on a critical gap which the EU will need to close if it is to catch up with innovation leaders world-wide.

3.2. Improving framework conditions

One of the priority areas under Innovation Union is the drastic improvement of the business environment that underpins private investment in research and innovation. This requires setting in place a number of key framework conditions and the following priorities have been highlighted in Innovation Union and by the European Council:

in the area of standardisation: reforming the European standardisation system to make it much faster and more efficient in delivering interoperable standards, in particular in the ICT sector;

in the area of public procurement: improving the application of current legislation and developing a Small Business Innovation Research type Scheme to promote the take up and use of innovative products;

in the area of intellectual property: adopting the European patent and creating an EU-wide knowledge market to facilitate the exploitation of knowledge⁷.

3.3. Enhancing access to finance for innovative companies

During 2010, access to finance continued to be a major obstacle to reaching Europe's research and innovation investment goal.

⁷ The Council authorised on 10 March 2011 the launch of an enhanced cooperation among EU Member States for the creation of a unitary patent title.

The Innovation Union's commitments to help tackle this state of affairs cover developing a new generation of EU-level financial instruments to overcome market gaps and attract a major increase in private finance for research and innovation; establishing a regime to enable venture capital funds established in any Member State to operate and invest freely across the EU; making it easier for innovative firms to match up with suitable investors, EU-wide; and reviewing the State aid framework for R&D and innovation in order to clarify which forms of innovation can be properly supported.

The new generation of financial instruments will build on the striking success of the Risk-Sharing Finance Facility⁸ (RSFF) under the Seventh Framework Programme, and of other EU-level schemes.

3.4. Tackling societal challenges: European Innovation Partnerships

The concept of European Innovation partnerships (EIPs) was introduced as part of Innovation Union together with a proposal to launch a pilot EIP on Active and Healthy Ageing. EIPs are aimed at mobilising and coordinating all relevant supply- and demand-side measures. One important aspect concerns addressing regulatory or financial bottlenecks and streamline existing support measures to ensure that innovative products and solutions reach the marketplace quickly.

Following support from the Council in November 2010⁹ the Commission launched a stakeholder consultation on the scope and content of the pilot EIP and outlined in a FAQ paper the governance arrangements and selection criteria for the next EIPs. The European Council endorsed the pilot partnership on 4 February 2011.

3.5. Delivering the European Research Area (ERA)

3.5.1. ERA Governance

The Ljubljana process¹⁰ aims through concerted actions and the five ERA partnerships between the Member States and the EU to tackle deficiencies and inefficiencies in the European research system due to fragmentation, a lack of coherence and coordination, and constraints on the free movement of knowledge.

Innovation Union announced that the Commission will propose a new ERA Framework in 2012. This framework will identify and address the key bottlenecks which prevent the development of a research system worthy of the knowledge economy aspirations of the EU. To put in place such an ERA framework, the Commission will analyse how to take advantage of the strengthened legal basis for ERA in the Lisbon Treaty.

Another key step in the overall governance of ERA was the adoption of a new mandate for CREST, which changed its name to European Research Area Committee¹¹ (ERAC) to better reflect the new emphasis given to ERA¹².

⁸ http://ec.europa.eu/invest-in-research/funding/funding02_en.htm

⁹ http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/118028.pdf

¹⁰ COM(2008) 9076

¹¹ ERAC is a strategic policy advisory body to the Council and the Commission in the sphere of research and technological development.

¹² Council Resolution of 26 May 2010 (3016)

3.5.2. Researchers

The Steering Group for Human Resources and Mobility continued in 2010 to play an active role in the implementation of the European Partnership for Researchers. Via National Action Plans, a number of countries contributed to progress towards a more open and unified EU labour market for researchers. A contract to monitor the implementation of these actions was launched so as to produce an annual progress report for the coming three years.

Other key actions include the design of a framework for researchers' career stages, a study to facilitate the creation of pan-European pension funds for researchers, a study on the mobility patterns and career paths of EU researchers (MORE), and the expansion of the EURAXESS-Links with European researchers abroad to India and Singapore.

Looking ahead in 2011, a comparable research career structure will be promoted, efforts to facilitate a pan-EU pension fund will be continued and the idea of a researcher's card to create a Europe-wide registration and information system will be tested.

3.5.3. Joint Programming Initiative (JPI)

The Council Conclusions of December 2009 launched the pilot JPI on Neurodegenerative diseases and selected three more themes for JPIs on which the Commission adopted Commission Recommendations: Agriculture, Food Security and Climate Change; Cultural Heritage and Global Change; A Healthy diet for a healthy life. The Council launched the three JPIs in its October 2010 session.

The High-Level Group on Joint Programming identified a second wave of six JPIs, endorsed by the Council in May 2010:

- (1) More Years, Better Lives - The Potential and Challenges of Demographic Change
- (2) The microbial challenge - An emerging threat to human health
- (3) Healthy and Productive Seas and Oceans
- (4) Water Challenges for a Changing World
- (5) Connecting Climate Knowledge for Europe
- (6) Urban Europe - Global Challenges, Local Solutions

The November 2010 Council Conclusions welcomed the first biennial report on Joint Programming, including the Voluntary Guidelines on Framework Conditions, which reviews progress and charts the future of the JPI process.

3.5.4. Research Infrastructures

The regulation setting up a legal framework for a European Research Infrastructure Consortium (ERIC)¹³ was designed to facilitate the establishment and operation of large research infrastructures involving several European countries. However, the uniform and

¹³ Council Regulation No 723/2009 of 25 June 2009

timely implementation of the ERIC regulation in the various Member States remains a challenge. The first request to set up an ERIC was submitted in October 2010; the SHARE ERIC (Survey of Health, Ageing and Retirement in Europe) was established in March 2011¹⁴.

The implementation of the European Strategy Forum for Research Infrastructures' (ESFRI) Roadmap significantly progressed in 2010, in particular thanks to the Preparatory Phase Projects funded by the FP7 Research Infrastructure theme. In 2010, ten agreements have been reached and the construction phase of the projects is ongoing or imminent.

Through its incubator role, ESFRI has been successful in starting new infrastructures and in developing a common ERA approach, but now the longer-term sustainability of pan-European research infrastructures has to be addressed. The standards of excellence must be extended to the operation of existing ones and contribute to evaluating and prioritising all pan-European research infrastructures. Thus, a working group has been set up to develop and propose a methodological frame for evaluation and priority setting by 2011.

3.5.5. External Dimension of ERA

The European Partnership for International S&T Cooperation aiming at developing greater coherence between the EU and the Member States continued in 2010 to be a core element of the Union's activities in this area. The Strategic Forum for International S&T Cooperation (SFIC) ensured the progress of this partnership.

Specific focus has been given on implementing the 'India Pilot Initiative' on water and bio-resources related challenges with a view to develop a EU/Member States-India Strategic Research and Innovation Agenda during 2011. SFIC has also identified further common EU/Member States priorities by initiating coordinated or joint initiatives through additional geographical "pilot initiatives" with China and the USA.

3.5.6. Knowledge Transfer

The ERAC working group on Knowledge Transfer promotes and monitor the Council Resolution on the Commission's Recommendation and Code of Practice on Knowledge Transfer¹⁵. The group facilitated mutual learning and submitted in 2010 a first report which identified initiatives taken and envisaged at the national level to implement the Recommendation. The working group progressed on work to create guidelines for stakeholders on knowledge transfer and intellectual property management for international research cooperation and for indicators.

In addition, the Commission launched a three-year long monitoring study on measures taken by Member States on the basis of the Recommendation and their impact. To involve stakeholders, the Commission organised its third stakeholders' forum in November 2010.

¹⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:071:0020:0031:EN:PDF>
¹⁵ COM(2008) 1329

3.5.7. Universities: Modernisation Agenda

In 2010, a series of Peer Learning Activities on five topics which form part of the modernisation agenda for universities¹⁶ took place and their overall results were discussed in the Belgian Presidency Conference "Conditions for achieving excellence in universities and other research organisations" in October. An ERAC Seminar took place in March 2011 to finalise the conclusions and discuss how to feed the results into the policy process.

Meanwhile, a stakeholders' platform was launched to develop common principles for external competitive research funding. Its Report is being used to feed policy debates, e.g. for the preparatory work on the ERA Framework and the follow-up Communication on the modernisation agenda of higher education.

4. THE SEVENTH FRAMEWORK PROGRAMME

4.1. Implementation of the 2010 work programmes

63 calls for proposals were concluded in 2010 for a total indicative budget of EUR 3.9 billion. A total of 12,397 eligible proposals, of which 2,582 were retained for funding¹⁷ resulting in a success rate of 21 % on a proposal basis.

A total of 57,315 applicants took part in all eligible proposals, for a total project cost of EUR 23.3 billion and a total requested EU contribution of EUR 17.8 billion. A total of 13,710 applicants were in the retained proposals, for total project costs of EUR 5.2 billion and a total requested EU contribution of EUR 3.8 billion. The overall success rate was 24 % in terms of applicants

4.2. The 2011 work programmes

The 2011 work programmes were adopted on 19 July 2010 and covered calls for nearly EUR 6.4 billion of EU investment in research and innovation. They were the first FP7 work programmes following the publication of the Europe 2020 strategy. The work programmes included the following features:

- Top priority given to Small and Medium-sized Enterprises (SME). SMEs will receive close to EUR 800 million and for the first time ring-fenced budgets were introduced in several themes;
- In health, one-third of the overall budget for 2011 will be spent on investigator-driven clinical trials to get new medicines on the market quicker;
- Around EUR 1.1 billion of ICT funding will help deliver the Digital Agenda for Europe by addressing challenges such as an ageing society and a lower-carbon economy through focusing on next generation network and service infrastructures, robotic systems, electronic and photonic components, digital content technologies and the future internet.
- The call on the 'Ocean of tomorrow: joining research forces to meet challenges in ocean management' cuts across several themes;

¹⁶ These include: institutional reform, costing of research projects, world-class excellence, recruitment, and career of young researchers.

¹⁷ Passed all evaluation thresholds and were main listed in the selection procedure

- Following the 2010 EU-Latin America and Caribbean (LAC) Summit¹⁸, particular attention was given to the participation of research entities from the LAC region;
- More than EUR 1.3 billion was reserved for the best creative scientists selected by the European Research Council;
- Nearly EUR 750 million were allocated to training and career development of researchers, including cross-border and cross-sectoral mobility, through Marie Curie actions.

4.3. Related initiatives

As regards Article 185 Initiatives, the results of the interim evaluation of the Ambient Assisted Living (AAL) Joint Programme concluded its success in joining 23 partner countries towards a common goal to fund innovative projects based on ICT technologies, to the benefit of older people, and to support the industry in Europe. During 2010 AAL implemented a third call with a total budget of EUR 55 million, of which EUR 23 million was EU contribution.

In 2010, Eurostars continued to successfully attract European R&D SMEs, as the fifth call saw a 10% rise in the number of applicants. An interim evaluation of Eurostars also took place this year. It was concluded that Eurostars is a good programme adding value to European R&D performing SMEs, but that scope for further improvement remains.

The EU invested EUR 48 million in the European Metrology Research Programme (EMRP) initiative covering European research in metrology. In its third year of implementation, EMRP now covers 44% of all ERA research in this area.

The European Parliament and Council adopted the decision on the Joint Baltic Sea Research Programme (BONUS)¹⁹.

Financial support for research and innovation is being provided to private companies through the Risk Sharing Finance Facility (RSFF). By end-2010, the volume of the RSFF loans concluded amounted to EUR 6.305 billion for 67 projects.

At mid-term (end-2010), and with a positive interim evaluation²⁰, RSFF is well ahead of its planned implementation, and the level of demand is above initial expectations. RSFF has leveraged investments worth over 32 times the EU budget contribution. In hard figures, this means that despite the financial and economic crisis, EUR 500 million of EU budget led to EUR 16 billion of investment for the period 2007-2010.

In 2010, a number of key milestones were achieved for ITER²¹ through the joint undertaking 'Fusion for Energy'²². Following the July 2010 ITER Council agreement on the baseline, which concerns the project's scope, schedule and cost, Euratom have been working with all the other ITER parties on further steps for improvement of management, cost containment and appropriate risk mitigation. This work will continue in 2011.

¹⁸ Madrid, 18-19 May 2010

¹⁹ ftp://ftp.cordis.europa.eu/pub/fp7/art169/docs/art-185-bonus_en.pdf

²⁰ http://ec.europa.eu/research/evaluations/index_en.cfm

²¹ <http://www.iter.org/>

²² <http://fusionforenergy.europa.eu/>

4.4. Highlights

4.4.1. *FP7 Interim Evaluation*

The interim evaluation of FP7 was carried out by a group of ten independent experts which looked at the design, the implementation and the early achievements of the programme. Their work was based on a comprehensive set of studies and reports, but also on interviews with stakeholders and Commission staff. In addition, the expert group organised over the summer 2010 a broad and open online stakeholder consultation.

The experts submitted their final report on 15 November 2010²³, and the overall key message is that FP7 is on course and clearly making a significant contribution to European science and the ERA.

The report shows that FP7 achieved very positive results up till now, but that significant challenges remain. These are detailed in 10 recommendations covering issues such as the need to better integrate the research base and at the same time secure a better separation between the EU and national levels; maintain the level of funding at current levels; secure a quantum leap in programme simplification; consider a moratorium of new research instruments; and fundamentally review the strategy for international research cooperation.

The Commission's formal response²⁴ was adopted on 9 February 2011. The structure of this communication follows each of the 10 recommendations by the Expert Group. It provides detailed information on actions to be taken or proposed and directions to be followed.

In some cases the response notes the limits to what the Commission can achieve on its own and to call on the support of the other Institutions and the Member States to develop joint approaches. The response also endorses the conclusions of the expert group regarding the goals and implementation of future funding programmes. It underlines that this will need to support the implementation of the Europe 2020 strategy, including the objectives in the Innovation Union and related flagship initiatives.

4.4.2. *Simplification*

2010 was an inflection point in the search for the optimal balance between simplification and assurance concerns. Despite the significant progress already achieved, feedback from stakeholders still evidenced certain concerns with the complexity of rules and the administrative burden of the framework programmes. Stakeholders as well as the EU institutions recognised that further effort was needed so that the design, management, procedures and tools would become even simpler and more effective.

A thorough analysis on the options for a comprehensive simplification of the research programmes was conducted by the Commission. The results were made public with the Communication on simplifying the implementation of the Research Framework Programmes of 29 April 2010²⁵. Also, the simplification objective was duly considered in the proposal on the revised Financial Regulation²⁶.

²³ http://ec.europa.eu/research/evaluations/index_en.cfm

²⁴ COM(2011) 52 final

²⁵ COM(2010) 187

²⁶ COM(2010) 815

Many of the measures advanced by the Commission received overall support and in the last quarter of 2010 the simplification activity was focused in defining short-term measures which could be already implemented in FP7. As a result, the Commission put forward a FP7 simplification package which was adopted on 24 January 2011²⁷. Intensive work is currently ongoing to tackle more profound changes in the context of the preparation of the next research and innovation programmes.

4.4.3. *Functioning of the Joint Technology Initiatives*

The present five Joint Technology Initiatives (JTIs) are based on Article 187 TFEU (ex Article 171 TEC). JTIs were introduced in FP7 as a new mechanism for performing research at EU level.

The Innovative Medicines Initiative Joint Undertaking (IMI) is a partnership between the Commission and the umbrella organisation of the European research-based pharmaceutical industry, EFPIA, on improving the health of citizens by addressing pre-competitive bottlenecks in drug development. A total volume of EUR 1 billion in-kind contribution from the pharmaceutical industry, matched by an equal amount of in-cash funding from the EU budget is foreseen. 2010 was the first year of full operation of the Executive office of IMI.

The first interim evaluation of IMI took place towards the end of 2010. The experts delivered an overall positive evaluation of IMI as the world's largest public-private partnership in health research. The recommendations are directed at further strengthening the functioning of IMI.

During 2010 **the Fuel Cells and Hydrogen Joint Undertaking (FCH)** was consolidated with the granting of autonomy. An amendment to the Council Regulation was also prepared in 2010. This amendment takes into account that the Research Grouping became the third member of the FCH and proposed that in-kind contribution of the research organisations that participates in the projects be counted as "matching" on equal footing as the one of the industry.

The first FCH interim evaluation is currently ongoing. A final report is planned for spring 2011.

After reaching its autonomy in 2009, **Clean Sky Joint Undertaking** (Aeronautics and Air Transport) has reached a steady state operation during 2010. 5 calls were launched and evaluated in the course of the year. Apart from this, Clean Sky has also successfully managed the 7 Grant Agreements for Members (named beneficiaries), covering 75% of the research activities of Clean Sky.

The interim evaluation of Clean Sky took place during 2010. The evaluation was generally positive, but it did contain a list of more than 40 recommendations at various levels.

A Commission Communication, covering responses to the mid-term assessment reports of IMI, FCH and Clean Sky, is planned to be presented during 2011.

The **ARTEMIS Joint Undertaking** on embedded computing systems launched the third Call for proposals in 2010. Overall, the 2010 R&D activities have resulted in launching 10 new projects with a cost of EUR 167,5 million. 50.5 % of the project cost is covered by the project

²⁷ COM(2011) 174

participants, 32.8 % by ARTEMIS Member States and 16.7% by the Joint Undertaking. Thus, Union funds produce a leverage effect of 1:6.

The ENIAC Joint Undertaking on nanoelectronics technologies 2020 was granted autonomy in 2010. The third Call for proposals was launched during 2010. Overall, the 2010 R&D activities have resulted in launching 10 new projects with a cost of EUR 201 million. 56.5 % of the project cost is covered by the project participants, 26.8 % by ENIAC member States and 16.7% by the Joint Undertaking. Union funds therefore produce a leverage effect of 1:6.

The Commission's report on the first interim evaluation of the ARTEMIS and ENIAC was adopted on 16 December 2010²⁸.

5. OUTLOOK FOR 2011

With the Green Paper *'From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding'*²⁹ the Commission launches a wide European public debate in order to seek input on a number of key issues which should help develop a common strategic framework and determine the priorities for future EU research and innovation funding programmes in the period post 2013.

The discussion includes issues such as how to target funding towards solving the present challenges, and how to support the innovation activities of European businesses more effectively, while simultaneously strengthening Europe's science base and the ERA. The result will be presented and discussed with the stakeholder community.

The Union's next research and innovation funding programmes will be part of the Commission's proposals for the next Multi-annual Financial Framework to be presented in June 2011. Regarding the Common Strategic Framework, legislative proposals are expected to be adopted by the Commission by the end of 2011.

6. SOURCES OF FURTHER INFORMATION

For further information, the following are publicly available:

- Annual Monitoring Reports for the Framework Programme and its Specific Programmes³⁰;
- Five-year assessment reports³¹;
- Regular Science, Technology and Competitiveness Key Figures reports³²;
- Statistics on science and technology in Europe (Eurostat)³³;
- Studies and analyses published in connection with European Union research activities and policies³⁴;

²⁸ COM(2010) 752

²⁹ http://ec.europa.eu/research/csfr/index_en.cfm

³⁰ http://ec.europa.eu/research/evaluations/index_en.cfm?pg=fp7-monitoring

³¹ http://ec.europa.eu/research/evaluations/index_en.cfm?pg=five-year-assessment

³² http://ec.europa.eu/research/era/facts/figures/key_figures_en.htm

³³ <http://ec.europa.eu/eurostat>

- Annual Activity Reports of the research Directorates-General³⁵;
- The practical guide to EU funding opportunities for research and innovation³⁶

Most of these documents can be obtained or ordered from the following websites:

- The CORDIS site: <http://cordis.europa.eu>;
- The Commission's Research website: <http://ec.europa.eu/research>;
- The ERA website: <http://ec.europa.eu/research/era>;
- The Investing in European research website: <http://ec.europa.eu/invest-in-research>;
- The ERAWATCH website: <http://cordis.europa.eu/erawatch>.

³⁴ http://ec.europa.eu/research/evaluations/index_en.cfm

³⁵ http://ec.europa.eu/atwork/synthesis/aar/index_en.htm

³⁶ http://cordis.europa.eu/eu-funding-guide/home_en.html