



On the next steps of Horizon 2020 and the next framework programme

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Research and
Innovation

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the European Commission. Please refer to official documents

Uddannelses- og Forskningsudvalget 2017-18
Offentligt



HORIZON 2020

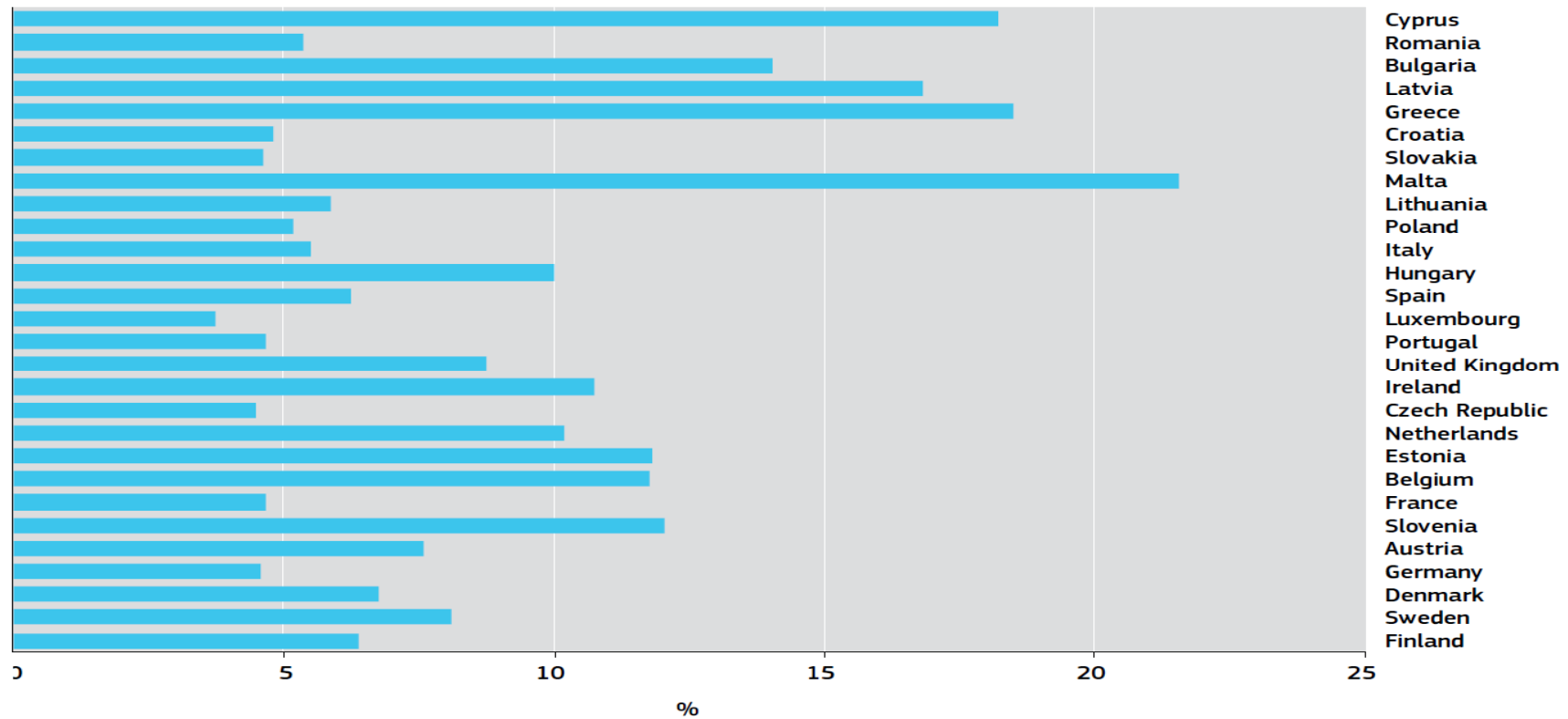
*Research and
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The Framework Programmes

- **EU direct support programmes for research and innovation:**
 - Multi-annual
 - Multi-thematic (e.g. health, energy, environment, transport)
 - Focused on activities where the EU can add value compared to action taken purely at Member State level
 - Focused to a large extent on cross-border collaborative (participants from at least 3 different Member States/Associated Countries) multi-disciplinary research (except e.g. ERC, Marie Curie: single country)
 - Participation by universities, research institutes, enterprises (except e.g. ERC, Marie Curie: individuals)
 - Funds competitively allocated through international peer review

The EU Framework Programmes are important

► **Figure II-2-4** Contribution of the FP7 (2007-2013) EU Framework Programme for R&D to the Member States⁽¹⁾ as % of total GBAORD, 2007-2013



Science, Research and Innovation performance of the EU 2016

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research Policies

Data: DG Research and Innovation, Eurostat

The Multiannual Financial Framework 2014-2020: European Council conclusions, 8 February 2013

Key challenge: stabilise the financial and economic system while taking measures to create economic opportunities

1. Smart & inclusive growth (€451 billion)



2. Sustainable growth, natural resources (€373 billion)

3. Security and citizenship (€16 billion)

4. Global Europe (€58 billion)

5. Administration (€61.6 billion)



What is Horizon 2020

- **Research and innovation funding programme (2014-2020)**
- **Core part of Europe 2020, Innovation Union & European Research Area:**
 - Responding to the economic crisis to invest in future jobs and growth
 - Addressing people's concerns about their livelihoods, safety and environment
 - Strengthening the EU's global position in research, innovation and technology

What's new

- **A significant increase of EU budget** for funding of research and innovation by around 30% to €70 Bio in current prices
- **A single programme** bringing together three separate programmes/initiatives*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond

* The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)

Three priorities



Funding 'Excellent science'

(€ million, 2014-2020)

| | |
|--|---------------|
| <i>European Research Council (ERC)</i> Frontier research by the best individual teams | 13 095 |
| <i>Future and Emerging Technologies</i> Collaborative research to open new fields of innovation | 2 696 |
| <i>Marie Skłodowska-Curie actions (MSCA)</i> Opportunities for training and career development | 6 162 |
| <i>Research infrastructures (including e-infrastructure)</i> Ensuring access to world-class facilities | 2 488 |

Funding 'Industrial leadership'

(€ million, 2014-2020)

| | |
|---|---|
| <p><i>Leadership in enabling and industrial technologies (LEITs)</i> (ICT, nanotechnologies, materials, biotechnology, manufacturing, space)</p> | <p>13 557</p> |
| <p><i>Access to risk finance</i> Leveraging private finance and venture capital for research and innovation</p> | <p>2 842</p> |
| <p><i>Innovation in SMEs</i> Fostering all forms of innovation in all types of SMEs</p> | <p>616 + complemented by expected 20% of budget of societal challenges + LEITs and 'Access to risk finance' with strong SME focus</p> |

Funding 'Societal challenges'

(€ million, 2014-2020)

| | |
|--|--------------|
| Health, demographic change and wellbeing | 7 472 |
| Food security, sustainable agriculture, marine and maritime research & the Bioeconomy | 3 851 |
| Secure, clean and efficient energy * | 5 931 |
| Smart, green and integrated transport | 6 339 |
| Climate action, resource efficiency and raw materials | 3 081 |
| Inclusive and reflective societies | 1 309 |
| Secure societies | 1 695 |
| <i>Science with and for society</i> | <i>462</i> |
| <i>Spreading excellence and widening participation</i> | <i>816</i> |

* Additional funding for nuclear safety and security from the Euratom Treaty activities (2014-2018)

Horizon 2020 implementation so far

- **159,968 eligible proposals, asking EUR 281.83 billion received**
- **17,975 proposals retained for funding (success rate of 11.95%)**
- **12,370 grant agreements signed**

Denmark in Horizon 2020 so far

- So far **11,183** participation applications from DK requesting **EUR 5.6 billion** (DK **12th** in terms of participation applications and **10th** in terms of EU funding requested)
- From DK, so far **1,633** participations requesting **EUR 702 million** retained for EU funding (DK **10th** in terms of applicants success rate (**14.6%**) and **10th** in terms of funding success rate (**12.5%**))
- With DK participants, so far **1,559** grant agreements signed involving **EUR 681 million** of EU funding to DK participants



TOWARDS FP9: LEARNING FROM THE PAST, CONSIDERING THE FUTURE & BENEFITING FROM CO-DESIGN

STAKEHOLDER
CONSULTATION

H2020 INTERIM
EVALUATION

FORESIGHT

ECONOMIC CASE
OF R&I

HIGH LEVEL
GROUP
CHAired BY
PASCAL LAMY

STAKEHOLDER
CONSULTATION

IMPACT
ASSESSMENT

PROPOSAL
FOR THE
SUCCESSOR
FRAMEWORK
PROGRAMME

POLITICAL DRIVERS:

EU budget under intense scrutiny: return on investment, impact on the ground, output-based funding, flexibility ...

Challenging **political climate:** EU added value; UK; EP elections

PROGRAMME DRIVERS:

Strong steer from **Juncker priorities** and **objectives of Commissioner Moedas** (3 Os, EIC); simplification...



European
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Research and innovation



TOWARDS FP9:

Key findings from the H2020 INTERIM EVALUATION

EFFICIENCY



ON TRACK TO BE MORE EFFICIENT THAN FP7

- Administrative expenditure below the 5% legal target
- Time-to-grant 110 days faster than FP7



NETWORKS A WIDE RANGE OF STAKEHOLDERS

- Participants from over 130 countries
- 52% of participants are **newcomers**; more of them come from EU-13 (31.2%) than EU-15 (19.7%)



LARGE-SCALE OVERSUBSCRIPTION

- Success rate only 11.6% (vs. 18.4% in FP7)
- ~EUR 1.7 billion spent to write unsuccessful proposals



TOWARDS FP9:

Key findings from the H2020 INTERIM EVALUATION

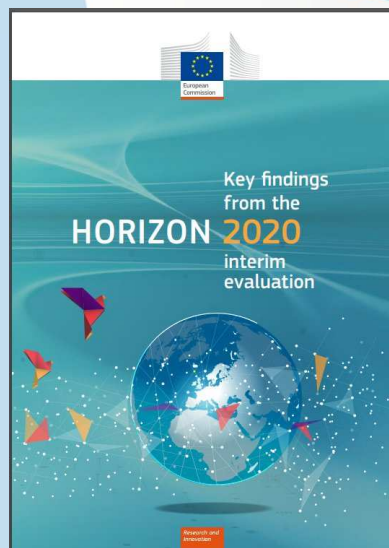
EFFICIENCY - ROOM FOR IMPROVEMENT

Over EUR 60 billion more needed to fund all high quality proposals.

Comprehensiveness of evaluation feedback is a concern.

International cooperation should be further increased.

Low participation from EU-13, but improving over time.



Research and Innovation



TOWARDS FP9:

Key findings from the H2020 INTERIM EVALUATION

EFFECTIVENESS - ECONOMIC IMPACT

PRODUCING INNOVATIONS & COMPETITIVENESS



- More **private sector participations** (33.2%) than FP7
- Funded projects ~40% more likely to be granted patents; patents are of **higher commercial value** than other peers
- 70% of SMEs aim at **new-to-market innovations**

GENERATING JOBS, GROWTH & INVESTMENTS



- **Every euro invested** under Horizon 2020 **brings** an estimated GDP increase of **6 to 8.5 euros** (EUR 400 to EUR 600 billion by 2030)

SUPPORTING & NETWORKING BUSINESS & SMEs



- 5,700 organisations funded under Access to Risk Finance
- EUR 13 billion **private funds leveraged**



TOWARDS FP9:

Key findings from the H2020 INTERIM EVALUATION

EFFECTIVENESS - ECONOMIC IMPACT:


ROOM FOR IMPROVEMENT



Support for breakthrough, market-creating-innovation can be strengthened.



More could be done to foster demand for innovative solutions & user-driven innovation.



Address potential barriers to innovation (e.g. regulation, access to finance) for full market uptake.



TOWARDS FP9:

Key findings from the H2020 INTERIM EVALUATION

KEY STRENGTHS



An **attractive, simplified and well-performing programme**, highly relevant for stakeholders and societal needs.



On track to deliver **value for money** and **to meet its knowledge-creating objectives**.



Strong **EU Added Value** through unique opportunities, competition & access to new knowledge.



TOWARDS FP9:

Key findings from the H2020 INTERIM EVALUATION

KEY AREAS FOR IMPROVEMENT



Underfunding

Has lower success rates than FP7, esp. for high quality proposals.



Support for market-creating innovation

Demonstrates potential for breakthrough, market-creating innovation, but it should be strengthened substantially.



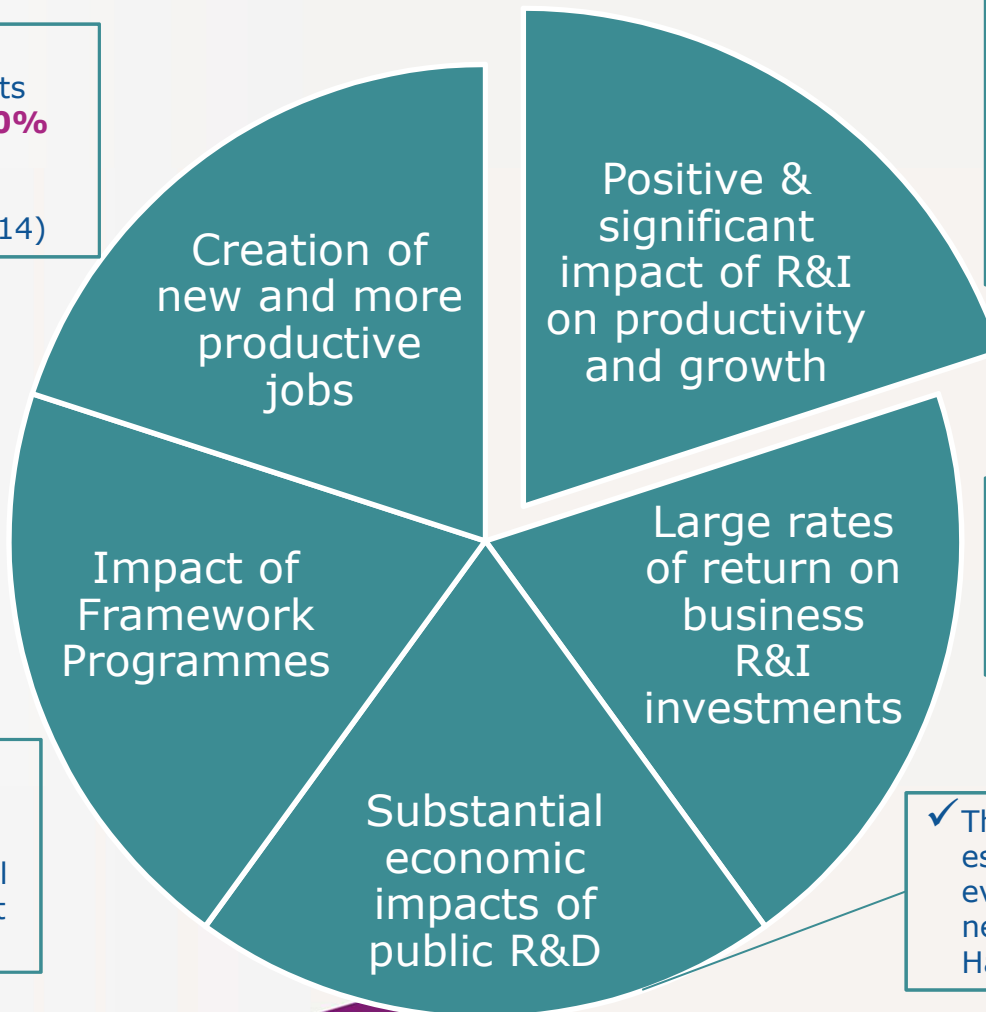
Greater outreach to civil society

Should better explain the impacts of R&I, and involve even more the users & citizens in agenda-setting & implementation.



TOWARDS FP9: THE ECONOMIC CASE OF R&I

✓ Companies with innovative products generate **30%-40% of new jobs in manufacturing** (Harrison et al 2014)



✓ **62% of growth in Europe** from 1995 to 2007 derives from R&I (NESTA, 2013)

✓ An **increase in R&D investment of 0.2% of GDP** can lead to an **increase of 1.1% of GDP**, i.e. five-fold in absolute terms (Donselaar and Koopmans, 2016)

✓ On average, the net **benefits** for a company that **invests 100 € in R&D** are **20 €**, and **up to 54 €** for R&D intensive companies (Hall et al, 2010)

✓ Economic growth: contribution of a **0.15% annual GDP growth** until 2030 (FP7 ex post evaluation, 2016)

✓ The **rate of return to public R&D** is estimated to be **around 20%**, i.e. for every 100 € of public R&D funding, the net benefit is of 20 € (Sveikaucas 2012, Haskel et al. 2014, Georghiou 2015)

High Level Group - recommendations

| | |
|----|---|
| 1. | Prioritise research and innovation in EU and national budgets <u>Action</u> : double the budget of the post-2020 EU research and innovation programme |
| 2. | Build a true EU innovation policy that creates future markets <u>Action</u> : foster ecosystems for researchers, innovators, industries and governments; promote and invest in innovative ideas with rapid scale-up potential through a European Innovation Council |
| 3. | Educate for the future and invest in people who will make the change <u>Action</u> : modernise, reward and resource the education and training of people for a creative and innovative Europe. |
| 4. | Design the EU R&I programme for greater impact <u>Action</u> : make the future programme's pillars driven by purpose and impact, fine-tune the proposal evaluation system and increase flexibility |
| 5. | Adopt a mission-oriented, impact-focused approach to address global challenges <u>Action</u> : set research and innovation missions that address global challenges and mobilise researchers, innovators and other stakeholders to realise them. |
| 6. | Rationalise the EU funding landscape and achieve synergy with structural funds <u>Action</u> : cut the number of R&I funding instruments, make those remaining reinforce each other and make synergy with other programmes work. |

High Level Group - recommendations

| | |
|-----|--|
| 7. | Simplify further <u>Action</u> : become the most attractive R&I funder in the world, privileging impact over process |
| 8. | Mobilise and involve citizens <u>Action</u> : stimulate co-design and co-creation through citizen involvement |
| 9. | Better align EU and national R&I investment <u>Action</u> : ensure EU and national alignment where it adds value to the EU's R&I ambitions and missions. |
| 10. | Make international R&I cooperation a trademark of EU research and innovation <u>Action</u> : open up the R&I programme to association by the best and participation by all, based on reciprocal co-funding or access to co-funding in the partner country. |
| 11. | Capture and better communicate impact <u>Action</u> : brand EU research and innovation and ensure wide communication of its results and impacts. |



TOWARDS FP9

A BRIDGING PHASE: HORIZON 2020 WORK PROGRAMME 2018-2020

- ▶ Prepare for a bridge in the last years of the programme to enable a smooth transition to any successor to Horizon 2020:
 - ▶ investment of 30 billion EUR for 3 years;
 - ▶ ... testing new approaches: European Innovation Council, simplification, international cooperation flagships...
 - ▶ ... flexibility for 2020, with 'minimum' content to bridge to the successor Framework Programme.



Work Programme 2018-2020 prepared through Strategic Programming

Objectives

Provide for a coherent implementation of the Horizon 2020 objectives and the multiannual approach, taking account of the Interim Evaluation and first two work programmes (for 2014-15 and 2016-17)

Enhance relevance and impact by delivering against the EU policy priorities and three O's

Prepare for a bridge in the last years of the programme to enable a smooth transition to any successor to Horizon 2020

Work Programme 2018-2020

- **R & I investment of around 30 billion EUR for 3 years**
- **Five mutually reinforcing strategic orientations addressing some main concerns of citizens:**

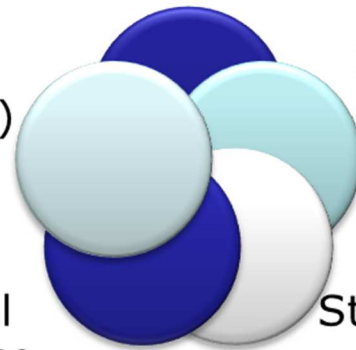
Increased investment in sustainable development and climate related R&I

Market creating innovation (EIC pilot)

Integrating digitisation in all enabling technologies and societal challenges

Societal Resilience

Strengthening international R&I cooperation



Open Innovation

- ✓ **EIC pilot**
- ✓ Open innovation test beds (€ 200 M)
- ✓ Ca. 30 topics of € 300 million budget in the Societal challenges pillar

Open Science

- ✓ € 2 billion channelled to direct/ indirect support for Open Science
- ✓ European Open Science Cloud and European Data Infrastructure (€ 600M)
- ✓ New: Open Research Europe platform for Horizon 2020 and successor framework publications

Open to the World

- ✓ **Over €1 billion investment for 30 international flagship initiatives:** Canada-human data storage for personalised medicine; EU-Africa-food; All Atlantic Research Alliance (US Flagship); Mission Innovation Initiative – energy (US Flagship); EU-India-water; Japan-Korea-China- Taiwan-calls for 5G, Russia-research infrastructure....
- ✓ Strong international component in the European Research Council (ERC) and Marie Skłodowska-Curie actions, e.g. ERC expected to fund 240 more non-EU/AC nationals as Principal Investigators



TOWARDS FP9



"I am convinced that the core values of Horizon 2020 and its successor have to be:"

EXCELLENCE

OPENNESS

IMPACT



TOWARDS FP9 INDICATIVE TIMELINE

| | |
|-------------|--|
| 2017 | |
| Jan | Public stakeholder consultation for the interim evaluation (with some forward looking questions) closed on 15 January |
| May | Publication of the Staff Working Document on the Interim Evaluation |
| June | <ul style="list-style-type: none">• Assessment of Horizon 2020 implementation in view of its interim evaluation and the Framework Programme 9 proposal by the European Parliament (EP);• ERAC Opinion on the interim evaluation of H2020 and in view of the preparations of the next FP |
| July | <ul style="list-style-type: none">• Publication of High Level Group report and stakeholder conference on Horizon 2020 Interim Evaluation (3 July)• Informal Competitiveness Council, Tallinn |
| Q4 | <ul style="list-style-type: none">• H2020 Work Programme 2018-2020 integrating main findings from the Interim Evaluation• Publication of Commission Communication on Interim Evaluation of Horizon 2020 |
| 2018 | |
| Mid | Next MFF Commission proposal |
| | Commission proposal tabled for the next Framework Programme & accompanying Impact Assessment |
| 2019 | |
| | European Parliament elections, appointment of the new Commission |
| 2021 | |
| | Launch of the 9th Framework Programme |