



European
Commission

Annual Activity Report 2020

Joint Research Centre

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THE DG IN BRIEF

As the science and knowledge service of the European Commission, JRC's mission is to support EU policies with independent scientific evidence throughout the whole policy cycle. The JRC supports EU policies in a variety of key areas from agriculture and food security, to the environment and climate change, as well as in nuclear safety and security and innovation and growth. As a boundary organisation at the interface between science and policy, it provides the cross-sectoral support required by policymakers to tackle increasingly complex societal challenges, combined with the capacity to respond rapidly to policy needs, all in close collaboration with the other Directorates-General. JRC's work has a direct impact on the lives of Europeans through internationally recognised research for crisis and emergencies response, a healthy and safe environment, secure energy supplies, sustainable mobility and consumer health and safety.

The JRC was established following the Treaty on the European Atomic Energy Community (Euratom) and is continually building its expertise and sharing know-how with EU countries and the scientific community. It works in collaboration with over a thousand organisations worldwide whose scientists have access to JRC facilities.

The JRC creates, manages and makes sense of scientific knowledge and anticipates emerging issues that benefit from EU level collaboration. Its knowledge centres connect experts to inform policymakers. Its competence centres develop analytical and innovative tools, making them available to policymakers and researchers. The JRC explores new and emerging areas of science. It hosts specialist laboratories and unique research facilities.



Figure 1. JRC is located in 6 different sites, spread across 5 European countries.

The EU's framework programme for research and innovation, Horizon 2020, and the Euratom Research and Training Programme funded the JRC during 2020. The JRC contributes to the overall objectives¹ of these programmes while being fully aligned with the political priorities of President von der Leyen's Commission.

The JRC is organised in two directorates with corporate responsibilities for strategy, work programme coordination and resources and support services respectively, and nine scientific directorates of which two are cross-JRC directorates for knowledge management and competences. In May 2020 the JRC welcomed both a new Director-General and deputy Director-General, the latter currently covering the two deputy Director-General positions. Unlike other Directorates-General of the Commission, the JRC also manages scientific infrastructures and nuclear facilities. The JRC has an ISO certified quality system and several of its laboratories are certified according to ISO17025.

¹ JRC objectives: 1) For non-nuclear work under Horizon 2020: 'to provide customer-driven scientific and technical support to Union policies, while flexibly responding to new policy demands'. 2) Under the Euratom programme: 'the pursuit of research, knowledge management and training activities with an emphasis on nuclear safety, security and safeguards'.

EXECUTIVE SUMMARY

This Annual Activity Report is a management report of the Director-General of the JRC to the College of Commissioners. Annual Activity Reports are the main instruments of management accountability within the Commission and constitute the basis on which the College takes political responsibility for the decisions it takes as well as for the coordinating, executive and management functions it exercises, as laid down in the Treaties².

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

As the science and knowledge service of the European Commission, the JRC's activities contribute to the general objective 'Modern high performing and sustainable European Commission', with the intended impact of enhancing the impact and image of the European Union. In addition, the JRC's work on decommissioning and nuclear waste management are part of the life-cycle of nuclear facilities and therefore support the aims of the 'European Green deal', in particular emissions reductions and energy savings.

The highlights and key achievements of 2020 can be grouped along four lines:

- Response of policy support to the COVID-19 pandemic – The JRC has swiftly set up an effective response to the policy needs for managing the short-term impacts of the **COVID-19 pandemic** and for the longer-term recovery (more details in section E).
- The JRC has successfully adjusted its scientific Work Programme 2020 to the Commission Work Programme (CWP) 2020 and other Commission obligations, to the longer-term goals (such as a climate-neutral Europe) and to the COVID-19 pandemic.
- Despite the prioritisation for the COVID-19 pandemic, the JRC has continued progress for greater impact and a more central role in policy support. Its contributions covered all the Commissions general objectives, with almost one third going to the European Green Deal and the digital transition.
- The business continuity on JRC sites was ensured, while respecting the severe restrictions imposed by the COVID-19 pandemic.

In the drive towards a **higher impact and a more strategic role in policy making**, there were some notable achievements and new initiatives in 2020:

- The JRC co-led the drafting of the fitness check on endocrine disruptors, which was included in the Communication on Chemicals Strategy for Sustainability. This is an

² Article 17(1) of the Treaty on European Union

important step towards the Commission's zero pollution ambition for a toxic-free environment, as set out in the European Green Deal.

- In cooperation with the Directorate-General for Regional and Urban Policy, a first worldwide common definition of cities and urban areas was developed and adopted by the UN Statistical Commission.
- In cooperation with the Secretariat-General, the first annual Strategic Foresight Report 'Charting the course towards a more resilient Europe' was drafted and adopted by the Commission. It presents the Commission's strategy to integrate strategic foresight into EU policy-making, identifies first lessons from the COVID-19 crisis and introduces resilience as a new compass for EU policy-making.
- The JRC was asked by President von der Leyen to lead the new Commission-wide activity 'the New European Bauhaus' that aims to make the Green Deal a cultural, human centred and positive, 'tangible' experience. Launched in September, a new unit was set up in December and helped define the phases of the initiative. A set of relevant actions were developed to ensure a) the launch of the design phase through a broad engagement process in early 2021 and b) the exploration of an EC delivery frame.
- A project (reset, re-imagine, re-energise the JRC) was launched to review directions and processes in view of the new demands, e.g. new Commission, new Multiannual Financial Framework and Brexit constraints. Senior management set out key ambitions and priorities which volunteers from middle management will turn into proposals for actions, taking into account input from staff during the process.

The performance tables in annex 2 show an impressive range of contributions to the Commission Work Programme.

The Key Performance Indicators (section B) show a slight decline in scientific excellence compared to the two previous years (but longer time series are required to discern any trends), whereas the number of impacts on policy making shows a record high (fuelled in part by the large number of policy initiatives and the contributions to the management of the COVID-19 pandemic). Customer satisfaction continues on a high level.

Despite the pandemic, business continuity of site management services was ensured at all times. The habitual means of ensuring safety, security and environmental protection were maintained (inspections, audits, supervision) even if they had to be adjusted for the restrictions imposed by COVID-19 pandemic. Following a review of site management, steps have been initiated to improve the organisation of the services and the staffing.

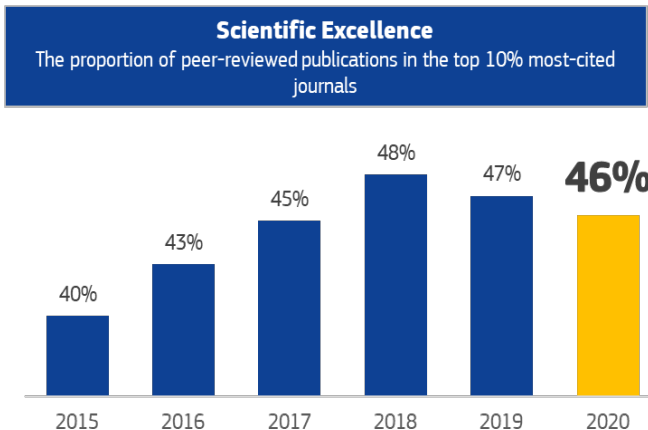
The JRC also manages the intellectual property portfolio of the European Commission, including the European Emblem. In 2020, the most significant achievement of the Central IP Service was the launch of EURECA, the corporate platform for IP management.

B. Key Performance Indicators (KPIs)

Scientific excellence

The proportion of peer-reviewed publications in the top 10 % most-cited journals³

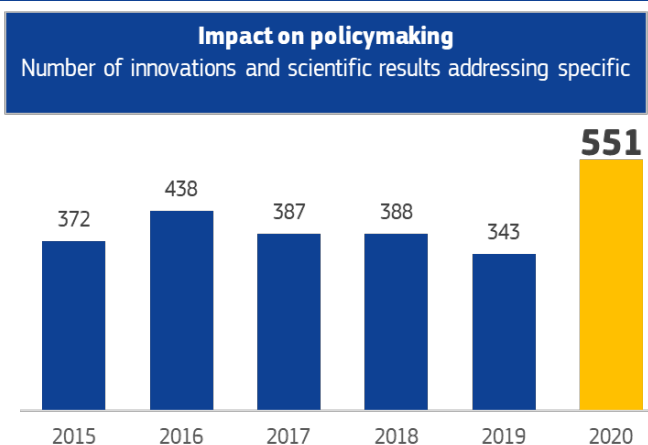
Target (2024):
>40 %



Impact on policymaking

Number of innovations and scientific results addressing specific EU policy priorities

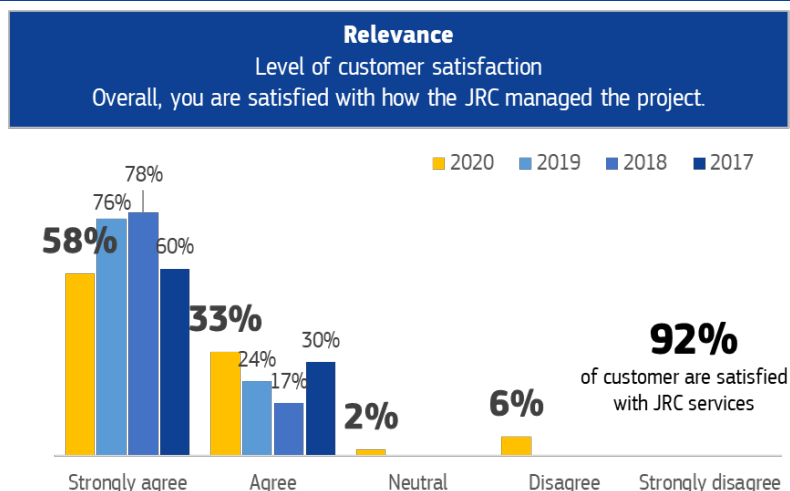
Target (2024):
>300



Relevance

Level of customer satisfaction⁴

Target (2024):
>80 % of customers are satisfied



³ Data extracted on 23/03/2021. At time of extraction, 2020 was still marked as incomplete therefore data may vary.

⁴ Results for 'strongly agree' and 'agree' shall be summed up to obtain the overall satisfaction. Percentages might not add up to 100% due to rounding.

C. Key conclusions on financial management and internal control (executive summary of section 2.1)

In accordance with the governance arrangements of the European Commission, the JRC 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.

To ensure the achievement of policy and management objectives, the Commission has adopted a set of internal control principles, based on international good practice. The financial regulation requires that the organisational structure and the internal control systems used to implement the budget be set up in accordance with these principles. The JRC has assessed its **internal control systems** during the reporting year and has concluded that they are **effective and the components and principles are present and functioning well overall**. Please refer to AAR section 2.1.3 for further details.

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

Indicator	Target	Last known value (31/12/2020)
Estimated risk at closure	Remains < 2 % of relevant expenditure	0.5% Despite the fact that the JRC’s detected error rate is 0 % it has estimated its average error rate to be 0.5 % which is a more conservative and prudent approach.

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 Director General, in his capacity as Authorising Officer by Delegation has signed the Declaration of Assurance.

D. Provision of information to the Commissioner(s)

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

E. Specific actions on COVID-19

In 2020, Europe was strongly impacted by the COVID-19 pandemic. The Commission has proposed a strong and coordinated response to the health crisis as well as to the impact on Europe's economy and society. COVID-19 has also posed challenges regarding performance, control, audit and assurance in relation to the 2020 EU budget. In an exercise coordinated at corporate level, all Commission services have promoted the consistent and rigorous protection of the EU budget ensuring that appropriate mitigating measures were put in place.

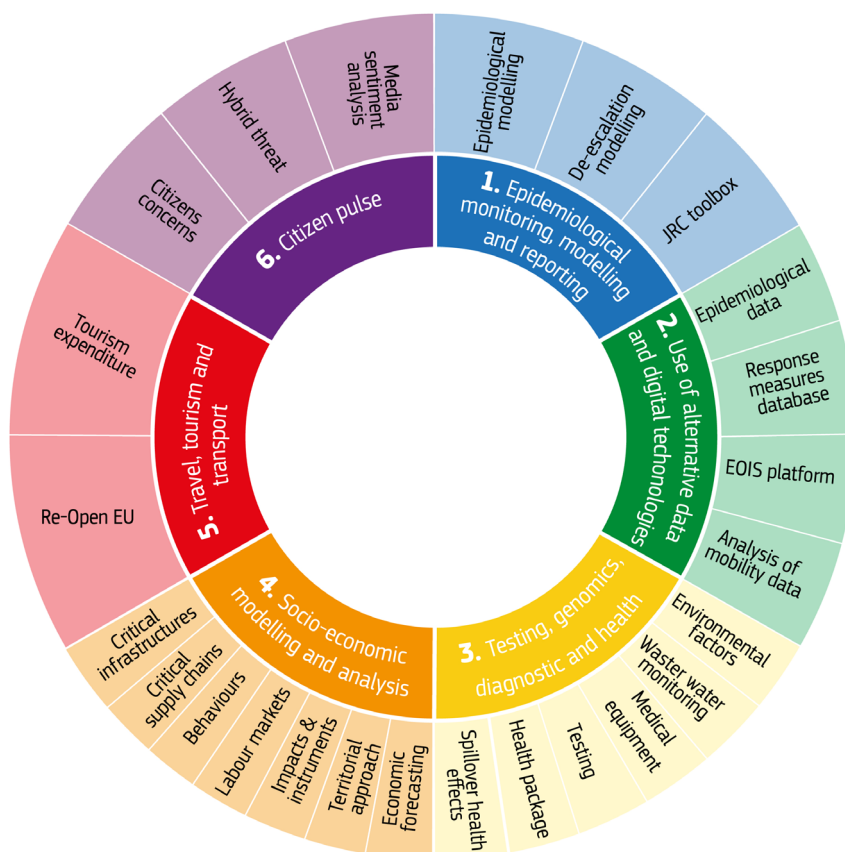


Figure 2. Overview of activities in response to the COVID-19 pandemic, to which the JRC contributed.

The JRC has swiftly set up an effective response to provide both the Commission and the Member States with evidence for an effective policy response to the crisis, supporting both the short-term impacts of the **COVID-19 pandemic** as well as for the longer-term recovery. JRC's multidisciplinary expertise allowed to contribute in many different domains, from public health (testing and epidemiological models) to socio-economics (scenario modelling). Figure 2 provides an overview of its main activities.

Some of the highlights are listed below.

- Timely development of several reference materials⁵, one for COVID-19 DNA-based tests and two for antibody tests. These are crucial for confidence in the reliability of tests, the latter two also allowing to monitor the effectiveness of vaccines.
- Design and putting into operation of the new web-platform 'Re-open EU', which provides citizens with a central overview of travel and other restrictions across the EU Member States.
- A large array of simulations and impact measures to assess and characterise the extent and heterogeneity of the damages and the recovery needs which fed into the Recovery Plan and the related Next Generation EU package.

Details are given under contributions to specific objective 7.1.

⁵ Reference materials are reliable quality assurance tools that improve confidence in test results obtained by laboratories. They play a key role in the calibration of laboratory instruments by providing precise reference values and data.

1. Key results and progress towards the achievement of the Commission's general objectives and DG's specific objectives

As defined in its Strategic Plan, the JRC has set the following priorities:

- enhancing the **focus on impact**, through increased work for central services and central Commission policymaking tools and processes such as better regulation, impact assessments and evaluations;
- improving the evidence base for policymaking through **knowledge management**;
- balancing the portfolio of activities and embedding **foresight** to address emerging challenges such as demography and migration, in particular in the socio-economic areas;
- breaking silos – providing a more **integrated response** to complex policy issues;
- **developing its sites** into modern science campuses, including enhanced sustainability and the further opening of selected research infrastructures to third parties.

JRC contributes to the two general objectives 7 and 1.



Figure 3. The JRC's research programme, described under specific objective 7.1, as well as the JRC site management activities (specific objective 7.2) and activities on intellectual property rights (specific objective 7.3) contribute to a 'Modern, high performing and sustainable European Commission' (European Commission general objective 7), with an intended impact of an enhanced image of the European Union.



Commission General Objective 1

the European Green Deal

JRC Specific objectives

1.1

The JRC progressively decommissions its disused nuclear facilities and safely disposes of its radioactive waste

1.2

The JRC establishes links and tools for nuclear decommissioning knowledge sharing and dissemination with stakeholders in the Member States

Figure 4. Decommissioning and waste management are a part of the life-cycle of nuclear facilities and hence these activities support the aims of the 'European Green Deal', in particular emissions reductions and energy savings. This aspect is therefore included under the first Commission general objective and captured in two specific objectives (1.1 and 1.2).

EUROPEAN COMMISSION GENERAL OBJECTIVE 7:



A modern, high-performing and sustainable
European Commission

Specific objective 7.1: The JRC supports evidence-informed policymaking through creating and managing high-quality and fit-for-purpose scientific knowledge

The main outputs can be grouped into the following categories:

- **Commission Work Programme** (new policy initiatives and REFIT⁶ evaluations). The outputs consist mainly of studies and reports, but also methodological developments and address all general objectives of the Commission.
- **Implementation of Commission policies** in selected policy areas through monitoring, methodological developments, quality assurance tools, reference materials and standards, etc.
- Awareness raising on **emerging or less-noticed issues**, through high-profile reports and briefings.
- **Support to better regulation**, with methodological developments for the toolbox and its implementation (e.g. the Sustainable Development Goals).
- Support to **crisis management**, e.g., for the COVID-19 pandemic, through operational regular and *ad hoc* support.
- The **New European Bauhaus**, launched in September as a key initiative of the von der Leyen Commission. The JRC was chosen to lead and coordinate its activities, for which a new unit was created.

Examples of key outputs are given under the different headings that follow and listed in the performance tables in Annex 2.



Scientific excellence, impact and efficiency

Scientific credibility is a must for sound policies. A JRC bibliometric analysis of its research performance 2014-2018 shows a decreasing trend in the overall production of peer-reviewed publications, which is however counterbalanced by a marked increase in the number of publications in the top 10 % most cited journals (KPI 1). JRC publications have been cited more than twice the world average over the period 2014-2018.

⁶ REFIT – ‘Regulatory Fitness and Performance programme’; evaluation of the EU legislation on plant protection products and pesticides residues.

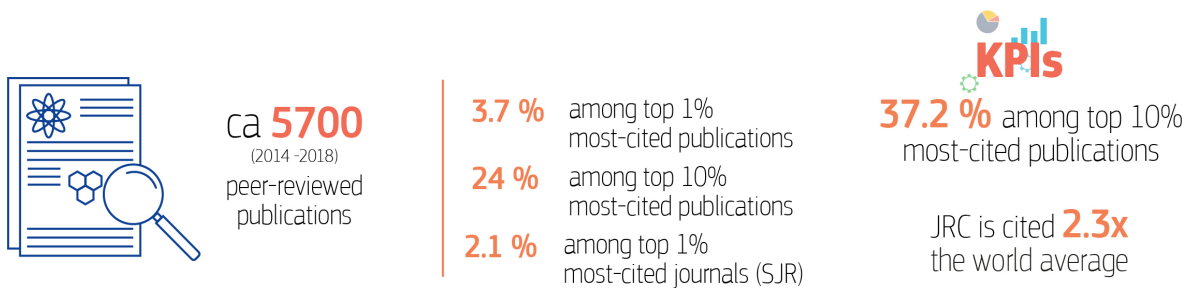


Figure 5. Overview of main bibliometric indicators and KPIs. Data refers to the period 2014-2018. The KPIs included in this figure are expressed as average for that period and might thus not be consistent with those reported in section B of the executive summary.

The overall JRC's research performance for 2020 shows an increase in the number of publications (more than 1100), a level in line with that of 2017. At the time of data extraction⁷, 2019-2020 results however show a decrease for the publications in the top 10 % most cited journals (SJR), 46-47 %, compared with 2018 (48 %). However, a longer time series is required to identify a clear pattern.

JRC showed a particularly strong performance in policy support in 2020, as measured by the number of documented impacts on EU policy making. This performance (more than 550 impacts) was fuelled in particular by JRC's support to managing the COVID-19 pandemic and the large number of new policy initiatives under the new Commission.

A methodology for drafting and assessing case studies was developed and tested on a number of pilot cases. Case studies are increasingly used to provide evidence on the impact of research and, if used on a continuous and systematic basis, can provide key information on how an organisation performs and help steer its research programme to achieve maximum impact. Case studies are structured around several types of impacts - with both short- and long-term perspectives - to capture the effect that the JRC's actions had on a variety of dimensions (public debate, policy, social, environment, etc.).



Open science

With 2.5 % of JRCs scientific staff engaged in cutting-edge scientific research in 2020, the JRC has successfully continued in building up its exploratory research capacity. Over 30 projects under all six priority areas of the Commission advanced the existing JRC competences as part of the **Exploratory Research Programme** (ER).

The JRCs **Centre for Advanced Studies** (CAS) enlarged the JRC's expertise and knowledge base in emerging science-policy areas such as digital transformation and artificial intelligence as well as the use of big data for economic forecasting, all of which proved highly relevant during the COVID-19 crisis. Dedicated Exploratory research and Centre for advanced studies calls related to global crisis situations were published and will strengthen the JRC's research oriented research.

⁷ The publication database used to extract publication data marks 2020 as incomplete; therefore data are not stable yet.

The **Collaborative Doctoral Partnership** is a strategic programme training young talents at the science-policy interface and strengthening the collaboration between academia and the JRC. In 2020, 30 PhD students started their doctoral studies under this programme, 14 of which started working at the JRC premises.

As part of its strategy to integrate with the European Forum for **Research Infrastructures**, the JRC offers open access to selected facilities, both nuclear and non-nuclear, to researchers and industry. In 2020, the JRC published 12 calls, and gave online access to 29 young scientists at the Nanobiotechnology Laboratory as part of the **Training and Capacity Building at JRC Research Infrastructures**. Despite the restrictions imposed by the COVID-19 crisis, the JRC carried out 64 projects, giving access to 224 researchers from 98 different institutions in 17 different countries in Europe.

The **Putting Science into Standards** (PSIS) workshops contribute to open science by bringing academia, research, industry, policy makers and standardisation communities together. The impact of the workshop on quantum technologies held in 2019 was observed in 2020 with the setting up of a focus group and the drafting of a roadmap on quantum technologies.

A new concept was developed through collaboration between the JRC and Directorate-General for Research and Innovation for easier **access to the JRC nuclear facilities** for the European research community. Under the new format, the JRC will continue hosting external users at its nuclear facilities and may provide a financial contribution to support their stay. Traineeships of 1-9 months are foreseen by the programme, primarily for students or young professionals at the beginning of their career.



Responding to crisis and emergencies

The **COVID-19 crisis** brought a climate of uncertainty with numerous challenging unknowns. Member States faced the requirement of both managing and exiting the crisis while also developing a recovery strategy. A coordinated EU response was justified in many areas, as it would add value to Member States' actions. The answers and support required from JRC scientists had rarely been so important, yet they provided it showing high adaptation skills and resilience under tight time constraint, high exposure and tremendous needs.

The JRC played a central role in supporting several initiatives through the COVID-19 pandemic. An overview of the timeline and actions is given in Figure 6. Further details can be found in the narratives under each general objective.

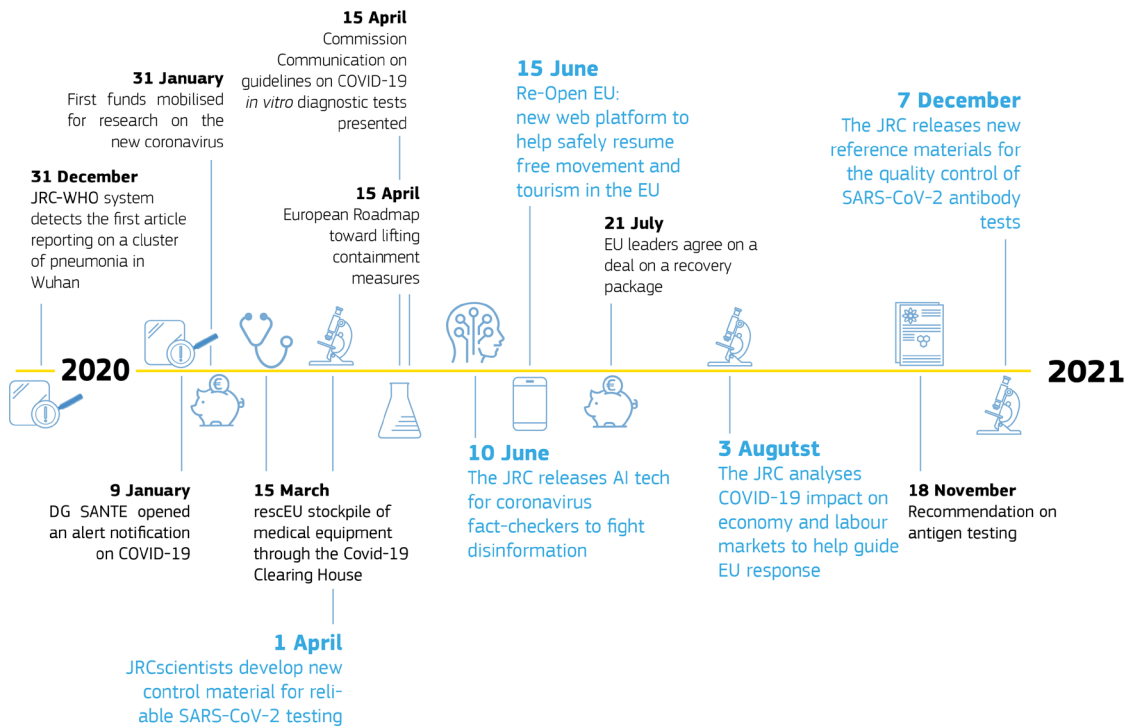


Figure 6. Timeline of EU policy actions with notable JRC support actions in support to the COVID-19 pandemic.



Working with stakeholders

Beyond its extensive in-house knowledge, the JRC worked together with world-leading partners to enhance the science base for policymaking and reinforce partnerships with international, national and regional stakeholders. One example is that the JRC, under the **UN World Water Quality Alliance**, became a regional hub for capacity development under the UN Environment programme Global Measurement System for Water.

Furthermore, the JRC maintained an active dialogue with the network of National Contact Points in Member States and associated countries to inform them about JRC's latest initiatives, events and opportunities for collaboration with JRC.



Communication

In 2020, JRC's external communication activities aimed at highlighting that good policy decisions must be based on robust scientific evidence. The JRC pursued its efforts to communicate the value of its work for the public and policy makers, both at European and national / regional level.

In line with the new priorities of the current Commission mandate, the JRC focused its communication in highlighting its research results and activities relevant for:

- the fight against the COVID-19 pandemic,
- the economic recovery and societal resilience,
- climate and digital transitions,
- foresight.

The JRC made full use of its vast communication portfolio, from science communication intended for fellow scientists and academic stakeholders to a rich online offering of news, virtual content, and social media.



To respond to the COVID-19 pandemic, JRC explored new citizen engagement techniques and innovative methods of communicating and engaging the public, especially in terms of virtual meetings and contacts. For example, the JRC pursued online activities for journalists. The JRC continued to offer support and advice to other Commission services on issues of dis/misinformation, behavioural sciences, science for policy and citizen’s engagement. Some statistics on communication activities are given in Figure 7.

The JRC encouraged and trained its scientists to communicate with the public, policymakers and academics, through initiatives such as the JRC Clear Writers’ Network, which offers tailored training for scientists writing for non-scientists to effectively bridge the science-policy gap. In 2020, the network piloted successful individual coaching programmes for authors and developed guides on step-by-step frameworks for clear writing.

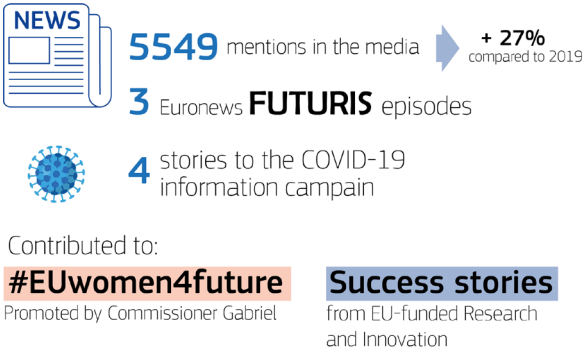


Figure 7. Overview of some communication activities



Better Regulation

The JRC made key contributions to strategic foresight, including co-authoring the annual strategic foresight report, a series of JRC foresight studies and improved the foresight capacity of the Commission. The building up of knowledge management capacities has continued, notably through the setting up of a number of knowledge centres. Furthering citizen’s engagement in EU policies, promoting participatory processes in policymaking, understanding the influence of values and technology and fostering interactive science communication has also been pursued to restore confidence in the EU policies.

The Competence Centre on Modelling coordinated the JRC contribution to the update of the **Better Regulation Guidelines and Toolbox**, providing significant inputs on the use and transparency of evidence, as well as on the methodological approaches to its quantification. The Commission’s Modelling Inventory and Knowledge Management System (MIDAS), which was already shared with the European Parliament in 2019, opened to the public, thereby allowing anyone to explore any of the 35 models used for impact assessments since 2017.



The European Green Deal

The European Green Deal is the EU's growth and recovery strategy and a blueprint for its transformation into a resilient, sustainable and carbon-neutral society by 2050.

The JRC made use of its rich portfolio of tools (e.g. scenario modelling, measurements, technical and socio-economic analysis, pre-normative research) to inform most of the crosscutting and sectoral initiatives adopted during the first year of delivery of this political ambition. For example, quantitative insights informed the Commission's contributions to the 26th UN Climate Change Conference of the Parties, such as the **2030 Climate Target Plan** and the **New EU Strategy for Adaption to Climate Change**. Further contributions supported *inter alia* the communications on the Renovation Wave and on Energy Efficiency.

Energy transition: the case of coal regions

The energy transition needs to be fair and inclusive. A JRC report on clean energy technologies in coal regions showed that the deployment of clean energy technologies in more than half of the EU coal regions could offset job losses induced by the transition by creating up to 460 000 jobs in total by 2050.



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Testing in JRC laboratories supported the **strategy on sustainable and smart mobility**, e.g. by developing a novel procedure for verification of CO₂ emissions from heavy duty vehicles. In support to the **New Circular Economy Action Plan**, the JRC published, among other things, the Best Available Techniques reference document on surface treatment using organic solvents.

It co-authored, with Directorate-General for Maritime Affairs, the third edition of the **EU Blue Economy Report**, containing overviews and assessment of economic sectors and ecosystems related to oceans and the coastal environment.

Under the remit of the **zero-pollution ambition for a toxic-free environment**, the JRC co-led the **Fitness Check on Endocrine Disruptors**, an in-depth analysis of over 30 pieces of sector-specific chemicals legislation with the involvement of 15 Directorates General and the Secretariat General.

In 2020 the JRC launched several tools for monitoring and knowledge to support the priority **Ecosystem and Biodiversity** (Figure 8). It also released a study on the sustainable use of **forest biomass** for energy production, as foreseen in the Biodiversity Strategy Action Plan. It contributed with an assessment to the first EU assessment of ecosystem services.



Figure 8. New tools released from the JRC in 2020 to support the priority 'Ecosystem and Biodiversity'.

In support to the **Farm to Fork (F2F)** Strategy, the JRC:

- performed an assessment of economic impacts of selected free trade agreements on the EU agri-food sector,
- contributed to a package of EC measures allowing flexibility in the implementation of physical on-the-spot checks for eligibility for support payments,
- published a review of scientific evidence on the impact on consumers of front-of-pack nutrition labelling.

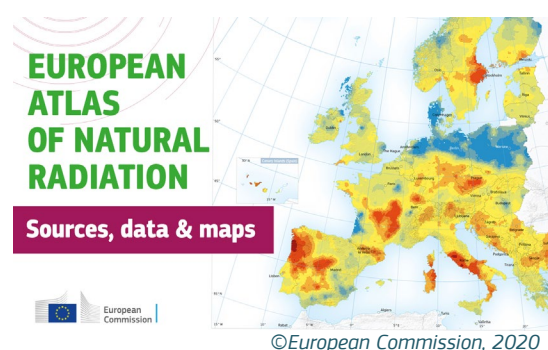
For the priority of **financing the Green Deal**, the JRC was instrumental, for example, to the adoption of the first delegated action under the Taxonomy Regulations and contributed to the development of standards for sustainable financial products.

Under the **research, innovation and competitiveness dimension**, in partnership with the Directorate-General for Energy, the JRC developed the **first clean energy competitiveness progress report** and assessed progress in research, innovation and competitiveness in the EU for the **2020 State of the Energy Union Report**.

New European Atlas maps out natural radiation sources and provides harmonised datasets

We are constantly and continuously exposed to ionising radiations as natural radionuclides migrate within our environment. This persistent exposure to radiations can have an impact on our health.

To gain a clearer overview of the natural sources of radiation, their level and possible variations, the JRC launched the European Atlas of Natural Radiation, in collaboration with over 60 institutions. Intended as an encyclopaedia of natural radioactivity, the Atlas describes the different sources of radioactivity, i.e. cosmic and terrestrial radiation, maps the levels of natural background radiation and provides harmonised datasets.





In 2020, JRC supported the three pillars⁸ of the EU's digital strategy with tools, studies, and access to its laboratories for demonstration and testing purposes. Some examples of this work are given below.

In response to increased demands during the pandemic, in cooperation with the Directorate-General for Education, Youth, Culture and Sports, the JRC released a new version of [SELFIE](#) (Self-reflection on Effective Learning by Fostering the use of Innovative Educational Technologies) to **support schools facing the remote teaching challenge**.

The implementation guidelines for the EU's DigComp (digital competence) were published to help educators, employers and recruiters assess and promote digital skills and to ensure that Europeans have the **digital skills** to thrive in the post-pandemic world of work.

The 2020 edition of the **Industrial research and development investment scoreboard** contributed to the New Industrial Strategy with evidence showing a slower EU structural change towards more knowledge-intensive sectors, such as digital and green technologies. JRC provided evidence on the participation of the European industry and workforce in global value chains, on competition policy, on the possible reasons for the recent EU productivity stagnation and on economic damages caused by regulatory barriers.

The JRC has contributed with several reports to the implementation and performance of the coordinated European action plan on **Artificial Intelligence** (AI), including the monitoring of the national AI action plans and by performing a sectorial analysis of the use of AI in the healthcare sector.

The JRC has provided several policy-relevant analysis on the **data and platform economy** (in particular around legal regimes and market powers), contributing to the **Digital Services and Markets Acts**.

The JRC's laboratories and Living Labs ecosystem were established as the main reference site for testing and demonstration activities under the EU **Global Navigation Satellite System** Programmes.

A JRC experimental infrastructure has been used to quickly prototype and deploy large-scale **blockchain infrastructures** enabling to test their scalability, performances and cybersecurity issues. This work is supporting the European blockchain service infrastructure initiative and several sectorial related activities (e.g. e-government services, the use of blockchain technologies in the energy sector).

⁸ Technology that works for people; A fair and competitive digital economy; An open, democratic and sustainable society

Supporting cybersecurity in the EU

The JRC flagship report ‘Cybersecurity: our digital anchor’ has brought together knowledge from across technological, economic and social disciplines. The report argues for a coherent, cross-sectoral and cross-societal cybersecurity strategy, to be implemented across all layers of European society. The report has informed the new cybersecurity strategy. The JRC has also supported the creation of a European ‘Cybersecurity Atlas’ and the technical coordination of the pilot networks of cybersecurity research centres representing the national EU R&D eco-system.



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An economy that works for people

The JRC contributed to the **Capital Markets Union** with the definition of indicators for investments and investors included in several staff working documents of Directorate-General for Financial Stability, Financial Services and Capital Markets Union.



The JRC contributed to the exit strategy for the COVID-19 pandemic with different initiatives. A new **European regional tourism typology** has been finalised, as input to the evaluation of economic impacts of COVID-19. A real-time assessment of the economic situation – **nowcasting** – is produced in collaboration with the Directorate-General for Economic and Financial Affairs⁹.

In support to the Commission proposal on **adequate minimum wages**, the JRC’s simulations suggest that improved adequacy of minimum wages can have significant net social impacts.

The JRC supported the Directorate-General for Economic and Financial Affairs for the European Semester, with macro-economic modelling and analysis of drivers for growth (such as high growth enterprises and venture capital).

⁹ Image credit: ©Flaticon – all rights reserved

Fairness in an economy that works for people

The JRC flagship report 'Beyond averages – Fairness in an economy that works for people' was extensively used in the Commission's 2020 edition of the Employment and Social Developments review. The report addresses some of the most pertinent fairness dimensions in relation to the agenda for a fair, inclusive and social European Union. Income inequality, educational inequality and the challenges facing existing welfare state arrangements are discussed from a pre-COVID-19 crisis perspective. The report also provides a benchmark against which some of the consequences of the current situation can be evaluated.



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A stronger Europe in the world

The JRC contributed with satellite and ground-based monitoring data to several **global reports**, e.g. on the **state of forests**, on **climate** and on **food crises** and published the **Atlas of Global Surface Water Dynamics**, which studies the consequences climate change and human actions has on the planet's surface water resources.

The JRC produced several bulletins that investigate trends in **foreign acquisitions** and greenfield investments in the EU.

In support to the EU's 'comprehensive strategy with **Africa**, the JRC studied among other issues, the economic implications of migrant remittances and of urban lockdowns.

The JRC and the Directorate-General for International Partnerships co-developed the **Global development data tool**, which supports data-driven decision making with its 160 indicators from globally recognised data sources.

The JRC continued to support **disasters and crisis management** worldwide, delivering maps for 75 disasters and crises, as well as timely information on early signals of food supply problems for 80 countries.

Tools for urban policies

The JRC launched the 'Atlas of the human planet 2019', presenting key human settlements and urbanisation statistics for 239 countries over 40 years time. This Atlas forms the knowledge base for the next generation of urban and territorial policies.



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The JRC co-developed a first worldwide common definition of cities and urban areas with the Directorate-General for Regional and Urban Policy, which was adopted by the UN Statistical Commission. The definition is based on the global baseline data of population and built-up areas provided by the Global Human Settlement Layer.



Promoting our European way of life

The work in 2020 on the priorities set out in the management plan (Education and skills, public health, security, migration and demography) was heavily influenced by the response to the COVID-19 pandemic.

In the area of **public health**, some examples of JRC contributions are listed below.

- EURL ECVAM¹⁰ issued a recommendation urging end-users and other stakeholders to recognise the scientific validity of non-animal-derived antibodies.
- A collaboration among the [European network of cancer registries](#), the [International Agency for Research on Cancer \(IARC\)](#) and the JRC allowed to release estimates on incidence of cancer and mortality in 2020 in EU27 countries. The data were uploaded on the [European Cancer Information System \(ECIS\)](#) platform.



The JRC set up and operates the COVID-19 in vitro diagnostic devices and test methods database, in response to Commission Guidelines on COVID-19 in vitro diagnostic tests¹¹.



In the framework of the '[Joint European Roadmap towards lifting COVID-19 containment measures](#)', aggregated and anonymised mobility data from mobile network operators in Europe were shared with the Commission to support policy-makers and practitioners with evidence and data-driven knowledge to understand and predict the spread of the disease, the effectiveness of the containment measures and their socio-economic impacts.

¹⁰ EU Reference Laboratory for alternatives to animal testing

¹¹ Commission Communication 15.04.2020

Confidence in testing for COVID-19

JRC is a leading global developer and producer of reference materials. Reference materials are reliable quality assurance tools that improve confidence in test results obtained by laboratories. At the beginning of the pandemic, JRC released the first reference material to identify corona virus (SARS-CoV-2 RT-PCR tests). Laboratories can use this reference material to check the correct functioning of their corona virus tests and to avoid false negatives. In December, the JRC released two reference materials for the quality and functioning control of COVID-19 antibody tests – the first reference materials to contain the crucial neutralising antibodies. They can also support research on immunity against COVID-19 and help monitor the efficiency of experimental vaccines.



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Re-open EU



As summer approached, in 2020, many citizens needed access to information to help them confidently make their travel plans and stay safe during their trip. This was also important for the already hard-hit transport and tourism sectors. In response, the JRC developed the 'Re-open EU' web platform, which provides real-time information on travel restrictions, public health and safety measures (e.g. physical distancing, facemasks, etc.) as well as other information on EU and national tourism offers. It helps Europeans take responsible and well-informed decisions on how to manage continuous COVID-19-related risks while planning their holidays and travels.



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To address the priorities of the new **EU Security Union Strategy**¹², the JRC is working on several overarching areas such as hybrid threats, strategic autonomy and cybersecurity, along with traditional security matters, such as borders, CBRN risk mitigation and forensics.

Examples of support include:

- several reports on hybrid threats, e.g. on hostile actors taking advantage of the COVID-19 pandemic or on conceptual model for mapping the [landscape of hybrid threats](#). 
- Competence building in the frame of the CBRN¹³ Centres of Excellence (CoE) initiative including the establishment of training centres in Jordan and Lebanon for handling COVID-19 contaminated patients. 
- Outputs of the **Knowledge Centre for Migration and Demography** included the 2020 edition of the 'Atlas of Migration', with a section on the impact of COVID-19,

¹² https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1379

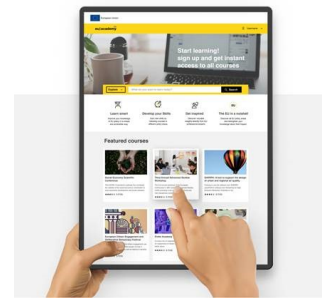
¹³ Chemical, biological, radiological and nuclear (CBRN)

as well as modelling and simulations directly supporting the on-going negotiations on new border mechanisms and solidarity procedures.

- Several reports on the long-term positive impacts that non-EU migrants may bring to the welfare systems of European societies, on the role and specific vulnerabilities of the migrant workforce during COVID-19.
- The study '[Current challenges of the European nuclear supply chain](#)' assessed to what extent European operators of nuclear power plants are facing challenges in the supply chain of safety-classified structures, systems and components.
- JRC supported with analyses and expertise the nine year long recast process of the dual-use regulation (adopted in 2020).

The EU Academy

As part of its training and education strategy, the JRC launched in November 2020 the EU Academy platform, a modern, scalable and inter-institutional eLearning platform. The EU Academy will provide progressively a large number of high quality eLearning courses as well as classroom type training accessible to citizens around the world. Already one month after launch, the platform registered more than 2000 users and the numbers are growing rapidly, with the expectation to attract several hundred thousand to one million users in 2021. The EU Academy contributes to the vision of the EU as a modern, forward thinking organisation.



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Enancing decryption to help criminal investigations

In December 2020, the JRC and EUROPOL inaugurated on the JRC Ispra site an innovative decryption platform that will significantly increase Europol's capability to decrypt information lawfully obtained in criminal investigations, in full respect of fundamental rights and without limiting or weakening encryption.

With the decryption platform, EU national police can now send lawfully obtained materials EUROPOL, which operates the platform, to be decrypted. If successful, this can potentially give law enforcement access to essential information to solve cases on child sexual abuse, terrorism or serious and organised crime.



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A new push for European democracy

In 2020, the JRC consolidated and broadened the competence base needed to help the EU policymaking process being at one time evidence-informed, more inclusive and aware of European values and national/regional specificities, thereby pursuing the President's pledge

to give Europeans ‘a greater say’. Furthermore, JRC scaled up its contribution to fighting disinformation and protecting EU democracy.

The Knowledge Centres on Migration and Demography and on Territorial Policies provided substantial support to **policy initiatives targeting Demography and Democracy**, with reports covering labour markets, gender gap, migration and demography at high spatial resolution.

The [Science for Policy Handbook](#) provides advice on how to translate science into policy, building on the extensive experience and competences of the JRC in this field.

In support of the European Democracy Action Plan and to the Digital Services Act, the JRC authored a report on how applied behavioural psychology could help making sense of the impact the online world is having on our political decisions and to identify actions to safeguard democracy.

Commission awareness on how to implement participatory and deliberative practices across the EU policy cycle received a boost from the **3rd Citizen Engagement and Deliberative Democracy Festival**.

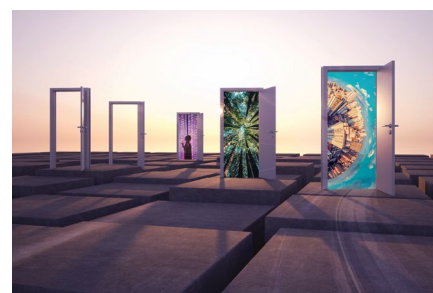


Through its continued research into the detection, monitoring and analysis of **disinformation**, JRC was able to provide regular briefings to experts across the EU Institutions on COVID-19 and anti-vaccine disinformation throughout the pandemic.

The JRC contributed to the **Conference on the Future of Europe** (CoFE), especially with the design of the online platform its response analysis tool, which is serving as single entry point for contributions from participants.

Resilience for policy making

The first annual [Strategic Foresight Report - Charting the course towards a more resilient Europe](#) presented the Commission’s strategy to integrate strategic foresight into EU policy-making. The report showed how forward-looking policies, supported by strategic foresight, will contribute to enhancing EU resilience and their importance for achieving the EU strategic objectives in the context of the digital, green and fair transitions. In particular, the JRC worked on the development of resilience dashboards in four interrelated dimensions: social and economic, green, digital and geopolitical. They depict in a holistic way vulnerabilities and resilience capacities of the Member States in these dimensions. The JRC delivered prototype dashboards, included in the report.



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Specific objective 7.2: The JRC operates modern, sustainable and open research campuses

Unlike other DGs & Services, the JRC owns and manages buildings and related infrastructures on all its sites, except Brussels headquarters. The main infrastructure works delivered, as scheduled in 2020, were:

- **in Geel:** the refurbishment of the Cafeteria, the launch of the design engineering for building 040 ('the bunker');
 - **in Ispra:** the new conference centre, the Collaborative and Makers Space, building 102 (including a Europol Decryption platform), the Citizen's Space, ongoing renovation of the sewage and co-generation energy plant;
 - **in Karlsruhe:** the continuation of the construction of Wing M;
 - **in Seville:** agreement to launch the architectural design contest for a new building
- are activities that will continue from 2020 into 2021.

Due to the COVID-19 crisis, some of the planned activities have not been fully achieved (e.g. in Ispra the upgrade of the electrical plant) due the fact that the external companies were not allowed to enter the site to perform the work during lockdowns.

In line with the European Green Deal ambitions (Commission general objective 1), the JRC has made progress towards compliance with the energy efficiency and energy performance directive (see the performance tables in annex 2).

Following an IAS recommendation in 2020, a review of the site services was carried out. Initial steps have been taken to adjust the organisation and the staffing, and to create more effective coordination structures.

Specific objective 7.3: The Commission has appropriate capacity to manage risks related to intellectual property rights and be compliant with the rules and regulations

The JRC manages the intellectual property (IP) portfolio of the European Commission, including the European Emblem. In 2020, the most significant achievement of the Central IP Service was the launch of EURECA¹⁴, the corporate platform for IP management. Together with the updated IP Management Standard Operating Procedures, EURECA is the basis for sound IP management at the Commission. To this end, ensuring uptake of the system is important. Although the target for 2020 was not fully achieved, 16 Directorates-General and Services already uploaded IP assets.

The identification of IP assets allows Directorates-General and Services to perform or request clearance of these assets (risk mitigation) before use (brands, patents, pictures, datasets) or distribution (software, datasets), and to manage licences (contracts). In 2020,

¹⁴ EU intellectual property Resource Catalogue

nine Directorates-General uploaded their assets in the EURECA platform. In the beginning of 2021, 16 Directorates-General have uploaded 552 assets in the EURECA platform.

The management of the portfolio of patents and trademarks required a similar number of actions as in 2019, around 800. Also the number of requests for legal advice on intellectual property issues from Commission staff remained stable. In 2020, 599 new requests were received, 80 % of which concerned copyright protected assets. Of these, 39 % concerned written works, 24 % photos or illustrations and 14 % software. Despite having to adapt the trainings from classroom to online training sessions the number of staff trained in 2020 increased by 3 % to a total of 582 colleagues.



European Green Deal

Specific objective 1.1: The JRC progressively decommissions its disused nuclear facilities and safely disposes of its radioactive waste

The JRC has to manage its nuclear liabilities and decommission its nuclear installations once they have been definitively shut down, and safely manage all the related waste. A reorganisation with the creation of a new directorate dedicated to nuclear decommissioning was launched in 2020 to adapt to the new 'Nuclear Safety and Decommissioning Programme' established in the Multi-annual Financial Framework 2021-2027. This new instrument also covers the Commission's support to Bulgaria and Slovakia.

In 2020, in addition to unforeseen technical issues affecting specific projects (a normal occurrence for this kind of complex and delicate operations), progress at all sites was impaired by the COVID-19 pandemic. While desk-top and less labour-intensive activities were performed as planned, some on-site labour intensive activities were delayed.

Major achievements at the Ispra site were: the completion of the transfer of all irradiated nuclear material from several facilities to a safe storage location; retrieval of the last containers from the dry pits; licence modification for storage of unconditioned Very Low Level Waste in the Interim Storage Facility (ISF) approved by the Authority; and the filing for the Environmental Impact Assessment document for the INE plant¹⁵. Due to the pandemic, dismantling activities in LCSR¹⁶ experienced some delays and are expected to be concluded in 2021. The preparation for the donation of cyclotron components was not completed in order to accommodate the request by the recipient to expand the list of components to be donated.

In Karlsruhe, the last batch of commercial spent fuel not in use for research activities was successfully shipped to the owner utility; a 'caisson' facility, to be used for upcoming glove box dismantling campaigns, was brought into operation; the clearance process was able to treat a considerable amount of materials; and the preparatory work for the evacuation of legacy backlog drums progressed.

¹⁵ INE: Isola Nucleare ESSOR (ESSOR nuclear island). ESSOR is a research reactor in Ispra. It started its operation in 1969 and was put in safe shut down condition in 1983.

¹⁶ LCSR: Laboratorio Caldo di Studi e Ricerche - a set of hot cells to be decommissioned in Ispra.

In Petten, preparation of a contract to transfer the ownership of TRABANT¹⁷ spent fuel to the Nuclear Research and Consultancy Group (NRG) and of a comprehensive framework contract for the removal of all remaining nuclear materials owned by JRC have progressed according to plan.

In Geel, the inventory of nuclear materials owned by JRC has been updated and discussions for possible removal of significant amounts from the site have started.

Specific objective 1.2: Establish links and tools for nuclear decommissioning knowledge sharing and dissemination with stakeholders in the Member States

Knowledge sharing for decommissioning and waste management is one of the two pillars foreseen in the Commission proposal for a spending programme 'Decommissioning of Nuclear Facilities and Management of Radioactive Waste' under the new Multiannual Financial Framework 2021-2027. The main activity for 2020 was to define a concept for the dissemination and sharing of good practices and experiences among Member States, in view of its operational implementation. However, this concept is still under discussion to reflect the effects of the new instrument and the new organisational structure.

¹⁷ TRABANT - Transmutation and Burning of Actinides in TRIOX - is the acronym for a project implemented in the 1990s which was based on preparation of fuel compounds and their irradiation in the High Flux Reactor (HFR) in Petten. There is a batch of irradiated TRABANT fuel in Petten owned by the JRC.

2. Modern and efficient administration and internal control

This section explains how the JRC delivered the achievements described in the previous section. It is divided into two subsections.

The first subsection reports the control results and other relevant information that supports management's assurance on the achievement of the financial management and internal control objectives¹⁸. It includes the information necessary to establish that the available evidence is reliable, complete and comprehensive. It covers all activities, programmes and management modes relevant to the JRC.

The second subsection deals with the other aspects for a modern and efficient administration: human resources, digital transformation and information management and sound environmental management.

2.1 Financial management and internal control

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

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

- assurance statements from sub-delegated authorising officers,
- the contribution of the Director in charge of Risk Management and Internal Control (RMIC), including the results of internal control monitoring at DG level,
- the reports of the *ex post* supervisory controls performed on a sample of the JRC's financial and procurement transactions,
- the limited conclusion of the internal auditor on the state of control, and the observations and recommendations reported by the Internal Audit Service (IAS),
- the observations and the recommendations reported by the European Court of Auditors (ECA).

These reports result from a systematic analysis of the 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 the JRC.

This section reports the control results and other relevant elements that support management's assurance. It is structured into (a) control results, (b) audit observations and

¹⁸ Art 36.2 FR: a) effectiveness, efficiency and economy of operations; b) reliability of reporting; c) safeguarding of assets and information; d) prevention, detection, correction and follow-up of fraud and irregularities; and e) adequate management of risks relating to the legality and regularity of underlying transactions

recommendations, (c) effectiveness of the internal control system, and resulting in (d) conclusions as regards assurance.

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 objectives¹⁹. The JRC's assurance building and materiality criteria are outlined in the AAR Annex 5. Annex 6 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. Annex 7 provides extensive reporting on the components of the financial management and internal control.

The JRC finances its research activities through the voted budget and supplementary credits as presented in the Annex 7 and Figure 2.1.1-1, detailing the JRC's financing sources for 2020. In addition, the JRC finances its research activities through the following activities:

- competitive activities in line with the Council Decision C126 of 26 April 1994 on the role of the JRC that requires that additional revenue be generated through competitive activities (up to 15 % of the institutional budget²⁰). These may be defined as the provision by the JRC of scientific and technical services to other bodies both within the European Institutions and for third parties. The reader is referred to Annex 7 for more information on the JRC's 'revenue operations'.
- In 2020, the JRC had EUR 25 600 000 (representing 5.9 % of its total financing sources in payments) allocated to **decommissioning activities**. The JRC's decommissioning and waste management (D&WM) programme was started in 1999²¹. This programme aims to dismantle former, obsolete Euratom nuclear installations (historical liabilities) as well as to plan for (and execute in the future) the long-term dismantling of installations which are still in use (future liabilities). Four JRC sites are involved i.e. Ispra, Karlsruhe, Petten and Geel.
- During 2020, the JRC received **cross-sub-delegated authority** to use the budgetary resources of other Directorates-General and services of the Commission. Such authorisations are linked to specific research projects or actions. The JRC has not provided cross-sub-delegations to other DGs of the European Commission. In addition, the JRC has put in place co-delegations type I, II and III²² (art. 3.2 of the Internal Rules) with other Directorates-General of the European Commission. The

¹⁹ 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 multiannual character of programmes as well as the nature of the payments (FR Art 36.2).

²⁰ The institutional budget means 'budget for JRC (direct actions) under the Framework Programme for Research'.

²¹ COM(1999)114 Communication from the Commission to the European Parliament and the Council – Historical liabilities resulting from nuclear activities carried out at the JRC under the Euratom Treaty – Decommissioning of obsolete nuclear installations and waste management'.

²² In accordance with Art. 3.2 of the Internal Rules (Decision C(2015) 1423 final of 05/03/2015 on the Internal Rules on the implementation of the general budget of the European Union (European Commission section) for the attention of the Commission department).

services and amounts concerned for sub-delegations (both cross and co-delegations) are summarised in Annex 7. Being a Commission service itself, the JRC is required to implement the appropriations subject to the common Commission rules, responsibilities and accountability arrangements and therefore payments related to the sub-delegations received are subject to the same financial circuits and controls in place. Statements of assurance on the effective and sound use of these funds were received or provided to the Directors-General concerned. Around 51 % of the JRC's financing sources are dedicated to staff costs. It is important to note that the salary payments are authorised and carried out by the Paymaster's Office (PMO) as part of vertical co-delegations.

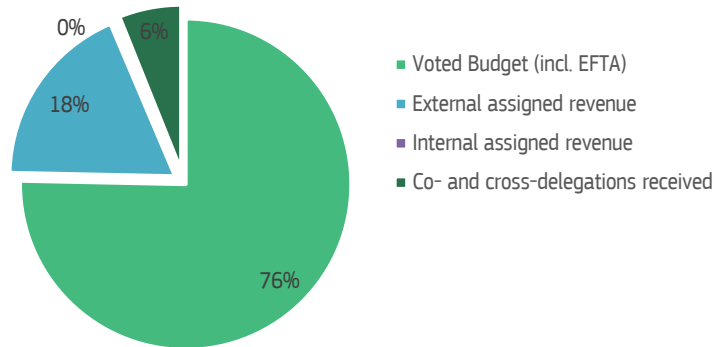


Figure 2.1.1-1. Financing sources in payment appropriations

All **JRC's operational activities**, both expenditure and revenue, are carried out under **direct management mode** which has been assessed as having a relatively low inherent risk. The risks are effectively mitigated by means of controls as detailed in Annex 6.

The JRC carries out its expenditure operations through procurement operations. The relevant control system(s) (RCS) for budget implementation covering the JRC's procurement is available in Annex 6. The type of procurement procedures carried out by the JRC during 2020 is described in Annex 7.

The additional income generated through competitive activities is used for purchasing scientific equipment and services, hiring temporary staff, and for financing part of the JRC's infrastructure used for these tasks. A RCS covering the JRC's income from contractual activities is available in Annex 6.

The financial circuit 1, used for the majority of the transactions at the JRC, provides a clear segregation between the operational and financial roles, respectively, and financial agents are hierarchically independent from the authorising officer. Annex 7 provides detailed information on JRC's financial circuits.

The main indicators and/or conclusions on each control objective for the JRC's operational activities are summarised in the overall control results conclusion table (Table 7.4 in Annex7). Based on these results, the JRC concludes that the control results are factual, complete and reliable. JRC's management factually concludes that the control results, presented in the following sections and related annexes are complete and reliable and thus provide reasonable assurance about the achievement of the internal control objectives.

2.1.1.1. Effectiveness = the control results and benefits

Legality and regularity of the transactions

The JRC is using internal control processes to ensure the adequate management of the risks relating to the legality and regularity of the underlying transactions it is responsible for, taking into account the multiannual character of programmes and the nature of the payments concerned.

The control objective is to ensure that the JRC has reasonable assurance that the total amount of any financial operation authorised during the reporting year, which would not be in conformity with the applicable contractual or regulatory provisions, does not exceed 2 % of the authorised payments or revenue concerned. To reach this conclusion, the JRC reviewed the results of the key controls in place (as described below). For each item, materiality is assessed in accordance with Annex 5.

The main risks together with the control processes aimed to mitigate them and the indicators used to measure the performance of the control systems, are outlined in Annex 6.

a. Procurement in direct management mode

Financial management and control of 'Procurement in direct management mode' (Annex 6 RCS No 1) is grouped around three main stages: 1) procurement (from the assessment of needs to the selection of the suppliers - award decision), 2) financial transactions (from establishing the financial commitment to payment and contract monitoring) and 3) supervisory measures (including *ex post* controls and management checks). In addition to the controls performed during the financial circuits, the JRC has made use of five main supervisory measures (including associated indicators) to assess the legality and regularity of its work, namely exception reporting, the Public Procurement Advisory Group (PPAG), accounting controls, *ex post* supervisory controls and the assurance statements from sub-delegated authorising officers.

Exception reporting

In total 101 exceptions and non-compliance events were recorded in the central register in the JRC in 2020, 21 of which were classified as exceptions. The exceptions were linked to deviations from standard financial and procurement procedures which cannot be directly associated with a material loss. To put the exception reporting into context, the JRC dealt in 2020 with 22 967 transactions and 16 753 of them were payments. The exceptions and non-compliance events amount to 0.44% of the total number of transactions, meeting the target set in the Management Plan (less than 1% of transactions subject to exception). For further details refer to Annex 7.

The Public Procurement Advisory Group (PPAG)

The PPAG is a consultative body providing *ex ante* controls on the correct application of tendering procedures. The PPAG must be consulted on procurement files for high value

contracts (≥ EUR 500 000) and for most contracts procedure negotiated that are based on the Financial Regulation 2018 (hereafter FR), Annex 1, point 11²³.

In 2020, 184 files were submitted to the PPAG; 83 files were screened by the PPAG, representing a value of approximately EUR 112 million²⁴. No procedure received an unfavourable opinion but one was withdrawn before the formal opinion and the procedure cancelled. This demonstrates that the PPAG is an effective *ex ante* instrument for avoiding procedural errors and ensuring the respect of the procurement principles, thus preventing complaints by tenderers in those procedures.

Accounting controls

The main aim of accounting controls is to assure the quality and reliability of the accounts and underlying transactions through methodical checks on the accounting records (data) and timely communication and correction of the errors. Considering the correction of errors carried out and that the sample has been taken using a risk-based methodology, the total amount of accounting errors is subsequently 0.73 % thus confirming the reliability of the accounts. More information on the accounting controls is presented in Annex 7.

There are no more open recommendations in the context of Directorate-General for Budget's validation of local systems as these have been satisfactorily closed. A new validation process started in December 2020 and is ongoing.

Ex post supervisory controls

As part of its control strategy, to determine whether there had been material losses (e.g. due to errors) and whether financial rules and procedures were respected, the JRC periodically carries out checks on the accuracy and regularity of its *ex ante* controls, via *ex post* controls on a sample of financial transactions.

Whilst a variety of formal errors were noted, neither systematic errors nor weaknesses in the JRC's control system were observed and no procurement issues were identified. More information on the *ex post* controls is presented in Annex 7.

Since the **detected error rate is 0 %**, the JRC estimated its **average error rate (AER)** by taking a most conservative and prudent approach to be at **0.5 %**.

²³ Contracts between EUR 60,001 and EUR 499,999 and contracts deriving from some negotiated procedures (repetition of similar services/works, additional deliveries, for some cases based on FR, Annex 1, point 12 and cases based on FR, Annex 1, point 14(2)) are also submitted to the PPAG for advice on the basis of a sampling system using a risk-based method.

²⁴ 101 were not selected by the sampling system (representing a value of roughly EUR 16 million)

Table 2.1.1.1 -1. Results of 2020 ex post controls.

Sampled transactions	Sample size: number	Sample size: value (EUR)	% of total value of transactions	Detected error rate (% of total)
Payments	120	24 218 935	10.1 %	0 %
Procurement	66	11 159 804	4.0 %	0 %

Management reports from sub-delegated authorising officers

The authorising officer by delegation (AOD) has the overall responsibility for the budget execution. In these duties, s(he) is assisted by competent authorising officers by subdelegation (AOSD).

In accordance with paragraph 4.8 of the Charter of tasks and responsibilities of authorising officers by subdelegation, all 134 assured the JRC Director-General that during the reporting period they effectively managed the risks associated with their activities; did not raise any matter of importance which might compromise the sound management of appropriations or prevent the attainment of objectives; filed the appropriate exceptions/non-compliance events linked to not respecting standard procedures, rules and regulations, where necessary; no request for written confirmation has been formulated; concluded that no incidents which could have damaged the reputation of the organisation occurred.

b. Revenue operations through competitive activities

All income and expenses for competitive activities are subject to *ex ante* controls and to the JRC financial circuits. Financial management and control of the JRC's revenue operations through competitive activities (Annex 6 RCS No 2) is grouped around three phases: 1) contract proposal (assessment and valuation of proposal), 2) contract preparation (from signature of contract to forecast of revenue) and 3) contract implementation (including financial management of the contract).

Revenue operations are also subject to the same legality and regularity indicators which are applied to payment and procurement transactions. None of these controls unveiled errors with impact on compliance of the revenue transactions.

During 2020, as a result of the JRC's financial circuits, 11 % of the forecast of revenue transactions and 12 % of recovery orders (i.e. invoices) have been subject to correction. These errors did not materialise due to the effectiveness of the *ex ante* controls carried out. It can be concluded that the controls carried out on the contractual activities contribute positively to the legality and regularity of the JRC's revenue operations.

c. Conclusion on the assessment as regards legality and regularity

JRC's portfolio consists of segments with a relatively low error rate. This is, respectively, thanks to the inherent risk profile of the JRC's operational activities, both expenditure and revenue, carried out under direct management mode and the performance of the related control systems.

Over 2020, the impact of the COVID-19 crisis overshadowed all other contributing factors towards meeting the targets. The working environment changed dramatically for the JRC as teleworking became the new norm and paper-based activities were avoided wherever possible. However, most of the negative effects were successfully mitigated by the adoption of flexible working techniques and much greater use of digital media. This was helped by the adoption of tailored administrative requirements that can be applied throughout the crisis period.

In conclusion, based on the analysis of the results of the above-mentioned control sources, no significant weakness has been unveiled which could have a material impact as regards the legality and regularity of the procurement and revenue operations. Therefore, it is possible to conclude that **the internal controls systems implemented by the JRC provide sufficient assurance to adequately manage the risks relating to the legality and regularity of the underlying transactions.**

The **estimated overall risk at payment** for 2020 expenditure amounts to EUR 1.2 million, representing 0.5 % of the DG's total relevant expenditure for 2020, despite the fact that the detected error rate was 0 %. This is the AOD's best, conservative estimation of the amount of relevant expenditure during the year not in conformity with the contractual and regulatory provisions applicable at the time the payment was made. This expenditure will subsequently be subject to *ex post* controls and a proportion of the underlying errors will be detected and corrected in subsequent years. The conservatively **estimated future corrections** for 2020 expenditure amount to EUR 0.1 million. This is the amount of errors that the DG conservatively estimates will be identified and corrected by controls planned to be carried out in subsequent years. The difference between those two amounts results in the **estimated overall risk at closure** of EUR 1.1 million, representing 0.45 % of the DG's total relevant expenditure for 2020. All the above mentioned indicators have been stable over the last 5 years. The detected error rate has been 0 % and the best, conservative estimation 0.5 % has been applied. In the context of the protection of the EU budget, the DGs' estimated overall risk at payment, estimated future corrections and risk at closure are consolidated at Commission level in the AMPR. Details of the JRC's estimated overall amount at risk at closure and estimated future corrections can be found in Annex 7, table 7.1.

Table X. Estimated risk at closure

JRC	Payments made (in FY; m€)	Minus New prefinancing (in FY; m€)	Plus Cleared prefinancing (in FY; m€)	= "relevant expenditure" (for the FY; m€)	Average Error Rate (weighted AER; %)	estimated risk at payment (FY; m€)	Average Recoveries and Corrections (adjusted ARC; %)	estimated future corrections (for FY; m€)	estimated risk at closure (in FY; m€)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Programme Budget line, or other relevant level	as per AAR annex 3, table 2	As per ABAC DWH BO report on prefinancing	As per ABAC DWH BO report on prefinancing	= (2)-(3)+(4)	Detected error rates, or equivalent estimates	= (5) x (6)	H-ARC (as per ABAC DWH BO report on corrective capacity), but adjusted	= (5) x (8)	= (7) - (9)
EDF	-	-	-	-	0.5%	-	0.05 %	-	-
Total EU excl. EDF and contributions to EUTFs, if any	238.963092	3.017673	3.757272	239.702691	0.5%	1.198513	0.05%	0.119851	1.078662
Total EU (and EDF), excl. contributions to EUTFs, if any	238.963092	3.017673	3.757272	239.702691	0.5 %	1.198513	0.05 %	0.119851	1.078662

(2) Payments made or equivalent, e.g. expenditure registered in the Commission's accounting system, accepted expenditure or cleared pre-financing. In any case, this means after the preventive (*ex ante*) control measures have already been implemented earlier in the cycle. In all cases of Co-Delegations (Internal Rules Article 3), "payments made" are covered by the Delegated DGs. For Cross-SubDelegations (Internal Rules Article 12), they remain with the Delegating DGs.

(3) New pre-financing actually paid by out the department itself during the financial year (i.e. excluding any pre-financing received as a transfer from another department). "Pre-financing" is covered as in the context of note 2.5.1 to the Commission annual accounts (i.e. excluding "Other advances to Member States" (note 2.5.2) which is covered on a purely payment-made basis). "Pre-financing paid/cleared" are always covered by the Delegated DGs, even for Cross-SubDelegations.

(4) Pre-financing actually cleared during the financial year (i.e. their 'delta' in the Financial Year 'actuals', not their 'cut-off' based estimated 'consumption').

(5) For the purpose of equivalence with the ECA's scope of the EC funds with potential exposure to legality & regularity errors (see the ECA's Annual Report methodological Annex 1.1), 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.

(6) In order to calculate the weighted Average Error Rate (AER) for the total relevant expenditure in the reporting year, since the detected error rate is 0 %, the JRC estimated its average error rate (AER) by taking a most conservative and prudent approach and estimating it to be at 0.5%.

(8) Even though to some extent based on the 7 years historic Average of Recoveries and financial Corrections (ARC), which is the best available indication of the corrective capacity of the *ex post* control systems implemented by the DG over the past years, the AOD does not consider it necessary to do an adjustment due to the nature and insignificance in terms of the amount of the coding error.

Fraud prevention, detection and correction

The JRC has developed and implemented its own anti-fraud strategy since 2013, on the basis of the methodology provided by OLAF. It is updated every three years. It was last updated in December 2020 and became fully operational as of 1 January 2021. Its implementation is being continuously monitored, assessed and reported to the management at least annually. All actions planned for 2020 have been implemented.

The JRC also contributed to the Commission anti-fraud strategy (CAFS), as shared coordinator DG for three actions and supporting DG for further five actions in the CAFS action plan. The JRC has received no OLAF financial recommendations to follow up.

The results achieved during the year thanks to the anti-fraud measures in place can be summarised as follows:

- The anti-fraud strategy was successfully revised during the year, in accordance with the CAFS, with a focus on two of the prioritised objectives, 'data collection and analysis' and 'coordination, cooperation and processes'.
- Ethics responsibilities roles have been clarified ensuring business continuity from the reorganisation of ethics responsibilities in 2018.
- The scientific integrity and research ethics framework was reinforced as planned, adopting a new set of guidelines and tools, which are also embedded in the revised JRC's scientific project management cycle. In addition, a new research ethics board was set up.
- Tailored online trainings were provided, at a smaller scale than planned due to COVID-19, but still reaching over 70 colleagues.
- An innovative training on fraud in procurement has been designed with the support of OLAF and it is planned to be launched in 2021.
- The JRC participated in OLAF's work with the fraud prevention and detection subgroups, contributing with its expertise in data analysis and indicator definition.

On the basis of the available information, the JRC has reasonable assurance that the anti-fraud measures in place are effective.

In an effort of continuous improvement, the JRC AFS 2021 envisages several measures, which will further ensure an effective anti-fraud climate within the DG, such as trainings and awareness raising on scientific integrity, ethics, whistleblowing and a specific training module for anti-fraud for financial officers.

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

The JRC is spread over 6 sites in 5 different countries with more than 40 000 fixed assets with a net book value of about EUR 230 million. The fixed assets are ranging from simple office furniture to complex scientific and laboratory equipment, including nuclear facilities and buildings.

The following measures are put in place to counterbalance the main risks potentially affecting the JRC sites, i.e. accidents, unauthorised access, intentional acts against safety

and security including against the protection of sensitive documents. Regular safety inspections are being carried out on JRC sites regarding laboratory facilities and hazardous materials, by the JRC itself, external consultants and visits by national authorities. Organisational measures are implemented to ensure that access to JRC sites and critical assets are controlled. Personal security clearances are issued to those staff required to deal with classified information. Certification of laboratories and institutes to internationally recognised quality management standards helps to offset risks and ensure compliance with norms and regulations. The JRC strives to perform physical localisation checks of the inventoried items at least on a three-year basis, which is respected in general. The JRC owns stock with a value of EUR 59 million (as reported in the JRC's Balance Sheet in Annex 3, Table 4).

The JRC is the business domain owner for the eProcurement Programme which is part of the Commission's actions to put in place a single data interchange area for submitting, storing and processing data in grant and procurement procedures. The progress during 2020 is detailed in Annex 7 and section 2.2.4.

Based on an assessment of the controls in place on the safeguarding of the JRC's assets, management considers that the control results are complete and reliable and that the control objective is achieved. Refer to Annex 7 for further information on safeguarding of assets.

2.1.1.2. Efficiency = the Time-to-... indicators and other efficiency indicators

Based on an assessment of the most relevant key indicators and control results, the JRC has assessed the efficiency of the control system and reached a positive conclusion.

The timeliness of payments for 2020 (93.8 %) scored slightly above the target (93 %) and is steady at the same average of the last 2 years. The average as with other years is heavily affected by the late payments occurring in January due to the carry-over activities. The new indicator 'payments on time' which looks at the value of payments rather than the actual number is higher at 96 %. The delays here are mainly due to the lack of payment credits in the previous year and the time taken to open the new financial year in the Central Accounting System.

Timely Payments	DG Score	EC Score
	96 %	99 %

The contractual cashing indicator (as a percentage of the institutional budget) has increased from 19.68 % of last year to 20.83 %, which remains significantly higher than the target of 15 %. The JRC has reached a positive conclusion on efficiency of contractual cashing indicator.

2.1.1.3. Economy = the estimated cost of controls

Procurement in direct management mode

The JRC has produced an estimation of the costs of control of the three main stages related to 'procurement in direct management mode'. The criteria for the calculation and the indicators used are shown in Annex 6 RCS No 1.

A quantitative estimation of the volume of errors prevented and detected is not available, therefore it is not possible to quantify the related benefits, other than the EUR 47 497 recovered as a result of these controls (Annex 3, Table 8). The main benefit is that the controls performed ensure that errors are detected and corrected and that potential litigations or contestations from tenderers are kept to a minimum.

In consequence, as it is not possible to determine the cost-effectiveness of controls by comparing costs with benefits, it is necessary to consider the efficiency indicators retained.

The overall cost of control related to 'procurement in direct management mode' in 2020 was EUR 8 090 701, which represent 2.13 % of the total value of closed procedures and payments executed by the JRC during the year.

Adding *ex post* controls and those not directly attributable to the control strategies brings total cost of controls for 2020 to 1.9 % of total associated payments and contract value, For further detail please see Annex 7, Table Y Overview of the DG's estimated cost of controls at Commission level. It should be noted that the calculation of costs of control have been refined to give a better view of related staff profile. This has led to a decrease of associated staff costs and accordingly a reduction in the overall cost of control.

Revenue operations through contractual activities

The overall cost of control related to 'revenue operations from contractual activities' in 2020 was EUR 173 000, which represents 0.22 % of total contractual project cashed value for the year. The overall cost of control indicator has decreased slightly from last year's indicator value of 0.26 %. For further detail please see Annex 7, Table Y Overview of the DG's estimated cost of controls at Commission level.

JRC considers that the necessity of the controls performed on revenue operations process is undeniable, as they are a regulatory requirement. Furthermore, the JRC considers that these controls are necessary to mitigate the risks outlined in Annex 6 (RCS No 2). The costs of controls incurred for the three main phases of the JRC's revenue operations through contractual activities have been estimated. The criteria for the calculation and the indicators used are shown in in Annex 6 RCS No 2. As mentioned in the previous section, it is not possible to quantify all of the costs and benefits of controls. Estimating the intangible benefits is particularly problematic.

The benefits of control in non-financial terms cover: accepting only project proposals which have an acceptable level of risk, which are in line with the JRC work programme and which meet customer expectations, sound financial management, deterrents efficiency gains, limiting the risk of litigation, respect of contractual provisions, system improvements and, as mentioned above, compliance with regulatory and research programme provisions.

2.1.1.4. Conclusions on the cost-effectiveness of controls

Based on the most relevant key indicators and control results, the JRC has assessed the effectiveness, efficiency and economy of the control system and reached a positive conclusion on the cost-effectiveness of controls.

The error rates and the cost of controls remain below the targets, and the timeliness of payments is slightly higher than the target. The timeliness of payments is still heavily affected by carry-over activities not linked to controls. JRC's control environment and control strategy remained stable during the reporting year compared to previous years, the conclusion on the cost-effectiveness of controls is deemed to be unchanged. Those cost of control actions affected by the COVID-19 crisis have been updated to digital and remote working with no identified negative effects to the control environment.

2.1.2 Audit observations and recommendations

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

2.1.2.1. Audit work carried out by the EC Internal Audit Service during the reporting year

During the reporting period, the Internal Audit Service (IAS) finalised six audits in which five very important recommendations were formulated for the JRC: 1) Site management & infrastructure support services in the JRC (two very important (VI) recommendations); 2) IT governance and project management practices and procedures (one VI recommendation); 3) JRC support to EU policy and knowledge management (one VI recommendation); 4) Accounting of assets in the JRC (one VI recommendation). The JRC accepted all recommendations and action plans are being implemented. The JRC was also associated to two multi-DG audits on Data protection and on Commission's strategy for data, information and knowledge management. Eighteen recommendations are currently under implementation²⁵, four of which very important.

Follow-up audits resulted in closing four very important recommendations, reopening and downgrading one very important and closing four important recommendations. The JRC is awaiting the IAS decision on eleven recommendations submitted as implemented by the JRC, three out of which are very important. Currently there is no long overdue²⁶ very important recommendation pending. Refer to Annex 7 for further details.

²⁵ For which an action plan has been approved by the IAS and implementation is ongoing.

²⁶ More than 6 months

The Internal Auditor, in its limited conclusion, stated that the JRC internal control systems in place for the audited processes are effective, except for the observations giving rise to 5 'very important' recommendations: two on site management & infrastructure support services, one on accounting of assets, one on IT governance and project management and one on JRC's support to EU policy and knowledge management.

Over the period 2018-2020 the IAS audited the following JRC processes: intellectual property rights, Decommissioning and waste management (D&WM) Programme implementation, recruitment of temporary scientific staff, site management & infrastructure support services, IT governance and project management practices and procedures, JRC support to EU policy and knowledge management and accounting of assets. Additionally, the JRC was associated Directorate-General to three multi-Directorate-General audits: data protection, synergies & efficiencies and Commission's strategy on data, information and knowledge management. The JRC accepted all the recommendations.

The recommendations implementation is on track except for two very important ones under the site management & infrastructure support services audit: completion of the one on governance and organisation is expected to have a delay of five and a half months, while the one on human resources management required three more months. Additional time was necessary for revising the governance and envisaged for adapting the concerned processes accordingly. To strengthen the internal governance, a new overarching body (Group of site managers) was set-up and mandated to steer and monitor site management activities. It was decided that new site management teams will be established in each site for advising site managers.

One very important recommendation on human resources management under the Decommissioning and waste management programme implementation audit was marked as overdue for more than 6 months during 2020. The establishment of a dedicated Directorate and the related specific provisions defining the future organisational structure of D&WMP addressed and completed the recommendation, which is currently under IAS review.

2.1.2.2. ECA audits

The JRC has no critical or very important findings from the European Court of Auditors (ECA) audits, and no overdue actions. Further details are presented in Annex 7.

ECA found no errors in the sampled JRC transactions as part of the Statement of Assurance for 2019²⁷. Therefore, the ECA's annual report²⁸ 2019 contained no reference to the JRC in respect of the error rate. In 2020, the ECA reviewed one JRC transactions and one project in which the JCR participates. The reviews were closed with no findings.

²⁷ Finalised during the first half of 2020

²⁸ 2020/C 377/10

2.1.2.3. Conclusion on the assessment of IAS and ECA audit results

During the reporting period, the JRC enhanced its qualitative performance through the endorsement of appropriate measures to mitigate risks. Nine recommendations (out of which four very important ones) reviewed by the IAS were closed. While the involvement of the JRC in ECA audits increased considerably in 2020, none of the findings nor their combined effect have an impact on assurance.

An effective follow-up to all audit recommendations is in place by the JRC management system. The audit follow-up activities are regularly monitored and reported to the JRC management. Given the actions outlined above, mitigating controls in place, and absence of cross-cutting risks, the JRC considers that the identified risks do not have a material impact on the declaration of assurance.

2.1.3 Assessment of the effectiveness of internal control systems

The Commission has adopted an Internal Control Framework based on international good practice, to ensure the achievement of its policy and management objectives. Compliance with the internal control framework is a compulsory requirement. DG JRC uses the organisational structure and the internal control systems suited to achieving its policy and internal control objectives in accordance with the internal control principles and has due regard to the risks associated with the environment in which it operates.

The JRC continued to work with the integration of the internal control framework and its integrated management system (IMS), which is based on the international quality standard ISO 9001. Such integration allows the JRC to combine requirements from different sources including legal requirements, in one management approach.

The JRC performed an annual assessment of its internal control systems using a variety of sources. These included:

- the analysis of the internal control weaknesses recorded during the year, starting from the internal control monitoring criteria targets achievement
- the risk assessment,
- the findings and recommendations from external and internal audits,
- the JRC results from the staff surveys 'coping with confinement' managed by DG HR during the year,
- the register of financial exceptions and non-compliance events and the annual management reports submitted by all JRC authorising officers by subdelegation,
- the JRC anti-fraud strategy action plans final report.

The JRC has assessed its internal control system during the reporting year and has concluded that it is effective and the components and principles are present and functioning well overall, but some improvements are needed as minor deficiencies were identified related to:

- site management and infrastructure support service,

- IT governance, risk and project management practices and procedures,
- asset accounting control process documentation, guidance and methodology.

In addition, the current version of business continuity plans and IT disaster recovery plans should be further developed including effectiveness aspects and be tested.

The improvements and remedial measures implemented are intended to further develop the performance framework for the site management and infrastructure support service. Specific action plans are envisaged for the efficiency and effectiveness of the IT governance and project management processes, as well as for the improved documentation of assets accounting.

2.1.4 Conclusions on the assurance

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

The assessment of the elements and the conclusions reported in these sections result from a systematic analysis of the evidence available. The following elements provide sufficient guarantees as to the completeness and reliability of the information reported and results in a comprehensive coverage of the budget delegated to the Director-General of the JRC:

- the JRC's internal controls systems provide sufficient assurance to adequately manage the risks relating to the legality and regularity of the underlying transactions,
- the JRC has implemented appropriate *ex ante* and *ex post* controls, to the extent that they remain cost-effective,
- the JRC has put in place suitable control measures to limit risks of error and prevent, detect and correct fraud and irregularities,
- recommendations issued by the JRC's auditing bodies do not raise any assurance implications and are being implemented as part of the ongoing continuous efforts in terms of further improvements,
- the JRC's internal control systems provide sufficient assurance with regards to the achievement of the other internal control objectives,
- resources were used for the intended purposes, sound financial management was applied, and the non-omission of significant information was ensured.

Overall conclusion

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 Director-General, in his capacity as Authorising Officer by Delegation has signed the Declaration of Assurance.

2.1.5 Declaration of Assurance

I, the undersigned, Director-General of the Joint Research Centre,

in my capacity as authorising officer by delegation

Declare that the information contained in this report gives a true and fair view²⁹.

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

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

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

Brussels, date 16/04/2021

Stephen Quest

²⁹True and fair in this context means a reliable, complete and correct view on the state of affairs in the DG/Executive Agency.

2.2 Modern and efficient administration – other aspects

2.2.1 Human resource management

In accordance with the JRC Strategy 2030, the JRC has adopted modern, flexible, people-centred and effective human resource (HR) management practices. The JRC implements the Commission's talent management strategy³⁰ by actively contributing to the Commission-wide actions, including staff engagement and promotion of staff mobility.

The promotion of **qualified female staff to management positions** remained a priority for the JRC in 2020. The support offered to female staff members led to an increase of applications to middle management positions when compared to previous years. Regarding the JRC target to appoint 11 first time female Heads of Unit before end 2022, 2 were appointed by the end of 2020.

The staff engagement index has decreased from 68 % in 2018 to 66 % in 2020, with significant differences between the JRC sites. The sites where a large proportion of staff could not continue to perform their normal duties (e.g. lab technicians, logistics and infrastructure technical staff) were more negatively affected by the COVID-19 crisis. In follow up to the 2018 staff survey, an action plan (AP) was adopted to further improve inclusion, recognition and professional development of staff and management. Most actions were implemented at the end of 2020, including several workshops and masterclasses for middle managers, as well as major efforts from Senior Management to outreach to all staff, especially during the current pandemic. Some of the actions that were included in the plan became obsolete, due to overlaps with other initiatives and changes in the workplace organisation in the context of the current pandemic. The AP was revised accordingly.

Another action in 2020 was the intensive support to AST staff applying for certification to become AD official. Due to the high failure rate of JRC candidates compared to other services (which can be largely understood due to the specific competences required at the JRC), an intensive programme of individual coaching and feedback as well as dedicated training and networking was implemented.

In intensive cooperation with the Ispra medical service, several activities were developed to support staff members and their managers during the prolonged periods of teleworking in the COVID-19 pandemic. Some of the JRC sites took the initiative to deliver ergonomic support (chairs, screens, etc.) to staff at their home. Managers frequently received updates on the teleworking arrangements, as well as guidance to stay in contact with staff and detect potential stress situations. Dedicated training sessions on managing teams in remote have been offered.

³⁰ INFO(2016) 62 'Launching the Talent Management Strategy', information note to the College

Representatives of the Ispra medical service participated to dedicated unit meetings on psychosocial support to provide an overview of their activities and possibilities to support units/staff members, especially with the COVID-19 pandemic still ongoing.

13 pulse surveys on issues connected with the pandemic were launched and the results analysed and reported to staff, management, staff representatives shortly after the closing of each survey.

Newcomers in 2020 received special attention to facilitate their integration in the difficult remote working circumstances. The JRC HR team, together with colleagues in Directorate General for Human Resources immediately tasked their teams to work together in designing, developing and implementing a new on-boarding programme entirely delivered online, focusing of the need for newcomers to connect and receive support. The first pilot session was delivered early May 2020 to 15 newcomers connecting from places as far as New Zealand, South Africa, Finland and Spain. Some newcomers were in a new country, isolated from family and friends and unable to meet their managers and colleagues. Since then, 80 sessions were offered to more than 300 newcomers.

In March 2020 the reserve lists of the JRC AD scientific competitions were published. This allowed starting intensive selection and recruitment activities to fill all vacant positions. After the start of the lockdown, JRC, in cooperation with colleagues from Directorate General for Human Resources and the Ispra medical service, managed to continue selection and recruitment earlier than other Commission services. During the last quarter of 2020, a new ICT application was introduced, to manage the processing of requests for temporary staff.

The impact of the COVID-19 crisis in 2020 on recruitment of talents for the Exploratory Research, Centre for Advanced Studies and Collaborative Doctoral Partnership programmes was marginal and excellent and motivated young talents at postdoc and PhD level could be attracted. Selected from an overall substantial number of applicants, young scientists joined these programmes from a dynamic and thematically crosscutting research community.

Walking the talk as a human centric organisation, the JRC Annual Excellence Awards recognise the work, motivation and enthusiasm of its staff in several categories. In 2020, 64 winners were selected from over 500 nominations in 7 award categories.

Reports on outputs defined in the Management Plan 2020 and on objectives and indicators set up in the Strategic Plan 2020-2024 are available in Annex 9.

2.2.2 Digital transformation and information management

The JRC has a long-standing expertise in providing digital solutions in support to European policies, whether through platforms for data collection, for monitoring indicators and progress; devising platforms for collaboration and information sharing; giving advice and support for effective knowledge management and evidence-based policies. The success and rising demand for JRC's digital solutions would not be possible without making sure

that the valuable assets shared via these tools are protected and the information provided is trusted.

The JRC is the business domain owner for the eProcurement Programme which is part of the Commission's actions to put in place a single data interchange area for submitting, storing and processing data in grant and procurement procedures. The progress during 2020 is detailed in Annex 9 as well as section 2.2.4.

The ICT architecture implementation plan was adopted in 2020. Based on these a number of projects have been initiated to achieve the goals of the ICT architecture, namely the consolidation and centralisation of the ICT infrastructures and the provision of business services. These include the development of a common application development platform, data management services in collaboration with the JRC data governance, and a virtual desktop environment, which are expected to be available in 2021. In addition, many activities are ongoing to improve the security of information systems, including the reinforcement of security assessments and vulnerability tests.

Through its research activities, the JRC is also producing a wealth of data, which can lead to new discoveries, innovations and correlations. To tap into this potential, and to match (and sometimes exceed) the expectations of policymaker, who see in the JRC a valuable partner, the JRC has been addressing the need to implement the right data practices, policies and infrastructure. The 2015 JRC data policy laid out the necessary basis to grant transparency obligations and legal commitments. It provided a framework for better data management, a corporate data governance (2018) so that the JRC and corporate policies are correctly implemented. Based on these first two-years experience, a revision of the current data governance structure is under discussion with the aim to make it lighter and to address the needs that have arisen since its creation.

The JRC is contributing to the implementation of the corporate data strategy as part of the Information Management Steering Board (IMSB) work programme 2020-2021. In this context, the JRC has led the establishment of a Data Advisory service that provides support to EC staff on data-related matters. The Data Advisory service was launched in pilot 1 July 2020, respecting the timeline planned. Furthermore, the JRC is leading the creation of a corporate data catalogue, where EC key data assets will be recorded and discoverable. As a temporary solution, the JRC finalised the creation of an inventory of data that allows for retrieval of key data assets held by DGs and during 2020 a pilot for the EC Data Catalogue with commercial solution has been completed in collaboration with DIGIT and SG involving the Local Data Correspondents network. This work on establishing a corporate data catalogue will continue in 2021.

JRC is collaborating with CERN and other research institutions and libraries on a CERN knowledge transfer project called Invenio Research Data Management (InvenioRDM). The aim of this project is to develop an institutional research data repository that allows researchers to manage and store/archive outputs of their research activities. Due to delays of the project in 2020, the initial target of releasing a pilot of the repository in Q4 of 2020 could not be met. A pilot is expected to be released in 2021.

The JRC continued its work on **country knowledge** with a workshop, organised on 16 December 2020 and dedicated to this subject with the IMT members and country knowledge desk officers (in total more than 50 colleagues from 28 DGs and Agencies), with the aim to hear from their stories and experience, in order to better understand both the opportunities and the obstacles that have prevented progress. In particular SG-RECOVER, DG's ECFIN, JUST and COMM presented recent important country knowledge experiences. The workshop was a further step towards finding common solutions to the country knowledge-related issues, based on an established knowledge management and collaboration methodology called the 'value proposition framework'. For further details refer to Annex 9.

The planned step-up of the **One-Stop Shop** progressed as planned: delivery on typical consultancy missions (34 projects as of November 2020), support to the M365 roll-out from a user perspective, set-up and nurturing of the Collaboration Hub; ad-hoc support was provided at the start of the COVID crisis, which resulted in the production of two very much demanded guidance material on 'on-line meetings' and on-line platforms.

Training and capacity building for scientists and policymakers activities continued successfully with 2-day training course on Evidence for Policy for JRC Researchers continued in 2020, delivered online. The training has been very highly appreciated by participants. For further details refer to Annex 9.

IT Platforms for knowledge management During 2020, the JRC has positioned the Knowledge4Policy platform (K4P) as the EC's 'leading edge' platform in evidence-informed policy and knowledge management, thus positioning JRC as central in knowledge for EC policymaking, and promotes the work of both Knowledge and Competence Centres. A training on K4P to the Policymaking Hub's 2020 summer school showed high interest from other Commission services in K4P, demonstrating that this unique story resonates. K4P has also saved the significant resources.

In the area of **data protection**, the planned data protection awareness campaign targeting the JRC senior management has been successfully finalised reaching 100% of the senior managers. In 2020, the JRC was also subject to a (multi-DG) audit by the Internal Audit Service in the field of data protection, with five units and the central JRC DPC function involved, which further contributed to raising the awareness about the issue of data protection, both among middle and senior JRC managers and among the staff responsible for the audited processes.

The launch of the **EU Academy** in October 2020 presented a major step forward in giving visibility to the EU in terms of training and education. With a modern and scalable eLearning platform, the EU Academy will provide high quality courses to citizens around the world and promote the EU as a forward-thinking organisation. The inter-institutional platform hosts top quality eLearning courses, classroom type training and new features such as VR type courses.

In 2020, the JRC's **Science and Art programme** concluded its third Resonances edition on the topic of Big Data and digital transformation at the BOZAR lab in Brussels. The topic was

very timely in the light of the COVID-19 pandemic: the Resonances III exhibition provided scientists, policy makers and the public a platform for discussing the impact of digital transformation on our lives – just ahead before the pandemic started.

2.2.3 Sound environmental management

In line with the implementation of the JRC local site development plans and the corporate EC EMAS strategy, the JRC pursues the implementation of its work programme seeking to reduce the environmental impact of these activities on the six sites where it is present by reducing its carbon footprint.

In particular, in 2020 the JRC has:

- continued the planned actions regarding the thermal insulation of buildings, as part of the general upgrades (refurbishments) of different building on the Geel, Ispra, Karlsruhe and Petten sites,
- increased the photovoltaic energy production,
- continued to replace parts of its service car fleet with e-cars,
- increased the number of e-charging pole for electrical vehicles,
- promoted sustainable mobility on the sites,
- introduced mission-free perimeters for each of the sites similar to DG HR's decision for Brussels,
- produced energy studies to support the timely implementation of the report of the Commission on how to become climate neutral by 2030,
- set up a monitoring and reporting system for data on Green Public Procurement.

2020 data cannot be considered as 'normal' due to the outbreak of the COVID-19 pandemic, associated with lockdown in Member States and rearrangements of working conditions. In fact, only a fraction of staff worked at the workplace. This had of course an impact on the achievement of goals (targets). For example, while on one side, reductions in consumptions of e.g. paper or water might have been higher than expected, specific measures like air conditioning systems, no longer recirculating air to help containing the spread of viruses, resulted in higher than expected reductions in energy consumption and CO₂ emissions.

2.2.4 Example(s) of initiatives to improve economy and efficiency of financial and non-financial activities

As noted above, it is JRC's prime objective to retain existing and effective control measures whilst applying new methodologies, such as use of the digital (rather than 'blue ink') signature or the acceptance of digitalised media. The JRC is the business domain owner for the eProcurement Programme which is part of the Commission's actions to put in place a single data interchange area for submitting, storing and processing data in grant and procurement procedures. This is a Commission-wide initiative involving many Directorates-General developing four business processes: preparation, submission and evaluation, contract management and inventory, and logistics management.

As the JRC is also the business process owner for the ePreparation module progress during 2020 is provided in detail at Annex 7. The JRC's ePreparation solution- the Public Procurement Management Tool (PPMT) - is now used by all Directorate Generals of the European Commission. The proposed roll-out has therefore been a success.

Furthermore, functionalities have been added facilitating *ex ante* publicity and nominations and improvements to integration with other eProcurement modules, such as eNotices, eTendering and eSubmission.

The new eSubmission solution integrated with MyWorkplace and ARES was brought into production for open procedures by all eProcurement users at the start of the year. It is also used by the RELEX 'family' of Directorate Generals for framework contracts with re-opening of competition. Pilot calls for restricted and negotiated calls for tender were launched in Q4 2020. eSubmission is now used by 80 entities and facilitated over 800 opening sessions during the year.

The Contract Management Business Process has overseen a number of pilots covering Framework Contracts with reopening of competition and a number of improvements made. The workflow for the revision of the corporate contract models was finalised and a number of analyses and invoicing transitional solution implemented.

The Inventory and logistics module saw the business requirements for service management tracking, enterprise organisation, master data and reporting validated and delivered in Q2. A new tracking solution for DGs OIB and OIL was introduced and the definitions for ownership and responsibilities objects consolidated for ILM and Asset Accounting.

Overall, good progress has been made in 2020 and more is expected in the next year.

As part of the Inter-Institutional Task Force set up to look at the minimum standards for authentication of electronic documents and digital signatures the JRC was appointed 'lead Editor' for a prototype 'eIDAS' Regulation for EU Institutions and EU Bodies. The prototype text was successfully delivered to the Inter-institutional Committee for Digital Transformation.