European Parliament

EU Research Policy:

Tackling the major challenges facing European society

- 2014 – 2020, EU funds for research and innovation near **€120 billion**.
- **€31 billion** of EU funds are set aside for research into societal challenges (2014 – 2020)
- A fully established European Research Area will generate **annual gains** of **€16 billion.**

A European Research Area to boost growth and jobs in Europe

In 1986, the European Economic Community wrote research policy into the European treaties in order to overcome the weakness of the scientific and technological foundations of European industry. Research cooperation and the pooling of research resources and knowledge among the Member States were aimed at supporting European industrial competitiveness at international level.

The concept of a European Research Area (ERA) is currently shaping the common European research policy. As the fragmentation of national research systems limits the full potential of European research to impact on technological progress and create further growth and jobs, the ERA concept aims to unify research across the EU Member States. Introduced in 2000, it helps to maximise the use of scientific capacities and material resources in the EU Member States. The ERA concept also helps to strengthen the EU's scientific and knowledge base and to ensure that new technology-intensive products and services are developed and growth and jobs generated in Europe.

The **European Parliament** (EP) has supported the implementation of ERA. However, it has also called for a European research policy that is able to react to changing circumstances and newly emerging research priorities. In addition, in recent years, the EP has called repeatedly for a substantial increase in research spending. For the 2014 to 2020 period, EU funding for research and innovation in Europe amounts to approximately €120 billion. Most of this total is earmarked for the four following EU programmes:



Source: European Parliamentary Research Service

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PE 598.597-March 2017

EU and Member States' key contributions in the field of research

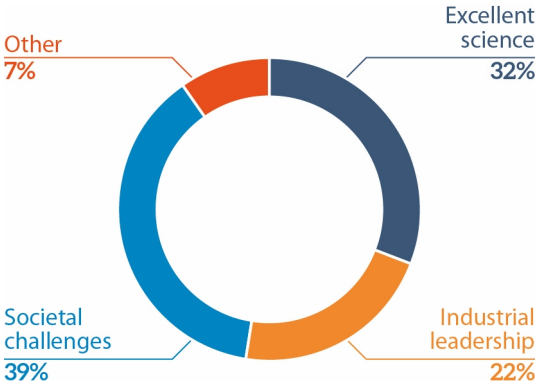
Both the European Commission and the Member States contribute by various initiatives to support European scientific research and to build up the ERA.

EU contribution

With a budget of close to €80 billion for the 2014 to 2020 period, the Commission's framework programme, Horizon 2020, is the largest EU programme supporting research ever established. Since it was set up in 2014, over 9 000 grants have been signed and €15.9 billion allocated to signed grants. Crucially, most of the Horizon 2020 budget is divided among three main pillars:

1) 31.71 % is allocated to **excellent science** (31.71 %) to extend the excellence of EU scientific research and to consolidate the ERA in order to make the EU's scientific research and innovation more competitive globally.
2) 22.09 % is channelled into **industrial leadership** to contribute to the development of technology and innovation to support future EU business and help SMEs to grow into world-leading companies.
3) With 38.5 %, the biggest share is directed towards research into **major societal challenges** such as demographic change, food security, secure and clean energy, smart and green transport, climate change and secure societies.

Distribution of the Horizon 2020 budget 2014-2020



Source: European Commission

The two examples below highlight the added value of EU research policy and the way in which projects funded by Horizon 2020 contribute to research into major **societal challenges**:

Example of research project	EU contribution	Research objectives
Analysis System for Gathered Raw Data (ASGARD) (ongoing)	Approximately €11.9 million	The project will develop tools and infrastructure for the extraction, fusion, exchange and analysis of big data. The tools and infrastructure will be used, for example, to tackle cyber offences by generating data for forensic investigations.
Ebola Virus Disease correlates of protection, determinants of outcome, and clinical management (EVIDENT) (completed)	Approximately €1.7 million	The project's objective is to contribute to the fight against Ebola epidemics by a variety of means, including monitoring the development of mutations of the Ebola virus. EVIDENT has confirmed that the Ebola virus has mutated at a lower rate than feared during the 2014 outbreak in West Africa. Thus, new diagnostic methods and treatments under development should still be effective in the fight to eradicate the disease.

The main initiatives of the Commission under the first Horizon 2020 **excellent science** pillar include the Marie Skłodowska-Curie actions (MSCA). Directed towards all stages of a researcher's career, the MSCA are aimed at supporting research training and career development with a focus on innovation skills. The programme funds worldwide and cross-sector mobility that implements excellent research in any field. Since it began in 1996, about 98 000 researchers have benefited from the programme. In addition, organisations outside academia such as pharmaceutical, electronics, chemical and software enterprises

have also received close to €170 million in support.
There are four different types of MSCA:

- Innovative Training Networks to develop new researchers;
- Individual fellowships, which back experienced researchers moving between countries;
- Research and Innovation Staff Exchanges, which are designed to provide staff from academia and private organisations with experience in different work environments by means of short-term exchanges;
- Co-funding for regional, national and international programmes that support research mobility by offering international and intersectoral dimensions and options for training and career development.

Two examples of ongoing training and mobility projects within the MSCA framework are:

Example of research project	EU contribution	Research objectives and results
Sustainable energy demand side management for Green Data Centres (GREENDC) (ongoing)	About €1 million	The project aims to develop a decision support tool that helps data centre managers predict energy demands better and evaluate strategies to minimise energy waste and CO_2 emissions, and thus contributing via green data centres to clean energy.
Smart robots for fire-fighting (SMOOTH) (ongoing)	About €0.9 million	The project aims to propose a novel robot-assisted decision making system for smart fire fighting to perform search and rescue in a fire situation and facilitate more efficient decision making.

Member States' contribution

In addition to shaping their national research systems according to the six ERA priorities in accordance with Member States' roadmaps, a key contribution made by the EU Member States to the European research area is their commitment to Joint Programming Initiatives (JPIs). The goal of JPIs is to pool national research efforts in order to make better use of Member States' research resources. By doing so, JPIs contribute towards reducing the fragmentation of the research landscape across EU Member States. JPIs are already generating added value for the research situation in Europe and boosting thematic coverage. Moreover, the JPIs' focus is on effectively tackling common European societal challenges. Ten JPIs, including the following two examples, have been launched so far.

- Agriculture, Food Security and Climate Change (FACCE-JPI) brings together 22 EU countries who are committed to addressing the interconnected challenges of sustainable agriculture, food security and the impacts of climate change. It provides research to support sustainable agricultural production and economic growth, to contribute to a European bio-based economy, while maintaining and restoring ecosystem services under current and future climate change.
- Urban Europe – Global Challenges, Joint European Solutions tackles the urgent need to improve understanding of the way urban areas should be shaped and managed to become socially, economically and environmentally sustainable. It supports Europe's cities in their transition towards a future that maximises their sustainability, resilience and liveability.

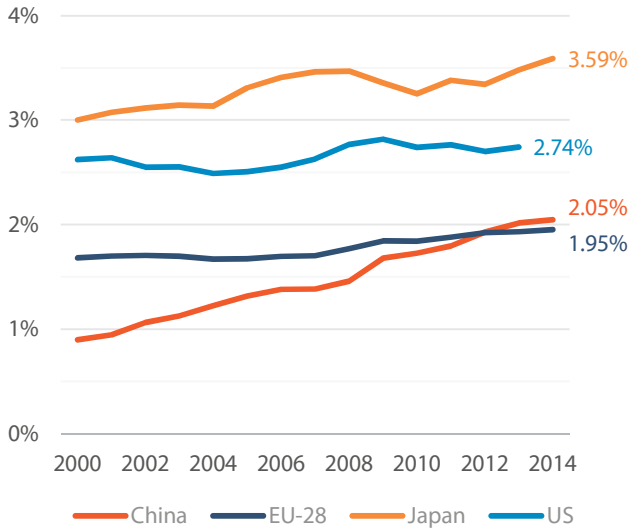
The general added value of all these initiatives for research in Europe is manifold. It lies in:



Remaining challenges

In order to be able to complete the ERA, tackle the common major societal challenges and restore EU industrial leadership, a number of obstacles still need to be overcome. It is particularly crucial to pool national research efforts and resources in transnational initiatives at European level. However, less than 1 % of national public funding for scientific research and development (R&D) is spent on transnational projects. In general, EU Member States' funding for scientific R&D has increased only marginally as a share of their gross domestic product (GDP) in recent years, from 1.81 % in 2002 to 1.95 % in 2014. Indeed, this runs against the 'Barcelona target', set by the European Council in 2002 to increase investment in scientific R&D to 3 % of GDP in EU Member States (one third of funding from governments and two thirds from business). The aim is to catch up with countries, such as the US and Japan, with high levels of scientific R&D expenditure. According to recent data, however, EU combined expenditure in scientific R&D is still lagging behind the US and Japan. Moreover, the EU has now been overtaken by China.

Total expenditure on R&D
1995-2014, % of GDP



Source: OCED, 2015

Benefits of a completed European Research Area

The EU needs to act coherently to achieve the scale of effort and impact needed to address major societal challenges and boost European competiveness with the limited public research funds available. Completing the ERA, which would imply a reallocation of national funds to transnationally coordinated research, could generate substantial benefits. The total gains of a fully completed ERA are estimated to amount to **€16 billion annually**. Even if this figure is only a rough estimate, completing the ERA is nevertheless likely to generate substantial added value in terms of synergies and efficiency of research, while also releasing money for further investment.

On the basis of a distance-to-target calculation, a 2016 European Parliamentary Research Service 'Cost of non-Europe' report states that there is a remaining implementation gap before ERA completion of 19 %, amounting to a loss of €3 billion annually. From another angle, the benefits of a completed ERA could be an additional 0.25 % of GDP growth and 323 000 more jobs by 2030. Above all, a completed, functioning ERA would maximise the impact of funds invested in research and benefit European society as a whole by enabling research to contribute fully to tackling the major challenges of tomorrow.

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Manuscript completed in February 2017. Brussels © European Union, 2017.

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