



EU Health Research Horizon 2020 Proposed Horizon Europe



Health Research, DG RTD

HORIZON 2020

The EU – A Partner of Excellence in R&I

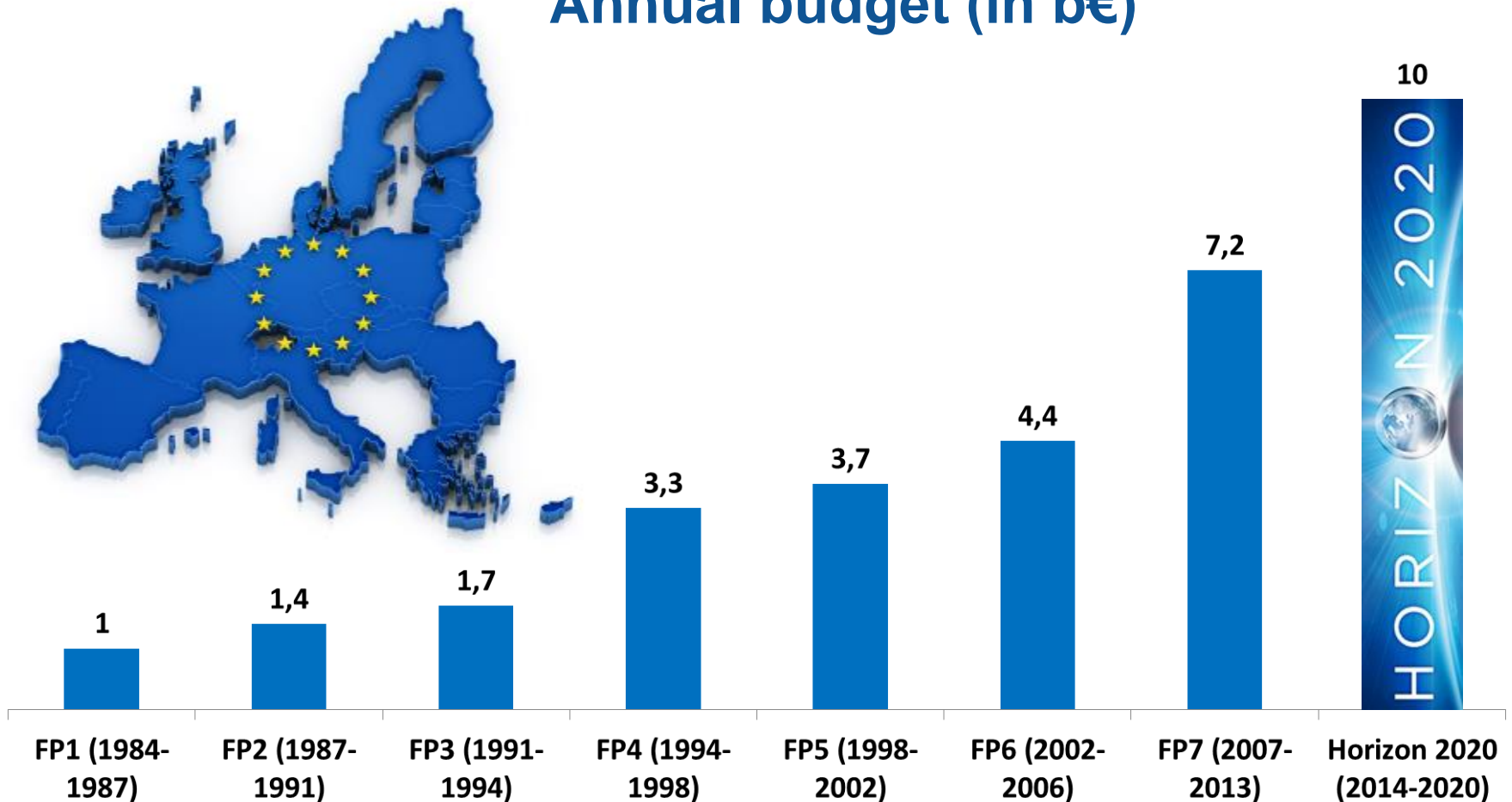
500 million people - 28 countries - a single market*



- 7% of the World's population
- 24% of world expenditure on research
- 32% of high-impact publications
- 32% of patent applications

*Free movement of people, goods, services, capital and **knowledge**

30 years of EU funded R&I Annual budget (in b€)



EU Investment in R&D

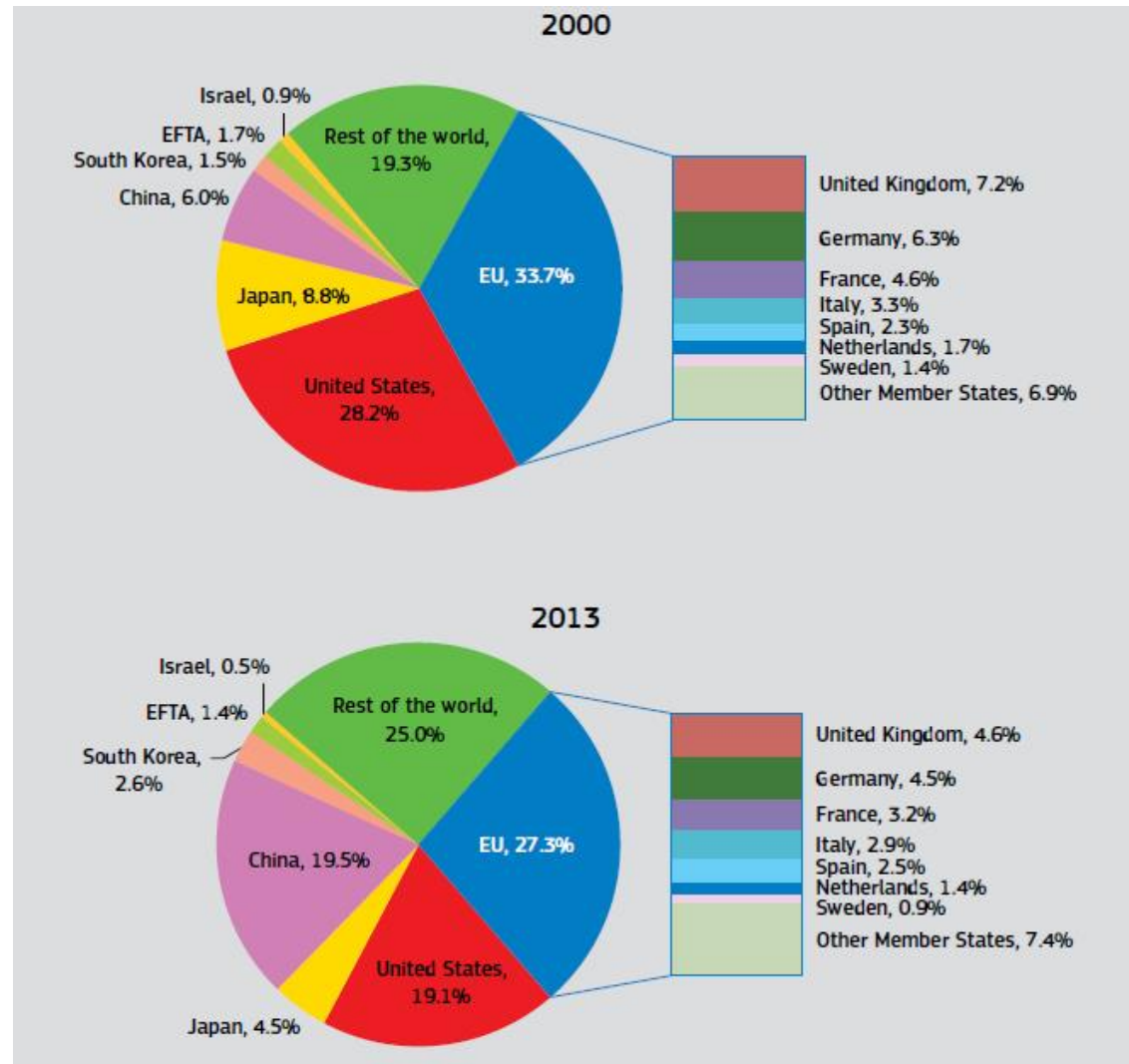


Gross domestic expenditure on R&D (R&D intensity), EU-28, 2002-14

EU has a strong scientific base

EU in world share of scientific publications

Source: Science, Research and Innovation Performance of the EU 2016, DG RTD

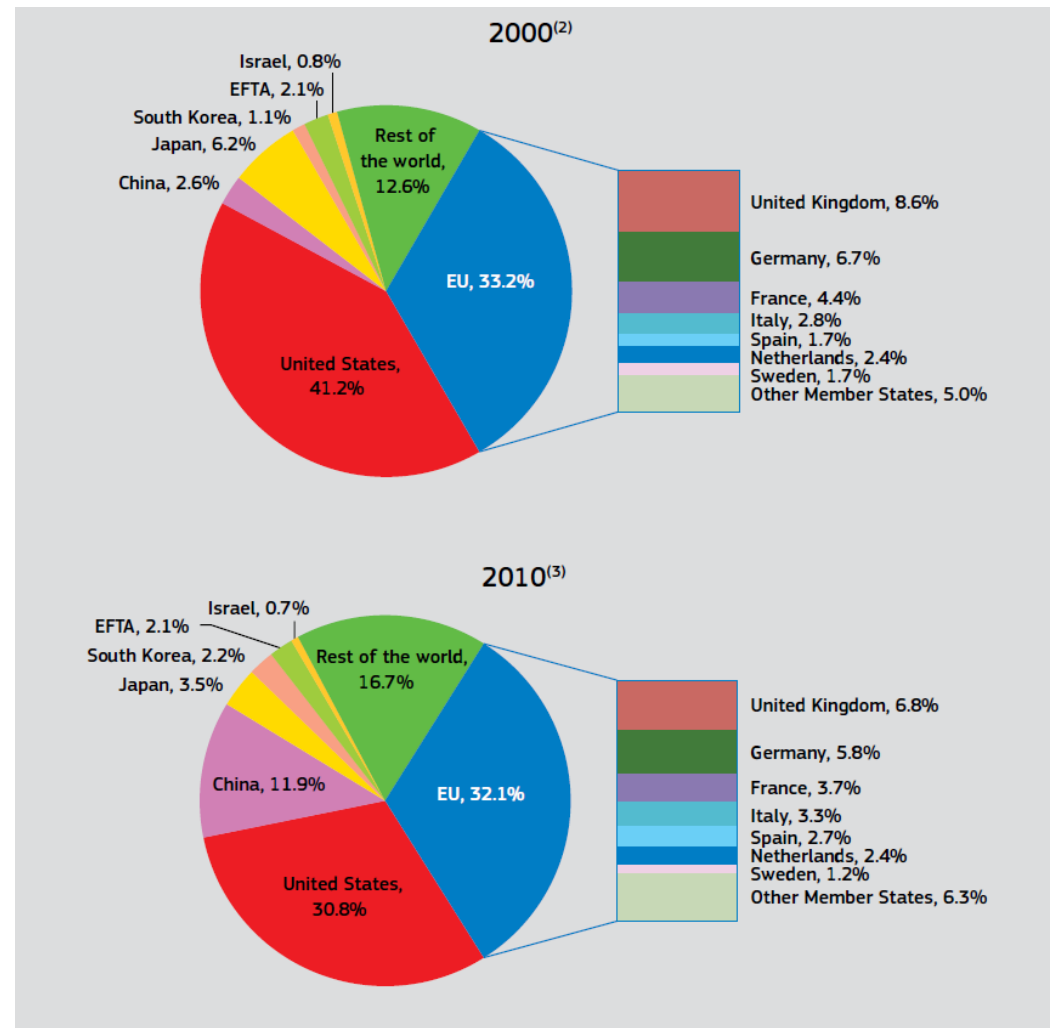


EU has a strong scientific base

EU in world share of highly cited scientific publications

Source: Science, Research and Innovation

Performance of the EU 2016, DG RTD



What is Horizon 2020



The EU's 2014-20 programme
for research & innovation

A 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*

<http://ec.europa.eu/research/horizon2020>

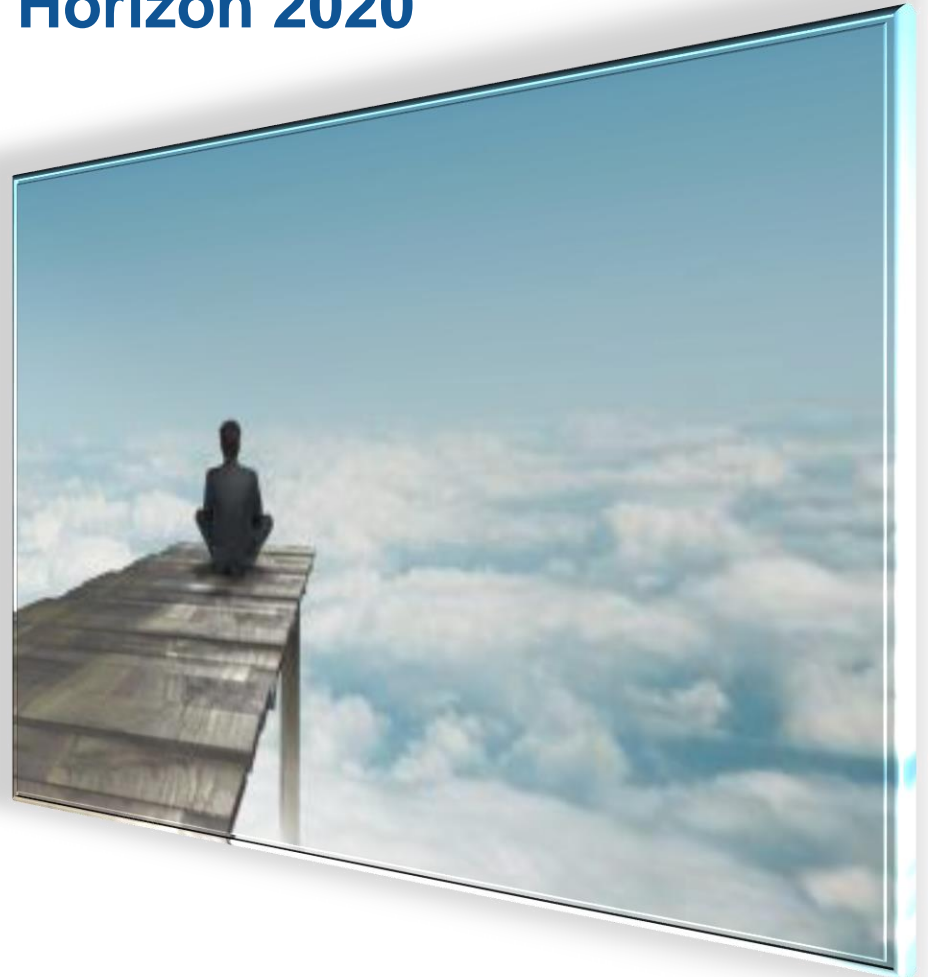
EU Framework Programme "Horizon 2020"

Nearly 80 billion EUR funding programme

Coupling research with innovation - from lab to market

Focus on societal challenges: health, clean energy, transport, etc.

*Open to the World !
Participation of companies, universities,
institutes in EU and beyond*



Horizon 2020 Multilateral Cooperation

28 Member-States (MS)

15 Countries Associated to the
framework programme (AC)

Horizon 2020 = more than 40
Countries to collaborate with
Mongolia on Research and
Innovation



Horizon 2020: Three priorities

Industry driven:
Strategic investments in key technologies
Support to innovative companies

2- Industrial leadership
€17 billion

1- Excellent science
€24.4 billion

3- Societal challenges
€31 billion

Researchers driven:
Excellent science is the foundation of tomorrow's technologies, jobs and wellbeing

Society driven:
Address concerns of citizens and society/EU policy objectives
Multidisciplinary collaborations

Priority 1. Excellent science

€24.4 Billion

Why:

- *World class science is the foundation of tomorrow's technologies, jobs and well-being*
- *Europe needs to develop, attract and retain research talent*
- *Researchers need access to the best infrastructures*

<p>European Research Council <i>Frontier research by the best individual teams</i></p>	13.095
<p>Future and Emerging Technologies <i>Collaborative research to open new fields of innovation</i></p>	2.696
<p>Marie Skłodowska Curie Actions* <i>Opportunities for training and career development</i></p>	6.162
<p>Research Infrastructures <i>(including e-infrastructures)</i> <i>Ensuring access to world-class facilities</i></p>	2.488

Priority 2. Industrial leadership €17 Billion

Why:

- *Strategic investments in key technologies (e.g. advanced manufacturing micro-electronics) underpin innovation across existing and emerging sectors*
- *Europe needs to attract more private investment in research and innovation*
- *Europe needs more innovative SMEs to create growth and jobs*

Leadership in enabling and industrial technologies <i>(ICT, nanotechnologies, materials, biotechnology, manufacturing, space)</i>	13.557
Access to risk finance <i>Leveraging private finance and venture capital for research and innovation</i>	2.842
Innovation in SMEs <i>Fostering all forms of innovation in all types of SMES</i>	616

Priority 3. Societal Challenges

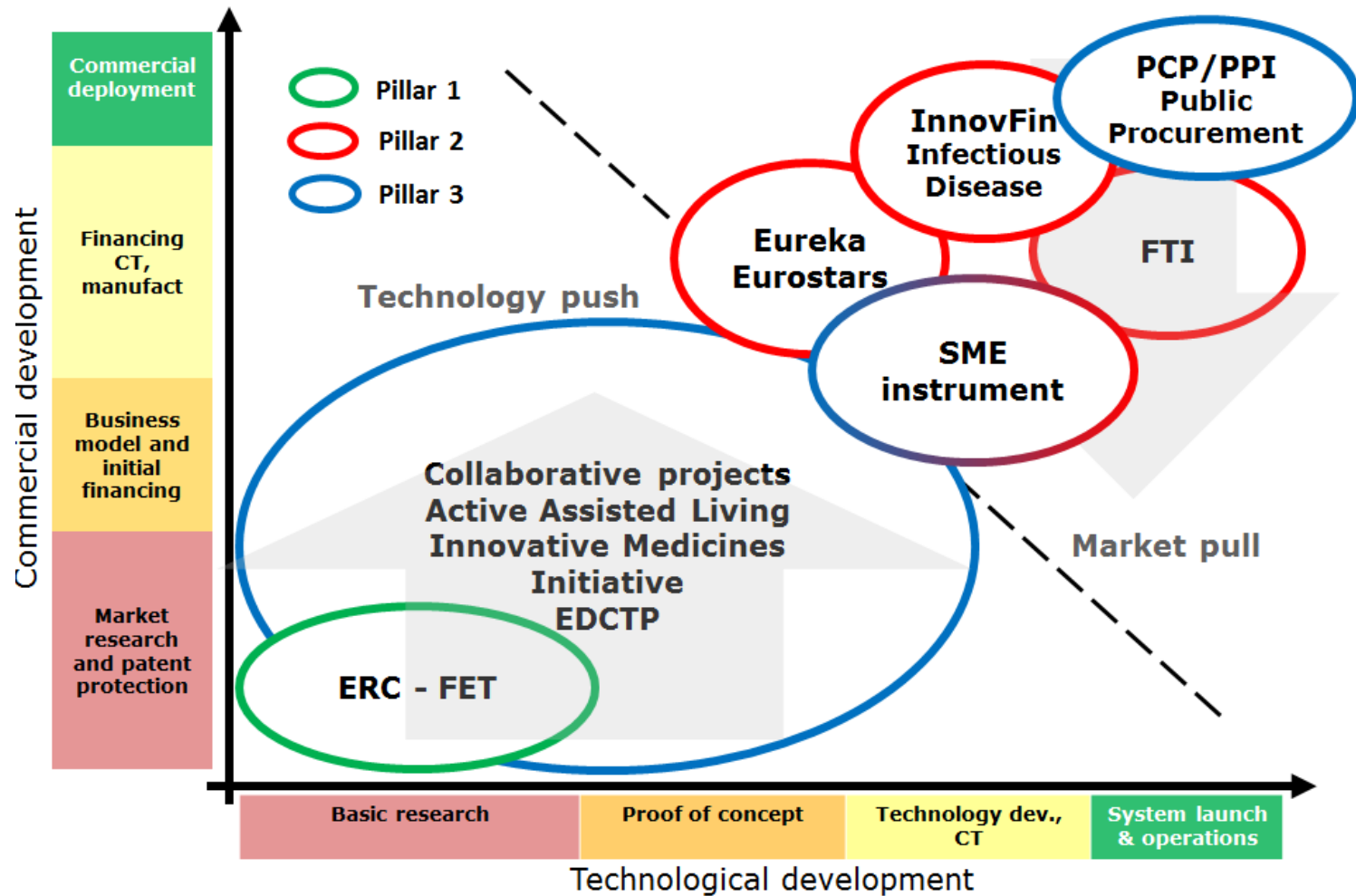
€31 Billion

Why:

- *Concerns of citizens and society EU policy objectives (climate, environment, energy, transport etc.) cannot be achieved without innovation*
- *Breakthrough solutions come from multi-disciplinary collaborations, including social sciences & humanities*
- *Promising solutions need to be tested, demonstrated and scaled up*

Health , demographic change and wellbeing	7.472
Food security , sustainable agriculture, marine and maritime and inland water research and the bioeconomy	3.851
Secure, clean and efficient energy	5.931
Smart, green and integrated transport	6.339
Climate action , environment, resource efficiency and raw materials	3.081
Inclusive, innovative and reflective societies	1.310
Secure societies	1.695
Science with and for society	462
Spreading excellence and widening participation	816

Implemented through various instruments



Health research: different programmes serving different communities & purposes



OBJECTIVE



- Better health for all
- A more competitive European health industry and care sector
- Maximising the digital potential
- Addressing health as a global challenge





European
Commission

Health research in Horizon 2020

Collaborative research

Real-life solutions based
on joint problem-solving

Public-private partnerships

Investing together for
next generation medicines
and treatments

Global co-operation

One world, one team
working to solve
common health challenges

EU health research

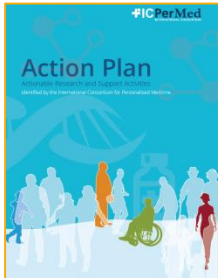
Inspiring collaboration

Public partnerships

Harnessing global
expertise to fight
poverty-related diseases

Research and
Innovation

Health collaborative research - 7 priorities for 2018–2020



Personalised medicine



Innovative health
and care industry



Innovative health, and
care systems –
Integration of care



Infectious diseases and
improving global health



Digital transformation in
Health and Care



Decoding the role of
the environment for
health and
well-being



Trusted Big Data
solutions and
Cybersecurity for
Health and Care



Personalised Medicine in Work Programme 2018–2020

- BHC-03-2018: Exploiting research outcomes and application potential of the human microbiome for personalised prediction, prevention and treatment of disease
- BHC-04-2018: Rare Disease European Joint Programme Cofund
- BHC-05-2018: International flagship collaboration with Canada for human data storage, integration and sharing to enable personalised medicine approaches
- **BHC-01-2019: Understanding causative mechanisms in co- and multimorbidities**
- **BHC-02-2019: Systems approaches for the discovery of combinatorial therapies for complex disorders**
- **SC1-BHC-30-2019: Towards risk-based screening strategies for non-communicable diseases**
- **SC1-BHC-31-2019: Pilot actions to build the foundations of a human cell atlas**



Innovative health and care systems – Integration of care in Work Programme 2018–2020

- BHC-23-2018: Novel patient-centred approaches for survivorship, palliation and/or end-of-life care
- BHC-26-2018: HTA research to support evidence-based healthcare
- **BHC-22-2019: Mental health in the workplace**
- **BHC-25-2019: Demonstration pilots for implementation of personalised medicine in healthcare**

Coordination and support actions

- HCO-12-2018: Innovation in healthcare – a CSA towards using pre-commercial procurement and public procurement of innovative solutions in healthcare systems

Innovative health and care industry in Work Programme 2018–2020

- BHC-09-2018: Innovation platforms for advanced therapies of the future
- **BHC-07-2019: Regenerative medicine: from new insights to new applications**
- **BHC-10-2019: Innovation Procurement: Next generation sequencing (NGS) for routine diagnosis**

Coordination and support actions

- HCO-05-2018: Strengthening regulatory sciences and supporting regulatory scientific advice

Commission proposal for **Horizon Europe**

THE NEXT EU RESEARCH & INNOVATION
PROGRAMME (2021 – 2027)

#HorizonEU

Irene Norstedt
28 September 2018, Luxembourg



Horizon Europe: investing in R&I to shape our future

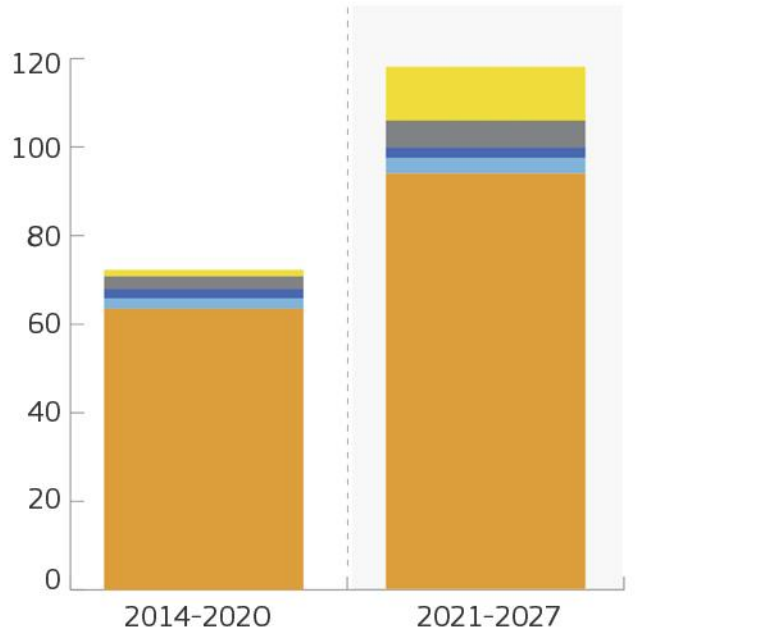
- The vision:
 - " a Europe that protects,
a Europe that empowers,
a Europe that defends"
Jean-Claude Juncker
- Tackling **climate change**
(35 % budgetary target)
- Helping to achieve **Sustainable Development Goals**
- Boosting the Union's **competitiveness and growth**



Credits: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

The next long-term EU budget:

Investing in the future



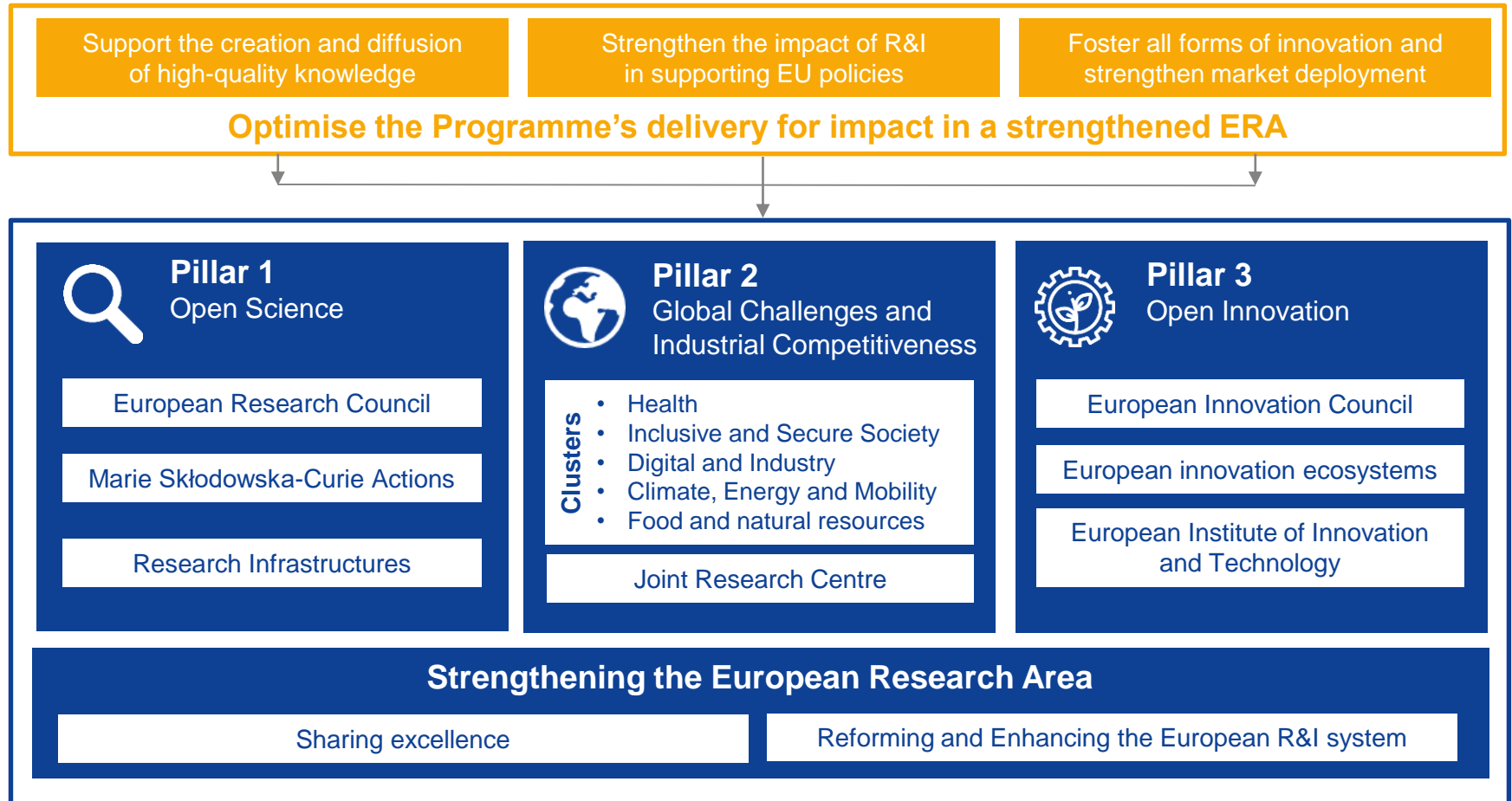
Building on the success of the EU's past flagship research and innovation programmes, the Commission proposes to **increase investment in research, innovation and digital** by allocating **€ 114.2 billion** for the future Multiannual Financial Framework.

- Digital Europe Programme & Connecting Europe Facility - Digital
- International Thermonuclear Experimental Reactor (ITER)
- Euratom Research and Training Programme
- Innovation Window InvestEU Fund
- Horizon Europe

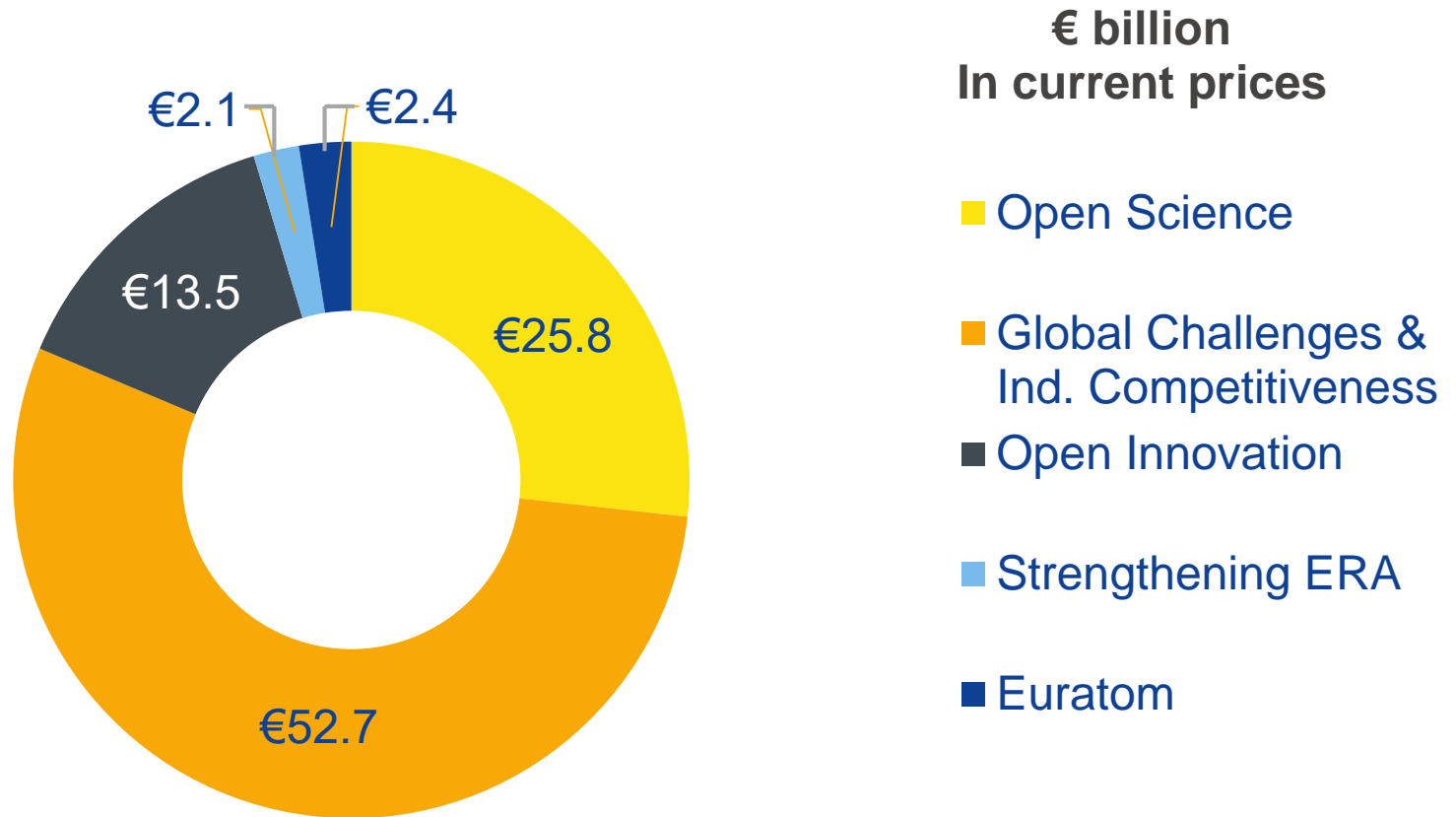
Source: European Commission
Note: Compared to the Multiannual Financial Framework 2014-2020 at EU-27 (estimate)

Horizon Europe: evolution not revolution

Specific objectives of the Programme



Budget: €100 billion* (2021-2027)



* This envelope includes EUR 3.5 billion allocated under the InvestEU Fund.

Global Challenges & Industrial Competitiveness:

boosting key technologies and solutions underpinning
EU policies & Sustainable Development Goals **€ 52.7billion**

Clusters implemented through usual calls, missions & partnerships	2021-24
Health	€ 7.7
Inclusive and Secure Societies	€ 2.8
Digital and Industry	€ 15
Climate, Energy and Mobility	€ 15
Food and Natural Resources	€ 10
Joint Research Centre supports European policies with independent scientific evidence & technical support throughout the policy cycle	2021-27 € 2.2

Pillar 2: Cluster 1 “Health”

Facts and figures on health

- Health care expenditure of EU countries is steadily increasing and now accounts for **nearly 10% of GDP**, as a result of increasing prevalence of chronic diseases due to unhealthy lifestyles and an ageing population.
- Avoidable environmental factors cause **1.4 million deaths** yearly in the EU.
- Infections resistant to antimicrobials (AMR) cause **25'000 deaths** yearly in the EU and **700'000 deaths** globally.
- Life expectancy in some EU countries is **six years lower** than the average.
- EU healthcare industry accounts for **3% of GDP** and **1.5 million employees**.

Rationale for EU funded health R&I

*Everyone has the right to timely access to affordable healthcare of good quality**

Newly emerging or persisting health challenges:

- Threats to citizens and public health
 - Sustainability of social and health care systems
 - Competitiveness of EU's health and care industry
- **These challenges are complex, interlinked and global**

The Health Cluster builds linkages between:

- Discovery, clinical, epidemiological, environmental and socio-economic research
- Academia – industry – healthcare providers – patients
- Expertise within the EU and beyond



* EU Pillar of Social Rights, UN SDGs

Aligned with major European policy goals...

- EU Pillar of Social Rights
- EU Digital Single Market
- EU Directive on cross-border healthcare
- European One Health Action Plan against antimicrobial resistance (AMR)

...and with global strategies

- United Nation's 2030 Agenda for Sustainable Development
- World Health Organization (WHO)



Six main areas of intervention



Health throughout
the Life Course



Environmental and Social
Health Determinants



Non-communicable
and Rare Diseases



Infectious diseases



Tools, Technologies
and Digital Solutions
for Health and Care

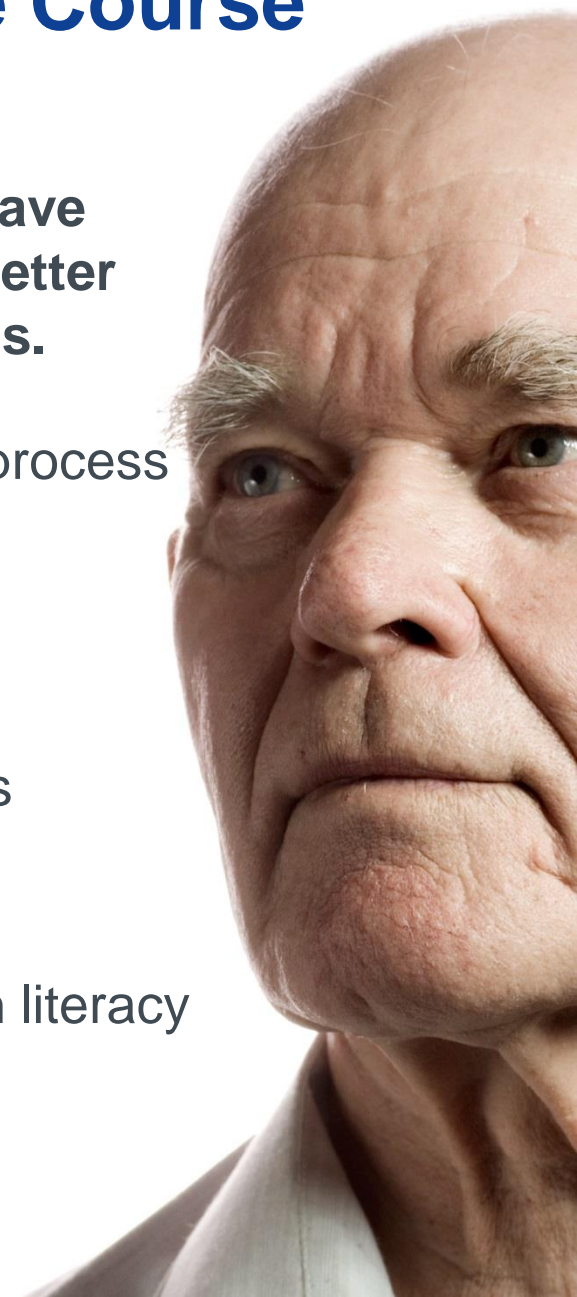


Health Care Systems

#1 Health throughout the Life Course

People in vulnerable stages of life have specific health needs, that require better understanding and tailored solutions.

- Early development and the aging process
- Maternal and child health
- Health needs of adolescents
- People with disabilities and injuries
- Active life for the elderly
- Health education and digital health literacy



#2 Environmental and Social Health Determinants

We need to better understand how the social, economic and physical environment impacts our health and mitigate health risks and threats.

- Health hazards of chemicals, pollutants and environmental stressors
- Capacity and infrastructure to collect, share and combine exposure data with health and diseases
- Environmental, occupational, social and behavioural factors impacting physical and mental health
- Risk assessment, management and communication
- Health promotion and prevention



#3 Non-Communicable and Rare Diseases

Non-communicable diseases remain a major health and societal challenge requiring personalized approaches.

- Earlier and more accurate diagnoses
- Prevention and screening programmes
- Treatments and cures
- Palliative care
- Comparative effectiveness of interventions
- Scale up of health interventions

#4 Infectious Diseases

We must protect people in the world from the threats of infectious diseases and AMR.

- Drivers for the emergence and re-emergence of infectious diseases and their spread
- Prediction, early detection and surveillance of infectious diseases and AMR pathogens
- Vaccines, diagnostics, treatments and cures
- Emergency preparedness, response and recovery measures
- Uptake of medical interventions in clinical practice, health systems
- Specific challenges in low- and middle-income countries (LMICs)



#5 Tools, Technologies and Digital Solutions for Health and Care

New technologies are vital for public health and the competitiveness of European Health related industries.

- Tools and technologies for medical indications
- Integrated solutions for health incl. mobile and telehealth
- Piloting and large-scale deployment of healthcare technologies and tools in real-life settings
- Innovative processes for development, manufacturing and rapid delivery
- Safety, efficacy, quality and ethical and social impact
- Regulatory science

#6 Health Care Systems

Health systems are a key asset of the EU social system. We shall keep them accessible, resilient and sustainable and harness the potential of data-driven and digital innovation.

- Reforms in public health systems and policies
- New models for health and care and future workforce
- Improving health technology assessment
- Use of health data respecting security, privacy and interoperability
- Health systems resilience – crises and disruptive innovation
- Patient empowerment, self-monitoring, user-centered integrated care

Cross-cutting issues

- **Digitalisation and personalisation** of health and care cut across all intervention areas
- **Health economics and health systems** are key for uptake of results and achieving impact
- **Patient-centered solutions and technologies** for health and care call for integrated approaches from medicines to medical devices (supported in Horizon 2020 under the pillar 'Leadership in Enabling and Industrial Technologies')

Horizon Europe – How?

Lessons Learned

from Horizon 2020 Interim Evaluation



Support breakthrough innovation



Create more impact through mission-orientation and citizens' involvement



Strengthen international cooperation



Reinforce openness



Rationalise the funding landscape



Key Novelties

in Horizon Europe

European Innovation Council

R&I Missions

Extended association possibilities

Open science policy

New approach to Partnerships

Implementation Strategy to shift the focus from administration to content

- **Enhancing harmonisation with other EU programmes**
- **Simplifying the model grant agreements and guidance to be beneficiaries**
- **Participant Portal – one stop shop for easy access to EU funding and project implementation**

Early consultation with stakeholders



R&I Missions

R&I Missions

Relating EU's research and innovation better to society and citizens' needs; with strong visibility and impact

A mission is a portfolio of actions intended to achieve **a bold and inspirational as well as measurable goal** within a set timeframe, with impact for science and technology, society and citizens that goes beyond individual actions

Horizon Europe proposal defines mission characteristics and elements of governance

Specific missions will be **co-designed with Member States, stakeholders and citizens** and programmed within the Global Challenges and Industrial Competitiveness pillar (drawing on inputs from other pillars)



*"We need to define **missions** that breakdown silos.*

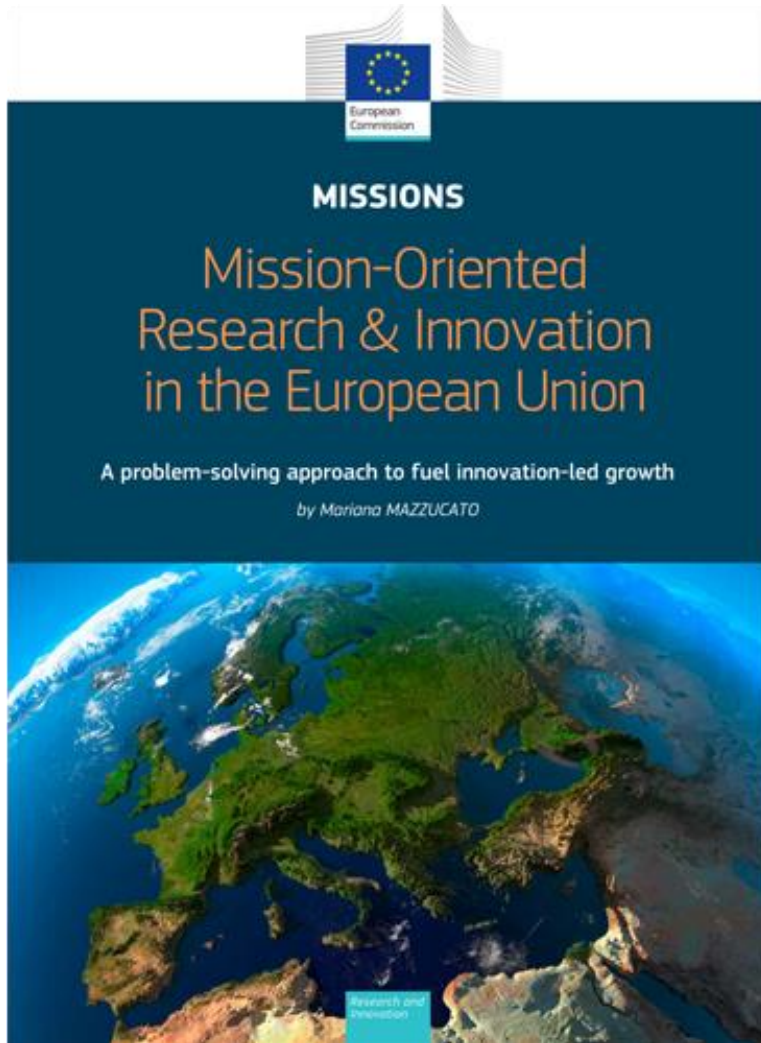
We have made progress in Horizon 2020 to focus resources in selected areas. But we still support too many different projects that disperse or fragment our funding.

We need to set our eyes on a specific target, and drive our scientific efforts towards reaching that target. And we need to be ambitious about it."

Carlos Moedas, Commissioner



Criteria for selecting R&I missions



- **Bold, inspirational, with wide societal relevance**
- **A clear direction:** Targeted, measurable and time-bound
- **Ambitious but realistic R&I actions**
- **Cross-disciplinary, cross-sectoral and cross-actor innovation**
- **Multiple bottom-up solutions**



New approach to European Partnerships

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- Simple architecture and toolbox
- Coherent life-cycle approach
- Strategic orientation

Co-programmed

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded

Based on a joint programme agreed by partners; commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe

Institutionalised

Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by Horizon Europe



International Cooperation

International Cooperation

Will ensure effective tackling of global societal challenges; access to the world's best talents, expertise and resources; enhanced supply and demand of innovative solutions

Extended openness to association

- Third countries with good capacity in science, technology and innovation
- Taking into account objective of driving economic growth in Europe through innovation
- General opening for international participation
- Intensified targeted actions (flagship initiatives, joint calls, etc.)

Strategic planning to define multiannual work programmes and calls for proposals

- Transparency and stakeholder involvement
- Prioritisation and flexibility to align to political priorities
- Internal programme coherence & synergies with other programmes

Multiannual Strategic R&I Plan

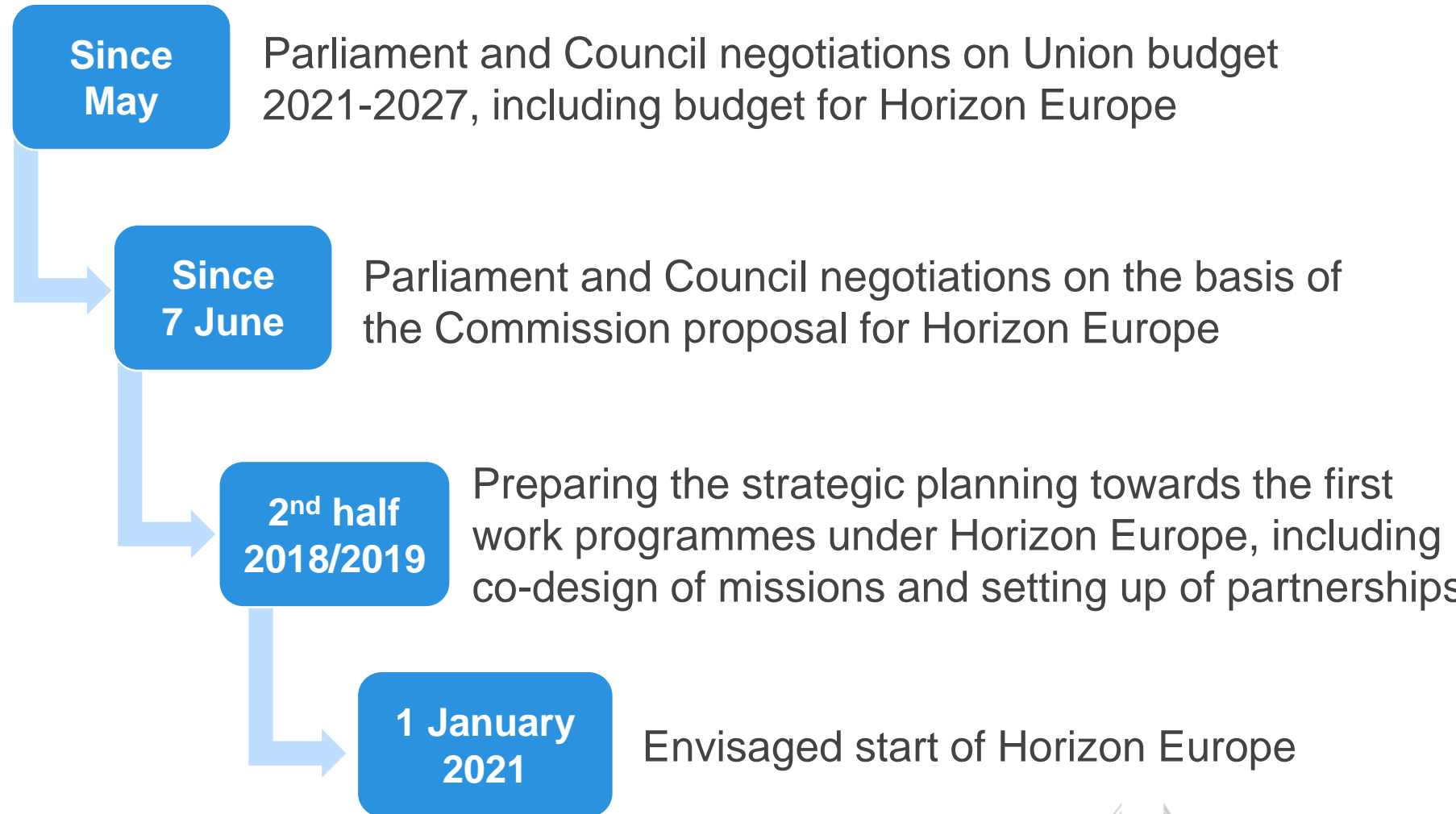
- * Multiannual orientations and priorities in one document
- * Areas for partnerships and missions

Strategic discussions with Member States and European Parliament

Consultation with stakeholders

Work Programmes

Next steps



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Horizon Europe dedicated website

<http://ec.europa.eu/horizon-europe>

European Innovation Council

<http://ec.europa.eu/research/eic>

EU budget for the future

http://ec.europa.eu/budget/mff/index_en.cfm





Thank you!

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