

2017

Annual Activity Report

**Directorate-General
for Research
and Innovation**

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FOREWORD

Dear Reader,

I am delighted to present this report on the work of DG Research and Innovation (DG RTD) in 2017. Following our strategy set for 2016-2020, we focused our efforts on those priorities of President Juncker where research and innovation can have the highest impact: creating jobs and growth and leveraging investment; moving towards a digital single market; achieving a sustainable energy union; and making Europe a stronger global actor.

Furthermore, DG RTD has taken forward Commissioner Moedas' priorities for Open Science, Open Innovation, and Open to the World in many areas, including progress towards a possible European Innovation Council to support breakthrough, market-creating innovation; progress towards the launch of the Fund of Funds to boost investment in new generations of highly innovative European firms; the Scientific Advice Mechanism to support better regulation by providing independent scientific advice; the introduction of the 'Innovation Principle' to systematically assess the impact of new EU policy and legislative initiatives on innovation; and the steering of the Mission Innovation initiative, a global initiative on clean energy innovation.

The implementation of Horizon 2020, the biggest ever Research and Innovation Framework Programme, reached its cruising speed, benefitting from a mature support system and simplified rules. The Interim Evaluation of Horizon 2020, and the conclusions of the Lamy report published in 2017 demonstrated the relevance, European added value, effectiveness, efficiency and coherence of this programme, its contribution towards the achievement of the Europe 2020 objectives, and the benefits it brought for the lives of Europe's citizens in general. Building on the success of Horizon 2020, but also taking into account the recommendations outlined in its Interim Evaluation, DG RTD, in close collaboration with the Research family, began in 2017 to lay out the foundations of the upcoming Framework Programme (FP9), to be adopted by Spring 2018.

These achievements have been made possible by the continued support and cooperation of all our partners in and beyond Europe: the Member States, the European Parliament, the partner institutions, the experts contributing to selecting the best projects to fund, the beneficiaries of the research grants, who are constantly making progress towards innovative responses to the societal, environmental and industrial challenges we face, and last but not least the staff of our Directorate-General; without their hard work, enthusiasm and dedication, many of these achievements would not have been possible.

This detailed narrative of our operational and administrative efforts and results, with their strengths and challenges, sets out the state of play of this collective undertaking.

Wolfgang Burtscher

Acting Director-General DG RTD

The DG in brief

DG RTD defines and implements European research and innovation (R&I) policy with a view to reinforcing the science and technology base, promoting innovation and turning societal challenges into innovation opportunities that will help deliver on the European Commission priorities. The DG's long-term objective is to make Europe a better place to live and work, by developing and implementing R&I policy to improve Europe's competitiveness, boost its growth, create jobs and tackle the main current and future societal challenges.

The DG contributes to the Commission's priorities^[1] for growth, jobs and investment, the Digital Single Market, the Energy Union and global action. In order to maximise the contribution of R&I to these priorities, the Commissioner for Research, Science and Innovation Carlos Moedas has grouped R&I activities under three lead objectives called the three "O's":

- Open Innovation – working with Member States to strengthen Europe's R&I systems and achieve the European Research Area, and establishing the right framework conditions for innovation in Europe;
- Open Science – ensuring excellent science and open access to results and ensuring that Europe benefits from the digital age to drive innovation;
- Open to the World – ensuring that Europe's strengths in science and technology allow it to become a leading global actor.

Horizon 2020, the FP for R&I (2014-2020), is designed to deliver on European research and innovation policy objectives. As the DG continues to strengthen its role as a policy-oriented DG, it concentrates increasingly its involvement in Horizon 2020 on policy-related activities (e.g. definition of work programmes, coordination of the Research family of DGs, etc.) and on the design of the future Framework Programme for Research and Innovation (FP9) while reducing its direct involvement in contract management (e.g. calls, contract finalisation, payments, etc.). Many of the implementation functions related to Horizon 2020 had already been delegated to the Executive Agencies, Joint Undertakings (JUs) and 'Article 185 initiatives', and scenarios for further externalisation are being explored under FP9.

On 1 March 2018, the Director General of DG RTD Mr Robert-Jan Smits left the DG after more than 25 years, seven of them as Director General. He has been at the heart of many of the initiatives that you will find in part 1 of this report. In particular, he was the driving force behind many of the new elements of Horizon 2020. Mr Wolfgang Burtscher, as Deputy Director-General, will sign the AAR for 2017. Mr Jean-Eric Paquet will officially become the new Director-General of DG RTD on 1 April 2018.

^[1] "A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change, Political Guidelines for the next European Commission" and "Opening Statement in the European Parliament Plenary Session".

EXECUTIVE SUMMARY

a) Key results and progress towards the achievement of general and specific objectives of the DG (executive summary of section 1)

PUTTING SCIENCE AND INNOVATION AT THE HEART OF POLICY MAKING

In 2017, renowned economists reaffirmed **R&I's crucial contribution to fostering economic growth**, creating new and better jobs, improving health outcomes and developing new sustainable energy technologies that can help fight and mitigate climate change¹.

DG RTD published a new edition of the **European Innovation Scoreboard** and the Industrial R&D Investment Scoreboard, which reported on the innovation performance of the EU Member States and the EU as a whole compared to our global competitors.

DG RTD made again a substantial contribution to the **European Semester** by contributing to nine country-specific recommendations calling upon the Member States concerned to strengthen their national science and innovation systems. The message is clear: Besides introducing the necessary reforms, the EU and its Member States need to step up investment in science and innovation, and respect **the objective of investing 3% of GDP in R&D**.

Through the **Horizon 2020 Policy Support Facility (PSF)** (sp. obj. 1.1), DG RTD provided in 2017 support to a number of countries on the reforms of their national science and innovation systems.

DG RTD and DG REGIO signed an agreement to enhance the complementarity and synergy between the Framework Programme and the Structural Funds notably aimed at optimising the **Seal of Excellence**.

Through its support for the **Strategic Advice to Policy Making mechanism (SAM)**, DG RTD contributes to providing the College of Commissioners with the tools to underpin their future (legislative) initiatives with scientific facts and figures. In 2017, SAM delivered scientific advice in the areas of Cybersecurity, New Techniques in Agricultural Biotechnology and Food from the Oceans.

Through **Mission Innovation**, the DG has been able to encourage an increasing number of countries from around the globe, to double their research spending on clean energy, which supports the ambitions of the **Energy Union**.

DG RTD contributed to the preparation of the **new Industry Strategy**, and the Industry Days brought together thousands of stakeholders. A substantial input was also made to the Communication on the **new Common Agricultural Policy**, which now contains an important section on research and innovation. Also, the new **Strategic Transport Research and Innovation Agenda (STRIA)** defines the path towards a clean,

¹ Please see reports: '**The Rationale for public R&D funding and its impacts**': <https://publications.europa.eu/en/publication-detail/-/publication/0635b07f-07bb-11e7-8a35-01aa75ed71a1/language-en>

The Science, Research and innovation Performance of the EU, 2018: https://ec.europa.eu/info/sites/info/files/srip-report-full_2018_en.pdf

connected and competitive transport system. In the health field, DG RTD played a key role in the development of the **EU One Health Action Plan on Antimicrobial Resistance (AMR)**, as part of 'Europe Protects'. The Lisbon event on Social Innovation provided an important contribution to the **Social Pillar** in the run-up to the Gothenburg Summit.

APPROPRIATE FRAMEWORK CONDITIONS FOR INNOVATION

The development of appropriate framework conditions for research and innovation was very much driven by the **3 O's agenda of Commissioner Moedas**: Open Innovation, Open Science, Open to the World.

As part of the **Open Innovation agenda**, DG RTD launched a pilot on the **Innovation Principle**. In the future, new EU legislation should be assessed, as part of the regulatory process, on its potential consequences on innovation.

Substantial progress was made on the development of the Pilot for a **European Innovation Council (EIC)** whose aim is to provide support to disruptive, market creating innovators (see below: Lamy Report). A dedicated High Level Group provided its first recommendations on the EIC² and a pilot phase was launched in October.

To further boost the venture capital landscape in Europe in support of innovative start-ups, a **Fund of Funds** is being established. The call for the selection of the Fund Managers was successfully completed and the results will be announced in early 2018. In the meantime, both **InnovFin and EFSI**, the Juncker Investment Package, provided substantial loans to research and innovation projects. EFSI allocated 22% of its investments to innovation projects.

In 2017, DG RTD agreed with DG COMP to explore ways to improve the **state aids regime for innovation** and facilitate the use of national and ESIF funding to co-fund EU-supported research and innovation actions.

Open Science is about the transformation of our science system as a result of "big data", digital technologies, working in teams, sharing information and data and internationalisation. It requires a cultural change inside our academic institutions. The expert reports on '**Rewards and Skills**' provided useful input for the necessary transformation to take place.

An update of the **European Code on Research Integrity** was presented at the World Congress on Research Integrity in May. The Code now includes 'data integrity' and will inspire Member States to review their national frameworks of research integrity.

At the request of President Juncker, a new **European Group on Ethics in Science and New Technologies** was launched in March. Its secretariat is run by DG RTD. Their first report will be on the Future of Work.

As part of the Open Science agenda, significant progress was made on the development of an **European Open Science Cloud (EOSC)**. At the EOSC Summit that took place in June, 39 actions were defined and stakeholders were asked to sign up to a 'coalition of do-ers' to make the cloud a reality by 2020.

DG RTD issued a Staff Working Paper on the **Long-Term Sustainability of Europe's Research Infrastructures** calling upon Member States to continue to invest in these state of the art facilities that are essential for enabling our scientists to extend the

² https://ec.europa.eu/info/sites/info/files/eic_hlg_bz_web.pdf

frontiers of knowledge.

Euraxess, the on-line job market service for researchers, celebrated the first year anniversary of its revamped portal with 28.000 jobs on offer. It resulted in 10 million page views and 30.000 registered researchers.

In the context of **Open to the World**, DG RTD stepped up its policy dialogue with its main global partners. In 2017, **Joint Science & Technology Committee meetings** were held with many countries, including China, India, Japan, Russia, South Korea, South Africa and the USA. DG RTD, together with its partners, defined 30 flagships for international cooperation with a total value of € 1billion, to be launched during the remaining years of Horizon 2020. On **PRIMA**, the Partnership on Research and Innovation in the Mediterranean Area, the decision for participation of the Union was jointly undertaken by several Member States in July 2017, and further agreements were signed with Middle Eastern and North African countries. The **Belem Declaration** gave a new impetus to the creation of an All Atlantic Ocean Research Alliance. The **Global Initiative on Earth Observation (GEO)** was in 2017 under the EU chairmanship with a special focus on delivery and end user involvement. At Summit meetings, science and innovation cooperation was highlighted.

HORIZON 2020 AND THE WORK TOWARDS FP9

In October, the Commission adopted the **Work Programmes** for the remaining 3 years of Horizon 2020 (2018-2020) with a total amount of € 30 billion. The calls will cover inter alia four focus areas: Building a low-carbon, climate resilient future; Connecting economic and environmental gains - the Circular Economy; Digitising and transforming European industry and services; and Boosting the effectiveness of the Security Union. DG RTD also made the necessary legislative proposals for the extension of the nuclear research activities under **EURATOM**.

In May, DG RTD completed the **Interim Evaluation of Horizon 2020**, on the basis of which a high level group, chaired by **Pascal Lamy**, published the report 'Lab, Fab, APP: Investing in the European future we want'. The report applauds the successes of Horizon 2020, calls for continuity as regards objectives, structure and approach, and recommends a doubling of its budget. Other recommendations of the Lamy report concern the need to achieve greater impact and bring science closer to the citizen through '**Missions**', to provide, in the future, support for breakthrough market-creating innovation by establishing a **European Innovation Council**, and to encourage the participation of researchers from third countries.

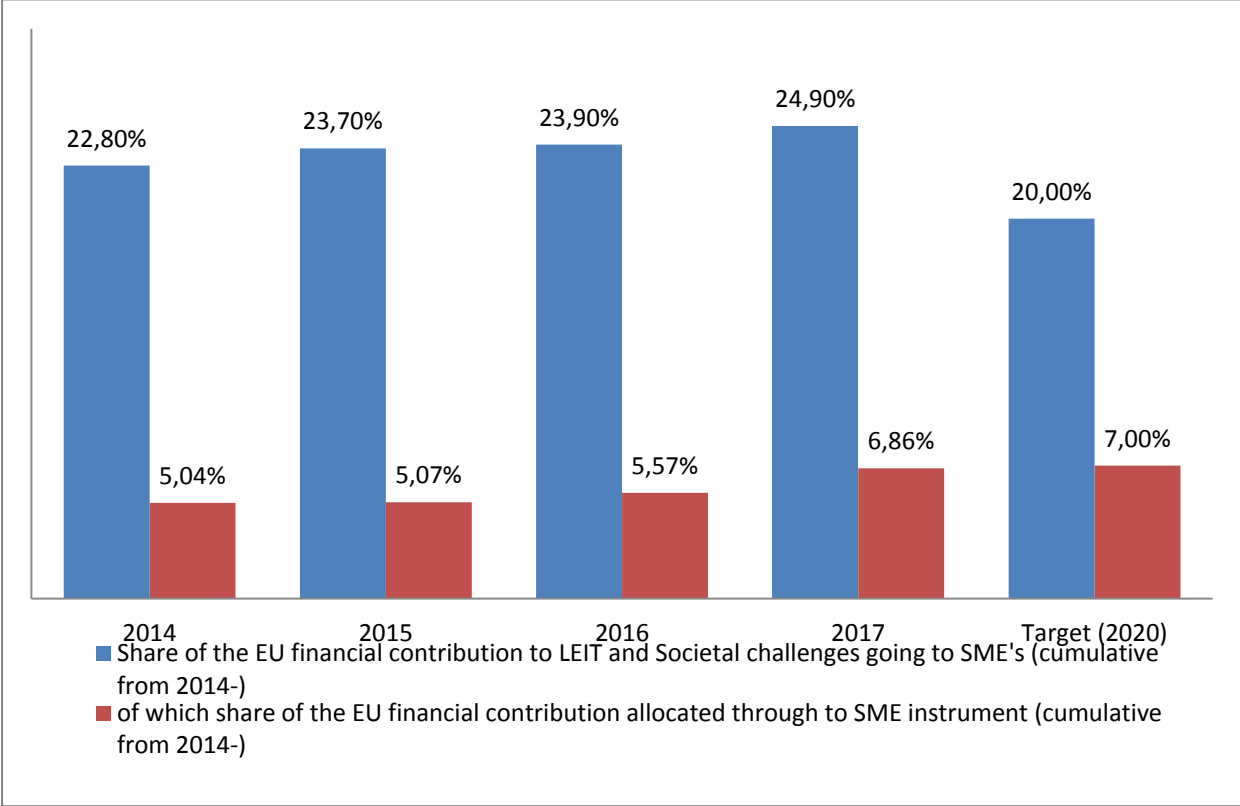
The Lamy Panel was very impressed by the simplification of rules and procedures under Horizon 2020, and called it an example for many other EU programmes. As a result, DG RTD has been asked to take the lead on the development of the IT tools for grant management for the Commission as a whole (the **SEDIA** project). This shows the impressive knowledge and performance of our IT team as part of the Common Support Centre (CSC). Since the job of simplification is never complete, DG RTD launched in 2017 a second wave of simplification measures, which includes a pilot on lump sum funding. That the DG reached once again a **100% execution of our budget** is notably the result of the first class work done by the RTD Administrative and Financial Units (AFU) and its Executive Agencies. And the Commission was granted the **Discharge** of last year's budget with an error rate much lower than previously.

DG RTD is part of the Core Group of DGs preparing the Commission proposal for **the next Multi Annual Financial Framework (MFF)** (sp. obj. 1.3) of the EU. In Spring 2018, the Commission will present its proposal for the next MFF.

b) Key Performance Indicators (KPIs)

In its Strategic plan for 2016-2020, DG RTD identified five main indicators to report on its achievements. Four of them are related to policy priorities of the Horizon 2020 framework programme and one concerns the administrative performance of the programme management.

Figure 1: KPI 1 Share of funds allocated to SMEs in the Horizon 2020 societal challenges and in the enabling and industrial technologies (LEIT)*, of which share of the EU financial contribution allocated through to SME instrument³**



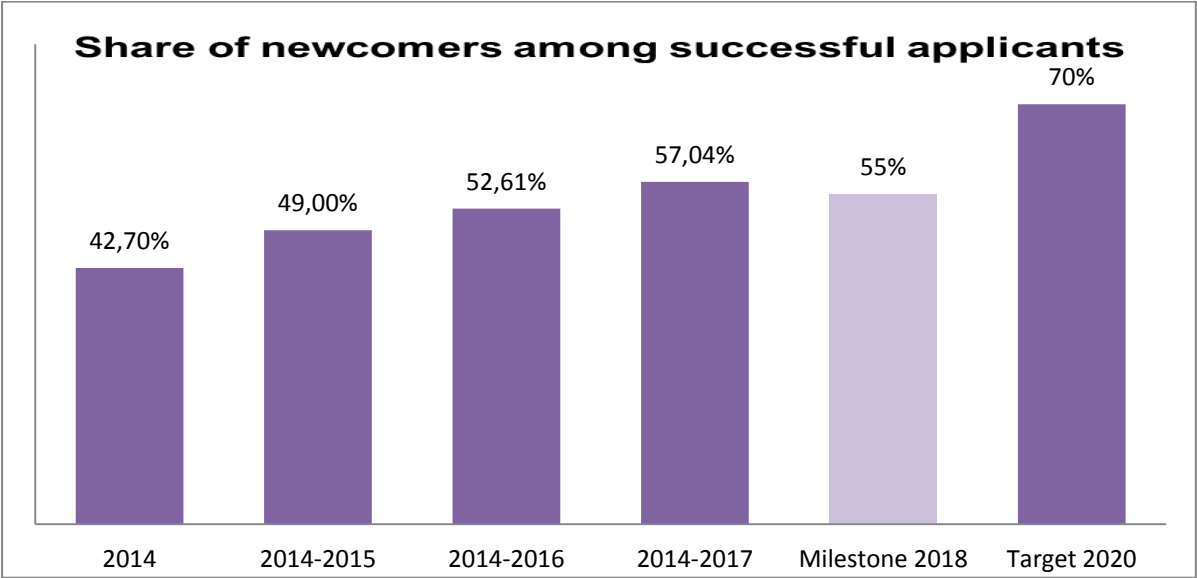
The level of SME participation in the Leadership in Enabling and Industrial Technologies (LEIT) part and the Societal Challenges Pillar of the Horizon 2020 programme continued to rise in 2017. By the end of December 2017, SMEs had received a cumulative EU financial contribution of over € 4 billion out of the total of ca € 17 billion that went to the LEIT part and the Societal Challenges Pillar; the target set by the EU Council and Parliament for 'at least 20%' was exceeded by close to 5 percentage points.

Support for SMEs continued to be provided through the SME Instrument: 865 new SME Instrument actions (616 under phase 1 – feasibility assessment; and 249 under phase 2 - innovation, development & demonstration purposes) were selected for funding in 2017. This helped raise the cumulative share of funds allocated through the SME Instrument to 6.86%; well within reach of the 7.00% target.

³ * Results based on data extracted from CORDA; compilation of budgets allocated to SMEs in the framework of Horizon 2020 grant agreements signed in 2014, 2015, 2016 and 2017.

** Results based on financial commitments under the different parts of the Horizon 2020 Work Programmes 2014-2015 and 2016-2017 contributing to the budget for the SME instrument call.

Figure 2: KPI 2 Share of newcomers among the successful applicants*⁴ (H2020)

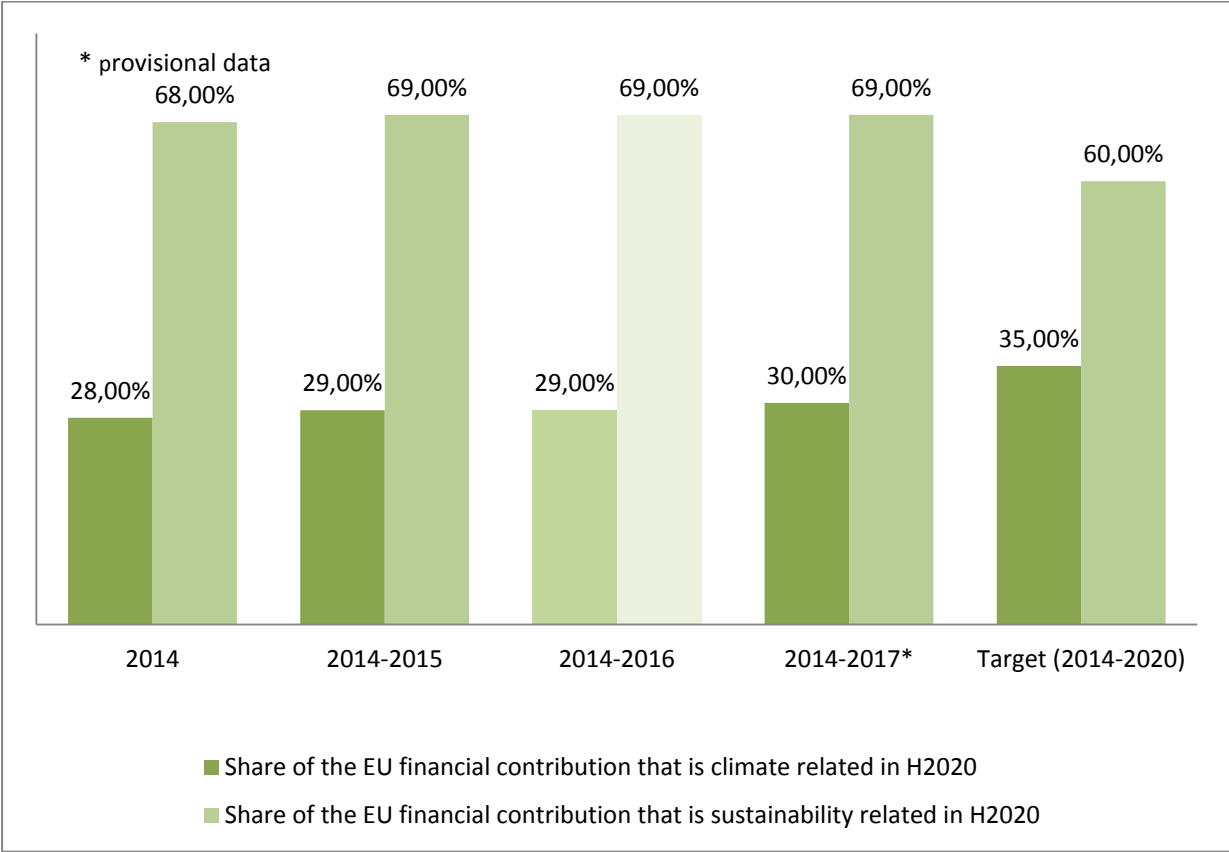


This indicator demonstrates the attractiveness of the Horizon 2020 programme amongst newcomers - those that did not participate in the previous framework programme. It is measured by the number of successful applicants that are newcomers compared to all the successful applicants.

For the time period 2014-2017, out of the 21,377 successful participants, 12,193 (57.04%) were newcomers. The milestone for 2018 has already been surpassed and, given the current trend, the Programme is on track to reach the target of 70% by the end of the Programme.

⁴ Source: CORDA

Figure 3: KPI 3 Climate-related and sustainability-related expenditure (H2020)⁵



Sustainable development and climate in particular, are important cross-cutting priorities of the Horizon 2020 programme.

The Regulation establishing Horizon 2020 states that at least 60% of the overall Horizon 2020 budget should be related to sustainable development. It is also expected that climate-related expenditure should exceed 35% of the overall Horizon 2020 budget.

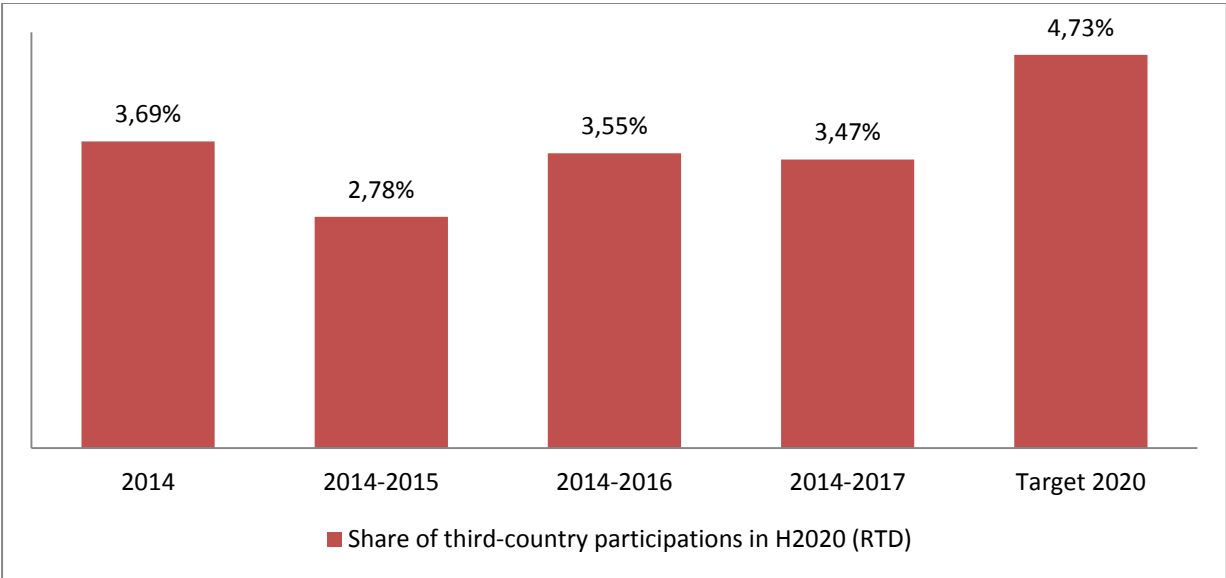
The indicators above show the share of Horizon 2020 expenditure allocated to climate and sustainability related projects. The figures are cumulative for the indicated periods and cover all the projects signed under Horizon 2020. Climate-related expenditure is a sub-set of sustainability related expenditure.

According to the tracking methodology, Horizon 2020 has so far invested € 8.6 billion on climate change and € 20 billion on sustainable development.

The target for expenditure on sustainable development has already been met and largely exceeded. Despite a considerable increase compared to FP7, investment for climate action has not yet reached its target. Attaining the target will remain a challenge, and particular attention and budget have been devoted to climate action in the Work Programme 2018-2020.

⁵ Calculation done by RTD services based on CORDA data and the UN’s Sustainable Development Goals (SDGs) definitions.

Figure 4: KPI 4 The share of third-country participations in Horizon 2020 (DG RTD)*⁶



The share of third-country participations is an indicator of international participation in the programme.

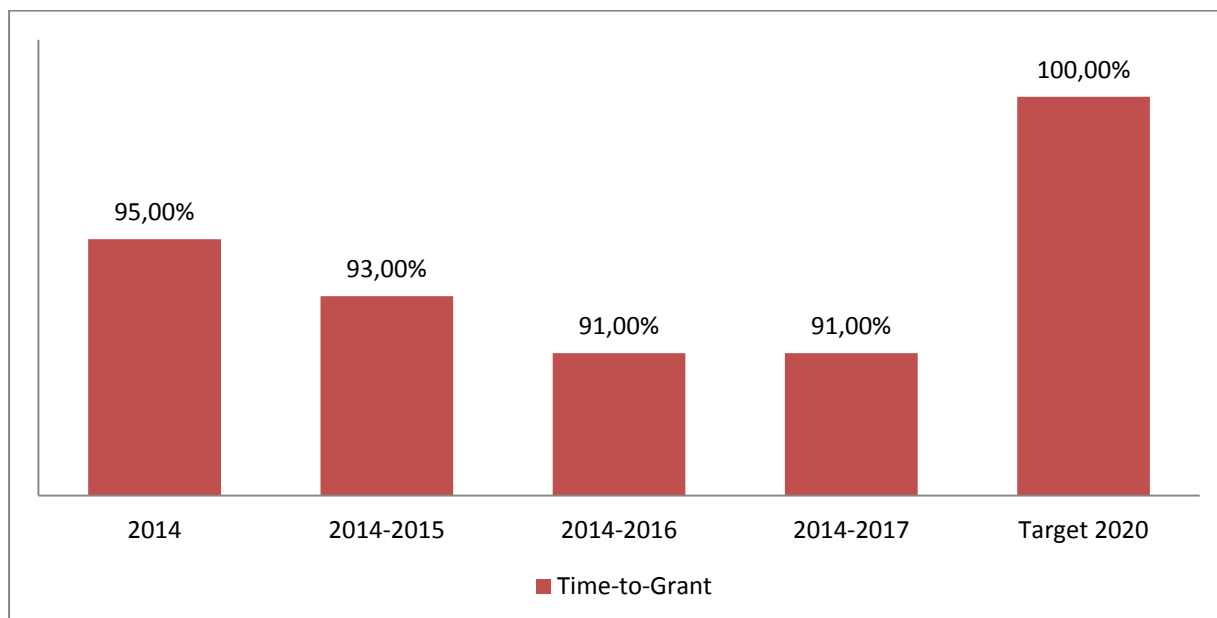
During the period 2014-2017, out of a cumulative 13,171 participations in signed grants in the parts of Horizon 2020 managed by DG RTD, 457 (3.47%) were from third countries.

The participation of third-country beneficiaries has decreased compared to FP7, mainly due the change in eligibility conditions for funding of participants from Brazil, Russia, India, China, and Mexico.

In order to encourage more participation from third-countries, DG RTD introduced the International Cooperation Flagships under Work programme 2018-2020. These are topics of wide scale and scope and are specifically devoted to international cooperation.

⁶*Source: CORDA

Figure 5: KPI 5 Share of grants signed with a time-to-grant within 245 days*⁷



96% of all Horizon 2020 grants signed from 2014-2017⁸ were signed in time (no more than 245 days, except for ERC grants). This is a huge improvement compared to FP7, which had an overall average of 313 days.

During the same period, **DG RTD signed 91% of its own grants in time** (in no more than 245 days) and with an average Time-to-Grant of 216 days. This represents a huge improvement on the DG’s performance under FP7 of 354 days average Time-to-Grant.

Grants for Research Infrastructures are considerably more complex than the average, and these are concentrated in DG RTD. This is why the RTD result, though still very good, is slightly lower than that for Horizon 2020 as a whole. Efforts will be continued during the remaining years of the programme to get even closer to the Horizon 2020 target. These efforts will focus notably on shortening the ‘Time-to-Signature’ (the phase following the informing of successful applicants).

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

In accordance with the governance statement of the European Commission, DG RTD conducts its operations in compliance with the applicable laws and regulations, working in an open and transparent manner and meeting the expected high level of professional and ethical standards.

The Commission has adopted a set of internal control standards, based on international good practice, aimed to ensure the achievement of policy and operational objectives. The financial regulation requires that the organisational structure and the internal control systems used for the implementation of the budget are set up in accordance with these standards. DG RTD has assessed the internal control systems during the reporting year and has concluded that the internal control standards are implemented and function as intended. Please refer to AAR section 2.1.3 for further details.

⁷ *Source: CORDA

⁸ Excluding those of ERCEA

In addition, DG RTD has systematically examined the available control results and indicators, including those aimed to supervise entities to which it has entrusted budget implementation tasks, as well as the observations and recommendations issued by internal auditors and the European Court of Auditors. These elements have been assessed to determine their impact on the management's assurance as regards the achievement of control objectives. Please refer to Section 2.1.4 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. The Acting Director-General, in his capacity as Authorising Officer by Delegation, has signed the Declaration of Assurance, albeit qualified by a reservation concerning FP7 and the Coal and Steel research funding programmes.

d) Provision of information to the Commissioner(s)

In the context of the regular meetings during the year between the DG and the Commissioner on management matters, also the main elements of this report and assurance declaration, including the reservation(s) envisaged, have been brought to the attention of Commissioner C. Moedas, responsible for Research, Science and Innovation.

1. KEY RESULTS AND PROGRESS TOWARDS THE ACHIEVEMENT OF GENERAL AND SPECIFIC OBJECTIVES OF THE DG

1. A New Boost for Jobs, Growth and Investment

A target was set under this Objective, that **the EU should invest 3% of its GDP in R&D** (combined public and private investment: 1% public; 2% private investment) by 2020.

DG RTD has been working on several fronts to achieve the above target.

1.1: To strengthen Europe's R&I systems and achieve the European Research Area through working with Member States

Economic analyses and foresight studies to strengthen the evidence base for R&I Policy in Europe

DG RTD performs **economic analyses** to strengthen evidence-based R&I policy-making in Europe. In 2017, it produced or contributed to the production of several reports such as the Joint paper with DG ECFIN on 'Unlocking Investment for Intangible Assets'⁹, a policy paper on 'R&D tax incentives'¹⁰, the EIB Investment Report 2017/2018: 'From recovery to sustainable growth'¹¹ and the report on 'the economic rationale for public R&I funding and its impact'¹².

This last report concluded that **public investment in R&I acts as a catalyst to boost private R&I activities and overall economic growth**. The report found that roughly two thirds of economic growth in Europe from 1995 to 2007 can be traced back to R&I. It underlined that the role of public R&I investment is especially important in light of today's rapidly changing and riskier innovation landscape.

DG RTD conducts **foresight** studies to support the development of proposals for the Framework Programme and its biannual work programmes. During 2017, foresight studies focused on the reflection towards the Framework Programme for the post 2020 period. Key milestones for the year included the publication of three reports: The publication of the Expert Group on Strategic Foresight in EU Policy and two reports from the BOHEMIA project¹³, which aim to support the preparation of the Commission's Proposals for future EU R&I policies.

Benchmarking of EU Performance in Innovation

DG RTD monitors the innovation performance of its Member States as well as that of its

⁹https://ec.europa.eu/info/publications/economy-finance/unlocking-investment-intangible-assets_en

¹⁰<https://publications.europa.eu/en/publication-detail/-/publication/d9ae78f3-9f41-11e7-b92d-01aa75ed71a1/language-en>

¹¹ <http://www.eib.org/infocentre/publications/all/investment-report-2017.htm>

¹²<https://publications.europa.eu/en/publication-detail/-/publication/0635b07f-07bb-11e7-8a35-01aa75ed71a1/language-en>

¹³<https://publications.europa.eu/en/publication-detail/-/publication/b2d78a84-3aae-11e7-a08e-01aa75ed71a1/language-en>; <https://publications.europa.eu/en/publication-detail/-/publication/d1ea6c83-e538-11e7-9749-01aa75ed71a1/language-en/format-PDF/source-60761593>

global competitors. In 2017, new editions of the **European Innovation Scoreboard**¹⁴ and the **EU Industrial R&D Investment Scoreboard**¹⁵ were published providing a benchmark of innovation performance across countries and main business R&D trends respectively.

European Semester

DG RTD identifies each Member State's key R&I policy challenges (i.e. the main bottlenecks impeding the full contribution of research and innovation to growth), assesses how the Member States respond to those challenges, and contributes to the Country-Specific Recommendations as necessary.

As part of the 2017 European Semester, the Commission released the **Country Reports** with substantial and pertinent R&I content on 22 February 2017. The Research and Innovation aspects of the Commission's Semester Country Report are included in the annual compendia¹⁶ made available via the Policy Support Facility website and distributed to a very large number of stakeholders via regular "newsletter" channels.

The Council adopted **nine Country-Specific Recommendations** (CSRs) to Belgium, the Czech Republic, Germany, Estonia, Spain, France, Ireland, Luxembourg and the Netherlands, addressing R&I issues such as public and private R&D investment, the efficiency of national R&D systems and Member States' innovation capacity.

Throughout 2017, DG RTD engaged in an **in-depth dialogue with Member States'** national administrations around the identified European Semester challenges and policy responses and encouraged Member States to take maximum ownership and actions.

Horizon 2020 Policy Support Facility

DG RTD, through its Horizon 2020 Policy Support Facility (PSF), provides services to Member States and countries associated to Horizon 2020 in their efforts to design, implement and evaluate reforms to their national research and innovation systems. These services took the form of comprehensive Peer Reviews, Specific Supports or Mutual Learning Exercises. Even though the Strategic Plan foresaw a rhythm of 10 PSF actions per year, due to the high interest from Member States and countries associated to Horizon 2020, **14 actions were carried out or launched in 2017**.

The feedback received from Member States on the various exercises carried out by the PSF is very positive, and the PSF builds on this feedback during the reference period of this Plan.

Synergies with the Structural and Other Funds and Policies

DG RTD seeks to promote investment in R&I through other funds beyond Horizon 2020 and to embed R&I Policy considerations in other EU Policy areas.

A Communication on '**Strengthening Innovation in Europe's Regions: Towards resilient, inclusive and sustainable growth at territorial level**' was adopted in July 2017. DG REGIO was chef de file with DGs RTD, GROW and JRC as co-responsible.

¹⁴ http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

¹⁵ <http://iri.jrc.ec.europa.eu/scoreboard17.html>

¹⁶ <https://rio.jrc.ec.europa.eu/en/library/research-innovation-european-semester-country-reports-2017> to access last year's compendium.

The Communication and related Staff Working Document include proposals which aim to increase regional cooperation in innovation investment, consolidate reform of regional innovation systems and harness synergies between EU policies and instruments.

In order to further strengthen the synergies between Horizon 2020 and ESIF, a **'Synergies Action Plan'** was signed by Directors General Robert-Jan Smits and Marc Lemaître (DG REGIO) in April 2017.

Moreover, in 2017, DG RTD launched, through the Horizon 2020 Policy Support facility, a specific **'Mutual Learning Exercise on Widening participation'** and ensuring synergies between the EU Research and Innovation programmes and Cohesion Policy.

The **'Seal of Excellence Certificate'** can be awarded to proposals under the *SME Instrument*, the *Marie Skłodowska-Curie actions (MSCA) Individual Fellowships* or *Teaming* projects that are above the necessary quality threshold, but for which there is insufficient Horizon 2020 budget. The idea is that the holder of this 'Seal of Excellence Certificate' can thus approach and attract alternative regional, national, private or public funding sources.

The **'Explanatory Note on the application of state aid rules to the Seal of Excellence'**, adopted in January 2017, simplifies the application of the General Block Exemption Regulation rules to the 'Seal of Excellence' proposals. In addition, for the future, DG RTD agreed in 2017 with DG COMP to explore ways to improve the state aids regime for innovation and facilitate the use of national and ESIF funding to co-fund EU-supported research and innovation actions.

By the end of 2017, **8,781 'Seals' (2,744 phase 1 & 6,037 phase 2) had been awarded** to SME Instrument project proposals. The number of MS/regions members of the Seal Community of Practice grew to around 240.

In 2017, **25 Seal schemes were launched at national and or regional level** in a total of 13 EU countries. This exceeds the target of 10 schemes foreseen for 2017, and even the 20 foreseen for the overall 2020 period.

European Research Area

As set out in Article 179 of the TFEU, the Union has the objective of achieving a European research Area (ERA) in which researchers, scientific knowledge and technology circulate freely. DG RTD is in the lead of several initiatives contributing towards achieving the ERA:

In September 2017, DG RTD published the **Staff Working Document (SWD) on the Long-Term Sustainability of Europe's Research Infrastructures**¹⁷. The SWD identifies a number of priority actions to be taken in support of the sustainability of Research Infrastructures with a medium to long-term vision.

Throughout 2017, the **European Strategy Forum on Research Infrastructures** (ESFRI) focused on the preparation of its 2018 Roadmap, which will further strengthen and structure the Research Infrastructures ecosystem in Europe. In particular, ESFRI received 12 proposals for new Pan-European Research Infrastructures, which are under evaluation, and carried out an assessment of progress of the ongoing initiatives, identifying bottlenecks for their implementation.

¹⁷ https://ec.europa.eu/research/infrastructures/pdf/swd-infrastructures_323-2017.pdf

In 2017, four new **ERICs** were established, namely: LifeWatch¹⁸ hosted by Spain, CESSDA¹⁹ and ECCSEL²⁰ both hosted by Norway and INSTRUCT²¹ hosted by the United Kingdom. The total number of established ERICs was 17 by the end of the year. Two new ERIC applications were launched in November 2017 for inter service consultation: a) EU-OPENSREEN²², hosted by Germany and b) EMBRC²³, hosted by France. The second ERIC Implementation Report²⁴ was launched in November 2017 for inter service consultation.

Euraxess²⁵ is a unique pan-European initiative delivering information and support services to professional researchers, backed by the European Union and its Member States. It provides an on-line platform for job market search for researchers. In 2017, it celebrated the first year anniversary of its revamped portal with 28.000 jobs on offer. During 2017, it attracted 10 million page views and 30.000 registered researchers. It is also the gateway to **Science4Refugees**, a Commission initiative helping refugee researchers find suitable jobs in today's challenging research landscape.

RESAVER (Pan-European Pension Fund for Research Professionals) aims at strengthening the European Research Area by enabling mobile employees to move between different countries and change jobs without losing their supplementary pension. In 2017, RESAVER became fully operational with the first contributions paid into the fund. RESAVER now needs to achieve a critical mass of participating organisations to ensure that it becomes successful and fulfils its goals.

Encouraging effective innovation and investment in thematic areas

In 2017, DG RTD carried out a **review**²⁶ **of the March 2012 EU Bioeconomy Strategy**. Following this review, and in light of the new political context stemming from the establishment of the United Nations Sustainable Development Goals (SDG) and the Paris Agreement of 25 September 2015, DG RTD, in close collaboration with relevant Commission services, will update the Commission's Bioeconomy Strategy and Action Plan in 2018.

In 2017, DG RTD started preparing a **Staff Working Document on the 'research and innovation response to the threat to human health from emerging and re-emerging infectious diseases'**, to be completed by Q2 2018 in preparation of the Commission Communication on 'Improving Health Security in the EU - a one health approach to counteracting the threat from infectious diseases'.

Also in the area of health, the **International Rare Diseases Research Consortium (IRDIRC)** to which DG RTD actively contributes, achieved its objective of delivering 200 new therapies for rare diseases three years earlier than foreseen, demonstrating the added value of the European Union's commitment to addressing global health challenges together with partners from other continents. Moreover, DG RTD together with DG

¹⁸ e-Science and Technology European Infrastructure for Biodiversity and Ecosystem Research

¹⁹ Consortium of European Social Science Data Archives

²⁰ European Carbon Dioxide Capture and Storage Laboratory

²¹ Integrated Structural Biology

²² European Infrastructure of Open Screening Platforms for Chemical Biology

²³ European Marine Biological Resource Centre

²⁴ in full: "Report on the Application of Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community legal framework for a European Research Infrastructure Consortium (ERIC)"

²⁵ <https://euraxess.ec.europa.eu/>

²⁶ SWD(2017)374

SANTE developed in 2017 the '**European One Health Action Plan against Antimicrobial Resistance (AMR)**', adopted on 29 June 2017. The Antimicrobial Resistance Joint Programming Initiative (JPI AMR) published its fifth call for transnational research projects, in partnership with 15 countries. In the first half of 2017, India, South Africa and Egypt joined the JPI AMR, demonstrating the global coordination and collaboration efforts of this EU-led initiative.

In July 2017, a **High-level Strategy Group on Industrial Technologies** was set up. The group, which includes representatives from industry, universities, research and technology organisations, the finance sector, trade unions and the OECD, will advise the Commission on how to further develop the existing strategy on Key Enabling Technologies (KETs) and how to adapt it in light of the ongoing rapid changes in the industrial environment. Preliminary recommendations from the group include a stronger orientation of KETs to societal needs, the confirmation of the six existing KETs, and expanding the scope of KETs by a few additional high-potential technologies.

Through close collaboration with DG AGRI, DG RTD actively contributed to the **communication on the modernisation of the new Common Agricultural Policy (CAP)** published on 29 November 2017, and in particular to the main section on Research and Innovation. For the first time, Research and Innovation are deemed critical to the success of the modern CAP in its goal of becoming more sustainable. The CAP can only meet these challenges if innovation moves from being an option to being fully embedded in the CAP. Both DGs agreed a joint paper for Commissioners Hogan and Moedas called "Innovation for sustainability in FP9 and the CAP – Harnessing the full potential of Research and Innovation for food and nutrition security and the sustainable management of natural resources".

In 2017, DG RTD published a Policy Review on **Social Innovation (SI)**²⁷. This Policy Review paper examines the place of Social Innovation in Research and Development projects, especially those funded by the EU. It also assesses the relevance of the SI concept and SI research in collective action, policy making and socio-political transformation in Europe today. The paper being one of the key position papers, it was presented at the Conference 'Opening up to an ERA of Social Innovation' at Lisbon, on 27-28th November 2017.

1.2: To establish the right framework conditions to capitalise on the results of European research and innovation by involving all actors in the innovation process ("Open Innovation")

Boosting investment and excellence in innovation

The **European Innovation Council (EIC) pilot**²⁸ was launched with the adoption of the new Horizon 2020 Work Programme for 2018-2020. The EIC will allow for more investment in true breakthrough market—creating innovation, the type of innovation with the highest potential for new job creation and growth acceleration.

The EIC pilot aims to support top-class innovators, start-ups, small companies and researchers with bright ideas that are radically different from existing products, services or business models, are highly risky and have the potential to scale up internationally. The pilot phase offers in a single place:

- € 2.7 billion in funding for the period 2018-2020 (financed through existing

²⁷ https://ec.europa.eu/research/social-sciences/pdf/policy_reviews/social_innovation_trigger_for_transformations.pdf

²⁸ <https://ec.europa.eu/research/eic/index.cfm>

budgets)

- Opportunities for networking, mentoring and coaching
- Strategic advice to upgrade the innovation ecosystem in Europe

Moreover, the pilot brings together several innovation support schemes such as the SME Instrument, the Fast Track to Innovation (FTI), Future and Emerging Technologies (FET) Open, and Horizon Prizes; and will test 'Blended finance', i.e. the combination of grant support with equity and/or loan guarantees.

It introduces a number of reforms, notably a fully 'bottom up' approach with no predefined topics, face-to-face interviews for the most promising proposals in the SME instrument phase 2 and the appointment of new high level expert evaluators with a strong innovation profile.

An independent High Level expert group of innovators has assisted the European Commission helping co-design the shape of a full-fledged EIC and producing a full set of recommendations in a report published on 24 January 2018 entitled '**Europe is back: Accelerating breakthrough innovation**²⁹'.

In order to recognise and reward excellence in Innovation, DG RTD launched the '**European Capital of Innovation Award**³⁰' in March 2017. The winning city of 2017 (Paris, France) was rewarded with a prize of € 1 million to help scale up its innovation efforts.

Moreover, in 2017 DG RTD launched its fifth edition of the '**EU Prize for Women Innovators**³¹' to award women entrepreneurs who have achieved outstanding innovations and brought them to market.

With respect to the '**Fund-of-Funds**', several fund managers have been pre-selected by the Commission. A due diligence process by the European Investment Fund (EIF) is ongoing. Due to the adoption on 5 December 2017 of the conclusions of the Council of the European Union on the EU list of non-cooperative jurisdictions for tax purposes, the first announcement has been postponed to the first half of 2018.

Under the **InnovFin** programme for Infectious Disease, four new loans were signed in 2017 (€ 80 m total). Since the instrument's inception, DG RTD, in collaboration with the European Investment Bank (EIB) has committed via debt financing € 125 million of investment and disbursed € 31 million.

InnovFin Energy Demonstration Projects (EDP) supports innovative first-of-a-kind projects (including manufacturing plants and services) at a pre-commercial stage covering clean energy technologies, storage and batteries, smart grids, and carbon capture utilisation and storage. Until now, InnovFin EDP has supported two operations for a total of € 24.5 million in loans for € 49 million total project costs in the areas of wave energy and advanced PV manufacturing.

Moreover, by the end of 2017, **EFSI** approved loans of ca € 8.65 billion to Research and

²⁹ https://ec.europa.eu/info/sites/info/files/eic_hlg_bz_web.pdf

³⁰ <https://ec.europa.eu/research/prizes/icapital/index.cfm>

³¹ <https://ec.europa.eu/research/prizes/women-innovators/index.cfm>

Innovation (RDI) Projects, which amounts to 22% of the total amount approved³².

Finally, following the launch of the **Circular Economy Finance Support Platform** on 26 January 2017, DG RTD set up an informal expert Group 'Support to Circular Economy Financing', with the objective to analyse the characteristics of Circular Economy projects and their financing needs, provide recommendations on improving bankability of Circular Economy projects, coordinate activities regarding financing of the Circular Economy, exchange information, and to share best practices.

Identifying regulatory obstacles to investment in innovation

On February 2017, DG RTD set up an intra-DG 'Task Force on the Innovation Principle'. The '**Innovation Principle**' and an associated 'R&I Tool' were introduced by the Commission in 2017 to systematically assess the impact of new EU policy and legislative initiatives on innovation.

The Commission has been piloting the application of the Innovation Principle in the Commission Work Programme 2017, through the application of the **revised 'R&I Tool'** in the impact assessments of six legislative and two policy initiatives related to the 'Low-emission mobility action plan: post-2020 strategy on cars/vans; post-2020 strategy on lorries, buses and coaches', and 'Clean vehicles directive'.

The work on implementing the Innovation Principle in proposals of the Commission continues with the Commission Work Programme 2018. DG RTD has conducted a screening of the initiatives to identify those offering grounds for the application of the innovation principle. The list of priority initiatives is composed of both new and REFIT reviews of current laws, taking into account the opinions of the REFIT platform.

Innovation Deals (ID) were introduced to help innovators facing regulatory obstacles (e.g. ambiguous legal provisions), by setting up agreements with stakeholders and public authorities. The objective of an ID is to provide an in-depth understanding and clarification of how an existing EU rule or regulation applies. If a rule or regulation is confirmed as an obstacle to innovations that could bring wider societal benefits, the ID will strive to design a more innovation-friendly legislation in line with the Better Regulation Agenda.

The Commission signed the first ID 'Sustainable Waste Water Treatment Combining Anaerobic Membrane Reactor Technology and Water Reuse' on 7 April 2017, together with 14 partners from national and regional authorities, universities, innovators and end-users.

The second ID, adopted by the Commission in November 2017, titled: 'From E-Mobility to Recycling: the Virtuous Loop of the Electric Vehicle', is to explore and analyse the existence of perceived legislative and regulatory barriers at EU level to the use of propulsion batteries in a second-life application as energy storage in buildings.

In December 2017, DG RTD presented proposals to expand the concept of IDs to other policy areas beyond the Circular Economy.

Within the framework of **modernising state aid**, and guided by the collaboration with respect to the 'Seal of Excellence' projects, DG RTD agreed in 2017 with DG COMP to explore ways to improve the state aids regime for innovation and facilitate the use of national and ESIF funding to co-fund EU-supported research and innovation actions.

³² http://www.eib.org/efsi/efsi_dashboard_en.jpg

1.3: To ensure an effective and efficient implementation of Horizon 2020 and other RTD programmes and maximise synergies

Contributing to New Framework Programme

As part of the next 'Multi-Annual Financial Framework beyond 2020' and the so called 'next generation programmes' mentioned in President Juncker's letter of intent, DG RTD started in 2017 preparations for the production in 2018 of the policy package for the future **Framework Programme for Research and Innovation ('FP9')**. The areas for improvement identified in the Interim Evaluation of Horizon 2020 have been taken up in these preparations, with an impact assessment for that programme expected to be published in May 2018 together with the adopted FP9 proposals.

The European Parliament ITRE committee, in its recommendations on FP9, highlighted that the 'EU has the potential to become a world-leading global centre for research and science; believes, furthermore, that in order to promote growth, jobs and innovation to this end, FP9 has to become a top priority for Europe'.

Building on the success of Horizon 2020, and following the recommendations of the Interim Horizon 2020 evaluation, the 'Lamy' and ITRE committee reports, and in the spirit of the 'White Paper on the Future of Europe', which identifies innovation as a priority for Europe's future, the **FP9 Concept Paper** (coordinated with all R&I DGs) has the aim to establish FP9 as the R&I programme of reference in Europe under the next Multi-Annual Financial Framework.

Horizon 2020 Work Programme 2018-2020

The Work Programme 2018 – 2020³³ for Horizon 2020 was adopted in October 2017, covering the budgetary years 2018, 2019 and 2020 and representing an investment of around € 30 billion.

Taking into account its Interim Evaluation and the Commission Political Priorities, the Work Programme includes measures to support market-creating innovation (most notably the introduction of the **European Innovation Council (EIC) pilot** with a budget of € 2.7 billion) and highly integrated activities called 'focus areas'; it provides more emphasis on better dissemination of results and a focus on open access to data. The Work Programme also includes measures to increase simplification (e.g. lump sum funding), to widen participation from less performing countries, and to address skills mismatches.

The **ERC work programme 2018**³⁴ {C(2017) 5307} was also published in August 2017 with a budget of € 1.87 billion for 2018.

Horizon 2020 - Implementation of the Work Programme 2017

Horizon 2020 is the EU Framework Programme for Research and Innovation. With a total budget of € 76.4 billion (in current prices) for the period 2014-2020 (€ 74.8 billion for Horizon 2020 (2014-2020) and € 1.6 billion for Euratom (2014-2018)), it provides a

³³ [http://europa.eu/rapid/press-release MEMO-17-4123_en.htm](http://europa.eu/rapid/press-release_MEMO-17-4123_en.htm)

³⁴ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:C2017/251/03>

major opportunity for boosting innovation and growth in the EU.

As mentioned in the **Programme Statement of Horizon 2020**, the first four years of the programme (2014-2017) were fully implemented, with a budget of around € 30 billion, which represents around 40% of the total for 2014-2020. By the end of 2017, around 150,000 eligible proposals had been submitted to Horizon 2020 calls. Over 15,000 grant agreements with around 80,000 participations had been signed. The proposal success rate remained low at about 12% (compared to 19% in FP7), which demonstrates the great interest in the programme and the competitiveness of the selection process.

It is worth noting that, in 2017, 24.90% of the combined budgets for 'Societal Challenges' and 'Leadership in Enabling and Industrial Technologies' – over € 4 billion in funding – went to SMEs; this meant that the goal for SME budget participation set in the EU Regulation establishing Horizon 2020 was exceeded by over 4%. Moreover, with slightly over € 1.1 billion awarded through the SME instrument calls, the budget allocated through the SME Instrument reached 6.86%, already very close to the target of 7% set for the entire Programme duration.

In terms of legal entity participation across Horizon 2020, 20.8% of all participations were SMEs. 57.04% of successful applicants were newcomers, well on the way to achieve the target of 70% newcomers during the lifetime of the Programme.

The added value of the Horizon 2020 Programme is demonstrated through a long list of examples listed in its Programme Statement for the Draft Budget 2019.

Horizon 2020 mid-term Evaluation

The Communication on the **Interim Evaluation of Horizon 2020** (adopted on 11 January 2018) demonstrated the added-value of the programme as well as the value of the simplifications introduced and the efficiency of its implementation. Below are some results that highlight the programme's success:

- Horizon 2020 is a very attractive programme for researchers. There are around 33000 applications per year, 66% up from FP7;
- More than half the applicants are newcomers, and the contribution to SMEs exceeds comfortably the 20% target;
- It is more efficient, cheaper to implement and with better and faster procedures. For example, the time taken to sign contracts is more than 100 days less than in FP7.

The Interim Evaluation was also an important opportunity to steer the debate internally and externally on future R&I in Europe and to deliver on the Commission's Better Regulation Agenda. The main purpose of the comprehensive interim evaluation of Horizon 2020 was to draw lessons for the future based on an analysis of both its strengths and weaknesses.

The 'Lamy' Report

Extensive stakeholder feedback was also obtained through the forward-looking report '**LAB – FAB – APP – Investing in the European future we want**' of the High Level Group chaired by Pascal **Lamy**, which calls for 'an evolution, not a revolution', but one that will set a new level of ambition for the EU's global leadership in science and innovation.

Paving the way to FP9, the Lamy report recommends that the European Union should

align its investment with that of its main partners; that it should build a true EU innovation policy that creates future markets; that it should 'educate for the future' and invest in people who can bring about change; and that it should adopt a **mission-oriented, impact-focused approach** to address global challenges.

Mid-term review of all contractual PPPs

DG RTD completed the mid-term review of all Contractual Public-Private Partnerships (cPPPs) in September 2017.

The findings of the review were published on 9 October 2017 and discussed with the Member States in the Council and ERAC. The Expert Group that carried out the review considered cPPPs to be a very important instrument supporting a stronger bottom-up approach with industry when defining priorities for applied research and innovation. Recommendations covered openness of the implementation processes and programming; synergies with other EU-actions; and actions and programming on national and regional level.

Joint Undertakings

The Commission Staff Working Document on the Executive Summary of **Interim Evaluation of Joint Undertakings (JUs)** operating under Horizon 2020 (SWD(2017)338), was adopted on 6 October 2017. The Interim evaluations of each Joint Undertaking under Horizon 2020 as well as the Final evaluations of each undertaking operating under FP7 can be found on the following Commission Website: https://ec.europa.eu/research/evaluations/index.cfm?pg=input_studies.

➤ IMI

The evaluations recommended that: (a) Stronger efforts be made to attract and integrate other industries than pharmaceuticals in the collaborative projects; (b) Better Key Performance Indicators be developed; (c) More efforts be deployed to attract more SMEs; (d) Access to project outcomes be broadened, and sustainability of project results be improved, to increase impact; (e) Intellectual Property policy be reviewed to make it more flexible to respond to the needs allowing negotiations on exclusive rights.

➤ Clean Sky

The evaluations concluded that Clean Sky 1 has met its objectives and that Clean Sky 2 is on a good path. Nevertheless, there are a number of remarks that need to be assessed, in particular in terms of governance and control.

➤ BBI (Biobased Industries)

The interim evaluation of the BBI JU concluded that the BBI JU has provided a structuring effect, bringing together the sectors and actors towards deployment of new value chains, and it has mobilised increasing investments on developing innovations for the bio-based industries. The SME participation rate far exceeded the overall target of 20%. Thus far, the BBI JU has leveraged € 2.6 euro from the industry for every euro of Union contribution.

Also regarding the BBI JU, in view of enabling constituent entities of the Bio-based Industries Consortium (BIC) to fulfil their financial obligation towards the BBI JU, on 22 February 2017 the Commission adopted a proposal to amend the Council Regulation establishing the BBI JU (COM(2017) 68). On 23 January 2018 the Council adopted the proposed amendment, which entered into force on 15 February 2018.

➤ Fuel Cells Hydrogen

The Interim Evaluation of the FCH 2 JU concluded that the JU remains relevant under H2020, and has made significant progress towards its objectives. A few recommendations were made, notably on the relationship with the Member States and other advisory bodies, as well as alignment with other Commission programmes.

Euratom

According to the **Programme Statement of the Euratom Programme**, progress has been made in terms of the specific objectives of the Programme. Most notably, in the area of nuclear safety, 23 new projects (joint research and/or coordinated actions) likely to lead to a demonstrable improvement in nuclear safety practice in Europe were signed in 2017. Moreover, 10 new projects were signed in 2017 contributing to the development of safe long term solutions for the management of ultimate nuclear waste.

The **Euratom 2018 Work Programme** was adopted with actions proposed addressing research challenges important for nuclear safety, waste management and radiation protection. A new approach is put forward in the area of waste management in the form of a European Joint Research Programme (EJP) for the management and disposal of radioactive waste. In addition, the Euratom WP 2018 places emphasis on research for decommissioning of nuclear installations as well as the promotion of innovation, education and training, and access to research infrastructures.

Since the Euratom Treaty only allows for a 5-year research programme, the Commission adopted a **proposal for a Council Regulation establishing the Euratom Research and Training Programme 2019-2020**. This proposal has the same objectives and the list of activities as in the current Euratom programme 2014-2018.

The proposal for extension of the Euratom programme was accompanied by a report from the Commission to the Council and the Parliament on the **Interim Evaluation of the Euratom Research and Training Programme 2014-2018**. The accompanying Commission Staff Working Documents provide a detailed evaluation of direct and indirect actions of the programme.

Research Fund for Coal and Steel

The revision of the RFCS legal base – Council Decision (EU)2017/955 – was adopted on 29 May 2017. This revision aligns the RFCS with Horizon 2020 rules.

39 grant agreements have been signed in 2017.

The RFCS programme has contributed to EU policies related to both steel and coal. The 'Future of European Steel' conference organised by DG RTD on 8 March provided the different Commission services (CLIMA, ENER, GROW and TRADE) the opportunity to present a comprehensive view on the challenges and possible options to maintain steel production in Europe. The key role of steel was later underlined in the Lamy report (as an example of mission for FP9) and in the Commission Communication 'A renewed EU Industrial Policy Strategy' - COM(2017)479. On coal, the RFCS contributed to the success of the launching of the 'Platform for Coal Regions in Transition' led by Vice-President Šefčovič.

Disseminating and boosting the exploitation of research results

The **'Dissemination and Exploitation Strategy'** (D&E strategy) of the R&I family defines how data and results generated by the Framework Programmes can be accessed and optimally utilised: internally to support policy making; and externally to achieve better impact.

Led by the Common Support Centre (CSC), an integral part of DG RTD, most actions of

the D&E strategy for 2015-2017 have been finalised. Based on the lessons learned from this strategy, and the need to anticipate for FP9, the CSC has proposed a **new D&E strategy** for the remaining years of Horizon 2020.

In addition to the Projects for Policy (P4P) initiative, the Common Support Centre (CSC) launched in September 2017 the **Horizon 2020 Dashboard**³⁵ which provides an enhanced and user-friendly reporting environment for Horizon 2020 projects and proposals. The CSC also implemented an IT tool to search and visualise information and research outputs from FP6, FP7 and Horizon 2020 (IRIS - Information Retrieval & Insight Software).

The 'Common Exploitation Booster' (CEB) helps projects develop exploitation measures and has a budget of € 1.6 million. 89% of the contracted 195 support services have been delivered. The first report indicated the active participation of more than 600 organisations with a satisfaction rate of 64% on the usefulness of the findings and recommendations (April 2017).

The 'Common Dissemination Booster' (CDB) started in July 2017 with a budget of € 0.7 million. It aims to build and foster the dissemination capacity of groups of projects. Six specific contracts have been signed since then and the first services have been provided in December 2017.

In the area of feedback of research results into policy making, and demonstrating the impact of the results of the projects funded under the FP7 Cooperation Programme, the CSC has designed, published and evaluated a tendering procedure for a new framework contract for 'Tracking Research Results', which will be used to systematically collect the outputs, outcomes and impacts of project results.

2. A Connected Digital Single Market

2.1: To increase impact and excellent science through openness ("Open Science")

Open Science – Open Access and Open Data

During 2017, DG RTD further developed and monitored **Open Access and Open Data** policies and started to prepare for Open Science in the next framework programme.

The proposal on EU copyright legislation³⁶ adopted by the Commission for modernising the EU copyright rules includes a mandatory exception for text and data by public interest research organisations, which corresponds to one of the two options supported by DG RTD. The proposal also aims to grant additional protection to press publications, with a definition of press publications which explicitly excludes periodical publications for scientific or academic purposes. Ensuring that this distinction/exclusion remains in the directive is important.

The **Open Science Policy Platform (OSPP)** delivered its first reports on 'Altmetrics' in March 2017 and 'Open education and skills, Rewards and incentives' in July 2017.

In 2012, the Commission issued a Recommendation (C(2012) 4890) to Member States on **Access to and preservation of scientific information**. This Recommendation covered improving policies and practices on open access to scientific publications and

³⁵ <http://webcorda.rtd.cec.eu.int/dashboard/index.cfm>

³⁶ <https://ec.europa.eu/digital-single-market/en/news/proposal-directive-european-parliament-and-council-copyright-digital-single-market>

research data, as well as the preservation and use of scientific information. The second report on action taken by the Member States in response to the above Recommendation (2nd report from the National Points of Reference) is expected to be published in Spring 2018.

European Open Science Cloud

The preparations for the launch of the **European Open Science Cloud** continued during 2017. Once set up, this Cloud will offer 1.7 million European researchers and 70 million professionals in science and technology a virtual environment with free at the point of use, open and seamless services for storage, management analysis and re-use of the data that is linked to their research activities, across borders and scientific disciplines. It will support the development of 'big data' in research and innovation.

After adoption of the Communication on a European Cloud Initiative, jointly prepared by DG RTD and DG CNECT, the implementation roadmap was prepared. An EOSC Declaration was finalised in view of wide diffusion to stakeholders in September 2017 and a first Stakeholders Forum was held in November 2017.

The European Open Science Cloud pilot ('EOSCpilot') was launched as expected on 1 January 2017 for a duration of 2 years and supported by a € 10 million grant from the Horizon 2020 Work-Programme 2016-2017. It will support the first phase of development, notably the governance framework, pilots integrating services and infrastructures in a number of scientific domains and engagement with a broad range of stakeholders to build the trust and skills required.

Research Integrity

The public needs full trust in science, and this can only be achieved if the highest levels of research ethics and integrity are guaranteed. Research integrity goes hand in hand with the Open Science agenda to ensure open access to scientific publications and data.

In 2017, DG RTD contributed to the revision of the '**European Code of Conduct for Research integrity**³⁷', published in March 2017. According to this code, good research practices are based on the fundamental principles of research integrity: reliability, honesty, respect, accountability.

Ethics in Science and New Technologies

Following Commission Decision (2016/835), President Juncker and Commissioner Moedas confirmed that ethical questions need a dedicated Group of experts at the highest level. DG RTD oversaw the launch, and took over the Secretariat of the '**European Group on Ethics**³⁸' whose mandate, since its inception in 1991, has been to provide high quality and independent advice (opinions) to the President, and to the College of Commissioners, on ethical aspects of science and new technologies with regard to legislation and policies.

Supporting the Commission with high quality, timely and independent scientific advice for its policy-making activities Scientific Advice Mechanism (SAM)

The **Scientific Advice Mechanism** High Level Group (SAM HLG) issued a scientific opinion on Cybersecurity in the European Digital Single Market in March 2017.

This opinion has been taken into account in the joint Commission and High

³⁷ <http://ec.europa.eu/research/index.cfm?na=na-240317-1&pg=newsalert&year=2017>

³⁸ <https://ec.europa.eu/research/ege/index.cfm?pg=home>

Representative Communication on 'Resilience, deterrence and defence: building strong cybersecurity for the EU', published on 13 September 2017. The Communication presented a range of measures to further strengthen the EU's cybersecurity structures and capabilities.

The SAM HLG also issued an 'Explanatory Note on New Techniques in Agricultural Biotechnology' in April 2017.

Moreover, the SAM HLG issued a scientific opinion on 'Food from the Oceans' in November 2017. The use of this opinion in the development of EC policies or legislation in 2018 will be reported on in AAR 2018.

2.2: Embedding digital into the grand societal challenges

DG RTD contributed to the Commission Communication on the **State of play of the Commission's Digital Single Market strategy (COM(2017) 228 final)**, adopted on 10 May 2017. The digitisation of health and care has been introduced as an important element of this mid-term review.

As a follow-up, DG RTD together with DG SANTE and DG CNECT launched a specific initiative on digital innovation in health and care (**DigiCare**) for the benefits of citizens and health systems in Europe. A Commission communication is expected to be adopted in early 2018.

DG RTD also contributed to the **Digitising European Industry (DEI)** initiative. DG RTD contributed to the reports of two working groups: 'Digital Innovation Hubs' and 'Leadership in Digital Industrial Platforms'.

Moreover, DG RTD allocated ca € 700 million of its Horizon 2020 budget to the focus area on 'Digitising and transforming European industry and services' of the Work Programme 2018-2020.

In 2016, to ensure a co-ordinated approach and to address the challenges faced by the European automotive industry, the Commission launched a High Level Group for the automotive industry: GEAR 2030. Among the three work areas of this group, DG RTD contributed actively to the one regarding **connected and automated vehicles**: during 2017, DG RTD, through its participation in the relevant project teams of GEAR 2030, contributed to recommendations for the adaptation of the policy and regulatory EU framework for automated and connected vehicles. DG RTD also helped define priorities to be addressed by financing instruments to support a fast development and implementation.

With regards to the **C-ITS Communication and the Round-Table on connected and automated driving**, DG RTD provided regular inputs as to the way to accommodate standards existing for automation (ITS G5) and the next standard for connectivity (5G).

3. A Resilient Energy Union with a Forward-Looking Climate Change Policy

3.1: To implement the Research, Innovation and Competitiveness dimension of the Energy Union, together with a forward-looking climate-change policy

State of the Energy Union

DG RTD contributed to the Second progress report on the **State of the Energy Union**³⁹.

³⁹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the

Elements related to the Research, Innovation and Competitiveness dimension of the Energy Union featured in several sections of the Communication. These included the Accelerating Clean Energy Innovation (ACEI) Communication, progress on the SET Plan, the EU's joining of the global Mission Innovation initiative launched in COP21, evidence of the EU's leadership in low-carbon key technologies innovation, the latest figures on EU's total investments in Energy Union R&I priorities, as well as figures on energy costs that affect directly the competitiveness of the European manufacturing industry.

DG RTD coordinates the implementation of all 20 actions presented in the **Accelerating Clean Energy Innovation (ACEI) Communication**⁴⁰. A progress report on their implementation was presented in the November 2017 State of the Energy Union Communication. A detailed account of progress achieved in each action was also made available then.

The Integrated SET Plan

DG RTD is responsible for four out of the 10 **SET Plan Key Actions** to deliver on the Energy Union R&I Priorities: two key actions on renewable energy in relation to the reduction of the costs of the technologies and the improvement of their performance, one key action on carbon capture, storage and use to foster decarbonisation, and a fourth key action on maintaining a high level of safety of nuclear reactors.

Throughout 2017, efforts concentrated on key actions regarding concentrated solar power, wind, photovoltaic, geothermal, ocean, carbon capture storage and use and nuclear safety. Implementation plans take stock of the R&I progress achieved so far and identify specific technological R&I activities, demonstration projects and other general actions that are needed to meet the SET Plan targets set in 2016.

DG RTD also contributes to the Implementation plan for batteries for e-mobility and stationary storage (endorsed in November 2017).

Strategic Transport Research & Innovation Agenda (STRIA)

The **Strategic Transport Research & Innovation Agenda** has been adopted as the Staff Working Document 'Towards clean, competitive and connected mobility: the contribution of Transport Research and Innovation to the Mobility package' on 31 May 2017 as part of the Mobility Package 1. It contains seven roadmaps with concrete actions set in the short and mid-long term. The setting-up of the governance structure and monitoring mechanisms has been launched through the organisation of an informal meeting with MS and 2 ETPs last 21 November 2017.

Mission Innovation

The European Union joined **Mission Innovation (MI)** in June 2016 on the occasion of its first ministerial meeting. MI is a global initiative on clean energy innovation, launched during the United Nations Climate Change Conference 2015 (COP21) in Paris with the aim of reinvigorating and accelerating public and private global clean energy innovation.

DG RTD represents the Commission vis-a-vis the initiative. It provides strategic guidance

European Investment Bank: Second Report on the State of the Energy Union (COM(2017) 53, 1.2.2017)

⁴⁰ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank: Accelerating Clean Energy Innovation (COM(2016) 763, 30.11.2016).

and operational support to the MI Secretariat and contributes to the initiative's seven clean energy Innovation Challenges two of which it leads.

In February 2017, the Commission, through DG RTD, took over the chairmanship of the MI steering committee from the US. DG RTD participated actively in the preparation of the second MI ministerial organised in Beijing in June where the MI action plan up to 2020 was presented. The Commission was represented by Vice President Maroš Šefčovič.

DG RTD is leading MI's Innovation Challenge 5 'Converting sunlight into storable solar fuels'. An EIC inducement prize on artificial photosynthesis – the first contribution of the Commission to the challenge – was launched at the One Planet summit held in Paris.

DG RTD also participates actively in Innovation Challenges 1 'Smart Grids', 2 'Off Grid Access to electricity', 3 'Carbon Capture and Use' and 4 'Sustainable Biofuels'.

During the first half of 2017 DG RTD developed a Work Programme for each of these Innovation Challenges, all of which were presented at the Ministerial meeting in Beijing. Implementation of this Work Programme was launched immediately thereafter.

Follow-up of the Paris Agreement

In order to demonstrate the EU commitment to Climate Action and the support that EU R&I activities provide to the implementation of the Paris Agreement, in 2017 a Focus Area on '**Building a Low-Carbon, Climate-Resilient Future**' has been established in the Horizon Work Programme 2018-2020. This 'Focus Area' will mobilise the investment of more than € 3.3 billion, with the goal to develop Research and Innovation actions that will help the implementation of the Paris Agreement, from energy to transport, industry, agriculture, biodiversity, cities, space and climate science.

A **European Decarbonisation Pathway** Initiative has been established, and a High-Level Panel (HLP) of experts has been set up at the end of 2016. The HLP has met five times (four times in 2017) to discuss the decarbonisation of the energy system, of cities, of energy-intensive industries, while addressing the role of the financial system in decarbonisation, and discussing the future of mobility with respect to greenhouse gas emissions. At the end of November 2017, the High-Level Panel produced its 'Interim Recommendations' centred on FP9, which have been submitted to Commissioner Moedas. The final expected output will be a report to Commissioner Moedas – due by mid-2018, where the HLP will explore possible R&I strategies in order to meet the challenges of cost-effective decarbonisation pathways.

The implementation of the **European Roadmap for Climate Services** is proceeding in consultation with all main stakeholders. This action has already stimulated the growth of a market of climate services, which the Copernicus Climate Change Service – soon operational – will further boost. DG RTD is also actively contributing to the **Global Framework for Climate Services**, in particular by supporting initiatives in Africa. In June 2017, the 3rd European Climate Change Adaptation conference, co-organised by the Commission through three EU-funded projects, took place in Glasgow with more than 700 participants.

4. A Stronger Global Actor

4.1: To translate Europe's strengths in science and technology into a leading global voice ("Open to the World")

Key Instruments

During 2017, **Joint Science & Technology Cooperation Committee meetings** were organised with the USA, China, India, Japan, Korea, Brazil, Argentina, Chile, Russia,

Algeria, Tunisia, Egypt, Jordan, Ukraine and South Africa.

These dialogues make an important contribution to the systematic identification of opportunities for cooperation and priority-setting. They also tackle framework conditions for cooperation in place for each country and the priorities for future improvements.

The **International Cooperation Service facility**, in support of international R&I cooperation, policy development, priority-setting and implementation started operating in 2017 and is now providing services for awareness raising and training, support to National Contact Points, organisation of R&I events, set-up of R&I, business and policy partnering platforms, and analysis and monitoring activities.

In order to attract non-EU resident highly skilled entrepreneurial innovators, DG RTD developed a platform as part of EURAXESS where both EU and non-EU residents alike can post their CV and search for Jobs.

A particular initiative under this scheme is **Science4Refugees**⁴¹. This initiative provides research refugee-friendly internships, part-time and full-time jobs, access to the European Research Community, as well as a complete range of information and support services on working and living in Europe.

The International Dimension of Horizon 2020

In order to serve as a basis for priority-setting in H2020 strategic programming, **roadmaps for targeted international cooperation** with twelve countries and six regions have been updated on a regular basis.

Examples of very large **flagship initiatives** include the EU-Africa Partnership on Food & Nutrition Security & Sustainable Agriculture, acceleration of clean energy innovation through the Mission Innovation initiative, multilateral cooperation on greener and safer aviation and road transport automation, climate action in support of the Paris Agreement; international cooperation on 5G, and multilateral cooperation on nanosafety.

In the context of the **Horizon 2020 Association Agreements**, DG RTD continued to monitor and assess their implementation and to examine measures to improve and develop cooperation. This has been done through Joint Committee meetings as well as through policy support to assist with reform agendas.

During 2017 DG RTD carried out in-depth **assessments for the ten Associated Countries** for which the review clause was applicable. These assessments looked at progress towards the ERA priorities, number of researchers in the country, participation in Horizon 2020 proposals and projects, and success rate of those proposals. In case of underperformance, the assessments also analysed the root causes and suggested remedies.

In 2015, the Commission signed the Stabilisation and Association Agreement (SAA) with Kosovo. This agreement would pave the way for Kosovo, among others, to participate in Horizon 2020. To this date, however, there has been no association agreement with Horizon 2020.

Key International Initiatives

- PRIMA

⁴¹ <https://euraxess.ec.europa.eu/jobs/science4refugees>.

During 2017, DG RTD intensively worked on the elaboration and adoption of the **Partnership on Research and Innovation in the Mediterranean Area (PRIMA)**, which will develop solutions for a more sustainable management of water and agro-food systems in the Mediterranean area. The main objective of the ten-year initiative, which is partly funded by Horizon 2020, is to devise new R&I approaches to improve water availability and sustainable agriculture production in a region heavily distressed by climate change, urbanisation and population growth.

The inter-institutional process has been completed under the Maltese Presidency in the first semester of 2017. The DECISION (EU) 2017/1324⁴² on the participation of the Union in PRIMA jointly undertaken by several Member States was adopted on 4 July 2017.

International agreements with Algeria, Egypt, Jordan, and Lebanon have been signed. Negotiations are ongoing with Morocco. The agreement with Algeria has already entered into force, and Algeria became a Participating State.

The Delegation Agreement by which the Commission will delegate the funds management powers to the PRIMA Foundation was approved and will be signed in January 2018. The Annual Work Plan 2018 has been approved. The associated Financing Decision to fund the PRIMA activities in 2018 was adopted in February 2018, and PRIMA started its activities by launching the first call for proposals in February 2018.

➤ Global Initiative on Earth Observation (GEO)

The initiative aims to maximise the Global Earth Observation System of Systems (GEOSS) benefits for European citizens, science and businesses, and to help implement environmental legislation and international commitments of the Union. It will provide a framework to reduce fragmentation of the European contribution to GEOSS, and coordinate with national programmes, Copernicus, the European Strategy Forum on Research Infrastructures (ESFRI), and the future European Open Science Cloud.

The initiative allows the coordination and integration of existing Earth Observation activities in Europe, in order to address the Sustainable Development Goals (SDGs) and other priorities of the Union, including the implementation of the Space Strategy for Europe.

The **EuroGEOSS Initiative** was officially launched during the GEO Plenary week in late October 2017 by Director General of DG RTD Robert-Jan Smits, in collaboration with DG GROW. Implementation will start in early 2018 and will be supported through the Horizon 2020 WP 2018-2020.

➤ The future of the Oceans

The G7 Ocean Expert Group further developed and drafted a two and a five-year **Action Plan** on global ocean observations, world ocean assessment, data sharing, regional ocean observations and hurdles. The progress report was presented at the G7 S&T Ministerial in September 2017 and the mandate for continuing this work was confirmed.

➤ South Atlantic Research and Innovation Flagship Initiative

The **Belém Statement**, launching the South Atlantic Research and Innovation Flagship Initiative, was signed on 13 July 2017 by Carlos Moedas, Commissioner for Research, Science and Innovation, on behalf of the EU, Gilberto Kassab, Minister of State for Science, Technology, Innovations and Communications of Brazil, and Naledi Pandor,

⁴²<https://publications.europa.eu/en/publication-detail/-/publication/93154fa1-6b81-11e7-b2f2-01aa75ed71a1/language-en>

Minister of Science and Technology of South Africa. This statement will further boost research and innovation cooperation with Brazil and South Africa in order to better understand marine ecosystems and climate, contribute to international ocean governance and complement the implementation of the Galway Statement of 2013. On 23 November 2017 a workshop was held to increase marine science cooperation with Argentina.

➤ Mission Innovation

The Mission Innovation (MI) initiative, a global initiative already mentioned under Specific Objective 3.1, is an example of DG RTD's global role and leadership. DG RTD has been a leading contributor to this initiative.

2. ORGANISATIONAL MANAGEMENT AND INTERNAL CONTROL

This section answers the question how the achievements described in the previous section were delivered by the DG. This section is divided in three subsections.

A first subsection (DG RTD and the Research and Innovation family) explains the role DG RTD plays as the head of the Research and Innovation family and the achievements related to this role.

The second subsection (2.1) reports the control results and all other relevant information that support management's assurance on the achievement of the financial management and internal control objectives.

It includes any additional information necessary to establish that the available evidence is reliable, complete and comprehensive, and appropriately covering all activities, programmes and management modes relevant for the DG.

The third subsection (2.2) deals with the other components of organisational management: human resources, better regulation principles, information management and external communication.

Annex 2 contains the performance tables summarising the state of play of the output indicators planned in the Annual Management Plan 2017.

DG RTD 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 RTD in implementing FP7 and Horizon 2020. DG RTD's responsibilities have increased as the budget for research and innovation has grown from FP7 to Horizon 2020, prompting also the move to new management structures.

Management modes for the programmes' implementation

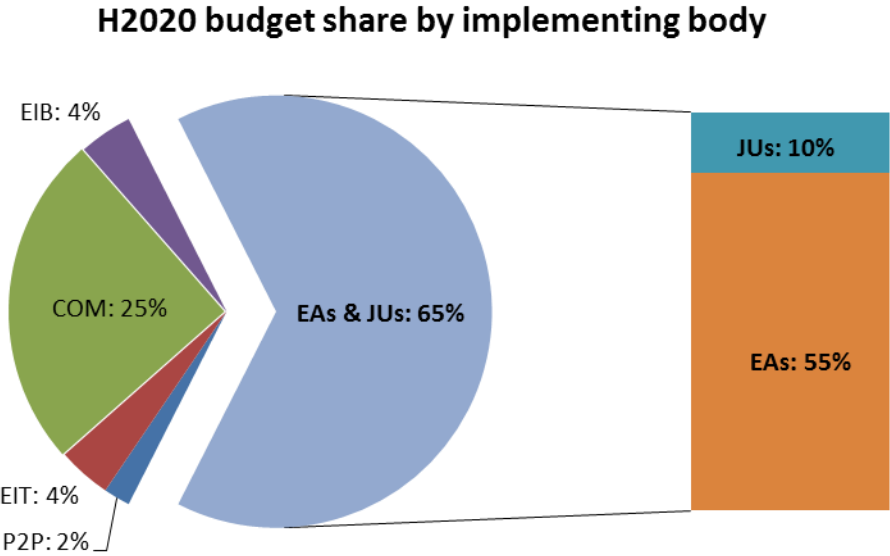
The responsibility to implement the Research FPs is shared among different Directorates-General. In order to focus on core institutional tasks, these Directorates-General have delegated parts of the programme implementation to Executive Agencies, Joint Undertakings and so called Article 185 bodies (partnerships with the Member States).

This multitude of actors involved in the implementation of the Research FPs is referred to as the "Research and Innovation Family", and requires a governance model that ensures:

- coordination and coherence in the setting up of the research agenda to be supported under the FPs (in particular strategic programming and work programmes);
- focus on core activities, i.e. policy-making, for the Directorates-General by delegating grant management tasks to Executive Agencies and other "external bodies";
- coherent implementation of the grant management process across all bodies involved in Horizon 2020 grant management.

In its 2011 Communication on the 2014-2020 MFF, the Commission announced a target of at least 66% for the share of the Horizon 2020 budget to be managed externally, and in fact this may reach 75% over the lifetime of Horizon 2020.

Figure 6 Horizon 2020 budget share by implementing body



DG RTD coordinates the Research and Innovation Family

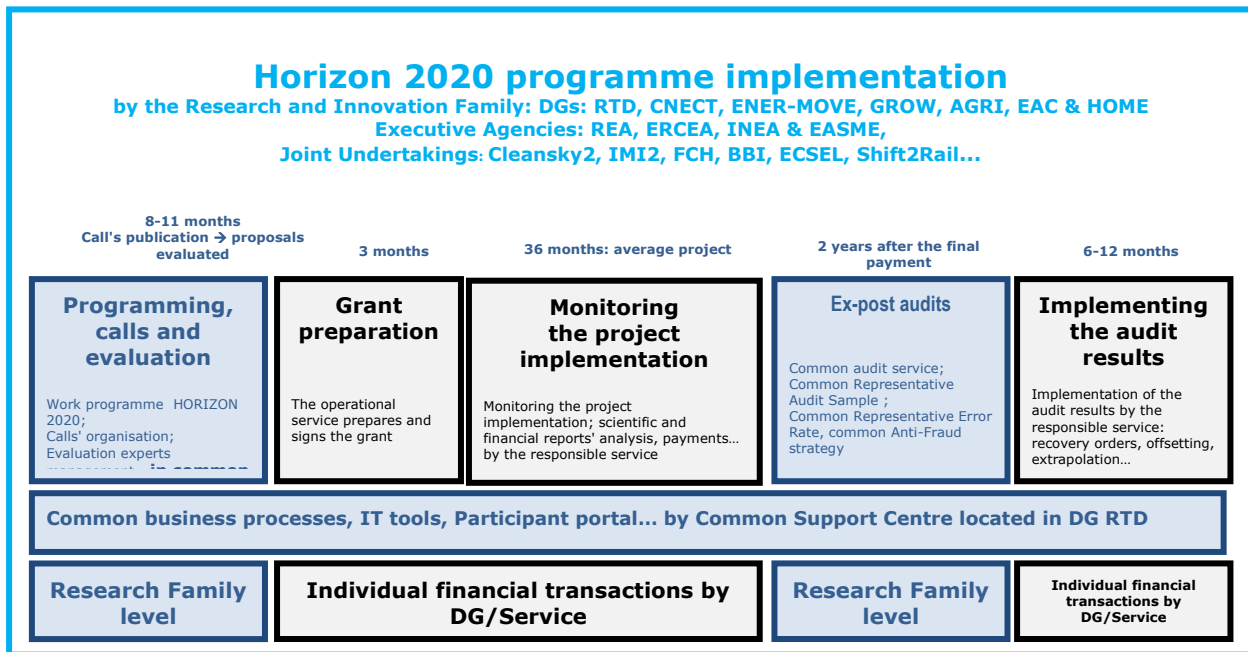
Given the multitude of implementing bodies, effective coordination within the Research and Innovation Family is essential. DG RTD, as the lead DG of the Family, invests considerable resources in this coordination.

Figure 7 summarises the current organisation of Horizon 2020 implementation⁴³. It differentiates the stages of the grant management system that are organised and managed mostly *at family level* (programming, calls, audits – with blue shadow), and the others, involving the concrete financial transactions, that are implemented *under the responsibility of each Authorising officer* (DGs and other services, taken individually – with grey shadow).

DG RTD has the overall coordination responsibility in the management of the whole of Horizon 2020, even for those parts that are not in its own budget appropriations and not included in the assurance given at the end of this report.

⁴³ Exception made of JRC, which implements direct research activity under the programme.

Figure 7 Horizon 2020 organisational set up



The Common Support Centre

The implementation of FP7 through different Directorates-General and other actors led to some divergent practices across different parts of the programme. For a consistent and uniform treatment of all beneficiaries and the coherent implementation of Horizon 2020, the Commission developed a single set of simplified rules for participation and dissemination and created a Common Support Centre (CSC).

The CSC provides common services in legal support, ex-post audit, IT systems and operations, business processes, programme information and data to all research DGs, Executive Agencies and Joint Undertakings implementing Horizon 2020. It helps to coordinate and deliver the programme across eight Commission Directorates-General, four Executive Agencies, and six Joint Undertakings⁴⁴, through:

- streamlined, harmonised and rationalised business processes;
- training and improved documentation linked to the programme and project implementation;
- a single set of common IT tools to be used by all implementing services and all participants;
- a common interpretation of the single set of rules and a common control strategy;
- the consolidation and dissemination of results and data generated by projects managed by different actors.

A CSC interim review took place in 2017 to address the quality of services and assess if the needs of the Research and Innovation Family are met. The final report is expected end of April 2018.

⁴⁴ The operating rules of the CSC were adopted by Commission Decision C(2014)2656, these include information on the CSC governance, the responsibilities of the various parties involved, the missions and tasks of each service as well as staff and budgetary issues: the CSC is part of RTD, as one of its directorates. For administrative and day-to-day operational matters, the CSC is accountable to the Director-General of RTD. It is overseen by a Steering Board made up of all Directors-General with authorising officer responsibility for Horizon 2020.

2.1 Financial management and internal control

This section reports 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 the internal control system, and resulting in (2.1.4) Conclusions as regards assurance with the (2.1.5) Declaration of assurance accompanied by the reservations.

Assurance is an objective examination of evidence for the purpose of providing an assessment of the effectiveness of risk management, control and governance processes.

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

- the reports submitted by the Directors, which include the outcome of the internal control monitoring taking place in each Directorate;
- the reports from Authorising Officers in other Directorates-General managing budget appropriations in cross-delegation;
- the reports on control results from entrusted entities in direct management as well as the results of the Commission supervisory controls on the activities of these bodies;
- the contribution of the Director in charge of Internal Control and Risk Management for DG RTD, including the results of internal control monitoring at Directorate-General level;
- the observations and recommendations reported by the Internal Audit Service (IAS);
- the observations and recommendations reported by the ECA.

These reports result from a systematic analysis of the evidence available. 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 RTD.

DG RTD's overall responsibilities for the budget "Research and Innovation"

DG RTD negotiates the Title 08 "Research and Innovation" of the budget of the European Commission and coordinates and monitors its implementation, *in fine* entrusted to the whole Research and Innovation Family. DGs and Executive Agencies receive delegation directly from the College, Joint undertakings and other bodies receive their budget from DG RTD. The Title 08 contains expenditure related to:

- Administrative charges dedicated to Research and Innovation;
- Research FPs⁴⁵;
- Euratom Research and Training Programme;

⁴⁵ Nota bene: The current *Horizon 2020* FP is not exclusively funded by the budget line 08 of DG RTD. Other Directorates-General are also contributing to *Horizon 2020* FP.

- Research Fund for Coal and Steel.

Amongst these items, the Framework Programmes represent the most important part, in quantitative terms. This explains that this report will mostly focus on this part of the budget.

Budget implemented by DG RTD in 2017

Table 1 gives an overview of the payments authorized by DG RTD in 2017 under different programmes (legal base) and management modes (direct/indirect).

Table 1 Payments authorized in 2017 per programmes/management modes

Credit type	Authorized payments in DG RTD in 2017 (M€) (Cross-subdelegations given included, received excluded)								Grand Total	%
	ADMIN		ADMIN Total	OPERATIONAL				OPERATIONAL Total		
Legal base	H-2020	RCFS		FP7	H2020	Previous FPs	RFCS			
Management mode / implementing body										
Total Direct	34,36	0,05	34,41	448,81	1328,13	0,01	47,47	1.824,42	1.858,82	57,97%
RTD	34,36	0,05	34,41	448,81	1328,13	0,01	47,47	1.824,42	1.858,82	57,97%
Total Indirect	114,03	0,00	114,03	168,60	1064,84	0,00	0,00	1.233,44	1.347,47	42,03%
Art 185 bodies				3,16	95,02			98,19	98,19	3,06%
EIB/EIF					539,90			539,90	539,90	16,84%
Executive Agencies	114,03		114,03					0,00	114,03	3,56%
Joint Undertakings				158,47	424,72			583,20	583,20	18,19%
Other DG's				6,97	5,20			12,16	12,16	0,38%
Grand Total	148,39	0,05	148,43	617,42	2.392,97	0,01	47,47	3.057,86	3.206,30	100,00%
%	4,63%	0,00%	4,63%	19,26%	74,63%	0,00%	1,48%	95,37%	100,00%	

In 2017, DG RTD managed directly 58% (against 60.67% in 2016) of its budget expressed in terms of payments. 42% of the payments went to other entrusted bodies, to be finally implemented by them.

Table 2 below gives another overview of the implemented budget, following the different control systems under which the payments were authorized. The controls applied for a payment are different for commercial invoices (procurement), reimbursements of cost claims (grants), reimbursement of the cost of experts or payments of the amounts entrusted to other implementing bodies.

Table 2 Payments authorized in DG RTD by control system

Credit type	ADMIN	OPERATIONAL	ALL	%
Controle system	Amount (M€)	Amount (M€)	Total Amount (M€)	
Administrative	2,23	0,00	2,23	0,07%
Experts contracts	0,00	5,45	5,45	0,17%
Financial instruments	0,00	539,90	539,90	16,84%
Grants	0,00	1797,16	1797,16	56,05%
Other	0,00	1,69	1,69	0,05%
Prizes	0,00	2,20	2,20	0,07%
Procurement	32,18	17,91	50,09	1,56%
Subsidies entrusted entities	114,03	681,39	795,41	24,81%
Cross-subdelegations	0,00	12,16	12,16	0,38%
Grand Total (€)	148,43	3057,86	3206,30	100,00%
%	4,63%	95,37%	100,00%	

These figures confirm that, although it is decreasing in importance, the main method of implementing the budget implemented by DG RTD in 2017 is still direct grant management (Grants), with 56% (against 58 % in 2016).

41.65% (against 39.36% in 2016) was entrusted to other entities outside the Commission, mostly to implement parts of the Framework Programmes under (*indirect*) grant management and *financial instruments* control systems.

Directly managed *administrative, experts, procurement and prizes (+ other)* related

payments amount to a total of 1.92 % of the expenditure.

0.38% of the 2017 payments have been authorized under cross-subdelegations by other Commission DGs. This part is considered as implemented in direct grant management by other DGs.

As a consequence, this report focuses on (direct and indirect) grant management and presents the financial instruments (covering 98,08% of the 2017 payments) but does not detail the other control systems.

Assurance on this expenditure is provided by DG RTD directly or through its supervisory arrangements on the variety of delegated bodies that implement a part of the budget on its behalf.

Grant management control system

In order to achieve both operational (research and innovation-related) and financial objectives, DG RTD has established a control framework to mitigate the inherent risks at the different stages of the direct grant management process and the indirect grant management⁴⁶.

This control framework must, however, be cost-effective and not cause excessive administrative burden for researchers and participants. DG RTD therefore operates a system of targeted controls before payment. It bases its main assurance on in-depth checks carried out on-the-spot after costs have been incurred and declared.

The Research Directorate-Generals have defined and implemented a common control strategy for FP7. The control system for Horizon 2020 has further improved the overall efficiency and coherence of the FP's implementation: the CSC develops, for Horizon 2020, corporate processes and tools. This leads to a streamlined control environment with embedded automatic controls whenever possible.

In 2016, DG RTD adopted its Horizon 2020 Control strategy⁴⁷, which is considered as a reference document for the other implementing bodies. As part of the overall common control approach, the Common Horizon 2020 Ex-post Audit Strategy was also adopted in 2016⁴⁸. The standard ex-ante control function in the IT system was available in 2017. In particular the risk management module has been enhanced, and the support for the assessment of reported costs was automated.

Financial instruments control system

DG RTD has delegated the implementation of its financial instruments to two international bodies: the EIB and the EIF.

As delegated bodies, EIB and EIF have a responsibility for how they carry out their tasks. However, RTD, in its role as delegating body and AOR, has a responsibility to supervise these bodies' implementation of the funds they receive. Therefore, RTD has established a supervision strategy for these instruments. This strategy aims to ensure that the financial as well as the research-related objectives are achieved.

The general strategy chosen is supervision based on the establishment of clear rules, the examination of reports and the approval of key documents, but with a hands-off

⁴⁶ For further details of the control systems, see Annex 5.

⁴⁷ Ares(2016)268114 - 19/01/2016

⁴⁸ Ares(2016)981660 - 25/02/2016

approach to detailed management issues, leaving the EIB and EIF a reasonable freedom to implement the programmes. Nevertheless, in the event that seriously adverse information about the non-achievement of a key control objective should come to DG RTD's knowledge, the delegating acts give the Commission the right to intervene more deeply in the operations of the EIB and EIF.

Budget cross-subdelegated/co-delegated to other services

As in previous years, DG RTD has delegated a number of activities to different services within the Commission.

In 2017, DG RTD cross-subdelegated EUR 12 million of its payment appropriations (operational credits) to other DGs.

Being a Commission service itself, the AOR 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 from other DGs and offices did not provide indication of any particular unfavourable observation with regard to the regularity and legality of the transactions concerned⁴⁹.

2.1.1 Control results

This section reports and assesses the elements identified by management that support the assurance on the achievement of the internal control objectives⁵⁰. The DG's assurance building and materiality criteria are outlined in the AAR Annex 4. Annex 5 outlines the main risks together with the control processes aimed to mitigate them and the indicators used to measure the performance of the control systems.

Control effectiveness as regards legality and regularity

DG RTD has set up internal control processes aimed to ensure the adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multi-annual character of programmes as well as the nature of the payments concerned.

Under point 2.1 of this report it was explained that DG RTD's budget is implemented under two main management modes, namely *direct and indirect grant management*. Innovfin financial instruments represent the second most important control system, and the rest less than 2.5% altogether.

Consequently, this section discusses the controls and their results for the main expenditure items. For the other expenditure items, if no other indication is given, the estimated level of legality and regularity is to be found in the conclusion of the section entitled "overall assessment of the legality and regularity of operations".

Control results for grant management (direct and indirect)

This section covers all expenditure implemented under direct or indirect grant

⁴⁹ The amounts subdelegated to other authorizing officers by DG RTD in order to implement FP7 projects will be included in the scope of DG RTD reservation.

⁵⁰ Effectiveness, efficiency and economy of operations; reliability of reporting; safeguarding of assets and information; prevention, detection, correction and follow-up of fraud and irregularities; and adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multi-annual character of programmes as well as the nature of the payments (FR Art 32).

management, the cross-subdelegations included⁵¹, with the exception of the expenditure managed by the Article 185 and 187 bodies, discussed under a different heading.

For the Research Framework Programmes, the main legality and regularity indicator is the error rate detected by ex-post audits. Because of its multi-annual nature, the effectiveness of the control strategy of the Research Directorates-General can only be fully measured and assessed in the final stages of the FP, once the ex-post control strategy has been fully implemented and systematic errors have been detected and corrected.

The general control objective for the Research services, as stated in Annex 4 to this report, is to ensure for the Seventh Framework Programme (and the Research Fund for Coal and Steel in DG RTD) that the residual error rate, i.e. the level of errors which remain undetected and uncorrected, does not exceed 2% by the end of the FP's management cycle. For Horizon 2020, the final control objective is to get a residual error rate as close as possible to 2%, without necessarily expecting it to get under 2%.

The question of being on track towards this objective is (re)assessed annually, in view of the results of the implementation of the ex-post audit strategy, and taking into account both the frequency and importance of the errors found as well as a cost-benefit analysis of the effort needed to detect and correct them.

Control results for FP7 and HORIZON 2020

Ex-post audit methodology (FP7 and HORIZON 2020)

The Common Representative Sample (CRS) provides an estimate, via a representative sample of cost claims across the Research and Innovation Family, of the **overall level of error** in the Research Framework Programmes, across all services involved in its management. All of these grants follow the same homogeneous overall control system set out in this report.

The CRS is complemented by 'risk-based' audits; audits selected according to one or more risk criteria. These audits are intended to detect and correct as many errors as possible, for instance by targeting the larger beneficiaries and through the identification of possibly fraudulent operators. These audits are also referred to as 'corrective' audits.

Different indicators are calculated to provide a comprehensive view of legality and regularity:

Overall Detected Error Rate: this is the error rate derived from the results of all audits, whether audits on a representative sample of beneficiaries or audits implemented for other reasons (large beneficiaries, preventive audits, risk factors, etc). Its value is cumulative and can be calculated for a specific implementing body or for the whole Research and Innovation Family.

Representative Error Rate for the Framework Programme: this is the error rate derived solely from the results of the CRS, extrapolated to the overall population and calculated for each FP as a whole. This error rate provides an estimate of the level of error in the given Framework Programme at the time of the audits, but does not factor in the follow-up and corrections/recoveries undertaken by Commission services after the audit, nor does it provide information on the net final financial impact of errors.

⁵¹ For the 2017 reporting year, the cross-delegated AORs have signalled no serious control issues.

Residual Error Rate: the residual error rate, on a multi-annual basis, is the extrapolated level of error remaining after corrections/recoveries undertaken by Commission services following the audits that have been made. The calculation of the residual error rate, as shown in **Annex 4**, is based on the following assumptions:

1. all errors detected will be corrected;
2. all non-audited expenditure subject to extension of audit findings is clean from systematic material errors so that the residual error rate can be estimated to be equal to the non-systematic error rate.

The residual error rate develops over time and depends on the assumptions set out above. This indicator is reliable and acceptable for the purposes for which it was intended, i.e. as a legality and regularity indicator on the progress made, through its ex-post audit strategy, in dealing with errors over a multi-annual basis. However, it remains an estimate as long as not all cost claims have been received and not all cases of extension of audit findings have been fully implemented yet.

Results of the ex-post audits for FP7

The audit work for FP7 is almost completed. The last Common Representative Audit Sample was launched in 2016. By the end of 2017, just 21 audits of the Common Representative Audit Sample remained open.

DG Research and Innovation spending as per the (cash) budget on FP7 accounted for 14% of expenditure in 2017, and this is expected to fall to 9% in 2018.

Against this background, a final wrap-up of the FP7 audit campaign is made below, and FP7 audits will no longer be covered in detail in future AARs.

Audit coverage of FP7

Research and Innovation Family

The Research and Innovation Family as a whole had a target of 4 056 audit results for FP7. With 4 324 audits results covering 64,2% of FP7 expenditure completed by the end of 2017, this original target was exceeded by 6%.

The percentage of FP7 expenditure covered by the audits (64,2%) refers to the value of the participations of the audited beneficiaries. It includes both the fully audited participations (8,4%), also referred to as the 'direct' coverage, and the non-audited participations which nevertheless, after the full treatment of audit results, are clean from systematic errors (55,8 %), also referred to as the 'indirect' coverage.

DG Research and Innovation alone had a target of 1851 audit results for FP7. With 1982 FP7 audit results covering 62,7% of FP7 expenditure completed by the end of 2017, this target was exceeded by 7%. Once the FP7 audits still open are closed (83 audits), the original target for FP7 audits will have been exceeded by 12%.

The percentage of FP7 expenditure covered by the audits (62,7%) refers to the value of the participations of the audited beneficiaries split in 9,2 % direct coverage and 53,5% indirect coverage.

Error rates

The error rates resulting from FP7 audit work are:

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Overall Detected Error Rate: based on 1982 results of audited participations, this error rate amounts to 4,74% **for RTD**⁵².

Common Representative Error Rate: based on 461 costs statements for which the audit is completed (95 % out of a sample of 486), this error rate is **4,95%**.

Residual Error Rate: at this point in time, this error rate amounts to **3,09 % for RTD**.

Conclusion on the ex-post audits for FP7

The audit strategy for FP7 has been fully implemented. The Common Representative Error Rate for FP7, calculated on a multi-annual basis, is around 5%. The Residual Error Rate is 3.09% for RTD.

As a result of 83 audit results still to be completed, the RTD Residual Error Rate may still change in 2018. However, since the current Residual Error Rate (3,09%) is almost identical to that of last year (3,07%) and only a small number of audits remains open, it can be assumed that the final Residual Error Rate will be around this value.

These results are in line with the conclusions expressed in AARs over the years: that the Common Representative Error Rate resulting from audits of FP7 will be around 5% at the end of the programme and the Residual Error Rate for DG Research and Innovation at around 3%.

These amounts do not necessarily mean that there is a loss to the Community budget. Many of the projects spend more than the capped budget, and so the real loss to the Community budget will be lower than when estimating the financial impact by using the error rates above.

The reservation in the declaration of assurance for the FP7 expenditure is addressed in Section 2.1.5.

DG Research and Innovation made continuous efforts to mitigate the risk of error in FP7 expenditure, including:

- a number of simplifications (for example those contained in the Commission Decision of 2011) and modifications to the Model Grant Agreement;
- a major communication campaign targeting beneficiaries and their auditors;
- continuous review of ex-ante control procedures, often based on the results of audits by the Commission's auditors as well as those of the European Court of Auditors;
- 1982 ex-post audits, together with the recovery of overpayments and the extrapolation of systemic errors to unaudited cost claims of the same beneficiaries in terms.

However it is clear that the 2% residual error target for FP7 will not be attained. Nevertheless, the lessons learned from FP7 audits have been used in the development of Horizon 2020 programme's general framework.

⁵² This is lower than the representative rate as it includes a number of preventive audits carried out at the beginning of FP7

Results of the ex-post audits and expectations for Horizon 2020

Given the stage of the programme lifecycle, a limited number of cost claims totalling 4.1 billion euro of requested funding had been received by the services by the end of 2017. The first Horizon 2020 audits were launched in the middle of 2016 and further audits were launched in 2017. The first Common Representative Sample (CRS), a Common Risk Sample and an Additional Sample⁵³ have been selected. In total, by December 2017, 625 participations had been selected for audit, covering all the services signing grants in Horizon 2020.

In total, the audit of 392 participations has been finalised. This includes 110 out of 142 selected in the first CRS. The error rate at 31/12/2017 is:

Overall Detected Error Rate based on 392 participations: 1,54 %

The Detected Error Rate based on 110 out of 142 participations selected in the first CRS is 1,6%. However, if we take into account the draft audit reports, then the expected representative error rate for the full sample will be around 2,82%.

Residual Error Rate for the Research and Innovation Family: 1,44 % (1.46% for DG RTD alone), expected to rise to around 2.24% when taking into account the draft audit reports.

Comments on the control results

The error rates set out above **can only be a preliminary estimation and must be treated with care**. The CRS is not yet complete, and so is not yet fully representative of the expenditure that it covered. In addition, the first CRS was taken at an early stage of the programme in order to provide an early indication of the error rate and, also, to help assess whether the simplifications introduced in Horizon 2020 had been effective. The nature of expenditure in the first years of the programme may not be totally representative of the expenditure across the whole period of expenditure. And the programme is in any case multi-annual, so the error rates, and especially the residual error rate, must be considered over time. In particular, the cleaning effect of audits over time will tend to increase the difference between the representative/detected error rate and the residual error rate, with the latter finishing at a lower rate.

There is nevertheless evidence that the simplifications introduced in Horizon 2020, as well as the increased experience of major beneficiaries, are reducing the number and level of errors made by beneficiaries. However, beneficiaries still make a number of errors, sometimes because of a lack of understanding of the rules, sometimes because of a non-respect of the rules.

To improve clarity of the rules and compliance with them DG RTD has already taken the following actions:

- The Model Grant Agreement, and its accompanying annotations, have already been adjusted to introduce simplifications or clarifications on different points. The results of the first audits were considered in a working group bringing together auditors from the Commission and the Court of Auditors to see where additional

⁵³ This last sampling accommodates special needs of certain stakeholders with regard to audit coverage and selection method. In addition, top ups, which are participations of selected beneficiaries which are added to the selected participations, are included in the total participations selected.

simplifications and clarifications may be needed⁵⁴.

- Considerable efforts have been made to ensure clear communication of the rules and guidance to participants and their auditors. By the end of 2017, a total of 75 communication events had been organised in 26 different countries with a total of 6.600 participants.
- Trials of lump sum funding will be undertaken in the 2018 work programme to evaluate if this form of entitlement funding, which would avoid errors of legality and regularity, is appropriate to achieving all the objectives of research policy.

The Financial Statement accompanying the Commission's proposal to the legislative authority 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 project. The ultimate aim for the **residual level of error** at the closure of the programmes after the financial impact of all audits, correction and recovery measures will have been taken into account, is to **achieve a level as close as possible to 2 %**.*"

The first audit results suggest that the detected (and in future representative) error rate will remain within the established range. Together with the experience in FP7, they also suggest that the objective for the residual error rate will be respected.

In conclusion, DG RTD still considers that the error rate will fall within the range established in the Financial Statement, so it does not consider that a reserve is needed for Horizon 2020 expenditure.

Control results for Research Fund for Coal and Steel

The RFCS 2008 legal base has been revised by Council Decision (EU)2017/955 on 29 May 2017. This revision aligns the RFCS with Horizon 2020 rules. Most of the beneficiaries are also participating in FP7/HORIZON 2020 projects. The number of the projects is small compared to the FPs: a total of 703 for the period 2009-2017.

Control strategy

The control strategy is based on ex-ante controls, most notably Certificates on Financial Statements, and ex-post audits at a rhythm of 5 audits per year. In addition the programme benefits from the results of the control strategy of the FP. The sample aims to have a maximum coverage and also to avoid repeated audits at the same beneficiary within a 5-year period. The audit intensity is higher than in the FP.

Because of the low number of projects, the audit sample is not designed to produce a result that is statistically representative of the population. Nevertheless, the coverage means that the errors detected give a reasonable estimate of the overall error rate.

Corrections are implemented following the audit results, and systematic errors are corrected by extrapolation.

Control results

Over the years 46 Research Fund for Coal and Steel audits (134 participations) have been closed by the end of 2017, of which 7 audits (21 participations) in 2017.

⁵⁴ This meeting took place on 14 March 2018.

The total audited amount by end 2017 (EC level) is €39.650.726 (accepted by FO), covering 9.31% of the total amount of cost statements received until end 2016 (€ 425,962,067).

As a result of all audits completed so far, the overall detected error rate is 4.55% (end 2017).

Recoveries and corrections including extrapolations that have followed will lead to a lower residual error rate, estimated at around 3.35%.

Conclusions

The reservation in the declaration of assurance for the *Research Fund for Coal and Steel* expenditure is addressed in Section 2.1.5.

In order to be close to the current FP's rules, and allow for simplification, which aims to reduce the error rates as well as administrative expenditure, a new Horizon 2020 inspired model grant agreement⁵⁵ is used for all grants signed after 1 January 2016. The financial management for RFCS is integrated within a unit that handles the FP. This allows to promote best practices and to review the ex-ante controls. In line with the audit strategy reviewed for Horizon 2020, the FP common audit service is providing advice on adjusting the RFCS audit strategy.

Control results for Joint Undertakings

The Joint Undertakings BBI, IMI2, FCH2, Clean Sky2 implement parts of FP7 and Horizon 2020, under the supervision of DG RTD.

They received from DG RTD in 2017 payments for operational and running costs for a total amount of EUR 583.2 million. Further details can be found in the Annex 6 of this report.

Supervision arrangements

The monitoring, supervisory and accountability arrangements include the following:

- the Commission is a member of the Governing Board. Arrangements are in place within the DG to ensure that all proposals to the Governing Board are properly assessed and the Commission position agreed;
- each Joint Undertaking is required to produce an AAR;
- the Joint Undertaking's Director signs a declaration of assurance in line with the one used in the Commission;
- the Joint Undertaking is required to inform the Commission without delay of any significant developments in the areas of risk management, control and audit;
- for FP7, the Joint Undertakings have harmonised their ex-post audit strategies with the Commission; DG RTD is aware of the results of the ex-post audits carried out;
- for Horizon 2020, the Joint Undertakings are fully integrated in the Research and Innovation Family, adopting (sometimes progressively) the IT tools and business processes of the Family, and with audits undertaken by the Common Audit Service.

⁵⁵ C(2015) 5757 final COMMISSION DECISION of 26.8.2015 on the multi-beneficiary model grant agreement for the Research Programme of the Research Fund for Coal and Steel.

- DG RTD may request any additional information deemed necessary and has the right to audit the Joint Undertakings' operations;
- the Commission's IAS may carry out audits in the Joint Undertakings, and DG RTD will receive the reports for action if necessary;
- the ECA is the external auditor of the JTI Joint Undertakings, and DG RTD receives copies of the reports for action if necessary;
- there are extensive informal and formal contacts regarding research matters, as well as on questions of internal control, audit (the JTIs are members of the Committee on Audit in Research), internal control, etc.

Control results

Neither the draft AARs, nor the regular supervision of these bodies, raised particular issues that would need to be included in this report. For Horizon 2020, the JUs are fully integrated in the Common Support Service structures, and apply the same audit strategy as the Commission services.

In addition, the Court of Auditors also gave a clear opinion on the 2016 accounts of all the JUs under DG RTD's supervision, with a residual error rate below 2%. The draft AARs of the JUs have been reviewed by DG RTD and also show residual error rates of less than 2%.

Control results for Article 185 bodies

Article 185 TFEU enables the EU to participate in research programmes undertaken jointly by several Member States, including participation in the structures created for the execution of national programmes.

The actions supported may cover subjects not directly linked to the themes of the FP, as far as they have a sufficient EU added value. They will also be used to enhance the complementarity and synergy between the FP and activities carried out under intergovernmental structures. The Article 185 bodies supported in 2017 are the following:

- EUROSTARS2 (Research for the benefit of SMEs)
- European Metrology Programme (EMRP)
- European Metrology Programme for Innovation and Research (EMPIR – successor to EMRP)
- European and Developing Countries Clinical Trial Partnership (EDCTP2)
- BONUS

In 2017, DG RTD paid a total of EUR 98,19 million to Article 185 initiatives. Details on the legal bases and the amounts entrusted can be found in Annex 6 of this report.

Monitoring arrangements

The monitoring and supervisory arrangements include the following:

- the Commission is an observer in the boards;

- there is a delegation agreement between the Commission and the body setting out its obligations;
- the bodies are subject to an ex-ante readiness assessment;
- the annual work plans are approved by the Commission;
- the Commission receives annual reports from the bodies, including a management declaration and an audit certificate;
- the Commission has the right to suspend payments if the reports are considered to be inadequate;
- there are interim and ex-post evaluations to ensure that the bodies are achieving their policy objectives.

Control results

Based on the established reporting, in 2017 DG RTD has not identified any particular issues that would need to be addressed in this report.

Expenditure under indirect management (other than grants)

This section reports and assesses the elements that support the assurance on the achievement of the internal control objectives as regards the results of the DG's supervisory controls on the budget implementation tasks carried out by other Commission DGs and entrusted entities distinct from the Commission.

As mentioned under 2.1., DG RTD has entrusted 42.03% of its 2017 budget (payments) for implementation to other Commission services, Executive Agencies⁵⁶, Joint Undertakings, other bodies linked to Article 185 initiatives, and to the EIB/EIF.

Operating budget of the Executive agencies

In 2017, DG RTD was the lead DG for the Executive Agencies REA and ERCEA. In Horizon 2020 some parts of the programme are implemented by the European Agency for Small and Medium-sized Enterprises (EASME) and the Innovation and Networks Executive Agency (INEA). RTD is a parent DG of these two agencies, although not the lead DG.

DG RTD paid to REA and ERCEA a total amount of EUR 114.03 million of administrative subsidies.

Supervision arrangements

The appropriate monitoring and supervision of the EAs' activities are mainly achieved by means of participation of the parent DG(s) in the Steering Committee of the EAs. The Executive Agency's Director ensures that the members and observers of the Steering Committee receive all relevant information and reliable control results needed for the appropriate fulfilment of their mandates.

The annual planning and reporting cycle forms the basis of the monitoring and supervision of the Executive Agencies' activities by the Steering Committee. In particular,

⁵⁶The EAs receive delegation directly from the Commission, the Executive Director of an EA is the AOD, who has to provide assurance on the operational expenditure of the EA in his/her AAR. As far as the administrative/operating budget is concerned, the Director of the Executive Agency is the Authorising Officer and has the entire responsibility of the subsidies received from the European Commission. The parent DG(s) has(have) the responsibility on the subsidies given to EAs. Hence, those subsidies are part of the Commission expenditure on which the AOD of the parent DG must provide assurance in his/her DG AAR.

the Annual Work Programme contains an obligation of assessment of risks and risk exposure, and provides a number of key performance indicators. These constitute the benchmark against which the performance of the EAs is monitored through its interim reporting and AAR. It is complemented by other relevant sources of information such as the reports from the Discharge Authority, ECA, IAS and OLAF.

The Executive Agencies are fully integrated in the systems implemented by the Common Support Centre. Moreover, part of the management staff of these Executive Agencies is staff from DG RTD on secondment.

Control results

The supervision of the Executive Agencies continued throughout 2017. The preparation of the AARs of these Executive Agencies was coordinated and reviewed by DG RTD and the Steering Committees of the Agencies. No unexpected issues arose that would need to be raised in this report. The reserves of the REA on a part of its FP7 expenditure mirror what is already reflected in this report and are well known to DG RTD.

A critical risk identified by the INEA Executive Agency does not impact on any activities linked to DG RTD.

Financial instruments implemented by EIB/EIF

Innovfin aims to support research and innovation through financial instruments. DG RTD has a duty to ensure proper supervision of the budget used, in accordance with the Financial Regulation and other legal acts and in line with the general principle of Sound Financial Management.

The amount transferred to EIB/EIF during 2017 is EUR 539.9 million.

To help ensure that the achievement of operational objectives is based on Sound Financial Management, the principles and details of the supervision of the budget entrusted to the EIB and EIF, and the internal control steps that apply to *Innovfin* have been established in 2015.

It includes a supervision strategy and procedure as well as the key documents relevant to *Innovfin*. It is supplemented by the control strategy that EIB is required to present to us according to the Delegation Agreement. The EIB supervision strategy and control procedure was approved by the Director-General in early 2016.

In accordance with the Delegation Agreement, both entrusted entities (EIB and EIF) submit to the Commission for each financial instrument:

- a management declaration of assurance annexed to the financial statements in the form defined in the Financial and Administrative Framework Agreement;
- a summary report on audits and controls carried out in the period in question, including an analysis of the nature and extent of errors and weaknesses in systems identified if any, as well as any corrective actions taken or planned;
- an independent audit opinion on the management declaration and the summary report on audits and controls.

Regarding the financial instruments *Innovfin*, their annual reports for 2017 are currently under analysis. So far, there are no particular issues that would need to be addressed in this report.

From monitoring work done, which includes regular contacts/representation and/or the desk reviews of relevant management reports and audit reports, we have no indications that their reporting would not be reliable.

Overall assessment of the legality and regularity of operations under RTD expenditure

In the context of the protection of the EU budget, at the Commission's corporate level, the DGs' estimated overall amounts at risk and their estimated future corrections are consolidated.

For DG RTD, the estimated overall amount at risk at payment⁵⁷ for the 2017 payments made is in a range of EUR 117.32-120,02 million. This is the AOD's best, conservative estimation of the amount of relevant expenditure⁵⁸ during the year (overall EUR 3703.65 million) not in conformity with the applicable contractual and regulatory provisions at the time the payment is made.

This expenditure will be subsequently subject to ex-post controls and a sizeable proportion of the underlying error will be detected and corrected in successive years. The conservatively estimated future corrections⁵⁹ for those 2017 payments made are EUR 37.61 million. This is the amount of errors that the DG conservatively estimates to identify and correct from controls that it will implement in successive years.

The difference between those two amounts leads to the estimated overall amount at risk at closure of EUR 79.71 - 82.41 million, 2.15% - 2.23 % of total expenditure).

⁵⁷ In order to calculate the weighted average error rate (AER) for the total *relevant expenditure* in the reporting year, the *detected* or estimated error rates have been used.

⁵⁸ "*relevant expenditure*" during the year = payments made, minus new pre-financing paid out, plus previous pre-financing cleared.

⁵⁹ Based on the impact of the implementation of conclusions ex-post controls and extrapolation of audit results to non-audited contracts.

Table 3 - Estimated overall amount at risk at closure

DG RTD	Payments made	Prefinancing paid (a)	Prefinancing cleared (b)	Relevant expenditure (c)	Minimum Detected/estimated Error Rate	Maximum Detected/estimated Error Rate	Minimum Estimated overall amount at risk at payment	Maximum Estimated overall amount at risk at payment	Average Recoveries and Corrections (d)	Estimated future corrections	Minimum Estimated overall amount at risk at closure	Maximum Estimated overall amount at risk at closure
	in 2017(m€)	in 2017 m(€)	in 2017 (m€)	in 2017 (m€)	(weighted AER; %)	(weighted AER; %)	in 2017 (m€)	in 2017 (m€)	(adjusted ARC; %)	in 2017 (m€)	in 2017 (m€)	in 2017 (m€)
	1	2	3	4=1-2+3	5a	5b	6a=4*5a	6b=4*5b	7	8=4*7	9a=6a-8	9b=6b-8
Administrative exp.												
Administrative												
H2020	2,19			2,19	0,50%	0,50%	0,01	0,01			0,01	0,01
RFCS	0,04			0,04	0,50%	0,50%	0,00	0,00			0,00	0,00
Procurement												
H2020	32,18	0,07		32,11	0,50%	0,50%	0,16	0,16			0,16	0,16
RFCS	0,00			0,00	0,50%	0,50%	0,00	0,00			0,00	0,00
Previous FPs	0,00			0,00	0,50%	0,50%	0,00	0,00			0,00	0,00
Subsidies entrusted entities												
H2020	114,03	114,03	102,68	102,68	0,50%	0,50%	0,51	0,51			0,51	0,51
Operational exp.												
Cross-subdelegations												
FP7	6,97			6,97	4,95%	4,95%	0,34	0,34	1,86%	0,13	0,22	0,22
H2020	5,20			5,20	2,82%	2,82%	0,15	0,15	0,58%	0,03	0,12	0,12
Experts contracts												
H2020	5,08			5,08	0,50%	0,50%	0,03	0,03			0,03	0,03
FP7	0,02			0,02	0,50%	0,50%	0,00	0,00			0,00	0,00
RFCS	0,36			0,36	0,50%	0,50%	0,00	0,00			0,00	0,00
Financial instruments												
H2020	539,90			539,90	0,00%	0,50%	-	2,70			-	2,70
Grants												
FP7	445,38		1.167,06	1.612,43	4,95%	4,95%	79,82	79,82	1,86%	29,99	49,82	49,82
H2020	1.304,66	678,15	94,21	720,71	2,82%	2,82%	20,32	20,32	0,58%	4,18	16,14	16,14
Previous FPs	0,01			0,01	0,50%	0,50%	0,00	0,00			0,00	0,00
RFCS	47,11	34,07	54,75	67,80	4,55%	4,55%	3,08	3,08	1,2%	0,81	2,27	2,27
Other												
FP7	0,00			0,00	0,50%	0,50%	0,00	0,00			0,00	0,00
H2020	1,69			1,69	0,50%	0,50%	0,01	0,01			0,01	0,01
Prizes												
H2020	2,20			2,20	0,50%	0,50%	0,01	0,01			0,01	0,01
Procurement												
FP7	3,41			3,41	0,50%	0,50%	0,02	0,02			0,02	0,02
H2020	14,50			14,50	0,50%	0,50%	0,07	0,07			0,07	0,07
Subsidies entrusted entities												
FP7	161,64			161,64	0,50%	0,50%	0,81	0,81			0,81	0,81
H2020	519,75	95,02		424,72	2,82%	2,82%	11,98	11,98	0,58%	2,46	9,51	9,51
Grand Total	3.206,30	921,34	1.418,70	3.703,65	3,17%	3,24%	117,32	120,02	1,02%	37,61	79,71	82,41
Share of the minimum/maximum amount at risk at closure of the total relevant expenditure:											2,15%	2,23%
Segment affected by a reservation (See paragraph 2.1.5)												

Foot notes related to table 3

- (a) New pre-financing (PF) actually paid out by DG RTD during the financial year FY (i.e. excluding any PF received as transfer from another DG) The reconciliation of total new prefinancing provided from ABAC mentioned in this table with the detailed by programme shows a slight difference.
- (b) PF actually having been cleared during the FY (i.e. in FY 'actuals', not their 'cut-off' based estimated 'consumption')
The total amount of prefinancing cleared that appears above shows a difference with ABAC data because it includes pre-financing cleared by recovery orders and by corrections (EUR 30 million) in addition to the pre-financing cleared by invoices.
- (c) For the purpose of equivalence with the ECA's scope of the EC funds with potential exposure to L&R errors (see the ECA's AR methodological Annex 1.1 point 10), also our concept of "relevant expenditure" includes the payments made, subtracts the new pre-financing paid out , and adds the previous pre-financing actually cleared during the FY. This is a separate and 'hybrid' concept, intentionally combining elements from the budgetary accounting and from the general ledger accounting.
- (d) The historic average of recoveries and financial corrections (ARC) received from the central services is 1.5%. However, further to ECA/IAS recommendations, RTD adjusted this value for grant management expenditure and used as best estimation the difference between overall representative detected error rate and the residual error rate.

The historic average of recoveries and financial corrections (ARC) received from the central services is 1.5%. However, In 2017, comments received from DG BUDG (in relation to the use of the recovery context) and the Internal Audit Service demonstrate that this figure may not be reliable and conservative enough. The European Court of Auditors (in its Annual Report 2016) also identified some inconsistencies in the calculation between members of the Research Family. DG RTD has therefore changed the methodology to calculate the estimated amount at risk at closure compared to 2016⁶⁰. For grant management expenditure, which accounts for the vast majority of the amount at risk at closure, the residual error rate has been used to estimate the average rate of correction (and so the risk at closure). The residual error rate is a well-established concept for the Research and Innovation Family (see Annex 4 Materiality criteria) and is considered to be the most reliable method to estimate, conservatively and reasonably, the corrective effect of audits. This has also allowed for greater harmonisation within this report and across the Research and Innovation Family. In 2016 the general Commission's guidance on estimated amount at risk at closure' was used.

For the error rates estimated for administrative expenditure (0.5%) and financial instruments (0-0.5%), these have been reviewed in light of comments from the European Court of Auditors (Annual Report 2016), and to ensure harmonisation across the Research and Innovation Family. For this expenditure no recoveries are assumed.

Table 3 above shows that 97,77% - 97,85% of the expenditure implemented in DG RTD in 2017 is considered as complying with all the legality and regularity requirements. The remaining 2,15% - 2,23% is the part of the expenditure impacted by the risk that the underlying transactions were not compliant with the legal or contractual provisions.

Despite this overall positive position, DG RTD makes a reservation for the Research Fund for Coal and Steel and the directly managed part of FP7, because the estimated residual error rate for these items is beyond the materiality threshold applied for these programmes (2%). Further details follow under point 2.1.5 of this report.

Efficiency of the controls

Based on an assessment of the most relevant key indicators and control results, DG RTD has assessed the cost-effectiveness and the efficiency of the control system and reached a positive conclusion.

The following chapter gives details firstly on the efficiency related indicators, and secondly on the overall cost-effectiveness of the control system.

Efficiency of the expenditure under direct management

This section presents the main efficiency performance indicators for the activities carried out in DG RTD: grant management for FP7 and HORIZON 2020 (and the Research Fund for Coal and Steel) programmes.

The report does not detail the part of the budget implemented under other control systems, as they are not significant compared to the grants.

⁶⁰ The impact of this change of methodology on the overall figures for the estimated amount at risk at closure is not significant. In 2016 the estimated overall amount at risk at closure was EUR 73.47-103.98 million (1.92% - 2.71% of total expenditure). The 2016 estimated overall amount at risk at closure with the 2017 methodology would have been EUR 87,9-90,09 million (2,29% -2,35%).

Grant management control results for FP7 and Horizon 2020

In 2017, two FPs were implemented in DG RTD. The management of these programmes is presented by control stages, with a varying scope depending on the stage and the programme.

Table 4 Scope of the efficiency/performance indicators in this report

Stage	Scope of the indicators for 2017 (data available)			
	FP7		Horizon 2020	
	R&I Family	RTD only	R&I Family	RTD only
1. Programming and evaluation	NO	NO	YES	YES
2. Grant preparation	NO	NO	YES	YES
3. Monitoring of the projects	NO	YES	YES	YES
4. Ex-post	YES	YES	YES	YES

FP7 represents in DG RTD, at the end of 2017, 4417 completed and closed grant agreements out of 4935. 518 ongoing projects and 199 closed projects with a "reste à liquider" represent a total of EUR 410.7 million still to be paid. 631 final payments took place in 2017.

FP7 projects still running in 2017, for DG RTD
 → 717 grant agreements with a RAL of EUR 410.7 million
 → 631 final payments in 2017

Horizon 2020 represents 985 agreements signed in DG RTD, out of which 241 were signed in 2017. The first HORIZON 2020 ex-post audits results were received in 2017.

Stage one: Programming and evaluation

The first stage concerns the preparation of calls, the calls for proposals, and the evaluation of proposals.

Overall control objective

The overall control objective is to evaluate the project proposals in order to ensure scientific excellence (selection of the best projects) and the achievement of the operational objectives set out in the specific work programmes, as adopted by the Council and the Parliament. Proposals are reviewed by panels of external reviewers, who are experts in the scientific field.

Scope

Being a corporate business process for the Horizon 2020 implementing bodies, this section reports data related mainly to the Research and Innovation Family. DG specific data are available for the indicator regarding the information sent to the successful projects.

Risk based key controls

Key controls include the screening of proposals for eligibility, the choice of independent evaluators, the evaluation by a minimum of three evaluators, and a panel review for the ranking of proposals. The list of approved proposals is checked for legal compliance by the AOSDs before it is submitted for a Commission inter-service consultation.

These are key checks to ensure the excellence of the science to be funded and the legality and regularity of operations, since a compliance deficiency in the selection process would affect the regularity of all the ensuing grants.

Family Picture

HORIZON 2020 calls' competitiveness

Around 1 in 8 eligible proposals retained for funding

A corporate approach for more efficiency

The planning of the Work Programmes and of the calls is organized in common for the Research and Innovation Family.

DG RTD coordinated the establishment of the HORIZON 2020 work programme for 2016-17 and followed its implementation. For a better efficiency of the whole system:

- some sub-processes of this stage are entrusted to REA

(validation of the beneficiaries, SME qualification, experts' management, etc.);

- a corporate technical support is provided by the Participant Portal for the publication of all the calls and the dissemination of the related reference documents, and by the common IT tools for the evaluation phase.

Family Picture

Time-to-Inform in 2017 HORIZON 2020

94,3% on time

Control results

By the end of 2017⁶¹, 457 HORIZON 2020 calls were concluded, with 151 067 eligible proposals submitted, requesting a total EU financial contribution of €232 billion. Of these, 18 059 proposals were retained for funding, bringing the overall success rate of eligible full proposals in the first four years to 12%.

For the concluded calls one proposal was retained for funding for, on average, about eight eligible proposals. This ratio, decreasing from 1/7 to 1/8 since 2014, demonstrates the attractiveness of the HORIZON 2020 programme and the competitiveness of the call process. It also underlines the importance of a good evaluation process, as the most excellent projects need to be chosen from a large number of proposals.

The main efficiency indicator of this stage is the Time-to-Inform. For the grants that were signed in 2017, DG RTD succeeded to respect, in 100% of the cases, the objective of a maximum of 5 months spent between the call's deadline and the moment the applicants are informed of the results of the evaluation.

Stage two: Grant preparation (contracting)

The second stage concerns the preparation and award of contracts.

Overall control objective

The overall objective of this stage is the translation of each of the retained scientific research proposals into a legally binding contract allowing for the management of both the scientific and financial aspects of the project.

Scope

In 2017 this stage concerned Horizon 2020.

⁶¹ This information is related to the HORIZON 2020 proposals and projects emanating from 2014-2017 calls, situation as of 09/02/2018

Risk based key controls

As well as the first stage, the second relies on corporate business process and IT tools, with the aim to ensure equal treatment of the beneficiaries and an efficient use of the scarce time dedicated to the finalization of the contracts.

In addition to the basic checks of the participants, risk based checks are undertaken in order to prevent or mitigate fraud and other risks (operational capacity, financial capacity).

A corporate approach for more efficiency

IT tools, business processes and some checks are organized at Research and Innovation Family level. The new legal entities undergo the validation process in REA, no matter what implementing body is finalising the contract.

Family Picture
Time-to-Grant HORIZON 2020 for the period 2014-2017

96% on time

Control results

In RTD, 241 grant agreements were signed in 2017 for HORIZON 2020, for a total EC contribution of EUR 1,2 billion. The total of the budgeted costs of these projects is EUR 1,41 billion.

The main performance indicator is the Time-to-Grant (TTG). This is important as participants, especially Small-and-Medium-Sized Enterprises, want a quick answer to their proposals. Nevertheless, it needs to be noted that a shorter TTG does bring some risks as it reduces the time available for the Commission to carry out extensive checks before signing grants.

Picture for DG RTD
Time-to-Grant in 2017 HORIZON 2020
92% of grants signed on time
210 days on average

Time-to-Grant (cumulative 2014-2017)
91 % of grants signed on time

For the year 2017 the TTG was respected in 92% of cases against the HORIZON 2020 target of 8 months, with an average TTG of 210 days. For the whole period 2014-2017, 91% of grants were signed within the deadline.

Concerning the results for the whole Research and Innovation Family, and the whole period 2014-2017, 96% of grants were signed within the deadline⁶² (97% for the year 2017).

Grants for Research Infrastructures are considerably more complex than the average, and these are concentrated in DG RTD. This is why the RTD result, though still very good, is slightly lower than that for Horizon 2020 as a whole.

Stage three: Monitoring the projects' implementation

The third stage concerns the management of the project and the contract, from the prefinancing to the final payment.

Overall control objective

The overall objective of the stage is to ensure the successful implementation of the granted projects through project monitoring and by timely and regular payments to the beneficiaries. Regular preventive controls, such as kick-off meetings and information

⁶² Without taking into account the grants signed by ERCEA, as the 8-month deadline is not binding in its case.

sessions, trainings, communication campaigns etc. take place in order to prevent errors or fraud in the reimbursement of the costs claimed.

Monitoring the results of the projects contributes to the overall evaluation of the programme's impact. For HORIZON 2020, the Commission published the interim evaluation on 29 May 2017⁶³.

Scope

In 2017, prefinancing was paid for HORIZON 2020 projects, and cost claims reimbursed for FP7 and HORIZON 2020 projects.

Risk based key controls

This stage covers the normal management of the contract over its lifetime: the monitoring of the project implementation and the payments against the cost claims with all the necessary ex-ante checks. These ex-ante checks include audit certificates on final cost statements established by external auditors, and the processing of transactions through Commission financial circuits.

For Horizon 2020, common ex-ante control guidance was adopted in December 2016 by the Steering Board of the Common Support Centre. This guidance, deriving from the overall control strategy for Horizon 2020, streamlines the control practices related to the treatment of the cost-claims. The guidance is linked to dedicated features in the corporate grant management IT system (Sygma), where particular attention was paid to the differentiation of the controls following the risks.

Control results

DG RTD managed 1623 ongoing projects in 2017:

- 519 open contracts and 119 contracts closed with a "Reste à liquider" for FP7 at the end of December 2017;
- 985 contracts for HORIZON 2020, signed before the end of December.

For the 2373 payments made in 2017 for grants⁶⁴, details are in tables 5 and 6 below. The efficiency of this stage is measured by the indicator 'Time-To-Pay' (TTP), which is defined as the percentage of payments made within the binding deadlines. Regarding grants, 98.8 % of the payments authorized in 2017 by DG RTD were made in time. This confirms the trend since 2013, and highlights the good performance of the payment workflows and the evolving IT environment.

Table 5 Evolution of the TTP for grants in DG RTD (%)

Expenditure type	2014	2015	2016	2017
Research grants payments	94%	95%	97.6%	98.8%

⁶³ For details, see part 1 of the AAR.

⁶⁴ Under all the programmes (HORIZON 2020, FP7, Euratom).

Table 6 Average net and gross TTP for grants in DG RTD in 2017

Payment type	Payments			
	Nr	Average time (calendar days)		
		Net	Suspension	Gross
RTD - HORIZON 2020 payments	580	45.5	10.1	55.6
RTD - HORIZON 2020 payments PreFin	245	10.0	3.1	13.0
RTD - FP7 payments	945	58.4	47.0	105.4
RTD - Other grants - not FP7	603	42.1	102.8	145.0
Gross = Beneficiary's point of view, ie Net + Suspensions				

As shown in Table 6 the average total time taken to pay is within the payment time limits imposed by the Financial Regulation and the respective contracts. However, DG RTD is aware that, in some cases, the total ('gross') time to pay is longer, because of the possibility, set out in the Financial Regulation, to suspend the payment deadline if information is missing or incomplete.

DG RTD is committed to smoothing the process by further simplification of internal procedures and better IT tools and guidance to beneficiaries.

Stage four: Ex-post controls and recoveries

The fourth stage includes the ex-post audits as well as the recovery of any amounts found to have been paid in excess of the amount due.

This section focuses on the audit work carried out in 2017 and its follow-up actions. The results of the audits, namely the error rates, are detailed in the section dedicated to the control results in terms of *effectiveness as regards legality and regularity*.

Overall control objective

The objectives of ex-post controls are to:

- provide an estimate of the level of irregularity in the population of cost claims paid;
- the detection, correction and follow up of irregularities;
- provide detailed information on the practical application of the rules by the beneficiaries.

The correction and follow-up of irregularities detected in ex-post control results has an important '*cleaning*' effect on the budget. It is expected for FP7 that the Representative Detected Error Rate around 5% is to be reduced to 3%, after the corrections are applied.

Scope

For 2017 this stage covers expenditure under FP7 and HORIZON 2020, with a small proportion for the Research Fund for Coal and Steel.

As mentioned at the beginning of the Chapter 2 of this report, the ex-post control stage for the research grant management is, largely, centralised in RTD, in a Common Audit Service (CAS). Therefore, the activity exposed here has to be read as related to the whole Research and Innovation Family.

Corporate approach for more efficiency and less burden

For FP7, in order to limit the audit burden on the beneficiaries and to ensure a consistent audit approach through the Commission services, the Common Audit Service undertook

audits for the DGs that fund research grants (DG CNECT, DG ENTR (now DG GROW), DG MOVE and DG ENER)⁶⁵; when relevant, it carries out joint audits with the European Court of Auditors.

For Horizon 2020 the CAS undertakes all (representative and complementary) audits, including for Executive Agencies and Joint Undertakings. It is a major step forward in ensuring a harmonised approach and also in ensuring that audit burden on beneficiaries is minimised.

Controls and methodology

Since 2007, the Research Directorates-General and the Executive Agencies have adopted a common audit strategy intended to ensure the legality and regularity of expenditure on a multi-annual basis, including detection and correction of systematic errors. The audits examine only interim and final claims by beneficiaries. Transactions relating to pre-financing are not included in the population subject to audit.

In 2015, the Common Audit Service conducted audits for the Common Representative Audit Sample and others initiated on a risk based approach⁶⁶.

Controls results

Ex-post audits carried out

With regard to the implementation of the FP7 Audit Strategy, the revised 2017 target of 210 audit results was met: 238 audit results were delivered by 31 December 2017 (113% of the annual target). The FP7 Representative Error Rate as of 31 December 2017 is at 4,95%.

FP7 audit coverage (cumulative figures)
1982 audits closed by DG RTD
62,7% of the FP7 budget covered (DG RTD)
(9,2% direct coverage and 53,5% by extrapolation)

HORIZON 2020 audit coverage for the Family (cumulative figures)
Audits of 385 participations were closed

For HORIZON 2020, in application of the IAS Action Plan, all the audits to be closed in 2018 were selected by

November 2017. Detected error rate based on 110 out of 142 participations selected in the first CRS is 1,6%. However, if we take into account the draft audit reports, then the expected representative error rate for the full sample will be around 2,82%. Following changes to the needs of the CAS clients (in particular Joint Undertakings), the overall target in the HORIZON 2020 Audit Strategy was revised down from 422 to 414 participations. By the end of December 2017, the audits of 392 participations were closed, meaning that the 95% of the overall target was achieved.

This is a good performance at this stage of the programme. A report by the Internal Audit Service provided a number of recommendations to improve performance, and an Action Plan has been established and is being implemented.

Implementation of FP7 audit results

It should be noted that there will always be a time lag between the start of the project, the payments, audits performed and recoveries made. Research projects are multi-annual and involve payments at different stages. Substantive payments (not pre-financing) only start around 2 years after the beginning of the project. Audits cannot start until substantive spending is made. When an overpayment is identified it may

⁶⁵ FP7 audits started in these DGs will be completed by the same DGs. Executive Agencies remain responsible for their FP7 audits. Full details can be found in the AARs of these other services.

⁶⁶ More details on the methodology can be found in the control effectiveness section (2.2.2).

sometimes be recovered immediately through a recovery order, but it is more common that it is recovered by offsetting against another future payment, especially when projects are still ongoing. As payments are usually made at 18-24 month intervals, there will often be a considerable time lag between the identification of a recovery and the effective recovery. Given the pattern of payments, and the type of beneficiaries, this does not generally present a particular risk to the EU financial interests. However, it is one of the major reasons why there are many outstanding recoveries.

By the end of 2017, and in a cumulative way from the beginning of the programme FP7, adjustments were proposed for 1 995 audited DG RTD participations. By the end of 2017 the amount to be recovered was EUR 77.47 million, of which more than EUR 55.34 million (71.4%) has been effectively recovered (this includes liquidated damages).

Table 7 Implementation of FP7 audit results in DG RTD (cumulatively)

Cumulative	Results from External Audits		Adjustments Pending Implementation		Adjustments Temporarily Suspended		Adjustments Implemented	
	Number of Participations	Funding Adjustments Set by AOSDs	Number	Value	Number	Value	Number	Value
FP7	1995	77.476.162,07	225	22.387.639,87	18	1.380.536,22	1752	55.341.355,71

For 2017 alone, corrections amounting to EUR 5.6 million were implemented for FP7 (including liquidated damages). There are currently 243 FP7 cases pending implementation (including suspended ones) for a total value of EUR 23.76 million⁶⁷. The implementation rate for FP7 audit results by the end of December 2017 was 87.8%.

Implementation of extrapolation

The extrapolation process allows correcting systemic errors of a beneficiary detected by an audit in all its ongoing participations. When the audit results mention systemic errors, all the contracts of the beneficiary are analysed, and for those where these systemic errors affect the expenditure, adjustments are made. It has to be noted that this process often takes place after the audit is closed, which means 3-4 years after the final payment of the grant.

As regards the FP7 programme, 3 516 extrapolations were implemented for 5 058 DG RTD participations with possible systemic errors. The implementation rate for extrapolation by the end of December 2017 was 69.51% for FP7. This is lower than the expected implementation rate at this stage, but is explained by an important number of new files introduced into the workflow in 2017.

Table 8 Implementation of FP7 extrapolation in DG RTD (cumulatively)

Cumulatively	Number of Contracts Analysed for Extrapolation	Implemented Cases					Number of cases to be Implemented
		Without Systemic Errors	With Systemic errors				
			In favour of the Commission		In favour of the Beneficiary		
		Number	Number	Amount	Number	Amount	
FP7	5058	1929	1357	€ 29.232.411,97	230	€ 1.035.032,56	1542

Tables 7 and 8 together show that, to date, EUR 84.57 million has been recovered following audits of FP7.

⁶⁷ Source: ASUR application (extract 11/01/2018).

Cost-effectiveness of the controls

Direct grant management

Following the Commission central services' guidelines, the cost effectiveness of the controls in direct grant management is assessed by the cost of the different control stages compared to the amounts associated to them (committed, audited, paid amounts). The overall assessment is obtained from the ratio between all those costs and the total amount paid in the year for grants.

The costs can be divided in three main categories of costs:

- DG RTD costs,
- Common support services provided by REA for stage 1 on evaluation/selection,
- Common support services provided by the CSC which is hosted in DG RTD.

DG RTD costs

Table 9 Cost of control for RTD

Direct grant management	Internal costs (M€)	Total amount of payments M€	Overall rate (total costs/total amount paid)
Ex ante controls for grant management Stage 1 Evaluation /selection Stage 2 Grant finalization Stage 3 Contract monitoring	41,85	1797,16	2,33%

The costs of controls for RTD are estimated at EUR 41.85 million for internal costs (staff).

Common support services provided by REA for stage 1 Evaluation/selection

For more efficiency and the cost-effectiveness of the HORIZON 2020 programme, REA manages the validation of the beneficiaries and the contracting of the evaluation experts for the whole Research and Innovation Family (except ERCEA). REA also pays the expert evaluators for the Family (except for ERCEA). Both activities are linked to the first control stage.

The costs of REA support services (costs of validation of beneficiaries and contracting of evaluation experts, and costs of experts evaluators) represent 0.82% of the total budget implemented in 2017 by the Research and Innovation Family (in terms of payments).

Table 10 Cost of Common support services provided by REA

Effectiveness indicator in direct grant management	Costs (Million €)	Operational Payments 2017 Research and Innovation Family Cross-subdelegations excluded (less payments EIB/EIF, ART 185 and JRC)	Overall rate (total costs/total amount paid)
Evaluation Experts paid by REA	51.55	8,142.11	0.63%
REA Support services (costs of validation of beneficiaries and contracting of evaluation experts)	18.38	9,743.35	0.19%
Total for REA shared services			0,82%

Common support services provided by the Common Support Centre hosted by DG RTD

The costs of common services⁶⁸ (in legal support, ex-post audits, IT systems and operations, business processes, programme information and data) represent 0,7 % of the total implemented budget for all Research DG's, Executive Agencies and Joint Undertakings implementing HORIZON 2020 (in terms of payments) in 2017. The part of costs dedicated to ex-post audits represents 0,15%.

Table 11 Costs of Common Support Centre

Overall cost effectiveness indicator in direct grant management	Costs (M€)			Operational Payments 2017 Research and Innovation Family without Cross-subdelegations (less payments ITER, EIB/EIF, ART 185 and JRC)	Over all rate (total costs/total amount paid)
	Internal costs	External costs	Total		
Common Support Center				Total amount in M€	%
Common services in legal support, ex-post audits*, IT systems and operations, business processes, programme information and data for all research DGs, executive agencies and joint undertakings implementing H2020	29,4	38,5	67,9	9.743,35	0,70%
<i>(*) part of ex post audits in the total costs of the CSC</i>	10,4	4,3	14,6		0,15%

According to the three tables above, the overall cost of the controls in grant management represents 3.85% of the total implemented budget (in terms of payments) in 2017.

The figures must nevertheless be read with some caution:

DG RTD Internal costs are an estimate, and may include some overstatement

Data from RTD's annual task mapping exercise are used to estimate the cost of control in grant management. This yearly staff allocation survey exercise gives an estimate of total FTE dedicated to "programme management" for 2017.

In addition, the full costs of Financial Staff has been assumed to apply to grant management. In reality, Financial Staff spend a part of their time on tasks linked to policy or other work, for example tendering procedures and contracting for expert groups.

The average cost of an FTE is calculated on the basis of the number of RTD FTE by category multiplied by the average staff cost by category as provided by DG BUDG⁶⁹. Note however that there is no data in the task mapping exercise regarding the category of the staff (permanent, contractual agent, SNEs), nor the grade of staff allocated to programme management. A conservative approach was taken.

Cost of ex-post audits

The costs related to the implementation of the audit results and the extrapolation are not identifiable as such: they are included in the costs of project monitoring.

⁶⁸ Human resources and payments 2017.

⁶⁹ These average costs include real estate spendings.

Mixing of Framework Programmes

DG RTD does not distinguish costs between HORIZON 2020 and FP7, though their control systems have differences; the value of the indicators depends strongly on the implementation stage of the programme.

It should also be noted that the benefits of the grant management control system cannot be expressed by the only implemented budgetary amounts.

The first objective of the control system is to achieve the main policy objective – to create growth and jobs, especially by contributing to more and better science in Europe. In this sense, the controls aim to ensure good work programmes, select the best proposals to be funded and verify the scientific deliverables. Thus, the benefits are much wider than the budget implemented in the given year.

The second objective of the control system is to ensure that the EC contribution paid to the beneficiaries is complying with internal control objectives. This means, in short, legal and regular transactions done in a cost-effective way. This report develops at several points how the balance between these two requirements is found.

Overall, given:

- the achievements of research policy as set out in Part 1;
- the quantitative and qualitative benefits arising from the control systems adopted;
- the error rates set out above, which are at a level considered as being an appropriate balance 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 research and innovation policy.

Executives agencies and indirect grant management

Executive Agencies

In DG RTD, it is estimated that 9.45 FTE were employed in supervision and coordination activities related to these bodies. This relates to a total cost of around EUR 1,35 million, or 1.19% of the amount of the total expenditure sub-delegated by DG RTD to them (only administrative subsidies).

It should be noted that the supervision of Executive Agencies also includes the implementation of their operational budget, which they receive directly from the College, without passing by DG RTD. REA and ERCEA implemented a total of EUR 1 951.37 million payment appropriations on the budget lines 08 (RTD)⁷⁰. EASME and INEA implemented in 2017 EUR 1 031.32 million payment appropriations on the same line.

These amounts should also be considered when it comes to the cost-effectiveness of the supervision.

Joint undertakings

Total costs of supervision of the Joint Undertakings incurred in 2017 by DG RTD are estimated at EUR 1,52 million, 0.26% of the EUR 583.2 million paid to these bodies.

⁷⁰ Not a direct part of the DG RTD budget and so not covered directly by the assurance in this report.

Article 185 bodies

The costs of their supervision are estimated to EUR 0.515 million, or 0.52% of the payments made in 2017. DG RTD considers that its management and supervision is effective and cost-effective.

Overall assessment of the cost effectiveness in indirect grant management

Table 12 Overall cost effectiveness indicator for direct grant management

Indirect Grant Management	Payments	FTE	Total costs	%/total costs
Executive Agencies	114.026.629,92	9,45	1.351.350,00	1,19%
Article 185	98.185.716,31	3,60	514.800,00	0,52%
Article 187 (JU's)	583.199.673,00	9,90	1.522.950,00	0,26%
Total	795.412.019,23	23,45	3.389.100,00	0,43%

Overall, it is considered that a cost-effective control system for indirect grant management has been put in place.

Indirect management of the financial instruments

DG RTD payments to EIB and EIF amount in 2017 to a total of EUR 547.40 million⁷¹.

Administrative and policy-related incentive fees were deducted by the implementing institutions from the EC contribution paid: a total of EUR 34.27 million:

EIB has drawn in 2017 from the EU account an amount of EUR 3.93 million for administrative fees, EUR 4.66 million for policy-related incentive fees and EUR 0.40 million for treasury asset management fees and unforeseen expenditures. The cumulative amount of fees drawn by the EIB as of 31/12/2017 reaches EUR 32.33 million.

EIF has drawn in 2017 from the EU SMEG account an amount of EUR 12.66 million for administrative fees and EUR 8.44 million for policy-related incentive fees. The cumulative amount of fees related to InnovFin SMEG drawn by the EIF as of 31/12/2017 reaches EUR 45.37 million.

EIF has drawn in 2017 from the EU IFE account an amount of EUR 2.17 million for administrative fees and EUR 2 million for policy-related incentive fees. The cumulative amount of fees related to InnovFin IFE drawn by the EIF as of 31/12/2017 reaches EUR 10.93 million.

The share of fees in the 2017 payments is 6.26 %. These fees were drawn from the EU account according to the Delegation agreements' terms, which were designed to allow the funds' sound management.

The amounts delegated each year, and the management and other fees payable each year, will vary. In order to have a reliable picture on the share of the management fees in the total implemented amounts, the calculation must be done at the closure of the programme.

⁷¹ The amount includes a subdelegation received.

In addition, the supervision of these bodies was carried out in 2017 by 0.6 FTE DG RTD staff, representing a total cost of EUR 0.09 million.

As a conclusion, the financial instruments are managed in accordance with the Delegation agreements concluded with the EIB and the EIF, and in a cost-effective manner.

Fraud prevention and detection

DG RTD, together with the Research and Innovation Family, has developed and implemented a Common Anti-Fraud Strategy (RAFS, adopted on 18th March 2015) with a common Action Plan. The Commission will update its Anti-Fraud Strategy in 2018, with DG RTD actively involved in the discussions on its contents. This will trigger a review of the anti-fraud strategies currently in place in DG RTD and in the Research and Innovation Family.

The implementation of the RAFS is monitored once a year with reporting to the management.

The common action plan of the 2015 Common Anti-Fraud Strategy of the Research and Innovation Family has been completed to a high degree (87,5 %). The few remaining actions will be considered for carry-over into the next Common Anti-Fraud Strategy (to the extent that they are still relevant at that point in time). Overall, compared to a few years ago, the awareness of fraud and the access to specialised assistance when needed have increased in the Family.

In 2017, looking ahead to the future FP9, DG RTD took the lead to perform a wide-looking risk assessment of fraud risks in the Research and Innovation Family. The business areas considered were grants and the related area of experts, as well as financial instruments. The experience of the Research and Innovation Family in these areas was much appreciated by DG OLAF, and the risks identified will be considered for the next global Anti-Fraud Strategy for the Commission.

The main fraud prevention measure in the Research and Innovation Family lies in raising the fraud awareness amongst a target population (new staff members involved in direct grant management). This year, 4 sessions of the training course "Be Aware" were given in DG RTD. There were 15 RTD staff members trained out of a total of 59 participants (in comparison, 39 RTD staff members were trained in 2016 and 42 in 2015).

This reflects the fact that the number of newcomers in DG RTD has decreased significantly in the last few years, due to the delegation of grant management to the Executive Agencies, and to a lesser degree to the general staff cuts in the Commission. So it is expected that in the foreseeable future, the main demand for this training course (fraud awareness in grant management) will come from the Executive Agencies.

Cases of irregularities and fraud amongst beneficiaries of the Framework Programme are followed up by Unit J2 Common Audit Service. Unit J2 works in close coordination with OLAF on these matters.

The number of fraud cases regarding DG RTD beneficiaries and the Framework Programmes that it manages is relatively low, but this remains a sensitive area. In 2017, DG RTD transmitted 9 cases of suspicion of irregularities to OLAF; 30 further cases relevant to DG RTD were initiated by OLAF on the basis of information received from other sources.

Other control objectives: safeguarding of assets and information, reliability of reporting

The table 4 of the Annex 3 reports DG RTD's overall assets.

The main DG RTD assets are:

- available for sale financial assets of financial instruments which amount to EUR 2 395 million as per end of 2017;

- pre-financing paid to the research grant beneficiaries and to the different entrusted entities implementing parts of Horizon 2020 which amount to EUR 1 170 million as per end of 2017.

They are therefore managed and controlled in the context of:

- management of financial instruments;
- direct grant management;
- indirect grant management;

as explained in the relevant sections above.

The intangible assets are IT softwares amounting to EUR 16.5 million at the end of 2017.

2.1.2 Audit observations and recommendations

This section reports and assesses the observations, opinions and conclusions reported by auditors in their reports as well as the limited conclusion of the Internal Auditor on the state of control, which could have a material impact on the achievement of the internal control objectives, and therefore on assurance, together with any management measures taken in response to the audit recommendations.

IAS

In its contribution to the 2017 Annual Activity Report process⁷², the IAS states that the internal control systems audited are partially effective since a number of 'very important' recommendations listed below remain to be addressed, in line with the agreed action plans. The residual risks related to these recommendations may affect one or several internal control principles and/or components⁷³.

'Very important' recommendations that remain to be addressed:

Audit on HORIZON 2020 project management in DG RTD (2016)

Recommendation 1 - Determining the level of monitoring for projects: 6 months overdue at the cut-off date of this report (Original due date: 31/07/2017 Updated target date: 30/06/2018).

HORIZON 2020 implementing bodies have not reached a consensus on how project monitoring should be implemented. The existing guidance developed by the CSC recommends defining the level of monitoring on the basis of a project's risk profile. However it is only presented as a good practice and DG RTD does not systematically apply it.

This may result in inconsistent monitoring approaches and in the unequal treatment of beneficiaries.

Management action taken in response

A Guidance note — Best practices and recommendations on the monitoring strategy (including use of experts & review meetings) has been issued and integrated in the

⁷² Ref. Ares(2018)882363 IAS contribution to the 2017 Annual Activity Report process - DG RTD.

⁷³ As the Commission's newly adopted Internal Control Framework will become fully applicable only as from 01/01/2018, 2017 is a transitional year for which the DGs can opt to report on the previous Internal Control Standards or on the new Internal Control Principles.

corresponding chapter of the Vademecum dealing with project monitoring. This will be re-examined in 2018 in the light of experience. That is why the deadline has been postponed in time.

DG RTD has already taken steps to ensure that staff may properly deal with identified risks in their own work, using outside experts for technical reviews and/or carrying out missions to visit projects as this is considered necessary.

Audit on the implementation of the FP7 ex-post audit strategy by the Common Audit Service (2016)

Recommendation 1 - Delivery of individual audit engagements (due date: 31/03/2018).

The IAS identified that there are significant delays in finalising an important number of audit engagements. As well as harming the reputation and credibility of the Commission, this might affect the reliability of the annual residual error rate and, ultimately, the statement of assurance of the AOD may be affected.

The IAS recommended that the CAS should significantly reduce the average time needed to close the audit files by addressing the root causes of the delays.

Management action taken in response

An action plan was established following the audit and is being implemented in accordance with the timetable set out.

With regard to the risk identified by the IAS, DG RTD notes that the Research and Innovation Family as a whole had a target of 4 056 audit results for FP7. At the end of 2017 4 324 audits results covering 64,2% of FP7 expenditure were completed.

As a result of 83 audit results still to be completed, the RTD Residual Error Rate may still change in 2018. However, since the current Residual Error Rate (3,09%) is almost identical to that of last year (3,07%) and only a small number of audits remains open, it can be assumed that the final Residual Error Rate will be around this value. The delays in finalising some audit reports will not have a significant effect on the rate, and certainly not on the assurance of the AOD.

Recommendation 2 - Audit planning, monitoring and reporting (due date: 01/05/2018).

The IAS identified that some activities (i.e. planning of audit engagements, staff planning, and performance monitoring and reporting) are not sufficiently developed to support the level of activity of the CAS, especially in view of the new challenges linked to the implementation of the HORIZON 2020 ex-post audit strategy. The risk was that the CAS might not be able to deliver on its annual plan.

Management action taken in response

An action plan was established following the audit and is being implemented in accordance with the timetable set out.

With regard to identified risk, DG RTD notes that

- For FP7, the revised 2017 target of 210 audit results was met: 238 audit results were delivered by 31 December 2017 (113% of the annual target).
- For Horizon 2020, by the end of December 2017, the HORIZON 2020 audits of 392 participations were closed, meaning that 95% of the overall target was delivered.

This is a good performance at this stage of the programme. The IAS recommendations are being progressively implemented to ensure that this performance continues into the future.

Below is the list of the audits undertaken in 2017, together with comments on the very important findings.

Audit on HR Management in DG RTD, started in early 2017. Final report dated 21/12/2017 and Action Plan dated 18/01/2018. The audit did not result in the identification of any critical or very important issues, but the IAS considers that there is room for further improvement in certain areas, namely in strategic HR management, HR planning process and redeployment, and developing policy skills and knowledge. There were 3 recommendations issued.

Audit on Ex-Ante Controls for HORIZON 2020 in DG RTD, started in July 2017. The audit has not yet been finalised, the fieldwork was still ongoing by the end of the year.

Audit on the Commission's framework / arrangements for the Estimation, Assessment and Reporting on the Cost Effectiveness of Controls. The audit covered DG BUDGET as the responsible central service, with participation from DG RTD and others. The final report dated 16/10/2017 included one single recommendation addressed to DG BUDGET.

Audit on the Commission's governance / arrangements concerning Risk Management, Financial Reporting and the Ex-Post Verification / Audit Function, The audit has not yet been finalised, the fieldwork was still ongoing by the end of the year.

Audit on Synergies and Efficiencies Review, the preliminary work is ongoing at present.

Limited Review on the Reporting on the Corrective Capacity (in particular the amounts at risk at closure), The main auditee is DG BUDGET as the central service, with the participation of DG RTD, DG AGRI, DG DEVCO, DG EMPL, DG REGIO and EASME. The IAS issued a draft report on 24/01/2018. The draft observations to DG RTD have been reflected in the calculation of the amount at risk.

Audit on the Effectiveness of the Set-up and Supervision of Shift2Rail by DG MOVE, DG RTD was not the main auditee but is involved since it had an important role in the set-up of Shift2Rail.

The table below summarises the state of implementation according to DG RTD, as of 31 of December 2017 of the currently open IAS audits⁷⁴. At the end of the period, DG Research and Innovation had 14 open recommendations, with eight of them overdue.

4 out of the 14 open audit recommendations are very important and 2 out of the 8 overdue recommendations are very important.

The late implementation of audit recommendations is often justified by the need for IT development, by legislative deadlines or new priorities. Directorate R monitors these cases and there are no issues that particularly need to be raised.

⁷⁴ Without prejudice of the conclusions of subsequent follow-up audits by the IAS.

IAS AUDIT TITLE	Number of recommendations			
	TOTAL	CLOSED	OPEN	
				of which overdue
IAS AUDIT ON IMPLEMENTATION OF FP7 CONTROL SYSTEMS & SUPERVISION EXTERNAL BODIES	7	6	1	1
IAS AUDIT ON THE DESIGN AND SET-UP OF THE ICS FOR HORIZON 2020 IN DG RTD	8	6	2	2
IAS AUDIT ON THE SET-UP OF THE CSC FOR HORIZON 2020	5	4	1	1
IAS AUDIT ON THE PARTICIPANT GUARANTEE FUND FOR FP7 AND HORIZON 2020	3	2	1	1
IAS AUDIT ON PUBLIC PROCUREMENT	4	4	0	0
IAS AUDIT ON HORIZON 2020 PROJECT MANAGEMENT	5	2	3	3
IAS AUDIT ON IMPLEMENTATION OF EX-POST CONTROL STRATEGY BY CAS	5	2	3	0
IAS AUDIT ON HR MANAGEMENT BY DG RTD	3	0	3	0
TOTAL IAS	41	27	14	8

European Court of Auditors

Annual Report and DAS 2016

The Court's Annual Report for 2016 was published in October 2017. Chapter 5 of the Court's Annual Report deals with Research and Innovation and other internal policies.

The error rate in Research and Innovation and other Policies (4,1%) is lower compared to previous years. The Court also includes, for the third time, an assessment of the level of error that could have been avoided had controls by certifying auditors, the Commission services, functioned properly. This is 1,2%, compared to 0,6% in 2015 and 2,8% in 2014.

The Court issued three recommendations. They all have been accepted and are being implemented.

- **Recommendation 1:** further streamline the Horizon 2020 rules and procedures to reduce legal uncertainty by further taking into account the simplified cost options in the revised Financial Regulation such as unit costs, lump sums, flat-rate financing and prizes;
- **Recommendation 2:** ensure that its services take a consistent approach towards

the calculation of error rates and overall amounts at risk.;

- **Recommendation 3:** promptly address the weaknesses in its ex-post audits identified by the IAS, by reducing the time taken to close ex-post audits and improving internal processes for planning, monitoring and reporting of audits.

The follow-up to recommendations 2 and 3 are set out in sections above.

In relation to recommendation 1, DG RTD notes that unit costs, lump sum payments, flat rates and prizes are already used to some extent in the Framework Programme. For example:

- In the Marie Skłodowska-Curie schemes, salary costs are paid at a unit cost;
- Indirect costs are paid at a flat rate of 25% of direct costs;
- The SME phase 1 scheme includes a lump-sum payment of €50000, payable on submission of the expected deliverable.

The use of these simplified cost options will be extended wherever possible and, of course, are part of the review that will lead to proposals for the future Framework Programme. The Work Programme for 2018 included two calls for proposal that will be funded by lump sums – these are pilot exercises that will help the Commission to assess if this form of funding is appropriate in different areas of the Framework Programme.

DAS 2017

The DAS 2017 started in April 2017 and the work is close to its end but the results have not yet been received.

2.1.3 Assessment of the effectiveness of the internal control systems

The Commission has adopted an Internal Control Framework based on international good practice, aimed to ensure the achievement of policy and operational objectives. In addition, as regards financial management, compliance with the internal control framework is a compulsory requirement.

The Internal Control Framework has been renewed in 2017⁷⁵. The annual assessment on the basis of the new framework will be conducted in the context of the 2018 AAR. For 2017 DG RTD has opted to report on the previous Internal Control Standards.

DG RTD has put in place the organisational structure and the internal control systems suited to the achievement of the policy and control objectives, in accordance with the standards and having due regard to the risks associated with the environment in which it operates.

In the second half of 2017, DG RTD started work on the development of a new internal control framework, based on the recently adopted corporate framework. The end product, expected in April 2018, will be integrated with DG RTD's internal processes and procedures. Furthermore, it will lay down DG RTD's expectations regarding how each principle should be implemented.

The effectiveness review carried out for 2017 concluded that all Internal Control Standards were effectively implemented.

⁷⁵ C(2017)2373 final, 19.4.2017

This year's exercise was largely based on the analysis of the Director's reports for 2017 and the 2017 risk assessment exercise at Directorate and Directorate-General level. In the instructions for the preparation of these reports, Directors were requested to assess the level of effectiveness of the Internal Control system regarding each internal control standard.

To complement the effectiveness assessment, the information available from other internal control monitoring tools as well as the registry of exceptions and internal control weaknesses reported during the period and regular reporting to management, was analysed for its impact on effectiveness of internal control system.

The Court of Auditors' annual report for 2016 and the conclusion of the Internal Auditor on the state of internal control in DG RTD have been analysed. The conclusions of these analysis together with recommendations which are being implemented are presented in paragraph 2.1.2 .

The report on the validation of Local Systems⁷⁶ has been analysed. It states in its conclusion that based on the work done in 2017 and the follow-up of open recommendations, DG BUDG has not identified any weaknesses in the design or implementation of the local systems which would indicate that they do not meet the validation criteria laid down by the Accounting Officer of the Commission.

Nevertheless, without calling into question the conclusions of the individual validation reports, attention is drawn, for DG RTD, to the completeness of the registration of reflows from financial instruments, and the documentation and reporting on recovery. Although these issues are not found to have a material impact on the annual accounts, they impact the accuracy of the financial and management reporting.

An action plan has been established and its implementation will continue in 2018. A better system for tracking and accounting for reflows has been put in place during 2017, and new guidelines from DG BUDG, established in December 2017, will be implemented in 2018.

The system for verifying and accounting for recoveries is being improved, but as the method of calculating the corrective capacity of control has been changed this has no impact on the amount at risk.

On the basis of the outcome of this exercise, DG RTD concludes that the internal control systems in DG Research and Innovation meet their control objectives and are being effectively implemented.

No internal control standard will be prioritised in 2018 because, as indicated above, a new internal control framework will be put in place in mid-spring 2018. It should however be highlighted that important work is ongoing relating to the following ICS:

- "staff allocation and mobility" – various activities are underway in relation to HR strategy, Learning and Development and matching resources to priorities;
- "processes and procedures" – the simplification of internal procedures will be an important focus point over the year.

In conclusion, the internal control standards are effectively implemented and functioning.

⁷⁶ Ref. Ares(2018)1159401 - 01/03/2018

2.1.4 Conclusions as regards assurance

This section reviews the assessment of the elements reported above (in Sections 2.1.1, 2.1.2 and 2.1.3) and draws conclusions supporting the declaration of assurance and whether it should be qualified with reservations.

As regards the assessment by the management, the analysis of the results of the controls in place, as shown in the indicators outlined above, and the examination of the evidence available, all suggest that DG Research and Innovation's management is in a position to provide unqualified 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 payments for grants;
- management of the RSFF/INNOVFIN financial instruments and the underlying financial transactions with the EIB and EIF;
- payments to Joint Undertakings;
- the operating subsidy paid to the Executive Agencies.

At this stage, in view of our responsibility for the indirect management of the parts of our budget via the cross-delegated AODs, Executive Agencies and entrusted entities mentioned above, we can conclude that there are no control weaknesses affecting assurance.

Based on the control results on the legality and the regularity of the underlying transactions, the following areas are subject to a reservation annexed to the declaration of assurance:

- payments in reimbursement of cost claims under FP7;
- payments in reimbursement of cost claims under RFCS.

In the light of concerns expressed in the 2015 discharge procedure, DG RTD has considered whether a reserve on all FP7 expenditure is appropriate, or whether it can be limited to certain parts of FP7 expenditure.

Firstly, it should be noted that, already in previous years, certain parts of FP7 expenditure were not covered by a reserve where there was evidence that the risks (and so the residual error rates) are significantly lower than for all expenditure. Within RTD this applies to expenditure given to IMI, BBI, Cleansky and FCH. Outside DG RTD, this also applies to expenditure by REA under the Marie Curie programme, and all expenditure from the ERCEA.

However, the main collaborative research programme of FP7 managed by DG RTD cannot be sub-divided in terms of risk. Many of the same beneficiaries appear in each of the thematic areas (transport, health, etc), all have their share of SMEs and new entrants, the control system is precisely the same. Research spending is also not divided by Member State. Consortia must have a multinational character, and many beneficiaries are also present in several Member States. The representative sample covers all thematic areas without distinction.

Finally then, DG RTD concludes that its FP7 grant portfolio under direct management,

made up of collaborative projects, cannot be divided up into different risk categories, and so any reserve must cover all of this portfolio. And for FP7 a residual error rate of 3.09% is above the materiality level set in the standing instructions and so a reserve must be made. For the indirect management parts of our budget entrusted to other entities, we can conclude that there are no control weaknesses affecting the assurance.

As stated above, DG RTD considers that its overall control strategy ensures that trust, control and other policy objectives are kept in balance and that aiming to achieve a residual error rate of 2% at all costs is not a viable approach. This was set out explicitly in the financial statement accompanying the Horizon 2020 legislation, which was accepted by the legislative authority.

DG RTD is also concerned about the obligation to make a reserve covering all of its directly managed FP7 expenditure, when in fact it can give reasonable assurance over 96.9% of this expenditure (and 97.29% - 98.08% of its total expenditure). This gives a misleading impression about the overall standard of financial management in the DG. However, at the moment, DG RTD maintains a reserve for FP7 expenditure against cost statements in 2017.

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. The Acting Director-General, in his capacity as Authorising Officer by Delegation has signed the Declaration of Assurance albeit qualified by a reservation concerning:

- ***Payments in reimbursement of cost claims under the Seventh Framework Programme;***
- ***Payments in reimbursement of cost claims under the Research Fund for Coal and Steel.***

2.1.5 Declaration of Assurance and reservations

DECLARATION OF ASSURANCE

I, the undersigned,

Acting 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 view⁷⁷.

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 limited conclusion of the Internal Auditor on the state of control, the observations 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.

However the following reservations should be noted:

- *Payments in reimbursement of cost claims under the Seventh Framework Programme;*
- *Payments in reimbursement of cost claims under the Research Fund for Coal and Steel.*

Brussels, the 28 March 2018

[Signed in ARES]

Wolfgang Burtscher

Acting Director-General DG RTD

⁷⁷ True and fair in this context means a reliable, complete and correct view on the state of affairs in the DG/Executive Agency.

Reservation FP7

DG	RTD
Title of the reservation, including its scope	Reservation concerning the rate of the residual error within payments in reimbursement of cost claims in the Seventh Research Framework Programme (FP7), implemented directly by DG RTD.
Domain	Direct management grants paid by DG RTD in the 7 th FP.
Programme and amount affected (= "scope")	08.025100; 08.035100 Payments made directly by DG RTD (including Euratom expenditure) and the cross-subdelegated budget, amounting to a total of EUR 452.35 million in 2017 .
Reason for the reservation	At the end of 2017, the residual error rate is not below the materiality threshold foreseen for the multi-annual period.
Materiality criterion/criteria	<p>The materiality criterion is the residual error rate, i.e. the level of errors that remain undetected and uncorrected, by the end of the management cycle.</p> <p>The control objective is to ensure that the residual error rate on the overall population is below 2% at the end of the management cycle. As long as the residual error rate is not below 2% at the end of a reporting year within the FP's management lifecycle, a reservation would be made.</p>
Quantification of the impact (= actual exposure)	<p>The maximum impact is calculated by multiplying the residual error rate in favour of the Commission by the amount of FP7 payments based on cost statements (and clearings, pre-financings deduced) authorised in 2017 by RTD amounting a total of EUR 1,619.4 million. Based on the results of audits, it is estimated that the Residual Error Rate is 3.09%.</p> <p>The estimated impact in 2017 is EUR 50.04 million.</p>
Impact on the assurance	Legality and regularity of the affected transactions, i.e. only payments made against cost claims (interim payments and payments of balance). The impact on assurance is limited by the reduced net financial impact that will occur in some cases where eligible expenditure is limited by budget ceilings.
Responsibility for the weakness	<p>The main reason for errors is :</p> <ul style="list-style-type: none"> - the complexity of the eligibility rules as laid down in the basic acts decided by the Legislative Authorities, based on the reimbursement of actual eligible costs declared by the beneficiaries; - the fact that there are many thousands of beneficiaries making claims, and not all can be fully controlled. <p>The different control provisions set out by the Commission services, along with the audit certificates on financial statements and ex-post audits, can mitigate these risks to a certain extent, but can never be carried out on 100% of the cost claims received.</p>
Responsibility for the corrective action	<p>The possibilities to simplify the FP7 rules have been exhausted. The programme is now in its final stage of implementation: the total amount paid per year will be decreasing, and therefore the financial impact too. Audits may continue at a low level in case of the identification of potential irregularities in projects. However, no further actions are programmed.</p> <p>-</p>

Reservation Research Fund for Coal and Steel

DG	RTD
Title of the reservation, including its scope	Reservation concerning the rate of the residual error within payments in reimbursement of cost claims in the Research Fund for Coal and Steel (RFCS), implemented directly by DG RTD.
Domain	Direct management grants paid by DG RTD in the C&S RF.
Programme and amount affected ("scope")	08.050100 and 08.050200 Payments made by DG RTD: 2017 EUR 47.11 million
Reason for the reservation	At the end of 2017, the estimated residual error rate is not below the materiality threshold foreseen for the multi-annual period.
Materiality criterion/criteria	The materiality criterion is the residual error rate, i.e. the level of errors that remain undetected and uncorrected, by the end of the management cycle. The control objective is to ensure that the residual error rate on the overall population is below 2% at the end of the management cycle. As long as the residual error rate is not below 2% at the end of a reporting year within the programme's management lifecycle, a reservation would be made.
Quantification of the impact (= actual exposure")	The maximum impact is calculated by multiplying the residual error rate in favour of the Commission by the amount of C&S payments based on cost statements (and clearings, pre-financings deducted) authorised in 2017 by RTD amounting a total of EUR 67.8 million. It is estimated that the Residual Error Rate is 3.35% . The estimated impact in 2017 is EUR 2.27 million
Impact on the assurance	Legality and regularity of the affected transactions. The impact on assurance is limited by the reduced net financial impact that will occur in some cases where eligible expenditure is limited by budget ceilings.
Responsibility for the weakness	The main reason for errors is : <ul style="list-style-type: none"> - the complexity of the eligibility rules as laid down in the basic acts decided by the Legislative Authorities, based on the reimbursement of actual eligible costs declared by the beneficiaries; - because of the fact that the Grant agreement terms were very similar but not exactly the same than for FP7 projects, errors occurred when beneficiaries applied FP7 rules for their cost claims. The different control provisions set out by the Commission services, and ex-post audits, can mitigate these risks to a certain extent, but can never be carried out on 100% of the cost claims received.
Responsibility for the corrective action	In order to be close to the current FP's rules, and allow for simplification, which intends to reduce the error rates as well as administrative expenditure, a new HORIZON 2020 inspired model grant agreement is used for all grants signed after 1 Jan 2016. The financial management for RFCS is integrated within a unit that handles the FP, this allows to promote best practices and to review the ex-ante controls.

2.2 Other organisational management dimensions

2.2.1 Human resource management

In terms of Human Resources and Logistics, there were several outputs in 2017 that contributed to all aspects of the objective to deploy effectively its resources in support of the delivery of the Commission's priorities and core business, to have a competent and engaged workforce, which is driven by an effective and gender-balanced management and which can deploy its full potential within supportive working conditions.

Annual Human Resource Planning exercise

The Annual Human Resource Planning exercise was undertaken to try to match staff resources to policy priorities, and to meet the centrally given staff reduction targets. RTD contributed to the distribution across the DG of staff reduction targets linked to the delegation of Programme Management to Executive Agencies and to the corporate Commission Redeployment in the frame of the overall staff reduction targets 2014-2020. In 2017, 75 posts of officials and 46 Contract Agents were suppressed as a result of the annual exercise. This includes the reduction of 46 posts of permanent officials and 17 Contract Agents linked to the restructuring of Administration and Financial Units, reduced from 7 to 3 from 1/1/2018. At the same time 46 posts were transferred to central services as offsetting for transfer of activities.

Competent and engaged workforce, which is driven by an effective and gender-balanced management.

Consequent to the outcome of the 2016 Staff Survey, the subsequent action plan adopted by RTD management in January 2017, aimed to increase the level of satisfaction, engagement and motivation of the staff by allowing an open and constructive discussion with senior management on different internal issues. The actions taken cover five main areas: i) the role, mission, structure of DG RTD, ii) communication ,iii) simplification of internal processes, iv) personnel policy and v) wellbeing. Good progress has been made in implementing the action plan in certain areas (e.g. enhanced channels of communication with management, stronger annual political narrative, more focused briefings, role of policy officers), whilst more needs to be done in other areas that are also affected by ongoing corporate transformations (administrative processes, HR management/training) and that require continuous follow-up.

DG RTD has already reached the target of 40% female middle managers. Under the new Commission decision of 2017 "Female representation in management functions in the Commission – Report on the state of play and progress towards the 40% target"⁷⁸, each DG must reach a specific number of first appointments of female Head of Units for 2017-2019, thus ensuring that overall number of middle management female in the Commission will reach 40% by the end of 2019. The target for first appointments in DG RTD was fixed at 7 females out of 15 possible new appointments. One new appointment was already implemented which places the remaining target at 6 HoU positions. DG RTD has continued to encourage talented female colleagues to express their interest in increasing their range of responsibilities and to apply for middle management posts. To this end, DG RTD has put more emphasis on the participation of female colleagues in its talent management programme - the setup of the programme was approved in June 2017, aiming to create a pool of talents (male and female).

⁷⁸ SEC(2017)505

2.2.2 Better regulation (only for DGs managing regulatory acquis)

Not applicable

2.2.3 Information management aspects

During 2017, DG RTD has developed and implemented an effective strategy of knowledge management through the Intranet, the Library, the eDomec and Archiving activities of the DG.

By the end of 2017, 93% of the unfiled ARES documents (registered between 2010 and 2015) had been filed.

The data base for migration of the previous IT tool for registration of documents (ADONIS) has been prepared.

The new RTD-Intranet was delivered. It emphasises the policy-making mission of the DG, and is structured around its policies and activities. Collaborative spaces, aimed specifically at knowledge distribution and document collaborations, are provided in seamless integration with the Intranet.

36% of Commission colleagues use corporate collaboration tools.

2.2.4 External communication activities

A key communication focus for 2017 was the October launch of the Horizon 2020 Communication Campaign for the work programme 2018-2020 that took place in Brussels. It was followed by three events (the Web summit, the World Science Forum and the European Open Science Cloud conference) and 14 official Information Days also took place across the EU.

DG RTD contributed to the #InvestEU campaign: 19 stories from 10 EU countries are being promoted across Europe to highlight the impact of EU funded R&I as part of the Commission's corporate communication campaign.

DG RTD continued to collaborate, in partnership with DG CNECT and the JRC, with Euronews in the production of the Futuris emissions which showcase newsworthy stories about European research and innovation developments to a potential audience of over 412 million households across 167 countries worldwide.

In addition, over a hundred infographics have been professionally produced and published via DG RTD's social media accounts (Facebook and Twitter: @EUScienceInno 97 000 followers; and Twitter: @EU_H2020 73 000 followers). This reflects a shift in communication strategy towards faster messaging.

Migration to the new Europa Website took place.

The foreseen relaunched of the magazine [Horizon Magazine](#) (website upgrade) did not take place but a more proactive promotion campaign has led to a 67% increase in user number and a 47% increase in page views.

2.2.5 Examples of specific efforts to improve economy and efficiency of financial and non-financial activities

Simplification is a continuous endeavour and has been kept high under the priorities of

the Common Support Centre (CSC). The most significant achievements in 2017 have been the implementation of measures contained in the 'Second Wave of Simplification'.

The CSC coordinated and contributed to the implementation of the [second wave of simplification](#) which is to be finalised with the adoption of the 2018-2020 Work Programme:

- preparation of the pilot actions for testing lump sum funding for collaborative projects that will start with two topics in 2018;
- contribution to the implementation of the European Innovation Council pilot to improve SME Instrument;
- a number of practical improvements to grant management were agreed in 2017 with the HORIZON 2020 stakeholders and the HORIZON 2020 Model Grant Agreement updated accordingly.

In addition, standard ex-ante control functions in the IT system to support harmonised process were implemented end 2017. In particular, the risk management module of the IT tool SyGMA has been enhanced and the support for the assessment of reported costs was automated, including improved traceability and follow-up.

Another achievement to be highlighted for 2017 is the design and approval of the audit implementation process, including the guidance documents and necessary templates. To support and ensure a harmonised approach, the CSC Steering Board also agreed that the coordination of audit implementation will be centralised in the CSC. The IT Audit implementation workflow for ongoing projects was released.

Following a review of current and future transaction levels for FP7, the number of Administrative and Finance Units in DG RTD was reduced from 7 in 2017 to 3 in 2018. There was a reduction in Human Resources from 204 posts at 1/1/2017 to 128 posts on 1/1/2018. Staff were redeployed following an extensive consultation exercise.