



Annual Activity Report 2021

DG RESEARCH AND INNOVATION

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THE DG IN BRIEF

Directorate-General for Research and Innovation (DG Research & Innovation) defines and implements European **research and innovation policy** with a goal to reinforce the scientific base of the Union, to secure its technological sovereignty and to support innovation.

The DG under supervision of **Mariya Gabriel, Commissioner for Innovation, Research, Culture, Education and Youth**, contributes to **all the headline ambitions of Commission President von der Leyen**.



Faced with the long-term social and economic effects of the global pandemic, our vision remains unchanged: **a sustainable, safe, fair and prosperous future for people and planet**, based on solidarity and respect for common European values.



Our mission is to design and implement research and innovation policies and programmes in collaboration with the Member States, international partners, stakeholders and citizens. These policies and programmes, supported by investment and relevant regulation, will **deliver new knowledge and game-changing innovation for the green and digital transformation**. We aim to have a high scientific, technological and societal impact, built on scientific evidence and strong input from citizens.

In 2021, DG Research and Innovation spearheaded the launch of the **Horizon Europe framework programme** and the **Euratom** programme. Launching the **EU Missions** and the new **European Partnerships** under Horizon Europe was a priority in 2021. These instruments will address global challenges by putting forward ambitious and inspirational but achievable goals.

The DG organises its directorates around three key dimensions of sustainable development - **People, Planet, and Prosperity**. We put strong emphasis on **engagement with citizens and society** and the strategic role of **data analysis and business intelligence**.

The **Horizon Europe governance decision** adopted by the College in 2021 established the Common Policy Centre (CPC) and the Common Implementation Centre (CIC). The new architecture of the DG aims at breaking silos and facilitating a horizontal flow of information and skills. Shared strategy units, matrix structures and close cooperation with other Commission's services facilitate the **co-creation of policies and strategic priorities for the implementation of Horizon Europe**.

In 2021, the DG finalised the externalisation of its programme implementation to the Executive agencies, as well.

The DG was broadly involved in **tackling health, economic and social impacts of the COVID-19** pandemic and has contributed to the European Commission's efforts to finance, secure and distribute a safe vaccine to all.

DG RESEARCH & INNOVATION

SPECIFIC OBJECTIVES TO THE COMMISSION'S HEADLINE AMBITIONS

GENERAL OBJECTIVE 1: A EUROPEAN GREEN DEAL

- ◆ **Specific objective 1.1:** High-quality science, knowledge and innovative solutions support climate policies and help to preserve biodiversity, ecosystem and natural resources
- ◆ **Specific objective 1.2:** Mainstreaming of the public and private research and innovation investments for climate actions strengthens the European Green Deal's impact
- ◆ **Specific objective 1.3:** Co-creation of Horizon Europe and its missions and partnerships increases awareness of the key role of research and innovation for achieving climate neutrality

GENERAL OBJECTIVE 2: A EUROPE FIT FOR THE DIGITAL AGE

- ◆ **Specific objective 2.1:** High-quality science, knowledge and innovative solutions facilitate a digital transition in Europe, including a new European approach to Artificial Intelligence
- ◆ **Specific objective 2.2:** The revitalised European Research Area sets directions for societal, economic and ecological transitions in Europe and contributes to spreading excellence, closing research and innovation gap and working out a common global response to emerging challenges
- ◆ **Specific objective 2.3:** Research and innovation actions and the European Innovation Council in particular support development and scaling-up of SMEs with breakthrough and disruptive technologies

GENERAL OBJECTIVE 3: AN ECONOMY THAT WORKS FOR PEOPLE

- ◆ **Specific objective 3.1:** Research and innovation actions, increased R&I investments and the R&I component of the European Semester boost economic growth and jobs creation

GENERAL OBJECTIVE 4: A STRONGER EUROPE IN THE WORLD

- ◆ **Specific objective 4.1:** Regional research and innovation strategies and broader association policy contribute to promoting common European R&I values and creating a global Research and Innovation Space

GENERAL OBJECTIVE 5: PROMOTING OUR EUROPEAN WAY OF LIFE

- ◆ **Specific objective 5.1:** Research and innovation develop and deploy solutions, technologies and innovations to tackle emerging threats and improve crisis preparedness
- ◆ **Specific objective 5.2:** Research and innovation support the European health initiatives, including the European plan to fight cancer

GENERAL OBJECTIVE 6: A NEW PUSH FOR EUROPEAN DEMOCRACY

- ◆ **Specific objective 6.1:** European research and innovation support citizens' involvement, social inclusion and equalities in Europe, including through communication of the European R&I added value

GENERAL OBJECTIVE 7: A MODERN, HIGH PERFORMING AND SUSTAINABLE EUROPEAN COMMISSION

- ◆ **Specific objective 7.1:** The Common Implementation Centre and the Policy and Programming Centre provide user-friendly services and tools to the European Commission for effective and efficient planning, programming and implementation of the Research and Innovation Framework Programme and other EU programmes

EXECUTIVE SUMMARY

This Annual Activity Report is a management report of the Director-General Research and Innovation (DG R&I) to the College of Commissioners. Annual Activity Reports are the main instrument of management accountability within the Commission and constitute the basis on which the College takes political responsibility for the decisions it takes as well as for the coordinating, executive and management functions it exercises, as laid down in the Treaties ⁽¹⁾.

A. Key results and progress towards achieving the Commission's general objectives and DG's specific objectives (executive summary of section 1)

2021 marked the official launch of **Horizon Europe** – the new European framework programme for research and innovation, with the adoption of the first **Strategic Plan 2021-2024** and a whole set of **Work Programmes** – from the European Research Council (ERC), the European Innovation Council (EIC) and the ‘emergency’ work programme dedicated actions to address COVID-19 variants, and the ‘main’ work programme 2021-2022, including the preparatory actions for EU Missions, adopted in June 2021.

Directorate-General for Research & Innovation completed also the process of delegating the key implementation responsibilities to the relevant **Executive Agencies (EA)**.

Our contribution to the six headline ambitions of the European Commission was designed in a **co-creation process** and through **reinforced engagement with citizens and the society** at large. This was a key task especially towards the preparation of the draft implementation plans of **the five EU Missions**. They were **launched** on 29 September 2021 with the adoption of the Commission Communication on the EU Missions (COM(2021)609) and entered into their **implementation phase**.

Following coordinated impact assessments², two key initiatives proposed by the Commission related to institutionalised European Partnerships were adopted by the legislator at the end of 2021: the **Metrology Partnership** (based on Art. 185 TFEU) and the establishment of nine Joint Undertakings (JUs) under Horizon Europe, based on Art. 187 TFEU – **Single Basic Act (SBA)**.

A Commission Decision adopting the **Memoranda of Understanding for the eleven co-programmed partnerships** was adopted on 14 June 2021. The co-programmed partnerships have already started their activities and delivered their draft plans.

⁽¹⁾ Article 17(1) of the Treaty on European Union

² Published on 23 February 2021, https://ec.europa.eu/commission/presscorner/detail/en/IP_21_702

Co-programmed and co-funded partnerships have been identified in the **Horizon Europe Strategic Plan 2021-2024**. They address the key European challenges, including the twin green and digital transformation and the health urgencies.

A successful final phase of **Horizon 2020** - working in **synergy with other EU policies and programmes** - brought ground-breaking scientific results, new technologies and innovative services.

DG R&I actions have been **instrumental in the European response to the pandemic**. The DG contributed to the preparatory work related to setting up of **European Health Emergency Preparedness and Response Authority (HERA)**, which aims to re-boost Europe's preparedness and resilience in the long-term.

The revitalised **European Research Area (ERA)** continued to set directions for societal, economic and ecological transitions in Europe and contributed to spreading excellence, closing the research and innovation gap in the EU and formulating a common global response to emerging challenges. In addition, it provided the policy framework to enhance R&I investment at the national level and assess from a R&I perspective the national reform plans submitted under **the Recovery and Resilience Facility**.

In 2021, DG R&I made a significant contribution to the update of the **Industrial Strategy**, strengthening the role of science and innovation for a successful green and digital transformation, for industrial development, overcoming global pandemics, securing resilience and open strategic autonomy. The concept of **Industry 5.0** brought a new vision for a green, resilient and human-centric industry.

In 2021, the DG focused on boosting international R&I cooperation and enhancing new global cooperation patterns, also through the **international dimension of the Horizon Europe Strategic Plan 2021-2024** and targeted actions, including on **the EU's open strategic autonomy**. **The adoption of the Global Approach Communication (COM(2021) 252 final)** has been a considerable success and has raised the priority, visibility and importance of research and innovation **in delivering EU policies in the world**. During last year, DG R&I initiated a set of formal **association negotiations with third countries**.

The five key activities of Directorate-General for Research and Innovation in 2021:



Continuous and persistent use of the potential of European R&I to handle health, social and economic aspects of **the COVID-19 pandemic**, including through updates of the work programmes, the Manifesto for **EU Covid-19 Research** and the **European COVID-19 Data Platform**.



Launch of the **Horizon Europe framework programme**, and roll out of its new governance, including the adoption of the **Strategic Plan 2021-2024 and the**

Work Programmes, and launching **the European Institutionalised Partnerships** (including via the Single Basic act) **and the EU Missions**.



Effective **implementation of the R&I framework programmes** and encouraging **innovation and investment in thematic policy areas** which remain key for accelerating green and digital transitions, EU recovery and resilience, boosting Europe's R&I capacity and its global technological leadership, as well as the continuous development of the **European Research Area**



Supporting European economies and innovation, including technology diffusion and development of innovative SMEs and start-ups, through dedicated instruments of the EU R&I framework programmes and the **European Innovation Council**.



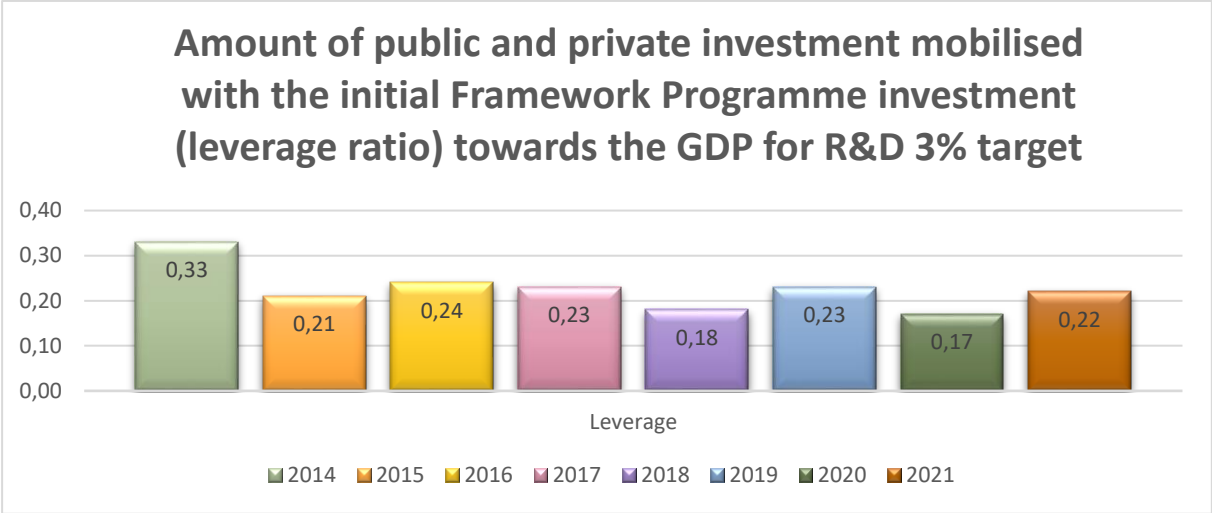
Intensified R&I international cooperation to strengthen the global impact of European science and technology, to support the global response to the COVID-19 pandemic and to prepare the implementation of the **association policy for Horizon Europe**.

As regards the performance of the R&I Programmes, the Programme Statements of Horizon Europe and Euratom reflect the fact that 2021 is the first year of the 2021-2027 Multiannual Financial Framework. At the same time, the document highlights substantial payments that are still being implemented for the 2014-2020 programmes.

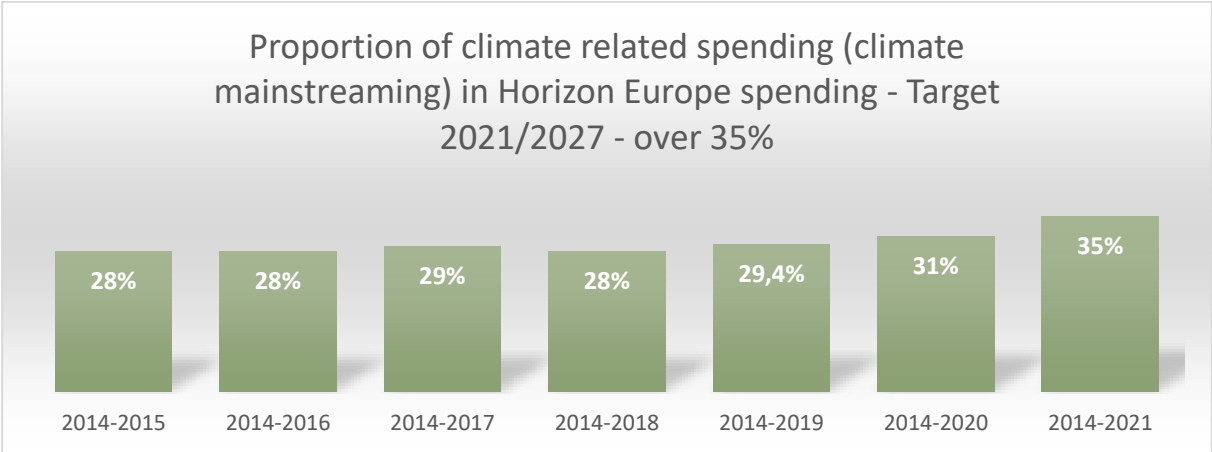
The report informs about the implementation stage and the progress towards the specific objectives (supported by the key achievements) as well as the contribution to the horizontal priorities.

B. Key Performance Indicators (KPIs)

- 1. Amount of public and private investment mobilised with the initial Framework Programme investment (leverage ratio) towards the GDP for R&D 3% target (Result indicator 8 in the performance tables - specific objective 2.1)



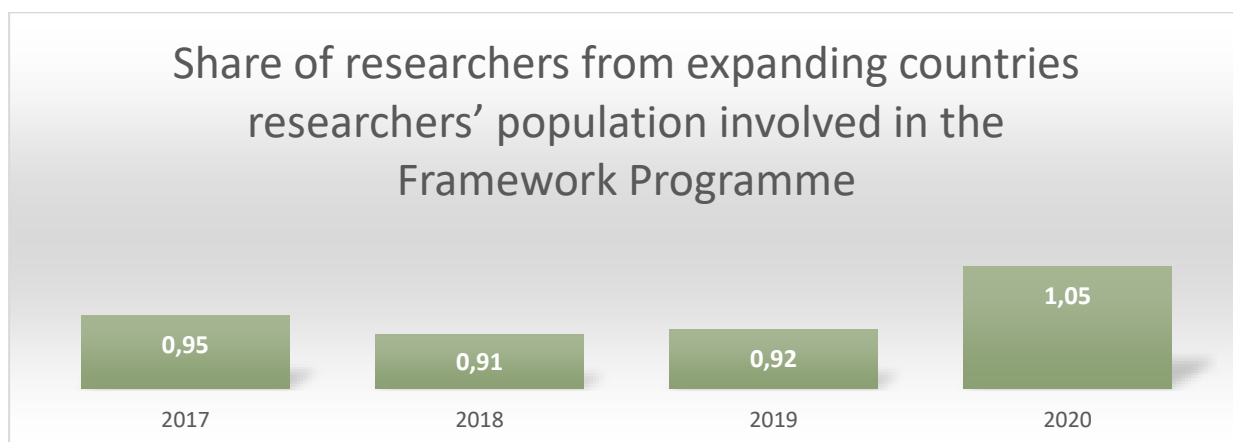
- 2. Proportion of climate related spending (climate mainstreaming) in Horizon Europe spending (Result indicator 3 in the performance tables - specific objective 1.2)



- 3. Progress towards R&I missions’ targets related to the European Green Deal (Result indicator 5 in the performance tables - specific objective 1.3)

Data not available as EU Missions were only launched on 29 September 2021.

4. Share of researchers from expanding countries researchers' population involved in the Framework Programme (Result indicator 10 in the performance tables - specific objective 2.2)



No data available for 2021.

The total number of widening researchers in 2021 will be known when all the Progress Reports with end date on 2021 will be paid. This indicator takes only into account the periods ending in 2021, already paid. At the moment of the last extraction, 71% of the periods ending in 2021 have been paid. Therefore, the figure for 2021 is still very partial.

Because it addresses only periods ending in 2021, it is more accurate to indicate "no data available", and indicate the value for 2021 in next year document.

C. Key conclusions on Financial management and Internal control (executive summary of section 2.1)

In line with the Commission's Internal Control Framework, DG Research and Innovation has assessed its internal control systems during the reporting year and has concluded that it is effective and the components and principles are present and functioning well overall, but some improvements are needed as minor deficiencies were identified related to principles: 10 and 12 (component III – "Control Activities"), 13 (component IV – "Information and Communication") and 17 (component V - "Monitoring Activities"), as the Internal Audit Service (IAS) audit reports made evident. Please refer to AAR section 2.1.3 for further details.

In addition, DG Research and Innovation has systematically examined the available control results and indicators, including those for supervising entities to which it has entrusted budget implementation tasks, as well as the observations and recommendations issued by the internal auditor and the European Court of Auditors (ECA). These elements have been assessed to determine their impact on management's assurance about the achievement of the control objectives. Please refer to Section 2.1 for further details.

In conclusion, management has reasonable assurance that, overall, suitable controls are in place and working as intended; risks are being appropriately monitored and mitigated; and necessary improvements and reinforcements are being implemented. Improvements are necessary concerning the DG's financial exposure, the monitoring of participation patterns of experts (use of available data on their fields of expertise) and the reliability of reporting on Horizon 2020 ex-post audit results. The following actions are being/will be taken in this respect: timely implementation of the approved action plans for the IAS recommendations careful consideration of the ECA recommendations, and close monitoring of the few internal control indicators falling short of the set targets. The Director-General, in his capacity as Authorising Officer by Delegation has signed the Declaration of Assurance.

D. Provision of information to the Commissioner(s)

In the context of the regular meetings during the year between the Director General and the Commissioner on management matters, the main elements of this report and assurance declaration, have been brought to the attention of Commissioner Mariya Gabriel, responsible for Innovation, Research, Culture, Education and Youth.

1. KEY RESULTS and progress towards achieving the Commission's general objectives and DG's specific objectives

COMMISSION'S OBJECTIVE 1: A EUROPEAN GREEN DEAL

In 2021, DG Research & Innovation advanced scientific and innovation actions for **the European Green Deal**.

The implementation of Horizon Europe, in particular its Clusters 5 (Climate, Energy and Mobility) and 6 (Food, Bioeconomy, Natural Resources, Agriculture), allowed to deliver on **biodiversity, nature-based solutions in investments and policies**.

The five **EU Missions** were launched with the adoption of the Commission **Communication on EU missions** (29 September 2021). The Missions will impact key green areas, demonstrate solutions, produce European public goods and involve citizens' in the green transformation and the **post-Covid green recovery**. DG R&I was involved in the preparatory phase **of the EU Missions**, the finalisation of their **implementation plans**, the preparation of the Work Programmes, setting-up of the implementing structures, engagement with stakeholders, outreach to citizens. The **European R&I Days** in June 2021 served as a platform to progress in these activities.

In 2021, DG R&I earmarked EUR 6.5 billion for 2021-2027 to support a new wave of **partnerships under Horizon Europe**. The legal acts for the partnerships were adopted at the end of 2021. The partnerships will deliver on the **EU Hydrogen Strategy**, the **Offshore renewable energy** strategy, the **EU strategy on Energy Systems** and the **Sustainable and Smart Mobility Strategy** among others. They will also help to boost R&I investments of the Member States and private sector.

MISSIONS' GOALS



Climate adaptation: 150 European regions and communities to become climate resilient by 2030



A Soil Deal for Europe: to create 100 living labs and lighthouses to lead the transition towards healthy soils



Cities: to achieve **100 climate-neutral** and smart cities by 2030



Restore our ocean and waters by 2030



Cancer Mission: to improve lives of more than 3 million people by 2030 through prevention, cure and solutions to live longer and better

EUROPEAN PARTNERSHIPS UNDER HORIZON EUROPE:

CLUSTER 1: Health	CLUSTER 4: Digital, Industry & Space	CLUSTER 5: Climate, Energy & Mobility	CLUSTER 6: Food, Bioeconomy, Agriculture,...
Innovative Health Initiative	Key Digital Technologies	Clean Hydrogen	Circular Bio-based Europe
Global Health Partnership	Smart Networks & Services	Clean Aviation	Rescuing Biodiversity to Safeguard Life on Earth
Transforming Health Care Systems	High Performance Computing	Single European Sky ATM Research 3	Climate Neutral, Sustainable and Productive Blue Economy
Risk Assessment of Chemicals	European Metrology (Art. 185)	Europe's Rail	Water4all "Water security for the planet"
ERA for Health	Artificial Intelligence, Data and Robotics	Cooperative, Connected and Automated Mobility (CCAM)	Animal Health and Welfare*
Rare Diseases*	Photonics	Batteries "Towards a competitive European industrial battery value chain"	Agroecology "Accelerating Farming Systems Transition"*
One Health / Antimicrobial Resistance*	Made in Europe	Zero-emission Waterborne Transport	Agriculture of Data*
Personalised Medicine*	Clean Steel - Low Carbon Steelmaking	Zero-emission Road Transport (2ZERO)	Safe and Sustainable Food Systems*
Pandemic Preparedness* <i>Co-funded or co-programmed</i>	Processes4Planet	People-centric Sustainable Built Environment (Built4People)	
	Globally Competitive Space Systems**	Clean Energy Transition	
		Driving Urban Transitions to a Sustainable Future	

Institutionalised Partnerships (Art 185/7)
 Co-Programmed
 Co-Funded

* Calls with opening dates in 2023-24
 ** Calls with opening dates not before 2022



In 2021, DG R&I provided horizontal support to keep the Work Programme's topics aligned with the new impact logic of Horizon Europe and to avoid significant harm to the environment (**'Do No Significant Harm' Principle**).

DG R&I continued to contribute to the green goals of the Commission also through the European Research Area, in particular the **ERA pilot on green hydrogen** and **revamping of the SET Plan**. The pilot prepares the ground for the implementation of research and investment activities critical for the EU hydrogen economy. The renewed ambition of the SET Plan is to deliver on the European Green Deal agenda, the Energy Union and recovery.

DG R&I contributed to promoting evidence-based climate policies underpinning the implementation of the **United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement**.

In 2021, the DG was part of the Commission delegation to the **UNFCCC COP26 in Glasgow** and covered the science-related items of the negotiations of the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI).

Generating the scientific basis was key to underpin ambitious climate action in the **Intergovernmental Panel on Climate Change (IPCC)**.



- **Communication on Horizon Europe:** a press release (15,903 page views), a video for general public (more than 2 million views), a webpage (609,436 unique page views) and factsheets on the programme (2,338 downloads for factsheet on average), social media campaign via RTD channels (220,700 total impressions).
- **Launch of the EU Missions:** a press release (16,816 page views), a webpage (117,808 unique page views), factsheet for each mission (6325 downloads), social media promotion across R&I channels (25,000 impressions/post).
- **Promotion of the European Partnerships:** a factsheet, a dedicated webpage, two press releases (on Institutionalised Partnerships - 23369 page views; on Co-programmed partnerships - 5951 page views), shared social media posts across R&I channels (16,000 impressions/post).
- **Social media campaign** on the Green Deal calls: 20.000 impressions per post, 1.2% engagement rate
- **Virtual event** on the results of the EU Green Deal: 146 live participants, 1.645 views of the wrap up videos
- **Factsheet** on winners of the Green Deal call: downloaded over 500 times
- **Food 2030 event:** over 500 participants

The **EU-Catalyst Partnership** between the Commission, the European Investment Bank and Breakthrough Energy Catalyst was launched in November 2021 at **COP26**. It will mobilise up to EUR 820 million between 2022-2026.

In the reported year, the DG introduced a strategic approach to make European research and innovation outputs relevant for the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)**.

DG R&I is leading the Commission's work on the **Bioeconomy Strategy** to develop bioeconomy policies and foster research and innovation for the just and sustainable transition.

In 2021, the European Commission was the **Lead Co-Chair for the global Group on Earth Observations** and steered the GEO agenda to ensure a sound connection between Earth and environmental observations through **Copernicus** and the **global Earth Observation System of Systems (GEOS)**.

The **EIC Horizon Prize on Early Warning for Epidemics** was granted in December 2021.

Furthermore, DG R&I contributed to the **Commission Work Programme 2021** through:

- Detailed input to the **Fit for 55 package** to deliver on the European Green Deal targets. The package recognises the importance of the R&I policy and its instruments (Horizon Europe, the Innovation Fund, the partnerships and EU Missions) for reducing the EU greenhouse gas emissions by at least 55% by 2030 and achieving a climate-neutral Europe by 2050, and promotes the **Innovation Principle** for smart, future-oriented policies, encouraging technological and social innovation.
- Policy-relevant knowledge from R&I projects in support of various initiatives under the mandate of the **Circular Economy Action Plan**, in particular to the **Sustainable Products Initiative** and the review of the **Waste Framework Directive**. In that context, DG R&I established the **Circular Cities and Regions Initiative (CCRI)**.
- Input to the **EU Taxonomy** for sustainable finance, research and innovation on adaptation included as an enabling activity in its own right.
- Input to the **updated Industrial Strategy**: promoting the R&I dimension, links between partnerships and industrial alliances and technology roadmaps; highlighting the role of the 'Clean Steel Partnership' and the 'Research For Coal and Steel – RFCS modernisation package' in the **Staff Working Document 'Towards competitive and clean European Steel'**; the reference to the **EU Mission** on climate neutral cities, the reference to the Safe and Sustainable by Design Principle for chemicals, both in the **Zero-Pollution Action Plan** and in the **New European Bauhaus**.

The DG coordinated the negotiations on the **Research Fund for Coal and Steel (RFCS) modernisation package**, in support of projects aiming at turning coal mines into hydrogen production and storage facilities, developing and testing carbon dioxide capture,

as well as turning coal waste into battery anodes or carbon fibres, in particular 'Big Tickets calls' for steel (EUR 52 million per year) and for coal (EUR 19 million per year). The RFCS will also complement the Commission's Just Transition Fund to help regions to move towards cleaner energy sources. The **RFCS Call 2021** was launched in June.

As part of the implementation of **Food 2030**, DG R&I strengthened synergies with the **EIT Food KIC**, advanced work on **Partnership 'Sustainable Food Systems for People, Planet & Climate'**. As Secretariat of the Standing Committee on Agricultural Research (SCAR), the DG advised the Member States on the food systems, bioeconomy, agricultural R&I agendas.

The Commission set-up a High-Level Expert Group to assess the need to strengthen the international science policy interface for improved food systems governance, as a key EU contribution to the **UN Food Systems Summit (UNFSS)** and the **Farm to Fork Strategy**.

The DG's contribution to the 'A European Green Deal' headline ambition is reflected by the following specific objective. The performance tables are included in the annexes:

- Specific objective 1.1: High-quality science, knowledge and innovative solutions support climate policies and help to preserve biodiversity, ecosystem and natural resources
- Specific objective 1.2: Mainstreaming of the public and private research and innovation investments for climate actions strengthens the European Green Deal's impact
- Specific objective 1.3: Co-creation of Horizon Europe and its missions and partnerships increases awareness of the key role of research and innovation for achieving climate neutrality.

COMMISSION OBJECTIVE 2: A EUROPE FIT FOR THE DIGITAL AGE

The digital transition of the Union calls for the broad involvement of industry, research and academia. The R&I policy remains at the forefront of digitalisation.

A new vision for a green, resilient and human-centric industry was developed via the concept **Industry 5.0** published in January 2021. DG R&I contributed to the updated **Industrial Strategy** (adopted in May 2021), strengthening the role of science and innovation for the industrial development, the twin transition, addressing the impacts of the COVID-19 pandemic, securing resilience and open strategic autonomy. The links between Horizon Europe and industry have been improved through the new European Partnerships and Industrial Alliances.

Together with the Joint Research Centre, the DG co-created a pilot 'Industrial technology prospect report' on development of **low carbon industrial technologies**. This report served as a basis for a dialogue with the Member States and stakeholders in view of a Technology Roadmap for low carbon industries.

The **expert group on the economics and social impact of research and innovation** (ESIR) assisted the DG with strategic advice on how to develop an evidence-based, transformative R&I policy.

In order to maximise the impact of the key European policies and for more coherent European action, DG R&I reinforced in 2021 the **synergies** between relevant MFF programmes and Horizon Europe and between different R&I instruments and actions at the Commission's and the Member States' level. The DG advanced the preparation of guidelines on synergies between **Horizon Europe and Cohesion Programmes for current Multiannual Financial Framework**. The DG has also contributed to the implementation of the Action Plan on synergies between civil, defence and space industries.

In the second half of 2021, the R&I **Matrix Task Force on Artificial Intelligence (AI)** was renewed. Studies were also launched to analyse legislative files such as the **Open Data Directive, Data Governance Act, Data Act, Digital Markets Act and the Digital Services Act**.

The **EU Industrial R&D Investment Scoreboard 2021**, produced together with the JRC, deepened the information on 'green' research and development, digital and technology investments, notably on energy intensive industries.

In line with the Communication on the new ERA for R&I, the **ERA Forum for Transition** was set up in January, leading the path for proposing the **Pact for Research and Innovation in Europe** (adopted by the Council in autumn). The Pact comprises four parts: values and principles for R&I in the Union, priority areas for joint action in the Union, prioritising investments and reforms, and policy coordination and monitoring.



What was the EIC offer in 2021?

THE FIRST EIC ANNUAL WORK PROGRAMME LAUNCHED EUR 1.5 BILLION FUNDING

1

EIC Accelerator:
EUR 1 billion for start-ups and SMEs to develop and scale up high impact innovations with potential to create new markets or disrupt existing ones

2

EIC Pathfinder:
EUR 300 million for multi-disciplinary research teams to undertake visionary research with the potential to lead to technology breakthroughs

3

EIC Transition:
EUR 100 million funding to turn research results into innovation opportunities

European Innovation Council aims to identify and support breakthrough technologies and innovations to create new markets and scale up internationally



EU SCIENCE & INNOVATION #EUHORIZON #EUEIC

The Council conclusions on the future governance of ERA renewed the mandate of the European Research Area and Innovation Committee. The **ERA Policy Agenda** - a roadmap of twenty actions to be implemented between 2022-2024 - was agreed.

Since the new European Research Area requires a strong higher education sector, DG R&I supported the creation of the **European Strategy for Universities**, which reflects on the missions of modern universities - education, research, innovation and service to society –



- **Launch event of the EIC** as an official agency EISMEA: over 50.000 views of the videos promoting the EICs work
- **Communication campaign** of the Open Research Europe
- **Social media campaign** promoting R&I in Europe and future governance of the European Research Area: (#20ActionsFor2022): 58.849 impressions

as complementing each other, resulting in knowledge creation, knowledge valorisation, strengthening innovation ecosystems and skilling researchers and innovators. The DG contributed to the Council Conclusions on the **European Universities Initiative**.

DG R&I advanced its work towards a **European Framework for Research Careers** (to be completed in 2022), aiming at improving working conditions of researchers, strengthening employment opportunities and the attractiveness of research careers, supporting gender equality, promoting mobility. The study 'Knowledge Ecosystems in the new ERA' allowed to develop a taxonomy of skills and occupations for researchers, to update the **European Classification of Skills, Competences and Occupations (ESCO)**, and to deliver a European Competence Framework for Researchers.

The **European Strategy Forum on Research Infrastructures (ESFRI)** launched its **European Research Infrastructures Roadmap 2021**, identifying 11 new priority projects. With nearly EUR 4.2 billion budget, this is the most ambitious investment plan in research infrastructures since the first roadmap in 2006. The selected Research Infrastructures will deliver for example on **the European Health Union, European Green Deal, EU social pillar and digital transition**. In addition, the Commission tasked an Expert Group to provide an overall assessment of the implementation of the **ERIC Regulation** (published in October 2021).

The new **European Open Science Cloud (EOSC) Association** became operational in 2021. The EOSC Steering Board (EOSC-SB) was established in February 2021 to provide advice and expertise, to support synergies with European and national policies and investments and to help monitor the implementation of European Open Science Cloud.

To accelerate the uptake of research and innovation results by economy and society, the **Guiding Principles for knowledge valorisation** were co-created with the Member

States under the ERA policy agenda. The **Knowledge Valorisation Platform** was launched for sharing best practices, knowledge and expertise.

The DG's contribution to the 'A Europe fit for the Digital Age' headline ambition is reflected by the following specific objective. The performance tables are included in the annexes:

- Specific objective 2.1: High-quality science, knowledge and innovative solutions facilitate a digital transition in Europe, including a new European approach to Artificial Intelligence
- Specific objective 2.2: The revitalised European Research Area sets directions for societal, economic and ecological transitions in Europe and contributes to spreading excellence, closing research and innovation gap and working out a common global response to emerging challenge
- Specific objective 2.3: Research and innovation actions and the European Innovation Council in particular support development and scaling-up of SMEs with breakthrough and disruptive technologies.

COMMISSION OBJECTIVE 3: AN ECONOMY THAT WORKS FOR PEOPLE

In the reported year, DG R&I made a significant contribution to major Commission policy initiatives planned under the headline ambition 'An economy that works for people'.



Under the **Policy Support Facility 2.0**, DG R&I engaged in an in-depth dialogue with Romania, Croatia and Slovakia in order to define and support the reforms of their science and innovation systems.

This will strengthen the R&I capacity of the countries and contribute to the **stronger European Research Area**.

In 2021, the **'Future of Work'** was launched as a new initiative that contributes to the **European Pillar of Social Rights Action Plan**. An in-depth portfolio analysis revealed that the EU supported over 650 research and innovation projects, providing nearly EUR 1.9 billion through Horizon 2020.

DG R&I was engaged in the revamped **European Semester** that started with the launch of the **Annual Sustainability Growth Survey (ASGS)**. As part of this process, the DG delivered the R&I-related **Country Specific Recommendations**.

The **EU Industrial R&D Investment Scoreboard 2021**, published in December 2021, lists the top 2500 private research and development investors in the world and in the EU, focusing at their green investments and compliance with Sustainable Development Goals (SDGs). The **European Innovation Scoreboard 2021** and the **Regional Innovation Scoreboard 2021**, released jointly with DG GROW, show that innovation performance continues to improve across the EU.

The **Euratom Work Programme 2021 – 2022** (with a budget of EUR 300 million) was adopted, with an emphasis on the continuous improvement of nuclear safety, security and radiation protection. Cooperation with the Member States was continued through the co-funded partnerships under Euratom EUROfusion, EURAD and PIANOFORTE (the latter to be launched mid-2022).

The DG’s contribution to the ‘An Economy that works for the people’ headline ambition is reflected by the following specific objective. The performance tables are included in the annexes:

- Specific objective 3.1: Research and innovation actions, increased R&I investments and the R&I component of the European Semester boost economic growth and jobs creation

COMMISSION OBJECTIVE 4: A STRONGER EUROPE IN THE WORLD

The **Communication on the Global Approach to Research and Innovation** gave a new strategy for Europe to boost global cooperation in science and technology and strengthen EU’s leadership.

The Strategic Plan 2021-2024 and the first Horizon Europe Work Programme, adopted in 2021, have a strong international dimension. The targeted actions in all clusters focus on **the EU’s open strategic autonomy**. The R&I dimension is also embedded in new external relations policy frameworks, such as the **Global Gateway** and the **EU strategy for cooperation in the Indo-Pacific**.

In 2021, DG R&I **started formal association negotiations with third countries**, preceded by a series of exploratory talks in the first half of 2021.

The DG was **challenged to secure uninterrupted association to Horizon Europe** of all countries that have been associated to Horizon 2020 or to take the steps to start negotiations with those that expressed the will to join the new programme. The DG had to organise, conduct and conclude the parallel negotiations with

a large number of countries and to formalise association agreements in a very short time (36 rounds of exploratory talks and 50 rounds of negotiations with different countries).



Concerning **category a) countries** (Iceland and Norway, EEA countries with the exception of Lichtenstein), the association to the Framework Programme was renewed through an amendment to the relevant protocol of the EEA agreement (Protocol 31).

For **category b) and c) countries**, (acceding, candidate, potential candidates and ENP

countries), the DG prepared and coordinated with the Commission services **a model agreement for association to Horizon Europe**, including novelties of the new framework programme, like a new financial contribution model, reciprocity obligations and elements reflecting the Union's discretion to apply restrictions concerning strategic assets, interests, autonomy and security. On the basis of this model, the negotiations were launched with 14 countries: Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, Serbia, Turkey, Israel, Ukraine, Moldova, Georgia, Armenia, Tunisia, Kosovo*, and Morocco. By autumn 2021, all the negotiations were concluded, with the exception of Morocco. In the specific case of Ukraine, national ratification procedures are still to be completed. In the meantime, Ukraine is eligible to Horizon Europe funding as low to middle income country.

For **category d) countries** (third countries and territories fulfilling specific criterias in art. 16 of Horizon Europe), DG R&I concluded the negotiations with the Faroe Islands. Exploratory talks were initiated with Canada, and New Zealand submitted a Letter of Intent, confirming its interest in association. Technical discussions on the possible association continued with Australia, Japan, South Korea and Singapore.

Furthermore, DG R&I contributed to defining the role of **the Associated Countries in the new governance structures of ERA**.

DG R&I, in a co-creation with other DGs, worked on strengthening the relationship with Western Balkans, and launching the **Agenda on Innovation, Research, Education, Culture, Youth and Sport for the Western Balkans (WB)**.

Regional cooperation with the **Mediterranean region** was boosted with the further implementation of the **Partnership for Research and Innovation in the Mediterranean Area (PRIMA)** and adoption of three R&I Roadmaps in July 2021.

An implementation of the revamped **R&I cooperation strategy with the US** has started and a more regular dialogue with the US has been launched. This led to **the new EU-US Trade and Technology Council** with a steering role of DG R&I.

The fruitful and ambitious cooperation with **Canada**, including on possible association, was confirmed at the **EU-Canada Summit of 14 June 2021**.

Important progress was achieved in negotiations of **the EU-China Joint Roadmap for R&I collaboration**, in particular on the development of the **Research Flagship on Climate Change and Biodiversity**. The High Level Dialogue (Commissioner/Ministers) continues on the most controversial points.

As follow-up to **the first European Union - African Union R&I Ministerial meeting**, synergies are being sought with such programmes as ARISE and NDICI. The **Global Health Partnership (EDCTP3)** was launched in November 2021. The DG advanced work on the **EU-AU Innovation Agenda**.

The approval of the **EU-CELAC Roadmap** is a first concrete implementation of the Global Approach. Important steps were also made on **EU-Brazil cooperation**, with the signature of an Administrative Arrangement to support the co-funding of Brazilian entities participating in Horizon Europe projects (November 2021).

Strategic cooperation with **Japan** focused on providing synergies between the Soil Mission under Horizon Europe and Japan's Moonshot R&D programme.

Work started on developing a **Science Diplomacy Agenda** as requested in the Council Conclusions on the Global Approach.

In 2021, DG R&I led the efforts to define and launch the second phase of **Mission Innovation** - a global initiative of 22 countries and the European Union, focusing on providing clean energy affordable, attractive and accessible for all (DG R&I coordinates the Commission's involvement in this global action).



External communication was deployed to strengthen R&I activities against COVID-19:

- **Coronavirus global R&I cooperation portal**, a platform to facilitate international collaboration among research projects, was launched
- Two new portals were set-up on **EU-Mediterranean and EU-African Union R&I cooperation**

The DG's contribution to the 'A STRONGER EUROPE IN THE WORLD' headline ambition is reflected by the following specific objective. The performance tables are included in the annexes:

- Specific objective 4.1: Regional research and innovation strategies and broader association policy contribute to promoting common European R&I values and creating a global Research and Innovation Space

COMMISSION OBJECTIVE 5: PROMOTING OUR EUROPEAN WAY OF LIFE

Science and innovation enabled significant developments in the key areas of health policy and health systems.

In 2021, DG R&I contributed to the preparatory work on **HERA - European Health Emergency and Preparedness and Response Authority**. The DG was involved in the March Communication on the '**HERA Incubator**', the HERA preparatory actions on Anti-microbial resistance, Flexible manufacturing, Intelligence gathering and EU Mapping platform, and finally the legal proposal of HERA (published and adopted in September 2021). The HERA Incubator Communication (February 2021) presented an emergency plan to tackle the short- to medium-term threat with a focus **on the emerging SARS-CoV-2 virus variants**.

R&I investments combined with the ground-breaking scientific results and innovative solutions have a pivotal role in the **European response to the pandemic**. The **Horizon Europe Pandemic Preparedness Partnership** - next to the Emergency Preparedness and Response Authority (HERA) - helps to take this long-term vision forward.

Launching of the **Public Health Emergency call** in advance to the adoption of the Horizon Europe Framework Programme, and during the delegation process of the activities to the Executive Agencies, was a challenge of the last year. It forced DG R&I to pilot new types of calls for expression of interest (whilst half of the staff in the concerned services were changing their posts). The Commission adopted the first Horizon Europe Cluster 1 call as an ad hoc Work-Programme to address the Covid-19 public health emergency.

The Group of Chief Scientific Advisors (GCSA) together with the **European Group on Ethics in Science and New Technologies (EGE)** launched a three-step approach to preparedness for pandemics. Together with the Special Advisor to the President of the European Commission on COVID-19, they published a 'Statement on scientific advice to European policy makers during the COVID-19 pandemic'.



DG R&I joined the Management Board of the **European Medicines' Agency (EMA)** and fostered the awareness of the relevant R&I activities. It further developed major health-related actions such as the **Clinical Trials Platforms**, the **Innovative Health**

Initiative and upcoming actions related to **Real World Data**³. The aim is to develop a methodological framework for healthcare data collection, in order to harvest real world data that will be directly comparable to clinical trials information.

An institutionalised **EU-Africa partnership on Global Health - the European and Developing Countries Clinical Trials Partnership 3** - was successfully developed under Horizon Europe, focusing on preparedness research to tackle (re)emerging infectious threats.

The **EU Mission on Cancer** was set up in 2021, strengthening the **Europe's Beating Cancer Plan**. The implementation plan for the mission was published in September, and an amended missions work programme was adopted in December.

DG R&I provided regular input to the Pharma Strategy in view of revision of pharmaceutical legislation in 2022, including legislation on **rare diseases and paediatric medicines**.

A broad portfolio of the external communication actions supported the activities of the DG in health. It resulted in corporate campaigns and initiatives through several communication activities (publications, factsheets, videos), particularly on cancer research, rare diseases, Horizon 2020 and Horizon Europe projects. A few examples are reported below:

- A factsheet on the European Commission research actions on Coronavirus which has been downloaded 369 times and received over 1.200 visits.
- Among the press releases, the one on the COVID-19 variants call was the first emergency funding under Horizon Europe
- The social media campaign promoting the European Week Against Cancer took place from 25 – 31 May 2021, with nine tweets highlighting the different aspects of the Cancer Mission and Europe's Beating Cancer Plan, which had over 100.000 impressions and an average engagement rate of 0.8%.

³ The aim of the Real-world Data-related actions is to develop a methodological framework for healthcare data collection, leading to appropriate and validated data models so as to harvest real world data that will be directly comparable to clinical trial information and thereby acceptable for regulatory purposes.

- The launch of the EU Mission on Cancer was followed up by a major update of the dedicated Cancer Mission website which has attracted over 25.000 unique visitors, which have spent on average 1m 21s and social media promotion of the World Cancer Research Day which has generated over 9000 impressions at an average engagement rate of 2% and the Childhood Cancer Awareness Month.

In the reported year, DG R&I supported the EU efforts on **security** and was involved in the EU Security Union Strategy in Combating Trafficking in human beings 2021-2025, the EU Strategy to Tackle Organised Crime, the Counter-Terrorism Agenda for the EU, and the EU Strategy for fight against child sexual abuse, the initiative for the extension of the list of EU crimes to hate speech and hate crime with numerous research deliverables.

The DG's contribution to the 'Promoting our European Way of Life' headline ambition is reflected by the following specific objectives. The performance tables are included in the annexes:

- Specific objective 5.1: Research and Innovation develop and deploy solutions, technologies and innovations to tackle emerging threats and improve crisis preparedness
- Specific objective 5.2: Research and innovation support the European health initiatives, including the European plan to fight cancer

COMMISSION OBJECTIVE 6: A NEW PUSH FOR EUROPEAN DEMOCRACY

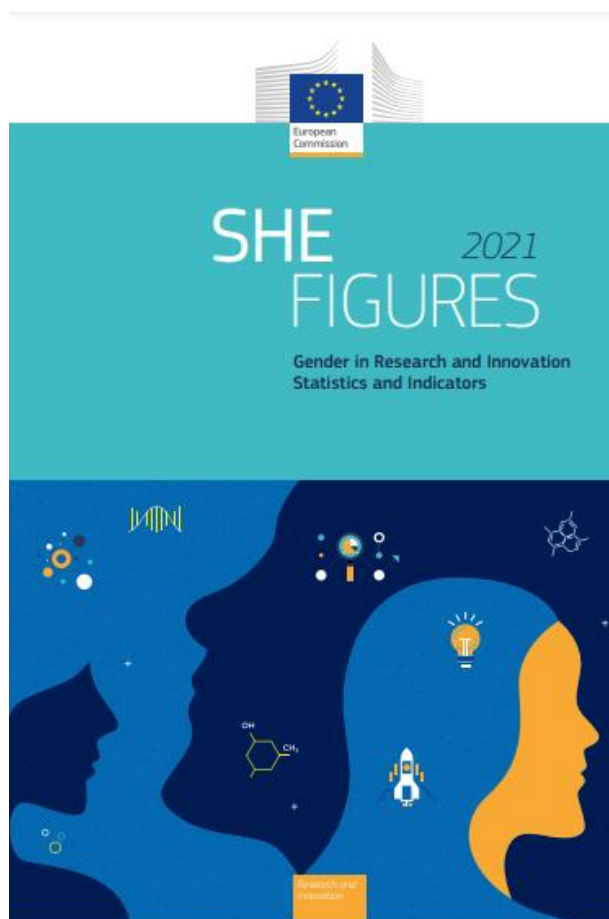
In 2021, DG R&I was actively involved in the implementation of **the European Democracy Action Plan (EDAP)** and follow-up actions to the 2020 Citizenship Report or the Media and Audio-visual Action Plan.

The **'Reinforcing democracy and integrity of elections' package** was adopted in November, with the recasts of the Council directives on the electoral rights of mobile EU citizens in European Parliament and municipal elections; the legislative proposal on transparency and targeting of political advertising; and the recast of the Regulation on the statute and funding of European political parties and European political foundations.

To expand the **citizen's engagement**, DG R&I launched a series of 27 citizens' panels – one per Member States – on the climate transition. Participatory workshops with over 800 citizens – a representative sample of 30 in each Member State – have started (and will run until March 2022) in order to provide input on a just climate transition. The results will feed the **Conference on the Future of Europe**.

DG R&I contributed to the **Green Paper on ageing** by stressing the need for better infrastructures and improved employability, bringing new skills and highlighting the importance of social innovation for social and health care.

To strengthen the gender dimension in R&I, the activities focused on the implementation of new provisions for gender equality, ensuring wide outreach on the new **gender equality plans (GEPs) as eligibility criterion for Horizon Europe**. The DG developed communication materials - detailed guidance and factsheet, online trainings, mutual learning workshops, mobilising the national networks and the Horizon 2020 funded projects. A new evaluation study has been launched to analyse the impact that EU and national policies and programmes on GEPs have had on gender equality in R&I. The DG proposed a relevant monitoring framework contributing to the upcoming ERA scoreboard and related dashboard.



In line with the Ljubljana Declaration on gender equality in R&I, the DG focused in 2021 on development of the **ERA Policy Agenda** and four outcome deliverables of its action 5 on promoting gender equality and fostering inclusiveness.

The **She Figures 2021 publication**, presenting data on gender equality in R&I across the EU and beyond, was published in November 2021. An interactive webpage shows key results per thematic chapter and hosts the complete publication, country fiches with results for each EU Member State, policy briefs, as well as a video message by Commissioner Gabriel. The **Women TechEU** scheme was also presented.

A new **Dissemination and Exploitation Strategy for Horizon Europe** has contributed to maximising and

demonstrating the European R&I added value via **an open dialogue with all stakeholders of the R&I framework programmes** (e.g. beneficiaries, policy makers, experts, citizens, investors etc.). In parallel, a **revised outreach strategy** focused on explaining how Horizon Europe is implemented. **Online events** became more interactive, with enriched digital content.

In 2021, the Common Implementation Centre (CIC) organised **nine remote-only webinars** on different aspects of Horizon Europe, attracting close to 25,000 participants. In addition, six webinars aimed at the reduction of the error rate in Horizon 2020 took place, with close to 4,000 participants. DG R&I also provided **three workshops on implementation during the R&I Days** and contributed actively to the **Horizon Europe Info Days** for most of the Programme clusters.

Despite many successes and contribution on the ‘New push for European Democracy’, the 2021 edition of the **Horizon Impact Award** had to be cancelled due to late adoption of Horizon Europe. It will be launched early 2022.

Regarding the rights of children, DG R&I will provide evidence and concrete proposals on promoting inclusive education and providing a safe and healthy environment for children as part of the EU strategy on the rights of the child.

The DG’s contribution to the ‘A new push for European Democracy’ headline ambition is reflected by the following specific objectives. The performance tables are included in the annexes:

- Specific objective 6.1: European research and innovation support citizens’ involvement, social inclusion and equalities in Europe, including through communication of the European research and innovation added value

COMMISSION OBJECTIVE 7: A MODERN, HIGH PERFORMING AND SUSTAINABLE EUROPEAN COMMISSION

In 2021, DG R&I worked on the whole policy cycle – from policy design and programming to monitoring and evaluation – ensuring the highest quality of evidence base and co-creation processes for reinforced impact.

With the adoption of the **Horizon Europe governance decision** on 24 June 2021⁴, it has formally established **the Common Policy Centre (CPC)** and **the Common Implementation Centre (CIC)**. It sets the governance and operating rules for the coordinated implementation of Horizon Europe. The CPC played a key coordination role across all EU priorities in the co-design of the Horizon Europe Strategic Plan 2021-2024 and work programmes.

In 2021, the Horizon Europe Steering Board endorsed the **‘Budget Management Guidelines’** setting out the approach for the management and the coordination of the budget and defining how the implementing services would collaborate for all budgetary aspects of the programme, as well as the ‘detailed multiannual financial planning for Horizon Europe’ and the ‘methodology for the distribution of associated countries contributions’.

In line with its mandate, the CPC steered in 2021 the **co-creation of the Draft Budget 2022** for Horizon Europe and Euratom, and defended an ambitious R&I budget during the inter-institutional negotiations. This resulted in the adoption of the 2022 budget for Horizon Europe with an **additional EUR 100 million compared to the Commission proposal**.

⁴ [C\(2021\)4472 of 24 June 2021](#)

Due to the delayed association process, the CPC proposed mitigating measures to maintain the level of ambition of the Work Programmes 2021.

The CPC steered all the budget forecast exercises and took all possible measures to achieve an **optimal budget implementation rate of more than 99.9% for the entire Horizon Europe**, Horizon 2020 and Euratom at the end of 2021, both in commitment and payment appropriations.

DG R&I, through the CIC, led the **finalisation of preparations for the delegation of Horizon Europe** implementation tasks to Executive Agencies under the new MFF, including the **Horizon 2020 legacy**. DG R&I has also **prepared the framework for supervising** the Executive Agencies, Joint Undertakings (JUs) and other funding bodies receiving delegation to implement Horizon Europe .

DG R&I continued the **Horizon Europe implementation framework** with the development of **guidance material** for participants, the finalisation of the **submission and evaluation tools**, publishing and gradually updating the **Horizon Europe General Model Grant Agreement** as well as the **EIC Accelerator Contract**, based on the **new corporate Model Grant Agreement**.

The CIC completed the revision of Article 1 to 6 of the explanations of **the (corporate) Annotated Grant Agreement**, in close cooperation with the horizontal services and Member States' experts. A simplified model contract for experts and the template for its amendments was delivered, as well.

DG R&I, through its newly set-up IT Department, continued to lead the **corporate IT suite for grant management (eGrants, including the eExperts application)** and ensured smooth operation and continuous enhancement of **the Funding and Tenders Portal**. The eGrants IT tools and portal are moving from 28 Commission programmes under the MFF 2014-20 to 69 EC programmes under the MFF 2021-27.

The Rules of procedure of the **Horizon Europe programme committee in the strategic configuration** were adopted in 2021, they are applicable for all configurations and have been taken up by the Euratom programme committee, as well.

In 2021, DG R&I has coordinated the drafting of a 'Handbook for work programme preparation' for services involved with co-creating the Horizon Europe work programmes, centralising technical and legal guidance on **how to draft work programmes for impact and support to key policy priorities**.

Preparatory work on a series of **ex-post evaluation studies**, covering for the first time the whole framework programme in a fully coordinated approach, was ongoing during the first Semester 2021. The evaluation studies were launched in the end of the year.

DG R&I supported a more strategic, coherent and impact-focussed preparation and implementation of **European Partnerships**. Two proposals related to institutionalised European Partnerships have been tabled by the Commission on 23 February 2021:

- A proposal for a Decision of the European Parliament and the Council regarding the **Metrology Partnership** (based on Art. 185 TFEU);
- A proposal for a Council Regulation establishing nine Joint Undertakings (based on Art. 187 TFEU) under Horizon Europe – **Single Basic Act (SBA)**.

DG R&I led the negotiations with the Council for the common part of the SBA applicable to all nine JUs and coordinated the negotiation for their specific provisions with DG CNECT and MOVE. The SBA was adopted on 19 November 2021.

Following intense negotiations with the Council and the European Parliament, the **Metrology partnership** was adopted on the same day.

In the first half of 2021, an agreement was also reached on the Council Regulation on establishing **High-Performance Computing Joint Undertaking (HPC)**.

A Commission Decision adopting the Memoranda of Understanding for the 11 co-programmed partnerships and empowering the relevant Commissioners to sign them on behalf of the Commission was adopted in June 2021. The formal signature process has now been completed and co-programmed partnerships have started their activities, including by preparing draft plans for Additional Activities.

The **EU Missions** were developed in a co-design process led by DG R&I, involving services across the Commission and working in Mission Owners Groups. The five missions were identified in the **Horizon Europe Strategic Plan 2021-2024**. The draft **Mission Implementation Plans** provided a clear statement on the R&I needs for the future missions, developed in the updated Mission Work Programme for 2021. The proposed EU Missions and the approach for their future implementation were described in a **Commission Communication on the European Missions**.

The **implementation of the Missions** is supported by the Executive Agencies according to the **Memorandum of Understanding** with the EAs. The reports of the foresight projects in support of the five Mission Boards have also been published.

Foresight and external expertise have been used to anticipate better the impacts of regulation on innovation, in line with **the Innovation Principle**.

Stemming from the **Horizon Europe Dissemination & Exploitation Strategy**, the **Dissemination & Exploitation** Action Plan 2021-2022 has been adopted in the end of 2021. It will encourage transferring R&I results to the economy and society. As part of this Strategy, **Feedback from projects' activities and results to Policy** is supported by the deployment of a dedicated implementation framework, including specific working groups to mainstream the actions and act as enablers, as well as coordination and support actions such as trainings, collaborative tools and guidance material.

The CIC worked with the R&I family to **design the control strategy for Horizon Europe** (ex-ante and ex-post controls and anti-fraud) in line with the principles of sound financial management and aiming at a simpler and, to the furthest extent possible, error free Horizon Europe (for more details see part 2.B). A key element in this light is the wider use of **simplified cost options (SCOs)**. The CIC worked intensively on the **rollout of lump sum funding and a unit cost scheme for personnel costs**. A comprehensive assessment of the Horizon 2020 lump sum pilot in 2021 showed that lump sum funding is

feasible for most types of grants and reduces administrative burden. The CIC organised numerous information and training activities for stakeholders, cooperating with the European Court of Auditors to further optimise the methodology. A stepwise increase of lump sums and the introduction of unit costs for personnel in 2022 and the coming years will allow further simplification and decrease of error rate in Horizon Europe.

In 2021, DG R&I worked on establishing the **strategic coordination process for partnerships with the Member States**, in line with the Horizon Europe Regulation.

The goal of this process is to support an evidence-based policy for European Partnerships and a strategic vision of their landscape. At the core of the strategic coordination process is the Partnership Knowledge Hub that allows working-level interactions with an initial focus on finalising the first Biennial Monitoring Report on European Partnerships.

The DG's contribution to the 'A modern, high performing and sustainable European Commission' headline ambition is reflected by the following specific objective. The performance tables are included in the annexes:

- Specific objective 7.1: The Common Implementation Centre and Common Policy and Programming Centre provide user-friendly services and tools to the European Commission for effective and efficient planning, programming and implementation of the Research and Innovation Framework Programme and other EU programmes

EXAMPLES OF THE EU ADDED VALUE

R&I results in fight against COVID-19:

- Horizon 2020 funds were pivotal for improving COVID-19 treatment and prevention methods. The programme funded three **large-scale therapeutic trials: the DisCoVeRy, the EU-SolidAct, and the REMAP-CAP**, through the EU-RESPONSE and the RECOVER projects. This enabled **an EU-wide network for COVID-19 therapeutic trials**. The REMAP-CAP delivered outstanding results, including on the effectiveness of tocilizumab and sarilumab for patients with severe COVID-19. These results allowed the meta-data analysis led by World Health Organization on the association between the administration of IL-6 antagonists and mortality among hospitalized patients.

R&I results to address water urgencies:

- The **SWAMP** project under Horizon 2020, showcased **Internet of Things (IoT) methods and approaches for smart water management**, providing solutions to adapt water resource management, to mitigate the effects of climate change, to combat resource pollution and depletion, and to prevent degradation of ecosystems.
- **SIM4NEXUS** project applied model-based analysis to predict society-wide impacts of resource use and relevant policies in agriculture, water, biodiversity and ecosystem services.

- [INNOQUA](#) developed a modular system to treat wastewater in both urban and rural environments.
- [Smart-PLANT](#) explored how technologies for recovering valuable materials from wastewater can be applied to existing sewage treatment plants to form marketable products.
- [INTCATCH](#) built 'smart' boats equipped with multi-parameter sensors to monitor water pollution.
- The [Ground Truth 2.0](#) project co-designed and implemented citizen observatories that help local stakeholders achieve sustainable natural resource management through the collection of data by citizens.
- [POWER](#) investigated new ways of raising awareness and transferring knowledge among citizens to enable effective exchange between stakeholders.
- [INCOVER](#) developed innovative and sustainable technologies for resource recovery-based treatment of waste-water.
- [INTEGROIL](#) created a smart platform for producing fit-for-purpose water that will reduce the oil and gas industries' water demand.
- [AquaNES](#) demonstrated innovative water and wastewater treatment processes and management based on improved, combined natural and engineered systems.
- [CENTAUR](#) developed a new approach to the real-time control of sewer networks to reduce local flood risk in urban areas.

R&I results is support of industry:

By supporting the development and integration of advanced nanomaterials, Horizon 2020 contributes to building the next European industrial revolution. A set of projects addressed the upscaling of laboratory-proven nano-based technologies for reaching industrial-scale production and application, providing exciting new opportunities for European industrial production. They made clear progress towards overcoming these barriers and demonstrating how nano-enhanced advanced materials can be safely, sustainably and competitively launched into the industrial mainstream.

- **NANOTUN3D** and **FAST** projects showcased how nanomaterials can positively contribute to the growing revolution in 3D printing, to feed the medical, automotive, space and construction sectors.
- **PEPTICAPS** project pioneered nano-capsules as carriers of medicine able to treat common conditions, such as allergic and irritant dermatitis and sunburn
- **NanoPilot** project constructed a pilot plant to produce small batches of polymer-based nanopharmaceuticals.
- **NANOFACTURING** project finalised a manufacturing platform for solid core nanopharmaceuticals.

EXAMPLE OF INITIATIVES TO IMPROVE ECONOMY AND EFFICIENCY OF FINANCIAL AND NON-FINANCIAL ACTIVITIES

The EU R&I days 2021 have been prepared on a virtual basis like the R&I days 2020 that were a pioneering example of large events organized virtually, following the outbreak of the COVID-19 crisis. In particular, it provided an opportunity to calculate the climate impact related to a virtual event, and analysed its possible carbon performance compared to the same event organised in 2019. Overall, the switch to a digital format significantly raised the chances to obtain a Carbon Neutral label for the event, issued by an independent certifying authority.

According to the methodology developed, the total CO₂ emissions have been reduced by 77% in 2021 thanks to the digital format, and the carbon impact related to a participant has been divided by 25, since the number of participants has increased significantly compared to the first onsite edition. (NB: *These results are consistent with the results provided by “le Sommet Virtuel du Climat” that has calculated a ratio of 3 kgCO₂e/participant for its event, that requests less technical means in terms of organization than the R&I days.*)

2. MODERN AND EFFICIENT ADMINISTRATION AND INTERNAL CONTROL

This section explains how DG R&I delivered the achievements described in the previous section. It is divided into two subsections.

The first subsection (2.1) reports on the control results and other relevant information that supports management's assurance on the achievement of the **financial management and internal control** objectives⁵. It includes any information necessary to establish that the available evidence is reliable, complete and comprehensive. It covers all activities, programmes and management modes relevant to the DG.

The second subsection (2.2) deals with the other components of a **modern and efficient administration: human resources, better regulation principles, information management and external communication**.

DG RESEARCH AND INNOVATION AND THE RESEARCH AND INNOVATION FAMILY

The control framework presented in this report should be seen in the overall context of the responsibilities of DG R&I in implementing Horizon Europe (HE), Horizon 2020 (H2020), Euratom and finalising the implementation of the Seventh Framework Programme (FP7).

Management modes for the programmes' implementation

The responsibility for implementing the EU Framework Programmes for Research and Innovation is shared among different Directorates-General in the Commission. In order to focus on core institutional policy tasks, these Directorates-General have delegated substantial parts (for DG R&I, the major part) of the programme implementation to Executive Agencies, Joint Undertakings (also called Article 187 bodies) and public-public partnerships with the Member States (also called Article 185 bodies). This multitude of actors involved in the implementation of the EU Framework Programmes for Research and Innovation is referred to as the **'Research and Innovation Family' (R&I Family)**.

On 1st April 2021 the transfer of the last Horizon 2020 programme activities of DG R&I to the Executive Agencies was finalised (2 187 projects were transferred) and the reorganisation of DG R&I took effect. This process has allowed the transformation of the DG into a policy-oriented DG, a step further for the future. DG R&I adapted quickly its structure and managed to achieve the intended objectives by adopting the necessary changes.

⁵ Art 36.2 FR: a) effectiveness, efficiency and economy of operations; b) reliability of reporting; c) safeguarding of assets and information; d) prevention, detection, correction and follow-up of fraud and irregularities; and e) adequate management of risks relating to the legality and regularity of underlying transactions

DG R&I coordinates the Research and Innovation Family

DG Research and Innovation, as the lead DG of the R&I Family, invests considerable resources in coordinating the management of Horizon 2020 and Horizon Europe by the members of the family, well beyond its own budget appropriations. In addition to its coordination activities within the family, the DG, as parent DG of the R&I Executive Agencies, monitors and supervises⁶ their activities. DG R&I is the lead parent DG of REA, ERCEA and EISMEA

With the new Multiannual Financial Framework (2021-2027) and the new Horizon Europe programme, new Horizon Europe governance and Operating Rules were adopted on 24 June 2021. A joint Executive Committee and Steering Board for the Common Implementation Centre (CIC) and the Common Policy Centre (CPC), was established.

Annex 7 presents the Horizon 2020 and Horizon Europe implementation model and the key role of the Common Implementation Centre and the Common Policy Center in simplifying, harmonising and supporting the underlying business processes.

2.1. Financial management and internal control

Assurance is provided on the basis of an objective examination of evidence of the effectiveness of risk management, control and governance processes.

This examination is carried out by the management, who monitors the functioning of the internal control systems on a continuous basis, and by internal and external auditors. The results are explicitly documented and reported to the Director-General. The following reports have been considered:

- the reports submitted by the Directors (including monitoring of joint undertakings and public-public partnerships) and by AOSDs where applicable;
- the activity report from the Common Implementation Centre ("CIC") to all research related implementing bodies;
- the reports from Authorising Officers in other DGs managing budget appropriations in cross-delegation;
- the reports on control results from entrusted entities in direct management (Executive Agencies) as well as the results of the DG's supervisory controls on the activities of these bodies;
- the contribution by the Director in charge of Internal Control and Risk Management, including the results of internal control monitoring at DG level;
- the reports on recorded exceptions, non-compliance events and any cases of 'confirmation of instructions' (Art 93.2 FR);

⁶ Supervision of Executive Agencies is described in section 5 of annex 7

- conclusion of the Internal Auditor on the state of internal control in DG Research and Innovation and observations and recommendations reported by the Internal Audit Service (IAS);
- the observations and the recommendations reported by the European Court of Auditors (ECA).

These reports result from a systematic analysis of the available evidence. This approach provides sufficient guarantees as to the completeness and reliability of the information reported and results in a complete coverage of the budget delegated to the Director-General of DG Research and Innovation.

This section covers the control results and other relevant elements that support management's assurance. It is structured into 2.1.1 Control results, 2.1.2 Audit observations and recommendations, 2.1.3 Effectiveness of internal control systems, and resulting in 2.1.4 Conclusions on the assurance.

2.1.1. Control results

This section reports and assesses the elements identified by management which support the assurance on the achievement of the internal control objectives (ICO)⁷. The DG's assurance building process and the materiality criteria are outlined in Annex 5. Annex 6 outlines the main risks, together with the control processes to mitigate them, and the indicators used to measure the performance of the relevant control systems.

Direct management concerns grants given to beneficiaries through the implementation of the EU Framework Programmes (Seventh Framework Programme, Horizon 2020, Euratom and Horizon Europe) as well as subsidies paid to Executive Agencies.

Indirect management concerns subsidies to grant-implementing entrusted entities: Joint Undertakings (Article 187 bodies), Public-Public Partnerships (Article 185 bodies) as well as financial instruments provided by the European Investment Bank and the European Investment Fund.

In 2021, indirect management accounted for 65 % of payments and direct management for the remaining 35%. Direct management sharply decreased in 2021 due to the transfer of the activities to Executive Agencies on 1st April 2021. Consequently, DG Research and Innovation's main budget management mode for the year was indirect management.

Both direct and indirect grant management⁸, together with financial instruments, accounted for about 93% of the DG R&I's payments in 2021, therefore this section mainly focuses on those two control systems.

⁷ The Internal Control objectives are: 1) Effectiveness, efficiency and economy of operations; 2) reliability of reporting; 3) safeguarding of assets and information; 4) prevention, detection, correction and follow-up of fraud and irregularities; and 5) adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multiannual character of programmes as well as the nature of the payments (FR Art 36.2).

⁸ Including payments to Executive Agencies

Overview table (amounts in EUR million)

Risk-type /Activities	Grants (e.g. actual costs based, or lump sums, or entitlements)	Procurements	Cross-delegations to DG BUDG ⁹	Contributions to Executive Agencies, article 185 and 187 bodies	Delegation agreements with EIB, EIF (InnovFin)	Other (prizes, experts, membership fees, ...)	Total Expenditure	Non Expenditure Items: Assets, liabilities, Off Balance sheet, Revenues¹⁰
Research framework programmes (including EURATOM)	178,16	69,16	5,12	849,49	124,78	17,27	1.243,97	- 2.134,15
Research Fund for Coal and Steel	0,26						0,26	
Totals (coverage)	178,42	69,16	5,12	849,49	124,78	17,27	1.244,23	-2 134,15

⁹ In 2021, DG R&I cross-subdelegated EUR 5.12 million of its payment appropriations to DG BUDG.

The Authorising Officer of services receiving delegation is required to implement the appropriations subject to the same rules, responsibilities and accountability arrangements. The cross-delegation agreements require the AODs of cross-delegated services to report on the use of these appropriations. The reports on the sub-delegations received did not provide any indication of any particular unfavourable observation with regard to the regularity and legality of the transactions concerned.

¹⁰ Source of data: annex 3 (sum of net assets in tables 4 balance sheet, total off balance sheet in table 5BIS , current year revenue recognized in table 7 situation on revenue and income).

In line with the 2018 Financial Regulation, DG Research and Innovation's assessment for the new reporting requirement is as follows:

- DG Research and Innovation had no cases of **'confirmation of instructions'**¹¹ in 2021.
- In Horizon 2020, there are no cases of financing not linked to costs (Financial Regulation Article 125.3). In Horizon Europe, there is, so far, **one case of financing not linked to costs**: it concerns the 'Women TechEU' actions granted by the European Innovation Council and SME Executive Agency (EISMEA), where the amount of financing not linked to costs for each grant is fixed at EUR 75 000¹².
- There were no cases **of flat rates > 7% for indirect costs in 2021**¹³. According to the Horizon 2020 and Horizon Europe Rules for Participation¹⁴, indirect eligible costs are determined by applying a flat rate of 25% of the total direct eligible costs.¹⁵
- 3 grant agreements signed in 2021 **derogated from the principle of non-retroactivity** pursuant to Article 193 of the Financial Regulation. In such cases, however, no costs incurred prior to the date of submission of the grant application are eligible.

There are no Financial Framework Partnerships with a duration of more than 4 years¹⁶ that entered into force during the reporting year 2021.

¹¹ FR art 92.3

¹² See RAO decision from DG RTD of 7 July 2021 available at: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he-womentecheu_en.pdf.

¹³ FR Article 181.6

¹⁴ Article 29 of Regulation (EU) No 1290/2013 of the European Parliament and of the Council of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)" and Article 39 Regulation (EU) 2021/65 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination.

¹⁵ See additional information in annex 7

¹⁶ FR art 130.4

1. Effectiveness of controls

This section describes the effectiveness of the control system for the main expenditure items, i.e., direct and indirect grant management.¹⁷ The effectiveness of the control systems assessed is based on (i) legality and regularity of transactions, (ii) fraud prevention, protection and detection measures and (iii) other control objectives, namely safeguarding of assets and information and reliability of reporting.

a) Legality and regularity of the transactions

DG Research and Innovation uses internal control processes to ensure the adequate management of the risks related to the legality and regularity of the underlying transactions for which it is responsible, taking into account the multiannual character of programmes and the nature of the payments concerned.

Ex-post control results for grant management

Since 2007, the R&I Family has adopted a common audit strategy intended to ensure the legality and regularity of expenditure on a multi-annual basis, including detection and correction of non-systematic and systematic errors.

For Horizon 2020, the Common Audit Service of the Common Implementation Centre carries out all audits, including those concerning grants concluded by the Executive Agencies and the Joint Undertakings. This is a major step towards ensuring a harmonised approach, legal certainty, equality of treatment and minimising the audit burden on beneficiaries.

The **main indicators** on legality and regularity¹⁸ of EU Framework Programmes for Research and Innovation are:

- **Representative detected error rate**, based on errors detected by ex-post audits on a Common Representative Sample of cost claims across the R&I Family.
- **Cumulative residual error rate**, which is the extrapolated level of error after corrective measures have been implemented by the Commission services following the audits, accumulated on a multi-annual basis.

The **targets** set for this control system are respectively:

¹⁷ For the other expenditure items, unless indicated, the assessed level of legality and regularity is found in the section “Estimated risk at closure”.

¹⁸ These indicators are described in point 1.1 of annex 5

- for the Seventh Framework Programme for Research and Innovation (2007-2013, 'FP7') and the Research Fund for Coal and Steel (in the European Research Executive Agency), to ensure that the cumulative residual error rate does not exceed 2% by the end of the Framework Programme's management cycle.
- for Horizon 2020, to ensure that the cumulative residual error rate remains within a range of 2-5 % aiming to be as close as possible to 2%. Progress against Horizon 2020 targets is assessed annually based on the results of the implementation of the ex-post audit strategy and taking into account the frequency and importance of the detected errors along with cost-benefit considerations regarding the effort and resources needed to detect and correct the errors.
- for Horizon Europe, to ensure that the cumulative residual error rate does not exceed 2%¹⁹

It should be noted, however, that due to its multi-annual nature, the effectiveness of the control strategy of the R&I Family can only be measured and assessed fully in the final stages of the EU Framework Programme, once the ex-post control strategy has been fully implemented, and errors, including those of a systematic nature, have been detected and corrected.

Due to the COVID-19 pandemic crisis and related travel limitations during 2021, the Common Audit Service (CAS) – in line with the instructions of the Commission – could not carry out the necessary on-the-spot missions and had to postpone some of them. To minimise the impact of COVID-19 on the implementation of the audit campaign, the CAS converted as many traditional audit assignments as possible into desk audits, in line with international best practices and auditing standards.

Despite restrictions and other objective challenges due to the COVID-19 pandemic, the foreseen audit target was achieved. The CAS managed to finalise audits on 514 participations corresponding to 104.3% of the planned most probable scenario for the 2021 target²⁰.

The following table presents the error rates calculated for the two Framework Programmes by the end of 2021.

¹⁹ No representative error rate for Horizon Europe will be available in 2022 and 2023 as the ex-post audit campaign for the Programme is planned to be launched by the end of 2023, at the earliest.

²⁰ Given the COVID-19 pandemic and related restrictions, the CAS developed several scenarios for the closure of audit targets.

	FP7 EX-POST AUDITS	HORIZON 2020 EX-POST AUDITS
REPRESENTATIVE DETECTED ERROR RATE	5.44%	2.29%
CUMULATIVE RESIDUAL ERROR RATE	3.47%	1.67%

Results of the Seventh Framework Programme ex-post audits

The error rates based on the audit work for the Seventh Framework Programme for Research and Innovation on 31 December 2021²¹ were:

- Representative detected error rate²²: **5.44%**²³
- Cumulative residual error rate: **3.47%** for DG Research and Innovation

The target of cumulative residual error rate of 2% was not attained. Nevertheless, the lessons learned from the Seventh Framework Programme's audits contributed significantly to the development of the enhanced Horizon 2020 control framework.

In 2019²⁴, a 'de minimis' threshold for financial reservations was introduced stipulating that quantified Annual Activity Report reservations related to residual error rates above the 2% materiality threshold are deemed not substantial for segments representing less than 5% of a DG's total payments and with a financial impact below EUR 5 million. As is the case for the Seventh Framework Programme expenditure²⁵, a quantified reservation is not required.

Results of the Horizon 2020 ex-post audits

In 2020, the Commission refined its methodology for calculating the Horizon 2020 error rates in line with the European Court of Auditors' observations in its 2018 and 2019 Annual Reports²⁶. The methodology applied is described in Annex 5 'Materiality criteria'. As of January 2020, DG R&I applied the revised methodology on a sample of 1 304 audit

²¹ The last Common Representative Sample for the Seventh Framework Programme for DG R&I was launched in 2016. With all Common Representative Sample items closed, the audit strategy for the Seventh Framework Programme was already considered to be fully implemented in 2020. The audit coverage for the Seventh Framework Programme is presented in Annex 7.

²² This is calculated on a multi-annual basis.

²³ This is based on 481 cost statements for which the audit has been completed.

²⁴ Agreement of the Corporate Management Board of 30/4/2019.

²⁵ FP7 payments represent 0.36% of 2021 R&I payments and the financial impact is EUR 0.66 million.

²⁶ When calculating the multi-annual error rate, the Commission took into account the results of the audit re-performed by the ECA as part of Module 2 of the DAS 2018-2019.

conclusions. This results in the following error rates for Horizon 2020²⁷ on 31 December 2021:

- Representative detected error rate: **2.29%**²⁸
- Cumulative residual error rate for the Research and Innovation Family DGs: **1.60%** (1.67 % for DG Research and Innovation²⁹).

In line with the Financial Statement³⁰ accompanying the Commission's proposal for the Horizon 2020 regulation, a reservation is not necessary for the related expenditure if the cumulative residual error rate for the programme falls within the target range of 2-5%. In 2021, and despite the above-mentioned caveats, the cumulative residual error rate for Horizon 2020, calculated at 1.67%, more than fulfils this condition and is below the materiality threshold. Despite the absence of reservation, the root causes of errors have been identified and targeted actions taken to address any identified weaknesses.

Since Horizon 2020 is a multi-annual programme, the error rates, and the residual error rate in particular, should be considered within a time perspective. Specifically, the cleaning effect of audits will tend to increase the difference between the representative detected error rate and the cumulative residual error rate, with the latter finishing at a lower value.

These error rates are calculated on the basis of the audit results available when drafting the Annual Activity Report. They should be treated with caution as they may change subject to the availability of additional data from audit results.

The decrease of the error rates in year 2021 could be due, among other reasons, to the beneficiaries' increased knowledge of the eligibility rules and its inherent learning curve, as well as to the results of the communication campaigns, targeted webinars and trainings, addressed in particular to newcomers and SMEs.

²⁷ The Horizon 2020 audit campaign started in 2016. At this stage, four Common Representative Samples with a total of 629 expected results have been selected. By the end of 2021, cost claims amounting to EUR 31.8 billion have been submitted by the beneficiaries to the services. The audit coverage for Horizon 2020 is presented in annex 7. In addition to the Common Representative Samples, Common Risk Samples and Additional Samples have also been selected. The audits of 3 424 participations were finalised by 31/12/2021 (of which 514 in 2021).

²⁸ Based on the 418 representative results out of the 629 expected in the four Common Representative Samples.

²⁹ It should be noted that in 2021 most H2020 grants managed by DG R&I were transferred to Executive Agencies. Hence, this figure is based only on the actions that remained with DG R&I at the end of 2021.

³⁰ The legislative financial statement accompanying the Commission's proposal for the Horizon 2020 regulation states: "The Commission considers therefore that, for research spending under Horizon 2020, a risk of error, on an annual basis, within a range between 2-5% is a realistic objective taking into account the costs of controls, the simplification measures proposed to reduce the complexity of rules and the related inherent risk associated to the reimbursement of costs of the research projects. The ultimate aim for the residual level of error at the closure of the programmes after the financial impact of all audits, corrections and recovery measures will have been taken into account is to achieve a level as close as possible to 2%."

Given the results of the audit campaign up until 2020, and the observations made by the European Court of Auditors in its Annual Reports, the Common Implementation Centre, in close cooperation with central Commission services, is defining actions aimed at significantly simplifying the rules, and paving the way for a significant reduction of the error rate in Horizon Europe. Actions were undertaken including further simplification, increased use of simplified forms of funding (including lump sums and unit costs), focused communication campaigns to more “error-prone” types of beneficiaries with higher than average error rates, such as SMEs and newcomers, and enhanced training to external audit firms performing audits on behalf of the Commission (the last three measures also target H2020 grants and beneficiaries). Focusing on the most common errors, these events will be straightforward, reaching more participants and achieving higher impact.

In the context of further reducing the error rates, the Common Implementation Centre will revisit the existing tools for ex-ante controls. It will consult the stakeholders in order to collect their views on possible improvements in the grant management risk module.

Horizon Europe

2021 was the first year of implementation of the Horizon Europe framework programme. The adoption of its Regulation later than initially planned, delayed the starting of its implementation³¹. By the end of 2021, only a very limited number of payments was executed (only pre-financings in DG R&I).

Consequently, taking into account the absence of relevant expenditure, the low-risk nature of the implemented transactions and the absence of ex-post audit results for grants, no detected error rate can be reported for Horizon Europe in 2021.

Results of the Euratom ex-post audits

The Euratom Regulation complements the Horizon 2020 Regulation. The Euratom Audit Strategy is articulated as a complement to the Horizon 2020 Audit Strategy. For the EURATOM programme, the 2021 cumulative detected error rate is 1.16%. However, in the AAR 2021, only the H2020 error rate has been presented in detail and used for the estimation of the amount at risk as the EURATOM error rate is not statistically representative.

Results of research fund for Coal and Steel ex-post audits

The Research Fund for Coal and Steel (RFCS) activity was transferred to REA as of 1st April 2021. The residual error rate of the previous RFCS audit strategy (under FP7) i.e. detected

³¹ For the R&I family 85 of calls for proposals had been launched and closed by the end of 2021. 35 of these calls were fully evaluated in 2021 and 50 by 16/03/2022. By the end of 2021 only 19 grant agreements (3 for DG R&I) and one framework agreement (FPA) had been signed.

error rate of 4.26% and Residual error rate of 3.13% has been used to calculate the 2021 amount at risk for all RFCS expenditure³².

Because of the 'de minimis' threshold for financial reservations introduced in 2019 a quantified reservation is not required for Research Fund for Coal and Steel³³.

Control results for Joint Undertakings, Public-Public Partnerships and Executive Agencies

Supervision arrangements

The established supervision strategies for all entrusted entities include participation in Steering Committees or Governing Boards, the regular reporting and the examination of reports from audit services such as the Internal Audit Service and the European Court of Auditors. For further information on supervision arrangements for entrusted bodies see Annex 10 for Joint Undertakings (Article 187 bodies) and Public-Public Partnerships (Article 185 bodies), and Annex 7 for Executives Agencies.

Control results for Joint Undertakings (Article 187 bodies)

The Joint Undertakings - Circular Bio-Based Europe (CBE), Clean Aviation (CA), Clean Hydrogen (CH), Global Health European & Developing Countries Clinical Trials Partnership (EDCTP3) and Innovative Health Initiative (IHI) - implement parts of the EU Framework Programmes for Research and Innovation (Horizon 2020 and Horizon Europe Framework Programmes), under the governance and oversight of DG R&I³⁴.

In 2021, they received from DG Research and Innovation a total of EUR 459.3 million for operational and running costs.

The Joint Undertakings are fully integrated into the Common Implementation Centre's structures and apply the same audit strategy as the Commission services. DG Research and Innovation reviewed the draft 2021 Annual Activity Reports of the Joint Undertakings under its governance, and did not identify any particular issues warranting a mention in this report.

The Court of Auditors gave a positive opinion on the 2020 Accounts of all the Joint Undertakings, under DG Research and Innovation's governance, with a residual error rate below 2%.

³² For more information see REA AAR 2021.

³³ RFCS payments represent 0.02 % of 2021 R&I payments and the financial impact is EUR 0.13 million. The de-minimis threshold was already applied in the 2019 and 2020 AAR.

³⁴ Annex 10 of this report summarises the underlying legal and financial parameters of the Joint Undertakings' operations.

Control results for Public-Public Partnerships (Article 185 bodies)

Article 185 of the Treaty enables the EU to participate in research programmes undertaken jointly by several Member States including participation in structures created for the execution of national programmes. The bodies supported under Article 185 in 2021 are the following: Research for the benefit of SMEs (EUROSTARS2), European Partnership on Metrology³⁵, European and Developing Countries Clinical Trial Partnership (EDCTP2), Joint Baltic Sea Research Programme (BONUS) and Partnership for Research and Innovation in the Mediterranean Area (PRIMA).

In 2021, DG Research and Innovation paid a total of EUR 228.5 million to Art.185 bodies for operational and running costs³⁶.

Following the review of the reports submitted in 2021, DG Research and Innovation did not identify any particular issues warranting a mention in this report.

Control results for Executive Agencies

With regard to the Executive Agencies, DG Research and Innovation monitors and supervises their activities according to Council Regulation (EC) No 58/2003 and the respective delegation instruments.

In 2021, a new framework of supervision for the Executive Agencies was prepared by the central DGs (DG BUDG, SecGen and DG HR) and will be part of the new guidelines on Executives Agencies.

This framework of supervision is reflected in the Memoranda of Understanding (general provisions) concluded between the Agencies and their parent-DGs, which are signed or ready to be signed.

The Memorandum of Understanding related to the management of Horizon Europe (specific provisions) is under finalisation. The signature of the Memorandum is not mandatory for the good implementation of the programme as the Memorandum currently in force remains valid. Furthermore, most of the operations related to the implementation of Horizon Europe are performed through the corporate eGrant, which benefits from specific central instructions and guidance³⁷.

In 2021, DG Research and Innovation was the lead parent DG of the Research Executive Agency (REA), the European Research Council Executive Agency (ERCEA) and, since the 1st April 2021, also of the European Innovation Council and SME Executive Agency (EISMEA). DG Research and Innovation is also a parent DG of the European Health and

³⁵ European Partnership on Metrology which is the Horizon Europe successor of European Metrology Programme for Innovation and Research (EMPIR) took over the activity of EMPIR end 2021.

³⁶ Annex 11 details on the respective legal bases and the amounts entrusted to each body.

³⁷ eGrant Vademecum

Digital Executive Agency (HADEA) and of the European Climate, Infrastructure and Environment Executive Agency (CINEA), as these two agencies implement parts of Horizon 2020 and Horizon Europe.

In 2021, DG Research and Innovation paid EUR 161.7 million to the REA, ERCEA and EISMEA to cover their administrative expenses.

DG Research and Innovation effectively supervised the three Executive Agencies throughout 2021. No issues warranting a mention in this report were identified. As in 2020, the Seventh Framework Programme segment of REA's 2020 expenditure affected by material errors falls within the 'de minimis' threshold, thus no reservation was introduced in the respective declaration of assurance regarding this expenditure.

The monitoring of CINEA and HaDEA did not identify issues warranting a mention in this report.

Control results for financial instruments – INNOVFIN (EU Finance for Innovators)

In 2021, DG Research and Innovation transferred a total of EUR 124.78 million to the European Investment Bank (EIB) and the European Investment Fund (EIF) for InnovFin-EU Finance for innovators. InnovFin is a joint initiative launched by the European Investment Bank Group (EIB and EIF) in cooperation with the European Commission under Horizon 2020. It aims at utilising specific financial instruments to accelerate access to finance by innovative businesses and other innovative entities in Europe.

The principles and details regarding the supervision of the budget entrusted to the EIB and EIF for InnovFin were established in 2015 along with the respective internal control system aiming to ensure that the achievement of operational objectives was based on sound financial management. These principles are presented in Annex 7.

The following 2021 annual reports have been timely received and reviewed for RSFF, EIB loan, EIF SME guarantees.

- Audited financial statements and report from the auditor
- Signed Management Declaration of Assurance Letter
- Report on factual findings resulting from the Agreed Upon Procedures engagement
- Summary Report on Audits & Controls

There are no particular issues that would need to be addressed in DG R&I annual activity report.

For the EIF SME Guarantee (SMEG) the annual reporting package³⁸ has not been received yet because it has been agreed in the delegation agreement that the annually recurring

³⁸ Signed Management declaration of assurance, The audited financial statements and the report from the auditor, Report on Agreed Upon Procedure engagement, summary reports on audits and controls

deadline for the reporting package is in May. The un-audited financial statements for SMEG received on March 14 are under review.

The 2020 audited financial statements and summary reports on audits and controls of the EIF financial instruments SMEG and IFE were received on 16 April 2021 and reviewing showed no particular issues that would need to be addressed in DG R&I AAR 2021.

Considering the values of the relevant indicators contributing to the objective of enhancing access to risk finance for investing in research and innovation (Industrial leadership), the performance of InnovFin exceeded expectations. More specifically, based on the latest data provided by the entrusted entities, the total volume of investments mobilized via debt financing and venture capital investments since the launching of the programme reached EUR 77.5 billion against a target of EUR 15 billion at the designing phase of the programme. The cumulative number of funded organisations reached 37 921 against a target of 5 000. Finally, the total amount of leveraged private funds reached EUR 43.6 billion against a target of EUR 35 billion.

Benefits of control

Through recoveries and financial corrections, DG Research and Innovation has put in place an effective mechanism for correcting errors. During the reporting year the executed corrective capacity amounted in total to EUR 4.28 million representing 0.41 % of the 2021 relevant expenditure. The benefit of the ex-ante level control amounts to EUR 1.61 million, whilst recoveries and financial corrections following the results of ex post controls amounted to EUR 2.67 million.

In 2016, DG Research and Innovation adopted its Horizon 2020 Control Strategy, a reference to other Commission implementing bodies, and the Common Horizon 2020 Ex-post Audit Strategy.

Thanks to the creation of a streamlined control environment with embedded automatic controls based on harmonised processes and tools, the control system for Horizon 2020 has significantly improved the overall efficiency and coherence of the Framework Programme's implementation.

Conclusion

DG Research and Innovation's portfolio of grants includes segments with a relatively low error rate, for example, the Horizon 2020 financial instruments with their inherent low-risk profile of funding modalities, and segments with a relatively higher error rate such as the Horizon 2020 grants. The relatively higher level of error in Horizon 2020 grants is linked to the applicable funding model, which is based on the reimbursement of eligible actual costs. Most of the errors relate to incorrect claims for personnel costs that are mainly due to beneficiaries' lack of thorough understanding of the inherently complex rules. Newcomers and Small and Medium Enterprises (SMEs) are more prone to this type of error in

comparison to other more experienced beneficiaries. There is evidence that the simplifications introduced under Horizon 2020, along with the ever-increasing experience, help in reducing the number of errors made by the beneficiaries, especially when compared to the Seventh Framework Programme. Notwithstanding these efforts, beneficiaries still make errors. Actions carried out to address these weaknesses are reported in the section “Results of the Horizon 2020 ex-post audits” and include focused communication campaigns to the more error-prone types of beneficiaries, and enhanced training to project and financial officers and external auditors.

Estimated overall risk at closure

DG Research and Innovation's relevant expenditure, its estimated overall risk at payment, estimated future corrections and risk at closure are set out in Table X: Estimated risk at payment and at closure.

The estimated overall risk at payment for 2021 expenditure amounts to EUR 19.32 million, representing 1.96% of the DG's total relevant expenditure for 2021. This is the AOD's best, conservative estimate of the amount of relevant expenditure during the year not in conformity with the contractual and regulatory provisions applicable at the time the payment was made.

This expenditure will subsequently be subject to ex-post controls and a proportion of the underlying errors will be detected and corrected in subsequent years. The conservatively estimated future corrections for 2021 expenditure amount to EUR 5.33 million.

The difference between those two amounts results in the estimated overall risk at closure of EUR 13.98 million, representing 1.42% of the DG's total relevant expenditure for 2021.

In 2021, the estimated overall risk at closure decreased by EUR 43.26 million in comparison to EUR 57.24 million in 2020. This decrease is mainly due to the lower H2020 Framework Programme relevant expenditure due to the transfer of activities to Executive Agencies in 2021. The simplifications introduced in Horizon 2020 along with the ever-increasing experience of major beneficiaries, also contributed to reduced errors by beneficiaries and to a lower estimated overall risk at closure.

For an overview at Commission level, the DGs' estimated overall risk at payment, estimated future corrections and risk at closure are consolidated in the Annual Management and Performance Report.

Table X³⁹ : Estimated risk at payment and at closure (amounts in EUR million)

The full detailed version of the table is provided in Annex 9.

DG RTD	'relevant expenditure' (for 2021;MEUR)	Detected error rate or equivalent	estimated risk at payment (2021;MEUR)	Adjusted Average Recoveries and	estimated future corrections [and	estimated risk at Closure (2021;MEUR)
-1	-5	-6	-7	-8	-9	-10
Grants FP7	18,89	5,44%	1,03	1,97%	0,37	0,66
Grants Horizon 2020 (including Euratom)	245,95	2,29%	5,63	0,62%	1,52	4,11
Grants Horizon Europe (including Euratom)	0,30	0,00%	0,00	0,00%	0,00	0,00
Grants Reseach fund for coal and steel	4,13	4,26%	0,18	1,13%	0,05	0,13
Procurement	74,27	0,50%	0,37	0,00%	0,00	0,37
Experts contracts	1,57	0,50%	0,01	0,00%	0,00	0,01
Prizes	6,95	0,50%	0,03	0,00%	0,00	0,03
Other	8,38	0,50%	0,04	0,00%	0,00	0,04
Financial instruments H2020 (INNOVFIN)	124,78	0,50%	0,62	0,00%	0,00	0,62
Subsidies to article 187 and 185 bodies FP7	7,64	2,00%	0,15	0,00%	0,00	0,15
Subsidies to article 187 and 185 bodies H2020	491,26	2,29%	11,25	0,69%	3,39	7,86
Total without contribution to EA's operating budget	984,11		19,32	0,54%	5,33	13,98
		Overall risk at payment in %	1,96% (7) / (5)		Overall risk at closure in %	1,42% (10) / (5)
REA	76,88	0,50%	0,38	0,00%	0,00	0,38
ERCEA	- 0,14	0,50%	0,00	0,00%	0,00	0,00
EISMEA	- 9,85	0,50%	- 0,05	0,00%	0,00	- 0,05
Sub-total contributions (if more than one)	66,89		0,33		0,00	0,33
Total DG (with contributions to EAs)	1 051,01					

b) Fraud prevention, detection and correction

The Common Anti-Fraud Strategy in the Research Family (RAFS 2019), updated in June 2019, jointly with its Action Plan, sets out broad principles to counter external fraud in grant expenditure in Research & Innovation (R&I) Programmes by building relevant preventive and detective measures. Such principles remain valid to date. The Common Audit Service (CAS) coordinates and monitors the RAFS2019 and the implementation of its Action Plan, which is almost fully implemented.

Main fraud prevention actions addressed this year include the creation of an intranet page for raising awareness of the R&I family's staff on anti-fraud. The webpage contains a list of 'red flags' in R&I grants as well as a repository of IT and other tools that can be used for fraud prevention and detection. In addition, the CAS continued to perform data analysis to

³⁹ The relevant expenditure for "Grants Horizon Europe (including Euratom)" of EUR 0.3m refers to a prefinancing registered as a payment. Therefore, it does not, in essence, constitute relevant expenditure. Consequently, no detected error rate (0%) is applied.

feed the selection of risk-based audits and assess how the Horizon Europe control strategy could better tackle fraud risks under Horizon Europe Programme, in line with the Commission Anti-Fraud Strategy. As part of the preparation of the ex-ante control strategy for Horizon Europe, guidance on ex-ante checks to detect potential fraud was also drafted in view of the endorsement by the Fraud & Irregularities in Research Committee (FAIR) in 2022.

The FAIR Committee, chaired by the CAS, remains the main network and forum of the R&I Family on anti-fraud matters. In 2021, the FAIR Committee met 3 times. These meetings were largely dedicated to the implementation of IAS recommendations on anti-fraud measures, such as establishing a set of common indicators for the R&I family to measure and monitor the overall performance of the RAFS, and guidance to FAIR members on the handling of sensitive OLAF information and the transmission of potential fraud cases to OLAF.

This year, the CAS continued to actively cooperate with the European Anti-Fraud Office (OLAF) on fraud prevention, case selections and investigations, and coordinated within DG R&I the OLAF financial and administrative monitoring exercises. When other R&I family services were concerned by the implementation, coordination meetings were organised by the CAS, ensuring a harmonised approach to the implementation of OLAF recommendations. In 2021, DG Research & Innovation transmitted 3 cases of suspicion of fraud to OLAF while 6 further cases relevant to the DG were initiated by OLAF based on information received from other sources.

The CAS was also appointed as the European Public Prosecutor Office (EPPO) correspondent for the DG.

By the end of 2021, 48% of the OLAF financial recommendations (issued in 2017-2021) have been fully implemented and 30.31% have not been implemented yet due to ongoing national judicial proceedings, contestations of the amounts to be recovered or missed repayment deadlines. The AOSD requested the waiver of the claims pursuant to Article 101(2)(b) (insolvency of the debtor) of the Financial Regulation (21.21%).

DG Research and Innovation also contributed to the Commission Anti-Fraud Strategy mainly through the further development of eGrants and through the publication of the contracted experts on the Funding and Tender Portal.

In 2021, out of the 4 newcomers colleagues in DG R&I dealing with grants, 2 followed the anti-fraud training. The other 2 will follow the training in March 2022.

In addition, DG Research and Innovation has developed and implemented its own anti-fraud strategy since August 2010 (R&I AFS). The R&I AFS and its action plan were last updated on 02 July 2019, in line with the Commission Anti-Fraud Strategy. It covers areas not related to Grant Management, i.e. fraud risks related to financial instruments, procurement, expert management, internal fraud etc. The Action Plan against internal fraud in DG Research and Innovation focuses on raising staff awareness on the rules of ethics, with particular emphasis on possible conflicts of interest in the DG. Its implementation is being monitored

and reported to the management twice a year. All necessary actions have been implemented. The results achieved during the year thanks to the anti-fraud measures in place can be summarised as follows:

- All newcomers colleagues attending the Welcome sessions in 2021 (including those online) were made aware of the importance of Ethics in their duties.
- DG R&I staff received communication related to ethical aspects during COVID-19 confinement and teleworking, and 104 members of R&I staff attended the Ethics trainings.

Based on the above information, DG Research and Innovation has reasonable assurance that the anti-fraud measures in place are effective overall.

c) **Assets and information, reliability of reporting**

Assets and information

The main DG Research and Innovation assets, liabilities ⁴⁰ and off balance sheets⁴¹ relates to items managed and controlled in the context of financial instruments (InnovFin) which are detailed in the table below:

Table financial instruments’ assets, liabilities and off balance sheet

	Amount in EUR million
Financial instruments: Available for Sale Investments	3.070,63
Available for Sale Financial Assets liquidable during the year	165,77
Current accounts and other liquidities < 3 months	187,05
Current financial liabilities	-411,03
Guarantees given for financial instruments	-2681,38

Intangible assets are IT software amounting to EUR 39 million at the end of 2021. No security incidents with significant impact on the confidentiality, integrity or availability of Information Systems, were reported during the year.

In conclusion, the supervision of direct and indirect grant management and financial instruments did not identify particular issues warranting mention in this report or that could have a material impact on the assurance. Overall, DG Research and Innovation considers that its safeguarding of the assets is effective and appropriate.

⁴⁰ Source of data : Table 4 in Annex 3 reports on DG R&I's overall assets.

⁴¹ Source of data : Table 5BIS in annex 3 reports on off balance sheet

- Reliability of reporting and accounting

The findings and recommendations of the DG BUDG reports on the validation of Local Systems are subject to a systematic follow up by DG Research and Innovation. The DG had only one open recommendation, which was closed at the end of 2021.

DG Research and Innovation implements a significant part of its budget through indirect management. It, therefore, relies on the reports and accounts provided by the relevant implementing bodies and considers that, overall, the reporting received is reliable and adequate for drawing assurance conclusions.

2. Efficiency of controls

Based on an assessment of the most relevant efficiency control results, DG Research and Innovation has assessed the efficiency of the control system and reached a positive conclusion.

Grant management

This section presents the main efficiency performance indicators for the activities carried out in DG Research and Innovation for Seventh Framework Programme, Horizon 2020, Horizon Europe and Euratom namely **Time-to-Inform (TTI)**, **Time-to-Grant (TTG)** and **Time-to-Pay (TTP)**. Some additional indicators on ex-post audits are presented in Annex 7.

At the end of 2021, five FP7 projects are still active. For three of them, the final payments have been made, however they cannot be considered as closed until all final procedures are completed. The FP7 'reste à liquider' amounts at approx. EUR 5.06 million.

In 2021, DG Research and Innovation signed 212 Horizon 2020 grant agreements with a total maximum EU contribution of EUR 0.96 billion. After the delegation of activities to Executive Agencies, 145 Horizon 2020 signed grant agreements⁴² remained under the responsibility of DG Research and Innovation, out of which 50 were completed and closed by the end of 2021. For the entire programme, around one out of eight proposals was retained for funding with the success rate standing at 11.94% (the respective success rate for FP7 was 18.53%⁴³).

By the end of 2021, 19 Horizon Europe grant agreements (3 of which in DG R&I) and one framework agreement had been signed for a total EU contribution of EUR 244 million (EUR 0.8 million of which in DG Research and Innovation). Finally, 1 Euratom grant agreement was signed with an EU contribution of EUR 546.94 million.

⁴² With a total EU contribution of EUR 1.31 billion

⁴³ Dashboard dataset of 08/07/2020 – consulted on 03/02/2022

Time-to-Inform (TTI)

During 2021, 88.7% of the DG Research and Innovation Horizon 2020 main-listed proposals received information letters within 5 months (153 calendar days) from the respective call deadline. On average, information letters for all main-listed proposals were sent within 127.6 days.

For the period covering 2014-2021, the respective figures were 94.7% and 97.7 days.

Table 3a: Horizon 2020 Time-to-Inform

Period	DG Research and Innovation		Research and Innovation family	
	Signed Grant Agreements where TTI <= 153 days	Average TTI for main-listed proposals (days)	Signed Grant Agreements where TTI <= 153 days	Average TTI for main-listed proposals (days)
2014-2021	94.7%	102.8	98.27%	112
2021	88.7%	127.6	96.65%	141

During 2021, 100% of the DG Research and Innovation Horizon Europe main-listed proposals received information letters within 5 months (153 calendar days) from the respective call deadline. On average, information letters for all main-listed proposals were sent within 45.3 days.

Table 3b: Horizon Europe Time-to-Inform

Period	DG Research and Innovation		Research and Innovation family	
	Signed Grant Agreements where TTI <= 153 days	Average TTI for main-listed proposals (days)	Signed Grant Agreements where TTI <= 153 days	Average TTI for main-listed proposals (days)
2021	100%	45.3	100%	54

In 2021, 1 Euratom grant was signed in DG Research and Innovation. The information letter was sent 86 days after the deadline of the respective call (against a target of 153).

Time-to-Grant (TTG)

During 2021, 83.3% of the DG Research and Innovation Horizon 2020 grant agreements from main-listed proposals were signed within 8 months (245 calendar days) from the respective call deadline, against a target of 100%. For the majority of cases with extended TTG, this was due to the structural complexity of the Infrastructure grants, ethical checks, and some delays due to uncertainties linked to the re-organisation of the DG. The average Time-to-Grant for all main-listed proposals was 204 days.

For the period covering 2014-2021, the respective figures were 86.9% and 206.8 days.

Table 4a: Horizon 2020 Time-to-Grant

Period	DG Research and Innovation		Research and Innovation family	
	Signed Grant Agreements where TTG <= 245 days	Average TTG for main-listed proposals (days)	Signed Grant Agreements where TTG <= 245 days	Average TTG for main-listed proposals (days)
2014-2021	88.8%	205.7	90%	188
2021	83.3%	215.2	93%	210

During 2021, 100% of the DG Research and Innovation Horizon Europe grant agreements from main-listed proposals were signed within 8 months (245 calendar days) from the respective call deadline. The average Time-to-Grant for all main-listed proposals was 87.7 days.

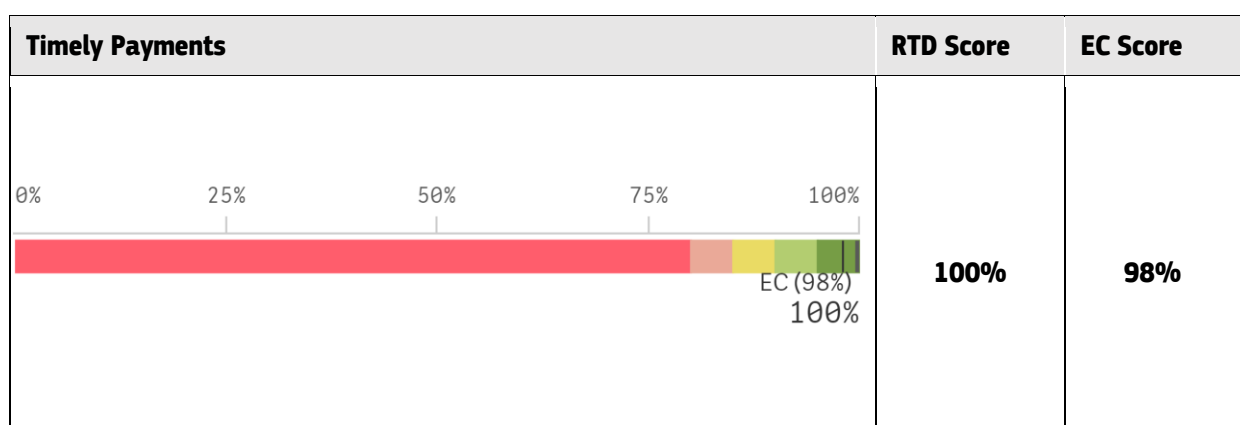
Table 4b: Horizon Europe Time-to-Grant

Period	DG Research and Innovation		Research and Innovation family	
	Signed Grant Agreements where TTG <= 245 days	Average TTG for main-listed proposals (days)	Signed Grant Agreements where TTG <= 245 days	Average TTG for main-listed proposals (days)
2021	100%	87.7	100%	135.7

The single Euratom grant of 2021 was signed in DG Research and Innovation within 8 months (245 calendar days) from the respective call deadline.

Time-to-Pay (TTP)

DG Research and Innovation achieved the 100% target on the efficient processing of payments within the legal deadlines. Although some payments were completed outside of the legal deadlines, the associated amounts were not significant and therefore, practically, the total amount was paid by the DG in time⁴⁴.



⁴⁴ 'Details on the calculation of this Timely Payments' indicator is presented in annex 4: Financial Scorecard

Initiatives taken to improve control efficiency in grant management

Following the decision to use Simplified Cost Options (SCOs) more widely in Horizon Europe, the CIC worked intensively on the rollout of lump-sum funding (comprehensive assessment of the H2020 lump-sum pilot published on EUROPA⁴⁵, intensive information and training campaign with many large online events, consultation of the European Court of Auditors in two major workshops) and on the methodology of new unit cost for personnel cost, which will be available as an option in any actual cost grant under Horizon Europe.

Joint Undertakings, Public-Public Partnerships and Executive Agencies

During 2021 there were significant efforts to ensure:

- the establishment of the new Executive Agencies, and a smooth transfer of programmes and staff to the Agencies REA, EISMEA, CINEA and HaDEA on 1st April 2021;
- the establishment on 30 November 2021 of the new generation of joint undertakings under Horizon Europe: Circular Bio-Based Europe (CBE), Clean Aviation (CA), Clean Hydrogen (CH), Global Health European & Developing Countries Clinical Trials Partnership (EDCTP3), Innovative Health Initiative (IHI) ⁴⁶;
- the creation of European Partnership on Metrology⁴⁷, the successor of the article 185 body EMPIR.

The legislative process preparing the Regulation establishing Joint Undertakings under Horizon Europe was a complex exercise as it covered all Joint Undertakings. It is built on a single set of rules and called “Single Basic Act” but contains individual legal and thematic specificities. All new Joint Undertakings had their first Governing Board meetings between December 2021 and January 2022.

For Clean Aviation JU, the impact of the pandemic on the work plan has been mitigated by updating the Clean Sky 2 development and work programmes ensuring that overall, the programme will reach its objectives as stated in the regulation. The reporting on the private in-kind contributions is delayed, partly due to COVID-19 related project progress and cost certification delays.

⁴⁵ [report_lump_sum_assessment_0.pdf \(europa.eu\)](#)

⁴⁶ Upon entry into force of Council Regulation 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe. These are the successor of Bio-Based Industries Joint Undertaking (BBI JU), Clean Sky 2 Joint Undertaking (CS2), Fuel Cells and Hydrogen 2 Joint Undertaking (FCH2), Innovative Medicines Initiative 2 Joint Undertaking (IMI2), EDCTP3 is a new JU and thus the structure needs to be built.

⁴⁷ The Decision (EU) 2021/2084 on the participation of the Union in the European Partnership on Metrology jointly undertaken by several Member States was published end-November 2021. The Decision entered into force on 1 December.

The COVID-19 pandemic during 2021 has had a major impact on the implementation of EDCTP2-funded projects. The majority of EDCTP2 projects experienced delays in planned activities.

The last three-year evaluations for the two Executive Agencies for which DG Research and Innovation was the lead parent DG, REA and ERCEA, concluded that during the 2015-2018 period these agencies continued to implement the delegated programme management tasks in an effective, efficient and coherent manner and that delegation to Agencies scenario is justified in terms of cost-savings and value added. These evaluations were finalised in 2019 and the respective Commission Staff Working Documents on the evaluation of REA and ERCEA were published in April 2020⁴⁸. The upcoming three-year evaluation for the period 2018-2021 will be coordinated by DG R&I for all six Executive Agencies and will be carried out during 2022 and 2023.

Joint Undertakings, Public-Public Partnerships and Executive Agencies are supervised and coordinated in an efficient manner.

Financial instruments

The financial instruments are managed efficiently, in accordance to the delegation agreements concluded with the EIB and the EIF (see information in section 3).

3. Economy of controls

This section assesses the costs of the internal control system.

Grant management

In accordance with the Commission central services' guidance⁴⁹, the cost of controls in direct grant management is assessed by the cost of the different control stages. The overall assessment is derived from the ratio between all of these costs and the total amount paid in the year for grants.

The overall cost of the controls in grant management is estimated at 3.3 % (EUR 6 million in 2021) of the total implemented budget (in terms of payments) in 2021.

The increase in percentage (0.7%) despite the decrease in absolute amount⁵⁰ of the cost of controls in grant management in comparison to last year is mainly due to the delegation of programme implementation to Executive Agencies and the unavoidable decrease of the economy of scale effect.

⁴⁸ COM(2020) 184 final

⁴⁹ Ares(2018)4917637

⁵⁰ In 2020, the costs of control for grants was estimated at EUR 55 million and represented 2.6 % of payments.

Therefore, the implementation of controls can be considered as a cost-effective operation.

The detailed calculation of costs of controls for direct grant management is provided in Annex 7 and can be divided into three main categories:

- Costs of controls in DG Research and Innovation;
- Costs of the common support services provided by REA for proposal evaluation/selection;
- Costs of services for controls provided by the Common Implementation Centre which is hosted by DG Research and Innovation.

Joint Undertakings, Public-Public Partnership and Executive Agencies

Total costs for supervision of Joint Undertakings (Art. 187 bodies-JUs) incurred in 2021 by DG Research and Innovation are estimated at EUR 4.11 million, i.e., 0.90% of the payments made to these bodies in 2021.

Total costs of supervision of Public-Public Partnerships (Art. 185 bodies) incurred in 2021 by DG Research and Innovation are estimated at EUR 1.47 million, i.e., 0.64% of the payments made to these bodies in 2021.

Total costs of supervision of Executive Agencies incurred in 2021 by DG Research and Innovation are estimated at EUR 3.12 million, i.e., 1.94% of the total expenditure sub-delegated by DG Research and Innovation to them, covering also the administrative costs.

Table 7: DG Research and Innovation cost of supervision of EAs, JUs and Public-Public Partnerships (Art 185 entities)

Executive agencies and Indirect Grant Management	Payments (a)	FTE	Total direct costs (b)	Horizontal costs (0.42% of payments see table Y annex 7) (c)	Total costs (b) + (c)	Total costs as % of (a)
Executive Agencies	161.675.271,03 €	19,65	2.450.377,20 €	679.036,14 €	3.129.413,34 €	1,94%
Article 185	228.515.342,95 €	4,10	511.274,63 €	959.764,44 €	1.471.039,07 €	0,64%
Article 187 (JU's)	459.297.792,41 €	17,50	2.182.269,78 €	1.929.050,73 €	4.111.320,50 €	0,90%
Total	849.488.406,39 €	41,25	5.143.921,61 €	3.567.851,31 €	8.711.772,92 €	1,03%

The supervision of Executive Agencies includes the implementation of their operational budget, which is not a direct part of the DG R&I budget and thus not covered directly by the assurance of this report. During 2021, REA, ERCEA and EISMEA implemented a total of EUR 4 529 million payment appropriations⁵¹ from the 2021 operational budget for research and innovation framework programmes. HaDEA and CINEA implemented EUR 1 863 million payment appropriations. These amounts should be taken into account when assessing the cost-effectiveness of supervision.

The increase of costs of controls for Executive Agencies is linked to the 2021 delegation of activities to them and, in particular, to the costs of supervision of EISMEA (for which DG R&I

⁵¹Data from ABAC 03/01/2022

is the lead parent DG since April 2021) and of monitoring of the newly created Executive Agency HaDEA.

Overall, the control system put in place for Executive Agencies and indirect grant management is considered to be cost-effective.

Financial instruments - EIB/EIF

In the year 2021, DG Research and Innovation's payments to the European Investment Bank (EIB) and the European Investment Fund (EIF) amounted to EUR 124.78 million, out of which the EIB and the EIF deducted EUR 45.10 million for administrative, treasury asset management and policy-related incentive fees.

The European Investment Bank withdrew from the EU account EUR 12.08 million for administrative fees, EUR 25.30 million for policy-related incentive fees and EUR 1.02 million for treasury asset management fees and unforeseen expenditures. The cumulative amount of fees (2014-2021) drawn by the EIB from the EU account as of 31/12/2021 was EUR 89.80 million.

The European Investment Fund (EIF) withdrew from the EU SMEG account EUR 4.98 million for administrative fees and EUR 0 for policy-related incentive fees. The cumulative amount of fees (2014-2021) related to InnovFin SMEG drawn by the EIF as of 31/12/2021 was EUR 61.75 million.

The European Investment Fund withdrew from the EU IFE account EUR 1.56 million for administrative fees, and EUR 0.17 million for policy-related incentive fees. The cumulative amount of fees related to InnovFin IFE drawn by the EIF as of 31/12/2021 was EUR 33.85 million.

The share of fees of the three instruments in the 2021 payments is 36.1%. This percentage is higher than historic values due to the low amount of payments in this period and to cashing in arrears from previous periods. These fees were withdrawn from the EU account according to the terms of the Delegation agreements, which were drafted specifically for the sound management of funds.

The amounts transferred for the management and other fees payable each year vary. For this reason, a full account of the share of management fees out of the total implemented amounts will only be possible upon the closure of the programme.

During 2021, the designated services (EIF and/or EIB) recovered EUR 11.19 million from the Seventh Framework Programme Risk-Sharing Finance Facility (RSFF) reflows, EUR 0 from the Seventh Framework Programme Risk sharing Instrument (RSI) reflows, EUR 5.88 million from InnovFin SMEG treasury income, EUR 2.56 million from the InnovFin IFE treasury income, and EUR 176.25 million from the Competitiveness and Innovation Framework Programme High Growth and Innovative SME Facility 1 (CIP GIF 1).

The supervision of the activities implemented by the EIB and the EIF was carried out in 2021 by 2.5 Full Time Equivalent DG Research and Innovation staff. The total cost of this supervision were estimated at EUR 0.31 million in addition to the costs of the horizontal control tasks estimated at EUR 0.52 million (0.42% of payments). See table Y in annex 7.

4. Conclusion on the cost-effectiveness of controls

Based on the most relevant key indicators and control results, DG Research and Innovation has assessed the effectiveness, efficiency and economy of its control system and reached a positive conclusion on the cost-effectiveness of the controls for which it is responsible.

The first objective of the control system is to achieve the main policy objective – to create growth and jobs, in particular, by contributing to more and better research and innovation in Europe. In this sense, the controls aim to ensure good work programmes, to select the best proposals to be funded and to verify the project's deliverables.

The second objective of the control system is to ensure that the EU contribution paid to the beneficiaries complies with the internal control objectives. Thus, that legal and regular transactions are carried out in a cost-effective way.

Overall, given:

- the achievements of research and innovation policy as set out in Part 1,
- the quantitative and qualitative benefits arising from the control systems adopted (common approach on processes and interpretation of rules thanks to the Common Implementation Centre, quality of proposals due to reviews which are performed by panels of independent external experts in the scientific field complemented by a real competition for funds, amount of rejected funding following ex-ante checks, and the amount recovered following the implementation of audit result),
- the error rates set out above, which are at levels considered as being appropriate when balanced between different policy objectives and between trust and control,
- the costs of the control system compared to the level of expenditure.

It is considered that a cost-effective control system has been put in place, balanced with the objectives of the research and innovation policy.

The same conclusion applies to the financial instruments, which are managed in accordance with the delegation agreements concluded with the EIB, EIF, Joint Undertakings (Article 187 bodies), Public-Private partnerships (Article 185) and Executive Agencies. These are monitored in conformity with the supervision arrangements described above and in a cost-effective manner.

2.1.2. Audit observations and recommendations

This section sets out the observations, opinions and conclusions reported by auditors – including the limited conclusion of the Internal Auditor on the state of internal control. Summaries of the management measures taken in response to the audit recommendations are also included, together with an assessment of the likely material impact of the findings

on the achievement of the internal control objectives, and therefore on management's assurance (annex 7).

INTERNAL AUDIT SERVICE (IAS)

According to the IAS, DG R&I's internal control systems in place for the audited processes proved to be effective with the exception of the observations giving rise to seven 'very important' recommendations related to the ex-post audit strategy by the Common Audit Service (two recommendations), the audit on the management of experts (two recommendations) and the audit on the implementation of ex-post audit results for Horizon 2020 (three recommendations).

The implementation of one of the very important recommendation from the audit on the management of experts was finalised at the end February and awaits the IAS follow up for confirmation of its closure.

Action plans for all recommendations have been defined. The action plan on the implementation of ex-post audit results for H2020 was sent to IAS for approval on 24/02/2022. The other actions plan have been approved by IAS.

Further information on the IAS recommendations is available in Annex 7.

EUROPEAN COURT OF AUDITORS

For the financial year 2020, the Court reported a 3.9 % error level for Chapter 4 stressing that research and innovation expenditure (FP7 and Horizon 2020) remains a higher-risk area and the main source of error in this chapter.

Regarding the 2020 DG R&I Annual Activity Report, the Court concluded that it gave a fair assessment of the DG's and agencies' financial management in relation to the regularity of underlying transactions.

The Court also reported some weaknesses related to ex-post audit work of the Commission and acknowledged that some improvements had been introduced since the previous annual report. However, the Court was of the opinion that the representative error rate is potentially understated. The Court issued three recommendations, which the Commission accepted and are currently being implemented.

Annex 7 presents the Court's recommendations and the respective action plan drawn by the responsible Commission services.

Furthermore, during the year 2021, several performance audits related to DG Research and Innovation activities were ongoing (Circular Economy, Climate Mainstreaming, Internationalisation of SMEs, Synergies and Widening). Their corresponding Special Reports are expected to be published in the year 2022.

OVERALL CONCLUSION ON AUDIT OBSERVATIONS AND RECOMMENDATIONS

Internal and external audit work contributes significantly to continuous improvements in DG Research and Innovation systems and operations. The Directorate-General systematically addresses and follows up the recommendations submitted by the Internal Audit Service (IAS) and the European Court of Auditors. The current residual risk from the audit recommendations that remain open in DG Research and Innovation does not impair the declaration of assurance.

2.1.3. Assessment of the effectiveness of internal control systems

Commission has adopted an Internal Control Framework based on international good practice, to ensure the achievement of its policy and management objectives. Compliance with the internal control framework is a compulsory requirement.

DG Research and Innovation uses the organisational structure and the internal control systems suited to achieving its policy and internal control objectives in accordance with the internal control principles and has due regard to the risks associated with the environment in which it operates.

The internal control assessment was performed in compliance with the methodology established by DG BUDG⁵². It was based on an evaluation of monitoring indicators defined in the DG Research and Innovation Internal Control Framework and a desk review of the analysis of information from various sources such as:

- the indicators set out in the Internal Control Framework of the DG;
- the Director's reports for 2021 and the 2021 risk assessment exercise at Directorate-General level;
- the reports on recorded exceptions, non-compliance events and any cases of confirmation of instructions (art 93.2 FR);
- the observations and recommendations reported by the Internal Audit Service and conclusion of the Internal Auditor on the state of internal control in DG Research and Innovation;
- the observations and recommendations reported by the European Court of Auditors;
- the DG BUDG reports on follow-up of recommendations on the validation of Local Systems;
- the error rates for the Seventh Framework Programme, Horizon 2020 and the Research Fund for Coal and Steel.

⁵² Implementation guide of the internal control framework of the Commission.

The evaluation and analysis showed that:

DG R&I has assessed its internal control system during the reporting year and has concluded that it is effective and its components and principles are present and functioning well overall, but some improvements are needed as minor deficiencies were identified related to the following four principles: 10⁵³ and 12⁵⁴ (component III – “Control Activities”), 13⁵⁵ (component IV – “Information and Communication”) and 17⁵⁶ (component V – “Monitoring Activities”), as the IAS audit reports made evident (see paragraph 2.1.2 audit observations and recommendations - IAS).

The improvements and/or remedial measures implemented or envisaged are:

- Continue the effort to execute payments in accordance to the Financial Regulation and further increase the (already high) percentage of timely payments⁵⁷ (principle 10). (98% of transactions, 100% of the amount).
- Minimise financial exposure and consequently help reducing the error rate and broaden the scope of ex-post audits by including high-risk areas. Moreover, improve monitoring of participation patterns of experts and optimise the use of available data on their expertise. This will allow better targeting and skill-matching to requirements (principle 12).
- Completion and timely implementation of the action plan related to the IAS Audit on Implementation of H2020 Ex-Post Audit Results (principle 13) thus ensuring reliable reporting and contributing to increased efficiency.

Continue the effort to reduce the number of overdue IAS recommendations to zero by increasing the response time and improving planning and action plan execution follow-up (principle 17).

⁵³ Principle 10: “The Commission selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels”

⁵⁴ Principle 12: “The Commission deploys control activities through corporate policies that establish what is expected and in procedures that put policies into action”

⁵⁵ Principle 13: “The Commission obtains or generates and uses relevant quality information to support the functioning of internal control”

⁵⁶ Principle 17: “The Commission assesses and communicates internal control deficiencies in a timely manner to those parties responsible for taking corrective action, including senior management and the College of Commissioners, as appropriate”

⁵⁷ 98% of transactions, 100% of the amount.

2.1.4. Conclusions on the assurance

This section reviews the assessment of the elements already reported above (in Sections 2.1.1, 2.1.2 and 2.1.3), and the sub-conclusions already reached. It draws an overall conclusion to support the declaration of assurance and whether it should be qualified with reservations.

Based on the analysis of the results of the controls in place shown in the indicators outlined above, and the examination of the evidence available, DG Research and Innovation's management is in a position to provide **reasonable assurance on the following areas:**

- policy-development activities;
- the processes relating to the selection of contractors and beneficiaries and the underlying financial operations (legal and financial commitments);
- payments relating to administrative expenditure and procurement;
- Horizon 2020, Euratom and Horizon Europe payments for grants;
- management of the RSFF/INNOVIN financial instruments and the underlying financial transactions with the EIB and EIF;
- payments to Joint Undertakings and Article 185 initiatives;
- the operating subsidy paid to the Executive Agencies.

Because of the 'de minimis' threshold for financial reservations introduced in 2019⁵⁸, a quantified reservation is no longer needed for the Seventh Framework Programme and Research Fund for Coal and Steel⁵⁹.

DG Research and Innovation considers that its overall control strategy is appropriate as it ensures **a good balance between low errors and efficient controls at a reasonable cost.**

OVERALL CONCLUSION

In conclusion, based on the elements reported above, management has reasonable assurance that, overall, suitable controls are in place and working as intended; risks are being appropriately monitored and mitigated; and the necessary improvements and reinforcements are being implemented. The Director General, in his capacity as Authorising Officer by Delegation has signed the Declaration of Assurance

⁵⁸ According to this threshold, quantified AAR reservations related to residual error rates above the 2% materiality threshold, are deemed not substantial for segments representing less than 5% of a DG's total payments and with a financial impact below EUR 5 million.

⁵⁹ FP7 payments represent 0.36 % of all 2021 DG R&I payments and the financial impact is EUR 0.66 million. RFCS payments represent 0.02 % of all 2021 DG R&I payments and the financial impact is EUR 0.13 million. The de minimis threshold was already applied in the 2019 and 2020 AAR.

2.1.5. Declaration of Assurance

I, the undersigned,

Director-General of Research and Innovation

In my capacity as authorising officer by delegation

Declare that the information contained in this report gives a true and fair view⁶⁰

State that I have reasonable assurance that the resources assigned to the activities described in this report have been used for their intended purpose and in accordance with the principles of sound financial management, and that the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions.

This reasonable assurance is based on my own judgement and on the information at my disposal, such as the results of the self-assessment, ex-post controls, the work of the Internal Audit Service, and the lessons learnt from the reports of the Court of Auditors for years prior to the year of this declaration.

Confirm that I am not aware of anything not reported here which could harm the interests of the institution.

Brussels, 13 April 2022

[Signed in ARES]

Jean-Eric Paquet

Director-General DG Research and Innovation

⁶⁰ True and fair in this context means a reliable, complete and correct view on the state of affairs in the DG/Executive Agency.

2.2. Modern and efficient administration – other aspects

2.2.1. Human resource management

DG Research and Innovation experienced major developments in the first half of 2021, mainly driven by the delegation of programme implementation to Executive Agencies. This event had many implications in terms of staff management and triggered as well the change of the organisational structure and the mission of the Directorate-General to better reflect the policy-oriented approach and the thematic cooperation with Member States and stakeholders, as well as the solid support in coordinating the implementation of the framework programme throughout the Commission, with its many cross-cutting features.

In addition to the regular HR related activities, HR BC Team focused on the following priorities:

- Human resources management in the context of the delegation of programme implementation to Executive Agencies and other EU bodies

HR BC Team managed the process of identification and transferring to Executive Agencies the staff working on the parts of the programme that had been delegated to Executive Agencies. In addition, HR BC Team also managed with the support of central services the secondment of staff on positions of responsibility in Executive Agencies. HR BC Team provided HR support to staff and properly informed them on the available opportunities and their consequences. HR BC Team liaised with the central services (e.g. DG BUDG, DG HR) and coordinated various actions across concerned services in a continuous changing context.

Furthermore, RTD HR BC co-chaired with the unit responsible with the relations with Executive Agencies, the works of the Matrix Team in charge with the delegation of programme implementation.

- The reorganisation of the Directorate-General

As a result of the above-mentioned delegation of programme implementation, RTD HR BC Team worked on the adoption of an updated organisational structure of the Directorate-General, coherent with its policy role. The staff allocation resulted from a series of discussions and reflections at management level and aimed to appropriately deploy staff in support of policy priorities, while absorbing the staff reductions generated by the delegation of programme implementation.

Among other significant actions, it is worth mentioning that RTD HR BC Team started the reflections for the development of a local HR strategy to support the evolution of the Directorate-General, complementary to the corporate HR strategy to be developed by central services.

With reference to the middle management appointments, the Directorate-General exceeded by 2 the target of first female appointments by end of 2022.

As regards hybrid working, extensive staff consultations took place, where staff and management had genuine discussions on the future of work and working environment. The outcome of such discussions was communicated to central services to be considered in the development of a new approach on working modalities.

All relevant HR matters were timely and properly communicated to staff via a variety of means, such as regular HR news in the internal newsletter (i.e. RTD Insights), creation and update of web pages, video messages from senior management, as well as discussion forums (e.g. Coffee seminar).

Staff engagement index is 70% as per 2021 Staff Survey, representing an increase of 8% compared with 2018. This is generated by an improvement in all areas contributing to staff engagement, in particular more staff feel that their work is recognised and praised, their opinion is valued, their colleagues are committed to do quality work, their managers care about staff as a person.

2.2.2. Digital transformation and information management

Data and knowledge assets

Monthly releases of Horizon 2020 data were made available to Member States and Associated Countries. Delivery methods were modernised and preparatory work is underway for Horizon Europe. **eCORDA2.0, the new framework that replaced the current eCORDA solution with the aim at simplifying and optimising the processes and deliverables, has been implemented.**

External data and KIPs: Analysis of the first KIPs to be delivered in 2022 has started, following the finalisation of the operationalisation plan for the KIPs. The upload of external datasets needed for the KIPs has started and will continue in 2022.

Funding & Tenders Portal – The IT Department ensured a smooth operation of and continuously enhanced the Funding and Tenders Portal. The pilot on multilingualism was implemented successfully. The services for legal entity registration are now available in all EU official languages. Preparations for the full roll-out of the multilingual portal are in an advanced state, using new possibilities of machine translation technologies of DGT. The person profile functionalities and the related partner search were developed and will be deployed in January 2022. New services for self-management by Member States of programme committee memberships and national contact points were developed.

Personal data protection

For ensuring full compliance of DG R&I with the legislative framework on data protection (DP), the office of the Data Protection Coordinator (DPC):

- Coordinated the elimination of the R&I family obsolete personal data;
- Advised and assisted the delegated and operational controllers on the management of personal data breaches, the handling of data subjects requests, and in general in

- complying with their DP obligations;
- Raised awareness on DP matters within the Directorate-General.

Throughout 2021, the DPC's office:

- Monitored the compliance of the Directorate-General with the Commission's DP action plan;
- Coordinated the elimination of obsolete personal data of 1,3 million roles in the R&I IT systems (ECS/EMI, CORDA, CPM, FORCE, SESAM) and the establishment of the yearly follow-up;
- Drafted and followed-up the endorsement by the Executive Committee of the Common Implementation Centre (CIC) and the signature by the 21 parties of the Joint Controllership Arrangement for the corporate personal data processing operations on the EU Funding and Tenders portal;
- Contributed to the drafting of the DP record and notice of the corporate eGrants/eProcurement suite;
- Prepared privacy statements and kept up-to-date the existing personal data processing records;
- Contributed to the IAS audit of the DP aspects of the CIC;

It delivered 11 DP trainings as well (for newcomers, general trainings and specific on expert management).

Digital Workplace

The Common Implementation Centre continued to contribute to the Digital Transformation of the Commission by providing the users with the eGrants IT suite for managing the complete direct grants management lifecycle for 69 programmes under both MFF 2014-2020 and MFF 2021-27 in the context of the ICT Synergies and efficiencies initiative. These activities will continue in 2022 and beyond.

Document Management

During the year, the DG R&I Library has further developed its services to adapt to a digital workplace by:

- Coordinating 100% online DG R&I Knowledge (Library) Talks (KTs) via MS Teams since the start of the COVID crisis. Since spring 2021, the virtual library talks are archived in recorded form for consultation up to 2 years after the talk. The topics of the KT's span the entire range of the R&I remit and can be found on the KT's page DG R&I Knowledge Talks (europa.eu). Almost 50 talks were organised during 2021, nearly one per week on average.
- Enabling access to its collections remotely via online authentication. Synergies with other libraries of the EC have continued in the view of increasing efficiency in the management of collections and services offered across the organisation, in particular with the JRC and the EC Central Library.

- Continuous efforts are made to include more participants from the research agencies and from the other Commission DGs. Two Talks dealt with the COVID crisis: 25 January 2021: “Facing the Future: European Societies after COVID 19,” and 9 July 2021 “R&I in the Recovery and Resilience Plans.”

2.2.3. Sound environmental management

During 2021, DG R&I has actively contributed to the EMAS network requests, participating and sharing comments at the EMAS Steering Committee, EMAS Network and EMAS training meetings, as well as being involved and promoting the different initiatives and campaigns at various level.

In January 2021, DG R&I adopted an updated ten-point action plan for ‘greening’ the DG, under which several actions have been already implemented, in continuity with the 2020 plan.

Since one of the main activities of the European Commission producing Green House Gas emissions is air travel, one of the key action of the 10-point plan is to decrease the staff missions, meetings and events, facilitating the remote mode. This has been implemented through several actions:

- in the frame of the revision of budget provisions for 2021 and 2022, the Directors agreed, and confirmed in the June budget revision, on a progressive decrease of the budget for staff missions, meetings and events, thus facilitating reaching the DG committed target for 2024 (see the action 1 and 2 of the 2021 10 points plan);
- The finalisation of audio-visual equipment installation for all management offices and all meeting rooms with the aim of easing remote teleconferences and events;
- Additionally, the library has been equipped with an audio-visual equipment to allow remote and hybrid ‘Library talks’ and a TV studio is under construction, which will enable high quality virtual and hybrid events;
- The 2021 edition of the European Research and Innovation Days, which took place on the 23rd and 24th of June, was organised with a fully virtual audience, and most of the speakers intervened virtually while very few speakers were physically on site.

Awareness actions aimed at and involving colleagues, were established during this first semester. Monthly actions and tips have been launched concerning diverse topics related to the environment and the reduction of our footprints in everyday life. Among those actions a green quiz contest was launched in September and the three winners received a ‘green’ prize.

Moreover, after a call for volunteers, the ‘Greening Ambassadors’ group representing every Directorate was created. It supports the Greening Correspondent on gathering ideas and spreading information among colleagues. The group regularly meet and communicate among the members, but also channels information to and from colleagues.

Despite a reduced presence at the office, volunteers maintained the herb garden.

DG R&I has promoted during the year different EMAS corporate campaigns, often combined with local actions. In September, the DG has produced a video in which the senior

management promoted sustainable commuting. Similarly a bike ride took place in September, combined with a visit to an urban farm.

With the completion of the installation of the new sorting system in ORBN building, the waste reduction target has been achieved. Together with JRC, these sorting bins were installed also in CDMA building. The phasing out related to paper subscription of newspapers and scientific / research journals subscription is going on.

On the “World Oceans Day” on 8th of June, an event related to marine biodiversity was organised in collaboration with DG MARE, “Coral reefs, EU research and membership to ICRI”.

To achieve a more effective communication, in addition to regular intranet articles and ad hoc emails, a dedicated intranet page on ‘Greening R&I’ was created, with a SharePoint to launch discussions and share documents.

Finally, DG R&I contributed substantially to DG HR’s informal consultation on a first draft of the Communication on Greening the Commission by sending preliminary comments, before the ISC. DG R&I organised an internal consultation with a view to deliver valuable comments to DG HR.