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RECH 265  
COMPET 565  
IND 280  
MI 472  
EDUC 242  
TELECOM 178  
ENER 324  
ENV 617  
AGRI 293  
TRANS 216  
SAN 341  
ATO 34

**COVER NOTE**

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From: Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director

date of receipt: 31 May 2023

To: Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union

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Subject: REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Annual Report on Research and Technological Development Activities of the European Union and Monitoring of Horizon Europe and Horizon 2020 in 2022

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Delegations will find attached document COM(2023) 277 final.

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EUROPEAN  
COMMISSION

Brussels, 31.5.2023  
COM(2023) 277 final

**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND  
THE COUNCIL**

**Annual Report on Research and Technological Development Activities of the European  
Union and Monitoring of Horizon Europe and Horizon 2020 in 2022**

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## 1. BACKGROUND

This report provides a non-exhaustive overview of the EU's key research and innovation (R&I) activities in 2022 and the monitoring of Horizon Europe, Horizon 2020 and the Euratom Programme.

It was drafted in accordance with Article 190 of the Treaty on the Functioning of the European Union and Article 7 of the [Euratom Treaty](#), in conjunction with [Article 50 of the Horizon Europe Framework Programme for Research and Innovation](#) and Article 12 of the [Council Regulation \(Euratom\) 2021/765 establishing the Research and Training Programme of the European Atomic Energy Community](#).

## 2. POLITICAL CONTEXT AND POLICY DEVELOPMENTS

In 2022, Russia's war against Ukraine marked a historical break, breaching international law and undermining European and global security. By doing so, Russia also violated the core values and principles of international cooperation on R&I, as set out in the [Communication on a Global Approach to Research and Innovation](#).

The war has had immense consequences for the EU and its R&I landscape, in particular for scientific collaboration with Ukraine and Russia, but also for energy supply, secure supply chains and migration.

### 2.1. Ukraine

The Commission imposed sanctions against Russia in the field of R&I<sup>1</sup>. Concretely it:

- stopped cooperation projects in R&I and terminated participations from Russian public entities in the [EU R&I programmes](#) and ensured a coordinated implementation of the sanctions through guidance and monitoring;
- launched dedicated actions to support the Ukrainian research and scientific community, including the [ERA4Ukraine portal](#) in March 2022, to support Ukrainian researchers; a [Marie Skłodowska-Curie action \(MSCA\) 4Ukraine](#) scheme in October 2022 with a budget of EUR 25 million to support displaced researchers from Ukraine; a call under the [European Innovation Council](#) with EUR 20 million to support Ukrainian innovative enterprises.
- published the [REPowerEU Plan](#) in May 2022, which aims to make Europe independent of Russian fossil fuels by accelerating the EU's clean energy transition;
- launched a new topic under the [Euratom programme](#) with a budget of EUR 10 million on the [Safety of alternative nuclear fuel for VVER reactors](#), to

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<sup>1</sup> See also [COUNCIL REGULATION \(EU\) No 833/2014](#)

ensure the continued operation of these reactors, which were built in the Soviet Union.

## 2.2. Green and digital transition

Both, Russia's war against Ukraine and the increased frequency of climate-related extreme events have made it even more urgent for the EU to transition to a fair green and digital society.

As part of the [REPowerEU Plan](#), the Commission published the [Communication on the EU solar strategy](#) and identified how R&I can help deliver on technologies such as wind, heat pumps, biomethane, hydrogen and in general the reduction of materials consumption and recyclability of renewable energy equipment. The [Communication on the Digitisation of the Energy Systems](#) underlined the need to expand R&I activities.

The [7th report on the state of the Energy Union](#) (October 2022) noted the need to increase R&I investments to stay at the forefront of clean energy research.

A [staff working document on the role of EU research and innovation investments to deliver on the EU's Hydrogen Strategy](#) (January 2022) showcased the project results in this area and underlined the need for skills development on hydrogen.

The [New European Innovation Agenda](#), adopted in July 2022, highlighted deep-tech innovation as indispensable to achieve the objectives of the green and digital transition.

In October 2022, the Commission published the [strategic research and innovation plan for safe and sustainable chemicals and materials](#) inviting stakeholders and research funders to use it as a guidance document. In addition, the Commission proposed creating a [European framework for 'safe and sustainable by design' chemicals and materials for R&I activities](#) in December 2022, launching a two-year testing phase of the framework.

The Circular Economy Package II (November 2022) built on the results of EU R&I projects relating to the circular plastics economy, sustainable packaging and carbon removal and storage ([sustainable products](#), [textiles](#), [construction materials](#), [packaging](#), [plastics](#)).

The [Joint Communication on International Ocean Governance](#) (June 2022) identified research to support evidence-based action to protect and sustainably manage the ocean.

[Towards a strong and sustainable EU algae sector](#) (November 2022) promoted further research on a resource that can be used – with a limited carbon and environmental footprint – to produce food, pharmaceuticals, cosmetics, bioplastics and plant biostimulants.

The Council adopted a [Recommendation on ensuring a fair transition towards climate neutrality](#) (June 2022), in which Member States commit to put in place comprehensive policy packages to ensure the green transition is fair. It recommended a strong role for R&I in creating a sound knowledge base for policy making.

The European Parliament and Council adopted the [Digital Decade Policy Programme 2030](#) (December 2022). The Policy Programme sets out digital targets that the EU is

aiming to achieve by 2030 and a cooperation mechanism between the Commission and the Member States that also provides a framework for developing multi-country projects that no single Member State can develop alone (e.g. in European common data infrastructure and services' and secure quantum communication).

In June, the Commission launched a [dialogue with Member States](#) on the *Collaborative Cloud for Cultural Heritage* to help safeguard European cultural treasures through a digital infrastructure, building on an [experts report](#) and a [stakeholder consultation](#).

### **2.3. Economy & industry**

The [European Chips Act](#) was proposed to help build up the EU's semiconductor ecosystem, in particular by strengthening the EU's research and technological leadership, and its capacity to innovate design, manufacturing and packaging of advanced chips.

The aggression of Russia in Ukraine underlined the urgent need to foster geographical independence for critical space technologies. 2022 saw the proposal of the Commission for a [Union Secure Connectivity Programme](#), to be achieved through a third satellite constellation for secure telecommunications.

The uptake of human-centred, resilient and sustainable 'Industry 5.0' has gained further traction. This was confirmed by the high-level roundtable with industry leaders in April 2022 and by the first [Industry of the Future Award](#), highlighting EU-funded R&I projects on 'Industry 5.0'.

### **2.4. Security**

Over the past years, the threat environment has evolved in significant ways. Cybersecurity attacks have continued to increase in scale and form and the impact of the war in Ukraine has been felt on the EU's internal security, leading to increased risks of organised crime activities as well as human and drug trafficking. Increasing extreme weather events, including drought, heat waves and wildfires, brought to the fore the need for civilian protection, societal resilience and capacity to react to crises, including against chemical, biological, radiological, nuclear and explosive incidents and natural events.

R&I contributed significantly to addressing the [fast-evolving threat landscape](#) as regards the protection in the EU of critical infrastructure with cross-border relevance. Member States were encouraged by the [Council Recommendation on a Union-wide coordinated approach to strengthen the resilience of critical infrastructure](#) to make best use of the results of R&I projects, in particular for stress tests and scenario planning.

The resilience of entities that provide services that are crucial for the maintenance of vital societal functions is being strengthened by the [Critical Entities Resilience Directive](#), as its implementation will be supported by R&I.

The role of research under Horizon Europe in making our digital infrastructure safer and in building capacity to prevent and mitigate cyberattacks, as well as in supporting law enforcement with new technologies (such as artificial intelligence) was highlighted by the fifth [Progress Report on the EU Security Union Strategy](#).

The [Community for European Research and Innovation for Security](#) expert group [started work](#), including [four sub-groups](#) one of them on ‘strengthening security research and innovation’.

The work started by the [European Food Security Crisis preparedness and response mechanism](#) highlighted the relevance of R&I in production diversification process.

## 2.5. COVID-19 pandemic

Although the pandemic moved into the endemic phase in 2022, research activities remained a high priority in order to tackle the disease and its consequences.

The [European COVID-19 Data Platform](#) continued to grow, currently holding over 11 million records of diverse data types, including over 6.4 million viral genomes recorded by 112 countries.

The communication on [COVID-19 - Sustaining EU Preparedness and Response: Looking ahead](#) (April 2022) tackled the need to develop the next generation of vaccines under Horizon Europe.

## 2.6. Partnership with Member States

In 2022, all [recovery and resilience plans](#) except for Hungary’s plan have been approved. The plans are R&I-rich, with a volume of EUR 47.4 billion in R&I. At this stage, out of the 608 R&I-related targets set, 98 have been completed and 36 have already been assessed as met.

The [enhanced dialogues](#) as a new approach to support Member States in implementing a common R&I policy agenda, has been piloted in five Member States.

The [European Research Area \(ERA\) Forum](#), bringing together Member States, stakeholders and associated countries, was created in 2022 to coordinate implementation of the [20 ERA Policy Agenda actions](#). These include researchers’ careers, open science, [research assessment](#) and infrastructures. In December 2022, the Council adopted the [recommendation on the guiding principles for knowledge valorisation](#) to increase the socioeconomic impact from R&I.

In November 2022, the Commission published a guidance note on ‘[Synergies between Horizon Europe and European regional development fund programmes](#)’, which outlines opportunities for synergies available to the programme managing authorities.

## 2.7. International aspects

The [Global Approach to R&I strategy](#) remained the backbone of international R&I cooperation in 2022. This approach strikes a balance between openness and promoting reciprocity underpinned by fundamental values and common framework conditions. In April 2022, the European Parliament supported the strategy in a [resolution](#).

The Commission strengthened R&I cooperation with Africa by developing the [African Union - EU Innovation Agenda](#). Cooperation activities with countries in the South Mediterranean received a boost with the adoption of a [Ministerial Declaration](#) at the first [Union for the Mediterranean Ministerial Conference on R&I](#) (June 2022).

Discussions on the [EU-China joint roadmap](#) for cooperation in science, technology and innovation continued with slow progress due to China's reluctance to engage in innovation activities. With the United States new actions were agreed in the [EU-US Joint Consultative Group](#) and the [EU-US Trade and Technology Council](#).

The Commission supported the [Intergovernmental Panel on Climate Change](#) and the [Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services](#) with science and policy options.

In 2022, the Commission held a series of dialogues on sustainability in agriculture with [Canada](#), [the United States](#) and [Latin America and the Caribbean](#) to identify R&I needs to tackle common challenges such as greenhouse gas emissions from livestock or soil health.

The [MSCAdvocacy project](#) was launched in June 2022 to foster cooperation with the 20 international partner countries and six regions.

## **2.8. Direct actions implemented by the Joint Research Centre of the Commission**

The Joint Research Centre (JRC) supported numerous Commission initiatives by providing scientific analyses, in particular in response to Russia's war against Ukraine such as energy pricing, the general macroeconomic situation, short- and long-term scenarios for energy supply and the risks related to the Russian occupation of the nuclear sites of Tchernobyl and Zaporozhye. The JRC also analysed the drivers affecting food security. In addition, the [2022 Strategic Foresight Report](#) focused on 'twinning the green and digital transitions in the new geopolitical context'. To help achieve the goal set out in the EU Green Deal, JRC created the [EU Blue Economy Observatory](#), a knowledge dissemination platform to foster sustainability of our oceans, seas and coastal areas. To help implement the [New European Bauhaus](#) projects, the JRC launched the [NEB Lab](#).

### **3. IMPLEMENTATION AND MONITORING OF HORIZON EUROPE, HORIZON 2020 & EURATOM**

#### **3.1. Horizon Europe in 2022 – Highlights & new features**

In May 2022, the Commission adopted an amendment to the '[main' Horizon Europe work programme 2021-2022](#)', which fully rolled out actions for [EU missions](#) in 2022.

During the [R&I Days 2022](#), the Commission launched the process for the next [Horizon Europe strategic plan 2025-2027](#).

In December 2022, the Commission adopted the 'main' [Horizon Europe work programme 2023-2024](#), which made available around EUR 13.5 billion for R&I to accelerate a fair green and digital transition, increase Europe's energy resilience, and contribute to a sustainable recovery following the COVID-19 pandemic. It also included actions to address the geopolitical situation with targeted support for Ukraine.

#### **International cooperation & association**

Topics encouraging international cooperation increased from approximately 20% in the 2021-2022 work programme to approximately 22% in the currently implemented 2023-2024 work programme.

The Horizon Europe Regulation Article 22(5), which allows restriction of participation in order to safeguard EU strategic assets, interests, autonomy or security in certain sensitive areas, was applied to 49 topics in the Horizon Europe work programme 2021-2022 representing around 4% of that work programme's budget (around 2% of the overall 2021-2022 Horizon Europe operational budget).

The eligibility criterion that obliges all public bodies, research organisations and higher education bodies in Member States and associated countries to have a gender equality plan in place to be eligible for funding, has entered into effect in 2022.

By the end of 2022, [16 third countries](#) were associated to Horizon Europe. Negotiations have been finalised with New Zealand and launched with Canada. Both are expected to become associated in 2023. Exploratory talks with Japan and South Korea were initiated.

### 3.2. Horizon Europe Monitoring data

#### Calls and Topics

Source: Call Passport System (CPS) data extraction of 19/01/2023

In 2022, 44 new calls for proposals covering a total of 202 topics were launched under the Horizon Europe main work programme 2021-2022. Overall, 874 topics under 160 calls for proposals as well as an additional 195 other actions were launched under the work programme 2021-2022 for a budget of around EUR 16 billion.

In addition, the [European Research Council](#) (ERC) launched 7 calls under the ‘excellent science’ pillar in its work programme 2022 for a total budget of EUR 2 427 million.

The [European Innovation Council](#) (EIC) launched four calls for proposals for the three key instruments (two pathfinder, transition and accelerator calls with multiple cutoff dates) and 13 other actions for a total budget of EUR 1 711.4<sup>2</sup> million.

The topics launched under the Horizon Europe main work programme were designed to attract projects that will help achieve the [Commission’s overarching political priorities for 2019-2024](#). A more precise contribution to each policy priority will be known when beneficiaries will have reported on the projects’ results.

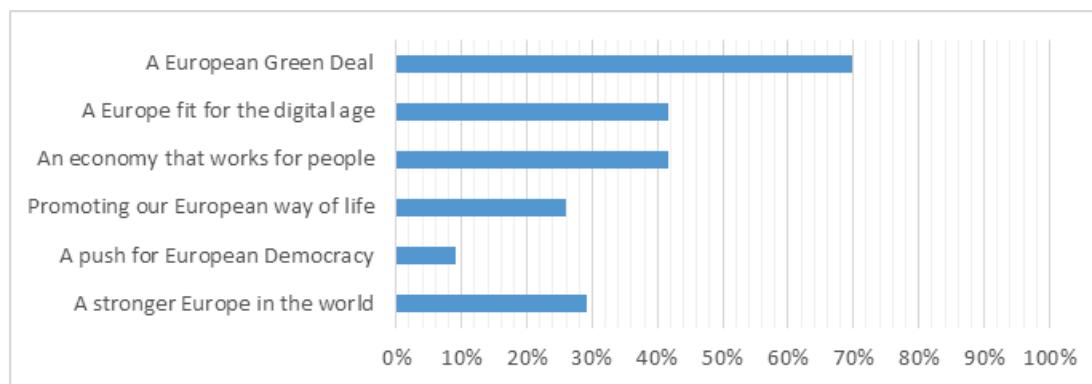


Fig 1: Percentage of topics of Horizon Europe main Work Programme 2021-2022 addressing the Commission’s priorities.

Research and innovation play a central role in accelerating the green transition. So far, 34% and 7.3% of Horizon Europe spending<sup>3</sup> have been allocated to address climate change and biodiversity, respectively.

<sup>2</sup> EIC budget programmed in the EIC Work Programme 2022

<sup>3</sup> Source: Preliminary Commission data for 2021 and 2022

## Proposals submitted and success rates

Source: Horizon Dashboard frozen data on 30/12/2022

A total of **44 832 eligible proposals** were submitted under the calls closed and fully evaluated by the end of 2022. 54% were assessed by external experts as being of high quality as they reached the minimum score threshold. 7 108 proposals were selected for funding, amounting to total requested funding of EUR 20.5 billion.

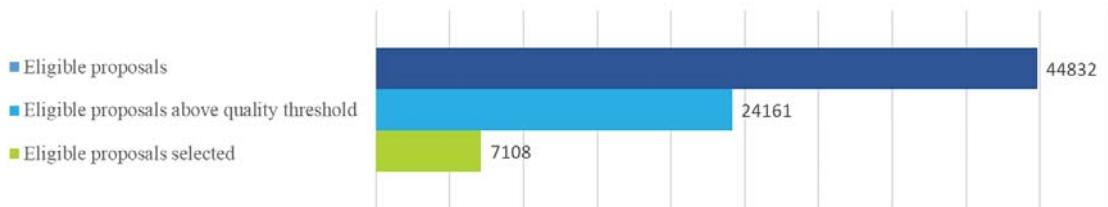


Fig. 2: Eligible and selected proposals

So far, the success rate of proposals<sup>4</sup> is higher for Horizon Europe (15.9%) than it was for Horizon 2020 (11.9%). 71% of the high quality proposals are still not receiving funding with 10.6% likely to as they were put on a reserve list. An additional amount of approximatively EUR 34.4 billion would have been needed to fund all high quality proposals.

## Grants signed

Source: Horizon Dashboard frozen on 30/12/2022

Following the evaluation of the proposals, **EUR 16.3 billion** have already been awarded through **5 509 signed grants**. However, many grants are still under preparation as 7 108 proposals have been selected for funding.

The average grant size is EUR 3 million, higher than the average under Horizon 2020 (EUR 2.3 million<sup>5</sup>). Average EU funding allocated to mono-beneficiary grants (43% of the grants) is around EUR 1.3 million while it is around EUR 4.2 million for collaborative grants (57% of the grants). Collaborative grants involve 12 participants on average.

<sup>4</sup> The success rate of proposals is the percentage of eligible proposals selected out of all eligible proposals

<sup>5</sup> Average grant size for H2020 - excluding the 4 234 SME instrument phase 1 small grants of 50.000 EUR that would have distorted the overall figure. When included, average grant size drops to EUR 1.9 million

Programme part	Eligible proposals	Selected proposals	Success rate of proposals (% of eligible)	EU contribution requested in selected proposals (in EUR million)	Signed grants	EU contribution in signed grants (in EUR million)	Average grant size (in EUR million)
<b>Pillar 1 - Excellent Science</b>							
European Research Council	14 814	1 769	11.9%	2 906	1 398	2 271	1.6
Marie Skłodowska-Curie Actions	16 672	2 692	16.1%	1 093	1 532	859	0.6
Research infrastructures	139	74	53.2%	512	73	506	6.9
<b>Pillar II - Global Challenges and European Industrial Competitiveness</b>							
Cluster 1	1 307	288	22.0%	2 291	187	1 575	8.4
Cluster 2	1 120	144	12.9%	444	139	405	2.9
Cluster 3	313	51	16.3%	229	54	229	4.2
Cluster 4	2 736	564	20.6%	3 606	556	3 290	5.9
Cluster 5	2 121	511	24.1%	4 434	427	3 506	8.2
Cluster 6	1 492	388	26.0%	2 341	308	1 766	5.7
<b>Pillar III – Innovative Europe</b>							
The European Innovation Council*	2 549	225	8.8%	691	465	1 171	2.5
European innovation ecosystems	569	93	16.3%	105	91	103	1.1
The European Institute of Innovation and Technology	20	17	85.0%	1 103	N/A	N/A	
<b>Widening Participation and Strengthening the European Research Area</b>							
Widening participation and spreading excellence	831	241	29.0%	666	230	488	2.1
Reforming and enhancing the European R&I System	149	51	34.2%	125	49	110	2.2
<b>Total for Horizon Europe</b>	<b>44 832</b>	<b>7 108</b>	<b>15.9%</b>	<b>20 546</b>	<b>5 509</b>	<b>16 279</b>	<b>3.0</b>

\* EIC accelerator proposals data was not available at the date of this analysis

Table 1: Proposals and grants per programme part

## Applicants and participants

Source: Horizon Dashboard frozen on 30/12/2022

Member States account for 81.8% of the eligible applications submitted; 18.8% came from organisations based in [widening countries](#).

Associated countries submitted 5.7% of all applications and third countries submitted 12.5% of applications, over 50% of which came from UK<sup>6</sup>-based organisations.

Country group	Applications in eligible proposals	% of total number of applications	Success rate of application	Participation in signed grants	% of all participations	EU contribution in signed grants (EUR million)	% of total EU contribution in signed grants
Member States	167 859	81.8%	21.9%	32 954	84.3%	14 989	92.1%
<i>Widening Countries</i>	<i>38 583</i>	<i>18.8%</i>	<i>19.9%</i>	<i>6 876</i>	<i>17.6%</i>	<i>2 221</i>	<i>13.6%</i>
<i>Other Member States</i>	<i>129 276</i>	<i>63.0%</i>	<i>22.6%</i>	<i>26 078</i>	<i>66.7%</i>	<i>12 768</i>	<i>78.4%</i>
Associated countries	11 794	5.7%	19.6%	2 090	5.3%	1 091	6.7%
Non-associated third countries	25 471	12.5%	21.2%	4 035	10.3%	200	1.2%
<b>TOTAL</b>	<b>205 124</b>	<b>100%</b>	<b>21.7%</b>	<b>39 079</b>	<b>100%</b>	<b>16 279</b>	<b>100%</b>

Table 2: Applicants origin

The first projects signed involve over **39 000 participants** from 142 different countries, including **19% of small and medium-sized enterprises** (SMEs) and 15.7% from non-EU countries. The highest shares of participants come from higher education institutions (32.7%), private sector entities (30.7%) and research organisations (22.6%). A preliminary analysis shows that 35.6% of participants are new applicants.

Overall, widening countries were allocated EUR 2.2 billion (13.6%) of the Horizon Europe funds through signed grants. Other Member States received EUR 12.8 billion, associated countries over EUR 1 billion and non-associated third countries EUR 200 million. SMEs were allocated 18% of the total budget (EUR 2.86 billion).

<sup>6</sup> Following Brexit, UK is not longer a Member State but a third country for whose entities there are transitional arrangements

## Focus on European partnerships

Source: [Performance of European Partnerships report](#)

Under the first [strategic plan 2021-2024](#), 49 partnerships were identified, of which 37 had been launched by May 2022.

PILLAR II - Global challenges & European industrial competitiveness				PILLAR III - Innovative Europe	
Cluster 1: Health	Cluster 4: Digital, industry and space	Cluster 5: Climate, energy and mobility	Cluster 6: Food, bioeconomy, natural resources, agriculture and environment	EIT: The European Institute of Innovation and Technology	European innovation ecosystems
Innovative Health Initiative	Key Digital Technologies	Clean Hydrogen	Circular Bio-based Europe	EIT InnoEnergy	Innovative SMEs
Global Health EDCTP3	Smart Networks and Services	Clean Aviation	Biodiversa+	Climate-KIC	
Transformation of Health Care Systems	High Performance Computing	Single European Sky ATM Research 3	Blue Economy	EIT Digital	
Risk Assessment of Chemicals	European Metrology (Art. 185)	Europe's Rail	Water4All	EIT Food	
ERA for Health	AI-Data-Robotics	Connected, Cooperative and Automated Mobility	Animal Health and Welfare	EIT Health	
Rare Diseases	Photonics	Batteries	Accelerating Farming Systems Transitions	EIT Raw materials	
One Health Antimicrobial Resistance	Made in Europe	Zero-emission Waterborne Transport	Agriculture of data	EIT Manufacturing	
Personalised Medicine	Clean Steel – Low-Carbon Steelmaking	Zero-emission Road Transport	Safe and Sustainable Food Systems	EIT Urban Mobility	
Pandemic Preparedness	Processes4Planet	Built4People		Cultural and Creative Sectors and Industries	
	Globally Competitive Space Systems	Clean Energy Transition			
		Driving Urban Transitions			
CROSS-PILLARS II and III					
European Open Science Cloud					

- Institutionalised partnerships (Art 185/7, EIT KICs)
- Co-programmed
- Co-funded
- Not covered in the BMR 2022 due to a later start date

Fig.3: European partnerships

Partnerships will be financed with estimated commitments of EUR 31.4 billion from partners other than the EU (EUR 9 billion from Member States and associated countries and EUR 22.4 billion from industry) and an estimated commitment of EUR 23.8 billion from Horizon Europe. This represents 37.7% of Horizon Europe pillar II budget and is distributed as follows:

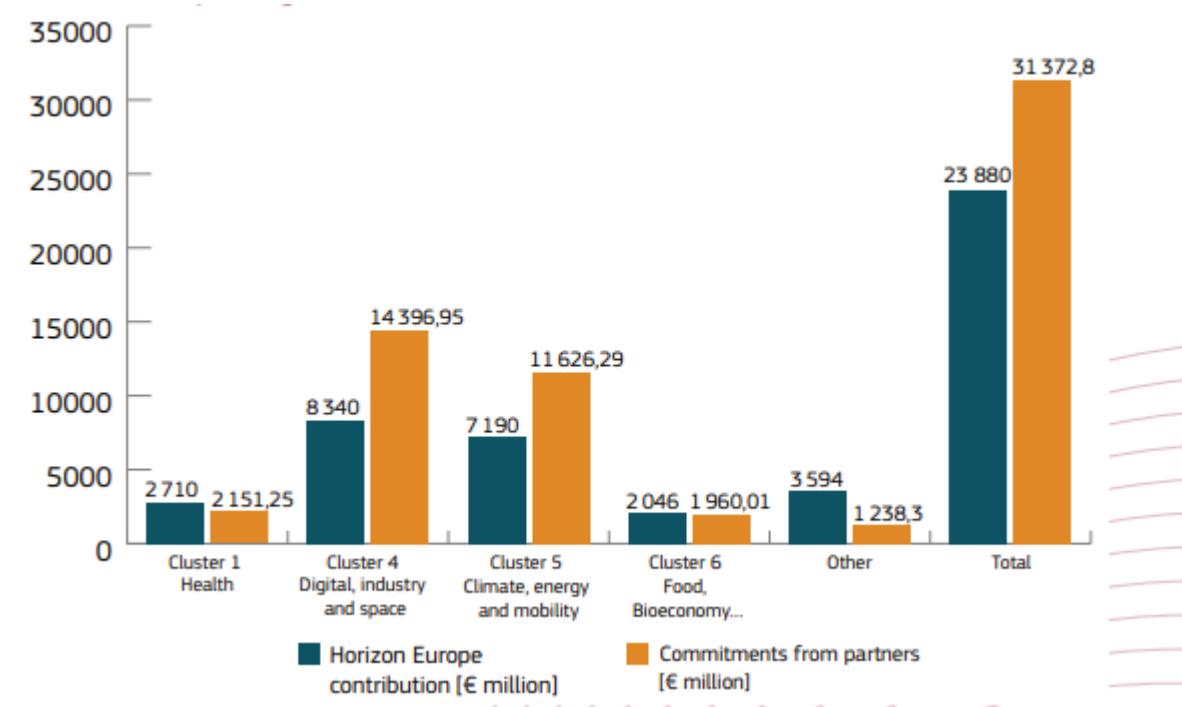


Fig. 4: Budgetary commitments per cluster of activities

## Focus on EU missions

Source: Horizon Dashboard frozen on 30/12/2022

By the end of 2022, 25 [Horizon Europe mission](#) calls had been launched, closed and fully evaluated. They had attracted 8 167 eligible research & innovation proposals of which 137 were selected for funding for a total of EUR 1 046 million of EU funding requested.

71 grants involving 1 525 participants had already been signed for a total amount of EUR 567 million split<sup>7</sup> as follows across the five missions:

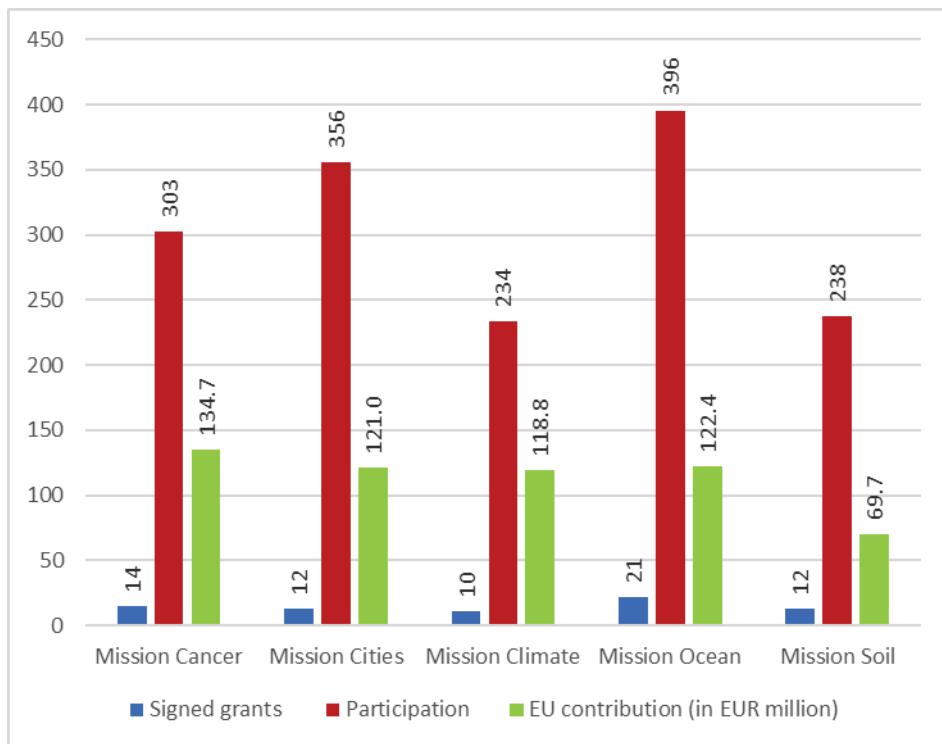


Fig. 5: Signed grants, participation and EU contribution per mission

## Focus on the European Institut of Innovation and Technology (EIT)

During 2021-2022<sup>8</sup>:

- 2 320 people graduated from [European Institute of Innovation and Technology](#) (EIT) labelled master and doctoral programmes;
- 76 start-ups were created by students from EIT programmes and 203 start-ups as a result of EIT innovation projects;
- 2 425 start-ups received support from EIT [Knowledge and Innovation Communities](#) (KICs);
- 607 innovative products or services were put on the market by the EIT KICs.

### 3.3. In-depth analysis: Horizon Europe monitoring flashes and other studies

#### Newcomers in EU R&I programmes

A new monitoring flash looks at [newcomers in EU R&I programmes](#). Mostly retrospective on participation in Horizon 2020, it shows that 69.2% of its successful

<sup>7</sup> Figures for horizontal or joint projects between missions are split equally between the missions to which those projects contribute which explains the non-rounded figures for projects.

<sup>8</sup> Targeted achievements

applicants did not participate in the previous seventh framework programme. Newcomers received EUR 12.9 billion, around half of which went to SMEs (EUR 6.1 billion). The first figures on newcomers in Horizon Europe point in the same direction.

## Update on evaluation studies

A series of evaluation studies are under way as part of the *ex-post* evaluation of Horizon 2020, while also preparing the ground for the interim evaluation of Horizon Europe. In 2022, the Commission published the [Evaluation study on the European Innovation Council \(EIC\) pilot](#) and launched the largest public consultation - on the past, present & future of European research and innovation programmes 2014-2027.

### 3.4. Horizon 2020

Under Horizon 2020, in total 35 426 grant agreements were signed for a total budget allocation of EUR 68.32 billion. Projects under the Societal challenges pillar received the biggest share (38.6%), followed by the Excellent Science pillar (36.6%) and the Industrial leadership pillar (20.2%).

A total of 41 575 different organisations benefitted from Horizon 2020. Higher education institutions received 39.5% (EUR 26.9 billion), followed by private-sector entities (28.2% or EUR 19.3 billion) and research organisations (25% or EUR 17 billion).

By end of 2022, 41% of the Horizon 2020-funded projects were still ongoing. Projects have generated more than 197 000 peer-reviewed publications, around 3 200 patents applications and 2 300 patent awards.

### 3.5. Dissemination and exploitation

Numerous activities during the [Research and Innovation Days](#) in September 2022 promoted the dissemination of Horizon Europe results.

The relevant dissemination tools - [Horizon Results platform](#), [Horizon Results Booster](#), [CORDIS](#), [Horizon Dashboard](#), [European data for research and innovation policy initiative](#), [the EU Innovation Radar](#) and the [H2020-Interreg synergies mapping tool](#) - continued to provide exploitable results from the framework programmes and made available rich data on innovative results of EU and national R&I funding.

Under the [Horizon Europe dissemination and exploitation strategy](#), the Commission has implemented an action plan for 2021-2022. This focusses on providing internal guidance, support services to beneficiaries, improving networking and synergies and mapping and valorising results.

In 2022, the [Horizon Standardisation Booster](#) was launched to boost the European Standardisation dialogue between Horizon Europe projects with corresponding Standards Developing Organisations and to increase the European impact on international standardisation.

Below are some examples of activities to boost the dissemination and use of results from the framework programmes in thematic areas:

- the Commission awarded the [2022 Security Innovation Award](#), which rewards excellency in great examples showing the uptake of security research;

- current and closed projects are promoted by the newly established [Community of European Research and Innovation for Security](#);
- [EIP-AGRI](#) boosts the uptake of R&I results by agricultural policy beneficiaries and ensures that it reaches farmers, foresters and rural actors;
- the [Blue Invest initiative](#) provided assistance and access to investment for maritime start-ups and SMEs, many of which had developed services and products in previous framework programmes;
- [CORDIS](#) disseminated results from EU funded R&I projects, attributed persistent identifiers to them and classified them according to their scientific fields.

### **3.6. Implementation and monitoring of the Euratom Programme 2021-2025**

#### **a) Nuclear direct actions implemented by the JRC**

The JRC implemented direct actions under the Euratom programme allocating the available resources with the following estimated breakdown<sup>9</sup>:

- 20% to safety on nuclear reactors and fuels,
- 10% on radioactive waste and spent fuel management,
- 32% to nuclear safeguards and security,
- 10% to nuclear reference materials and data,
- 9% to non-power applications and radioprotection,
- 11% to the Euratom objective to maintain competences in the EU,
- 8% to provide direct support to EU policies.

JRC opened the access of external users to JRC facilities; the call launched in 2022 encourages Ukrainian scientists to participate.

The JRC participated in 18 granted projects (related to the safety of nuclear systems) of the last call for indirect actions of the Euratom programme.

#### **b) Indirect actions of the Euratom Research & Training Programme (grants)**

In 2022, the Commission awarded 28 grants for a total amount of EUR 117 million for research projects in nuclear safety, radiation protection and non-power applications of nuclear technologies. In March 2022, Commissioner Mariya Gabriel convened the

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<sup>9</sup> Source: [JRC mission statement & work programme](#)

[Second High-Level Nuclear Roundtable](#) to discuss future of research in small modular reactors and medical applications using nuclear technologies.

#### **4. OUTLOOK 2023**

In 2023, the next Horizon Europe strategic plan 2025-2027 will be drafted. The adoption is planned for the 1<sup>st</sup> quarter of 2024. It sets out the R&I priorities for the second period of Horizon Europe.

The Commission will continue to support implementation of the REPowerEU Plan and to accelerate work to meet the aims of the European Green Deal through EU R&I actions.

The Commission will carry out communication activities on Horizon Europe, for instance by:

- promoting the results of the [public consultation](#) and the preparation of the strategic plan 2025-2027;
- promoting the EU missions and partnerships;
- citizens' engagement through communication initiatives, such as the 34th edition of the [EU Contest for Young Scientists](#) (September 2023 in Brussels);
- initiating the public debate on the future of R&I in Europe during the R&I Days to take place at the end of October 2023.