



# Horizon 2020

**Digital innovation and Digital transformation**

## Work Programme 2018-2020

### R & I investment of €31 billion over 3 years



- Addressing main concerns of citizens such as security, migration and economic situation...
- Focus on impact (fewer & broader topics with sharpened impact statements, better dissemination of results, open access to data...)

## In 2020:

- R&I investment of close to €11 billion
- Piloting new initiatives and paving the way to the successor programme Horizon Europe

# Horizon 2020

## After 5 years of implementation

### Participation (June 2019)

- ✓ over 24 500 grant agreements
- ✓ with €42.8 billion EU contribution
- ✓ €7.1 billion EU contribution went to SMEs
- ✓ nearly 109 000 participations
- ✓ €19 264 million risk finance for companies (primarily SMEs) under the EU finance for innovators scheme (InnovFin)
- ✓ over 5 000 ERC Principal Investigators in host organisations with almost €8.8 billion EU contribution
- ✓ over 45 000 fellows under the Marie Skłodowska-Curie Actions with almost €4.3 billion EU contribution

# Work Programme 2020 – Key Messages

The Work Programme 2020 will be the **largest investment in research and innovation** under Horizon 2020 with a budget of nearly €11 billion.

The Work Programme 2020 will support **key EU policy priorities**, such as sustainability, plastics and AI, and addressing main concerns of citizens and the three O's (Open Science, Open Innovation, Open to the World)

The WP2020 **shapes the future R&I landscape** by preparing the way for Horizon Europe

# ICT in H2020 > LEIT-ICT

## Excellent Science

Frontier Research (ERC)

Future and Emerging Technologies (FET)

ICT

Skills and career development (Marie Skłodowska-Curie)

Research Infrastructures

ICT

## Industrial Leadership

Leadership in enabling  
and industrial technologies

ICT

ICT

ICT

Nanotech., Materials, Manuf. & Processing

Biotechnology

Space

ICT

Access to risk finance

Innovation in SMEs

## Societal Challenges

Health, demographic change and wellbeing

ICT

Food security, sustainable agriculture,  
and the bio-based economy

ICT

Secure, clean and efficient energy

ICT

Smart, green and integrated transport

ICT

Climate action, resource efficiency,  
and raw materials

ICT

Inclusive, innovative and reflective societies

Secure societies

ICT

ICT

# **ICT** in Industrial leadership

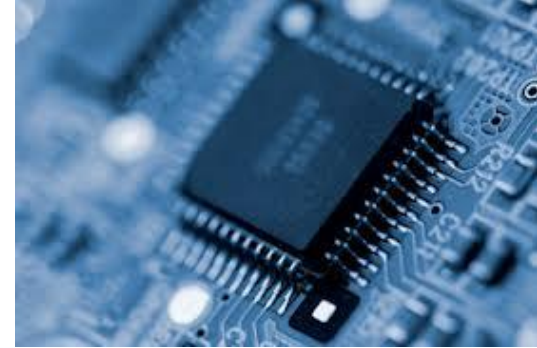


# Approach to WP2018-20

What's  
new?

- **Focus and align** with high-level **political priorities**
  - Digitising and transforming European industry and Services (including AI)
  - European Data Infrastructures (HPC, Big data and Cloud)
  - 5G Action plan and Connected and Automated Mobility
  - Next Generation Internet
  - Cybersecurity
- Support **core ICT industries** through **roadmap-based cPPPs**
  - Stronger synergies between cPPPs
- **Integrate digital technologies** across all parts of H2020
- Continued focus on **innovation**

# Industrial Leadership - ICT



## **Call – Information and Communication technologies**

- **Artificial Intelligence and Technologies for Digitising European Industry and Economy**
- **European Data Infrastructures: HPC, Big data and Cloud technologies**
- **5G**
- **Next Generation Internet (NGI)**
- **Cross-cutting activities**

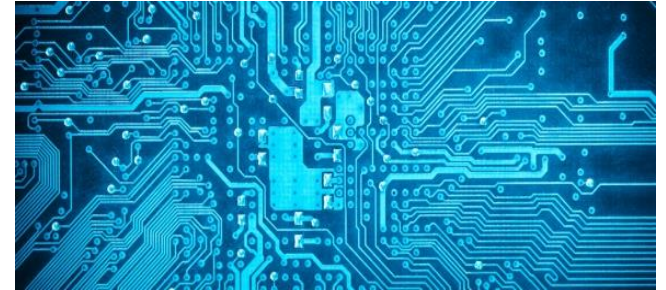
**Call - Digitising and transforming European industry and services: digital innovation hubs and platforms**

**Call - Cybersecurity**



# Artificial Intelligence and Technologies for Digitising European Industry and Economy 2020

349,5M€



- Cover wide range of ICT technologies including micro-electronics, cyberphysical systems, photonics and robotics. Systemic integration from smart integrated components to cyber-physical systems
- Complementary to the JU for Electronic Components and Systems (ECSEL JU)
- Organised in eight topics in 2020:
  - ICT-46-2020: Robotics in Application Areas and Coordination & Support
  - ICT-47-2020: Research and Innovation boosting promising robotics applications
  - ICT-48-2020: Towards a vibrant European network of AI excellence centres
  - ICT-49-2020: Artificial Intelligence on demand platform
  - ICT-38-2020: Artificial intelligence for manufacturing
  - ICT-36-2020: Disruptive photonics technologies
  - ICT-37-2020: Advancing photonics technologies and application driven photonics components and the innovation ecosystem
  - ICT-50-2020: Software Technologies

# European Data Infrastructures 2020

51,5M€



- Enable the creation of a world-class HPC/Big Data ecosystem
- Complementary to the work in the Excellent Science pillar under Research Infrastructures, FET and EuroHPC (on High Performance Computing)
- Develop competitive cloud solutions based on advanced platforms and services and cloud-based software and data application
- Organised in two topics in 2020:
  - ICT-51-2020: Big Data technologies and extreme-scale analytics
  - ICT-40-2020: Cloud Computing: towards a smart cloud computing continuum

**5G  
2020**

**183 M€**



- 5G cPPP targets validation of technologies and architectures in a system context and for multiple use cases
- 5G applied for Connected and Automated Mobility (CAM)
- 5G cPPP looking for Smart Connectivity beyond 5G
- Organised in four topics in 2020:
  - ICT-52-2020: 5G PPP – Smart Connectivity beyond 5G
  - ICT-41-2020: 5G PPP – 5G innovations for verticals with third party services
  - ICT-42-2020: 5G PPP – 5G core technologies innovation
  - ICT-53-2020: 5G PPP – 5G for Connected and Automated Mobility (CAM)

# Next Generation Internet (NGI) 2020

**110 M€**



- Next generation technologies for the internet in 10-15 years based on European values such as openness, neutrality, cooperation, inclusion, transparency and protection of data and privacy.
- Organised in five topics:
  - ICT-54-2020: Blockchain for the Next Generation Internet
  - ICT-55-2020: Interactive Technologies
  - ICT-56-2020: Next Generation Internet of Things
  - ICT-57-2020: An empowering, inclusive Next Generation Internet
  - ICT-44-2020: Next Generation Media

# Cross-cutting and international Cooperation activities 2020

15 M€

- Cross-cutting activities
  - ICT-45-2020: Reinforcing European presence in international ICT standardisation: Standardisation Observatory and Support Facility
- International Cooperation
  - ICT-58-2020: International partnership building between European and African innovation hubs

# Call - Digitising and transforming European industry and services: digital innovation hubs and platforms 2020

190,5 M€

- Focus area implemented mainly through:
  - Digital innovation hubs
  - Cross-sectorial and integrated digital platforms
- Organised in five topics in 2019:
  - DT-ICT-03-2020: I4MS (phase 4) - uptake of digital game changers
  - DT-ICT-04-2020: Photonics Innovation Hubs
  - DT-ICT-05-2020: Big Data Innovation Hubs
  - DT-ICT-09-2020: Boost rural economies through cross-sector digital service platforms
  - DT-ICT-12-2020: AI for the smart hospital of the future

# Call Cybersecurity 2020

47 M€



- Focus area
  - Combining contributions from **LEIT-ICT**, **SC1** and **SC7**
- Grouping the main R&D&I activities in Cybersecurity, from enabling technologies to specific use cases
- Organised in one topic in 2020:
  - SU-ICT-02-2020: Building blocks for resilience in evolving ICT systems



@DSMeu | #ICTpropday  
<http://bit.ly/ICTPropDay2019>



## Venue:

**Messukeskus Expo and Convention Centre, Helsinki**

<https://messukeskus.com/>

## Website and registration:

<https://ec.europa.eu/digital-single-market/en/news/digital-excellence-forum-ict-proposers-day-2019>



# Horizon Europe

is the Commission proposal for a **€ 100 billion** research and innovation funding programme for seven years (2021-2027)



**to strengthen the EU's scientific and technological bases**



**to boost Europe's innovation capacity, competitiveness and jobs**



**to deliver on citizens' priorities and sustain our socio-economic model and values**

Additional **€ 4.1 billion** are proposed to be allocated for defence research, in a separate proposal for a European Defence Fund

# Horizon Europe – Why?

# 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**

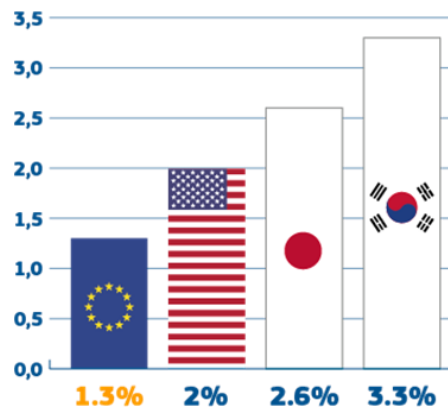


Credits: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

## While benefiting from world-class research and strong industries...

Our knowledge and skills are our main resources.

- **7%** of the world's population
- **20%** of global R&D
- **1/3** of all high-quality scientific publications

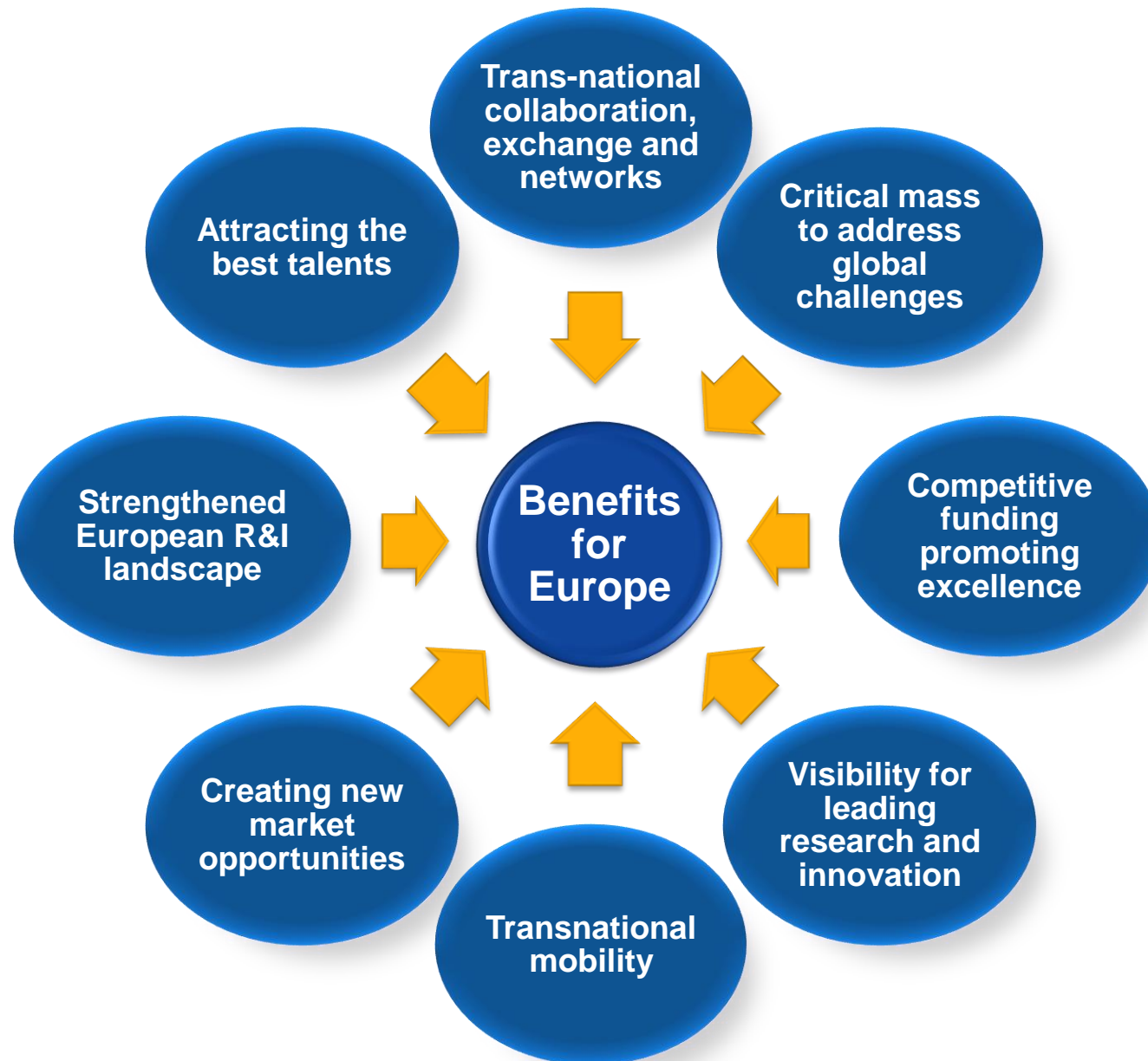


**1.3%**  
EU business  
R&D  
investment

**...Europe fails to transform leadership in science into leadership in innovation and entrepreneurship**



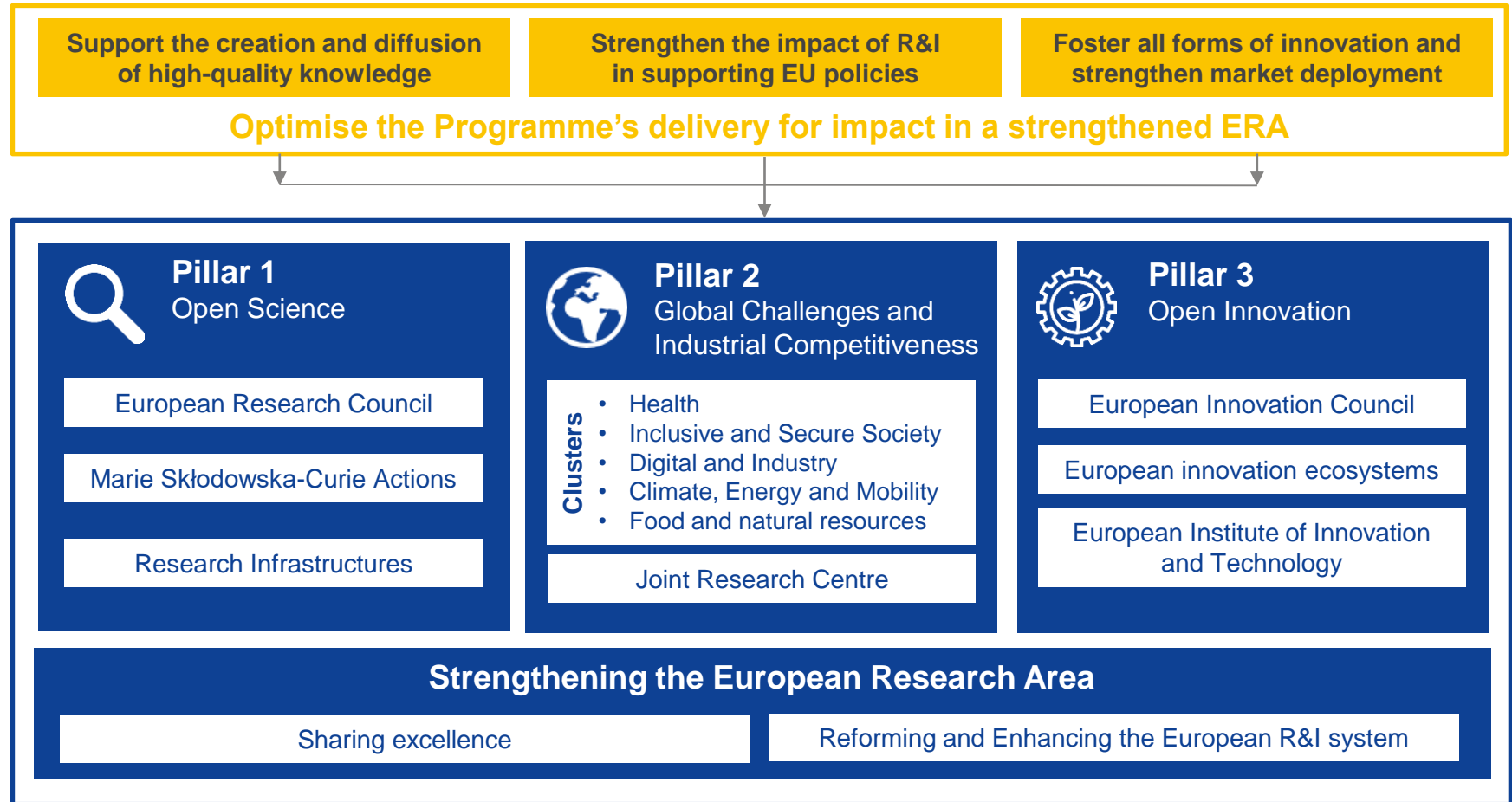
# Added value through Horizon Europe:



# Horizon Europe – What?

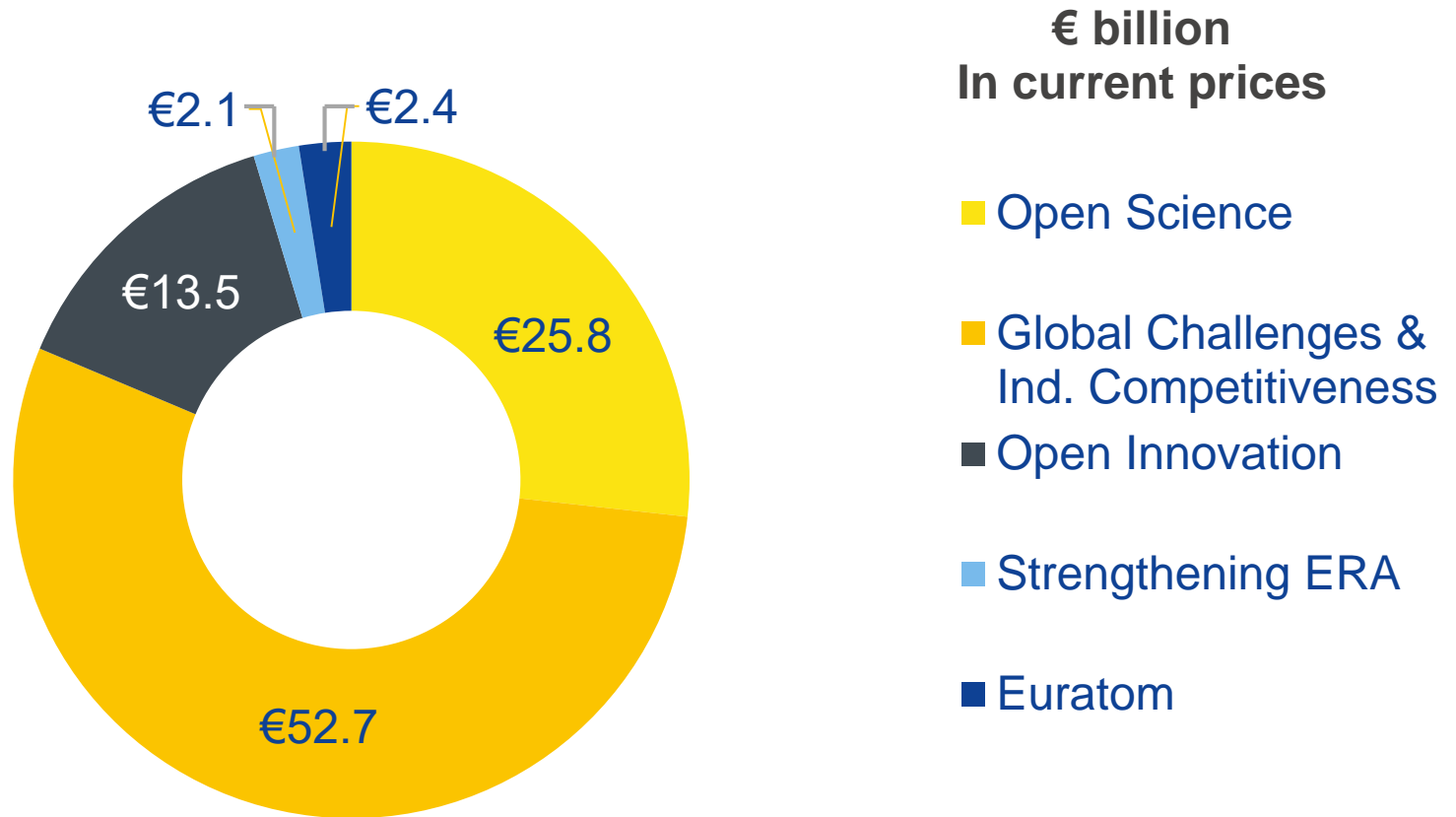
# Horizon Europe: evolution not revolution

## Specific objectives of the Programme










# Budget: €100 billion\* (2021-2027)



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

# Clusters in 'Global Challenges and Industrial Competitiveness'

Clusters	Areas of intervention	
Health 	<ul style="list-style-type: none"> <li>* Health throughout the life course</li> <li>* Non-communicable and rare diseases</li> <li>* <b>Tools, technologies and digital solutions for health and care</b></li> </ul>	<ul style="list-style-type: none"> <li>* Environmental and social health determinants</li> <li>* Infectious diseases</li> <li>* Health care systems</li> </ul>
Inclusive and Secure Societies 	<ul style="list-style-type: none"> <li>* Democracy</li> <li>* Social and economic transformations</li> <li>* Protection and Security</li> </ul>	<ul style="list-style-type: none"> <li>* Cultural heritage</li> <li>* Disaster-resilient societies</li> <li>* <b><u>Cybersecurity</u></b></li> </ul>
<b>Digital and Industry</b> 	<ul style="list-style-type: none"> <li>* Manufacturing technologies</li> <li>* Advanced materials</li> <li>* Space</li> <li>* Circular industries</li> </ul>	<ul style="list-style-type: none"> <li>* <b>Key digital technologies</b></li> <li>* <b>Artificial intelligence and robotics</b></li> <li>* <b>Advanced computing and Big Data</b></li> <li>* <b>Next generation internet</b></li> </ul>
Climate, Energy and Mobility 	<ul style="list-style-type: none"> <li>* Climate science and solutions</li> <li>* Energy systems and grids</li> <li>* Communities and cities</li> <li>* Industrial competitiveness in transport</li> <li>* Smart mobility</li> </ul>	<ul style="list-style-type: none"> <li>* Energy supply</li> <li>* Buildings and industrial facilities in energy transition</li> <li>* Clean transport and mobility</li> <li>* Energy storage</li> </ul>
Food and Natural Resources 	<ul style="list-style-type: none"> <li>* Environmental observation</li> <li>* Agriculture, forestry and rural areas</li> <li>* Food systems</li> <li>* Circular systems</li> </ul>	<ul style="list-style-type: none"> <li>* Biodiversity and natural capital</li> <li>* Sea and oceans</li> <li>* Bio-based innovation systems</li> </ul>

# Horizon Europe – What's new?

# 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



# European Innovation Council

Support to innovations with breakthrough and disruptive nature and scale up potential that are too risky for private investors.

**European  
Innovation  
Council**

**Helping innovators create markets of the future,  
leverage private finance, scale up their companies,  
Innovation centric, risk taking & agile, pro-  
active management and follow up**

Two complementary instruments bridging the gap from idea to investable project

**Pathfinder: grants**  
(from early technology  
to pre- commercial)

**Accelerator:**  
**grants & blended finance**  
(from pre-commercial  
to market & scale-up)



# 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)



# 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

# Thank you !

#DigitalEurope

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