



Annual Activity Report 2023

Joint Research Centre

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JOINT RESEARCH CENTRE IN BRIEF

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting European Union policies to positively impact society. It contributes to EU policy making in a variety of key areas from agriculture and food security, to the environment and climate change, as well as in digital transition, innovation and industrial policy, and nuclear safety and security.

As an organisation at the interface between science and policy, the JRC provides the cross-sectoral support required by policymakers to tackle and anticipate increasingly complex societal challenges, combined with the capacity to respond rapidly to policy needs, all in close collaboration with the other Directorates-General. The 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). It is building its expertise and sharing know-how with Member States and the scientific community. It works in collaboration with over a thousand organisations worldwide, whose scientists have access to JRC facilities.

The EU's framework programme for research and innovation, Horizon Europe and the Euratom Research and Training Programme funded the JRC in 2023. The JRC contributes to the overall objectives of these programmes while being fully aligned with the political priorities of President von der Leyen's Commission.

The JRC is organised in eleven directorates. Two have corporate responsibilities for 'strategy and impact' and 'support services', respectively. Eight are scientific directorates of which six are thematically organised and two are horizontal – 'innovation in science and policymaking' and 'digital transformation and data'. In addition, there is a directorate in charge of nuclear decommissioning and waste management. A Communication Unit is directly linked to the Director-General.



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

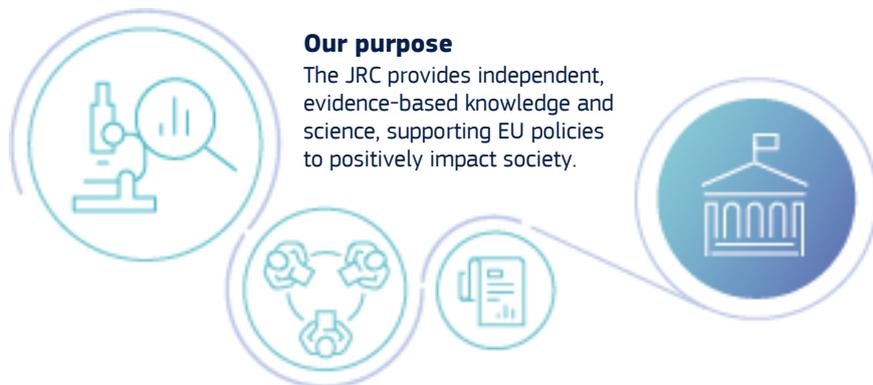
The JRC also manages scientific infrastructures and nuclear facilities. It has an ISO certified quality management system and several of its laboratories are accredited according to ISO 17025.

EXECUTIVE SUMMARY

This annual activity report is a management report of the Director-General of the Joint Research Centre to the College of Commissioners. Annual activity reports are the main instrument of management accountability within the Commission and constitute the basis on which the College takes political responsibility for the decisions it takes as well as for the coordinating, executive and management functions it exercises, as laid down in the Treaties ⁽¹⁾.

A. Key results and progress towards achieving the Commission's general objectives and department's specific objectives

In 2023, the JRC continued to carry out its **organisational transformation** with the objective to become a more modern organisation, anchored into its core values of trust, collaboration and transparency and able to better respond to the challenges of the ever more complex world the Commission is faced with. To drive JRC's transformation and repositioning, four ambitions were identified for 2023. 1) The JRC set the priority of developing a new **organisational approach** to further improve how the JRC runs the organisation to support its scientific purpose. This new approach contains several actions such as reviewing use of external service providers and reviewing research infrastructures and prioritise research infrastructure needs, etc. 2) In line with its ambition to be a great place to work, the JRC developed and implemented a new **human resources strategy 'HR Pathways'**, setting out the main priorities for HR and people management for the coming years. 3) The JRC committed to **nurturing vibrant ecosystems with stakeholders**, defining, inter alia, a new corporate vision for its approach towards the Member States and stakeholders in their territories. 4) Built around its core value proposition of anticipation, integration and impact, the **JRC scientific work programme for 2023-2024** was adopted in February 2023 by the College. Its main building blocks are 33 portfolios allowing a better integration of JRC's work across scientific and policy domains.



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

In 2023, a panel of independent experts carried out the **interim evaluation of the JRC under Horizon Europe and the Euratom research and training programme 2021-2025** yielding positive results, highlighting the JRC's relevance, high-quality work, and agility in addressing new challenges. The JRC was recognised for its role in formulating and implementing policies in areas such as the COVID-19 crisis, the Green Deal, supply chain management and emergency management. The panel also recommended to the JRC to strengthen its cooperation with Member States and enhance communication and outreach activities.

In 2023, the JRC supported various initiatives included in the **Commission Work Programme 2023** through modelling policy options and by providing analysis, knowledge tools and methods for the development and implementation of EU policies. It contributed to the **Commission Communication on the 2023 Strategic Foresight Report** through its science for policy report summarising the results of the foresight process. While supporting the development of a **Recommendation on the participation of citizens and civil society organisations in public policy-making**, the JRC provided rationales, principles, and enabled conditions to implement meaningful citizen participation in policy-making.

Three years after its launch, the New European Bauhaus (NEB) has become a catalyst for the European Green Deal transformation. Through its 2023 evaluation tool - the **New European Bauhaus Compass** - the JRC helps to understand to what extent projects are embodying the NEB approach. The Compass was presented together with the **New European Bauhaus Progress Report** on the occasion of a joint press conference with the European Parliament.

Since February 2022, **Russia's war of aggression against Ukraine** is testing Europe's economic and social resilience at a moment when it is undergoing profound transformations. Also in 2023, the JRC provided expertise in various areas including maps on migratory flows, effects of hybrid threats, stress test scenarios for security of gas supply and assessing war impacts and recovery planning in the agricultural sector. It also continued cooperation with its Ukrainian partners (e.g. State Standards of Ukraine and the Ukrainian Board of the Ministry of Education and Science) and worked on the integration of Copernicus Sentinel based high resolution crop mapping in crop production estimation in Ukraine.

Three particular challenges identified in 2023 were 1) the budgetary pressure because of inflation and the increased energy costs 2) potential restrictions on the operations of the JRC due to delays in a construction project at the JRC in Karlsruhe and 3) a potential reduced ability to provide support to policymaking due to cuts of resources. To address the first challenge, mitigation measures have been put in place to reduce expenditure (e.g. energy efficiency measures and building related expenditure) and a solution to bridge the financial gap was proposed in the frame of the Horizon Europe budget, mandated by the project group of Commissioners. With regards to the Euratom budget, the JRC continued the implementation of Nuclear Strategy (developed in late 2021), focused on prioritisation and reinforced collaboration to obtain synergies. Regarding the second challenge, based on lessons learned and on recommendations from the internal audit service, corrective actions were taken and a consulting engagement agreement was put in place. Regarding the last challenge, while the JRC continued its prioritisation exercise, a potential gap in evidence for

policy support might have to be filled by procurements which may result in delays and more costly support.

The **key performance indicators (section B.)** reflect the JRC's commitment to scientific excellence and relevance for policymaking. With 49% of its peer-reviewed scholarly publications in the top 10% most-cited journals it has reached its quality target and its relevance is demonstrated in the consistently high number of results taken up for shaping or implementing policies and the satisfaction rate of beneficiaries, both consistently above target values.

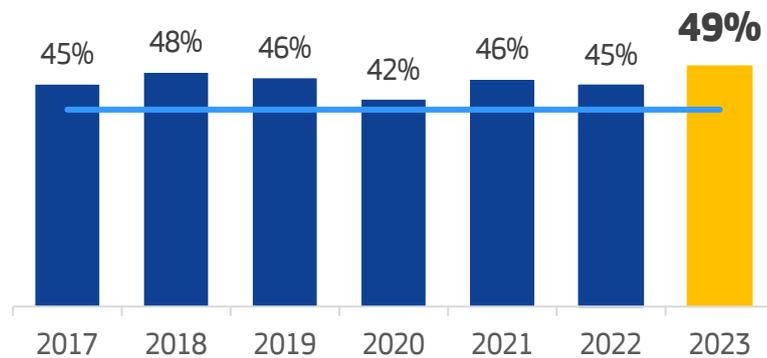
B. Key performance indicators

Scientific excellence

The proportion of peer-reviewed publications in the top 10 % most-cited journals²

Target (2024): >40 %

Source: Scopus® database



Impact on policymaking

Number of innovations and scientific results addressing specific EU policy priorities³

Target (2024): >300

Source: JRC internal process

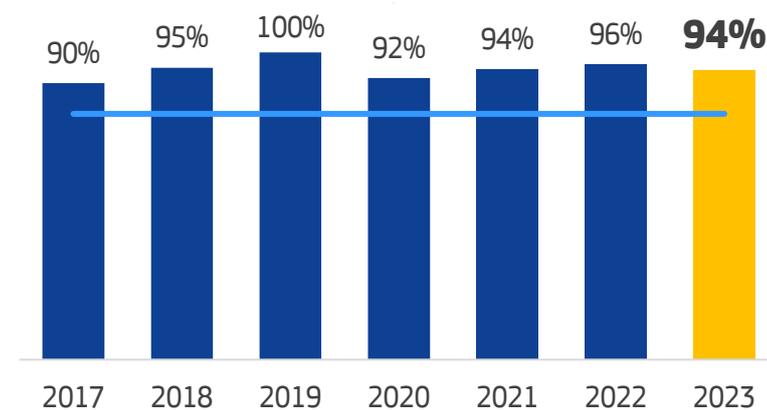


Relevance

Level of customer satisfaction⁴

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

Source: JRC customer survey



² Data extracted on 16 February 2024. Data for 2023 may still vary.

³ This refers to instances of using the JRC's scientific outputs in the policymaking process. The JRC scientific work programme is designed to address the Commission priorities and long-term goals.

⁴ Results for 'strongly agree' and 'agree' are summed up to obtain the overall satisfaction.

C. Key conclusions on internal control and financial management

In line with the Commission's Internal Control Framework the JRC has assessed its internal control systems during the reporting year and has concluded that it is effective and the components and principles are present and functioning well overall, but some improvements are needed as minor deficiencies were identified related to supervision, management and execution of procurements and contracts. Please refer to annual activity report section 2.3 for further details.

In addition, the JRC has systematically examined the available control results and indicators, 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 for further details.

In conclusion, management has reasonable assurance that, overall, suitable controls are in place and working as intended; risks are being appropriately monitored and mitigated. Improvements are necessary concerning the minor deficiency noted above. The following actions are/will be taken in this respect: enhanced sharing of good practices and their implementation in procurement; The Director-General, in his capacity as Authorising Officer by Delegation, has signed the Declaration of Assurance.

D. Provision of information to the Commissioner

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

1. KEY RESULTS AND PROGRESS TOWARDS ACHIEVING THE COMMISSION'S GENERAL OBJECTIVES AND SPECIFIC OBJECTIVES OF THE DEPARTMENT⁵

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

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

In 2023, the JRC provided scientific evidence to underpin numerous **new policy initiatives**, supported the **monitoring and implementation of legislation**, and helped innovating **better regulation** at the Commission. The JRC continued to be centrally involved in implementing and innovating the **better regulation** agenda. It offered methodological advice, training and IT solutions to policy DGs on evaluations and impact assessments, at various phases of the policy cycle. In 2023, the JRC:

- provided advice to 19 policy DGs at upstream meetings with the Regulatory Scrutiny Board, with five follow-up discussions;
- provided methodological support on evaluation to 12 policy DGs;
- gave dedicated trainings, including on Case Studies in Microeconomic Evaluation, attended by 13 policy DGs;
- carried out technical quality control of counterfactual studies in several areas, including on State Aid for DG COMP and on the evaluation of the European Social Fund for DG EMPL.

The JRC supported the [Commission Communication on the 2023 Strategic Foresight Report](#). It analysed how to put 'sustainability and people's wellbeing at the heart of Europe's Open Strategic Autonomy' and suggested ten concrete actions to achieve this aim. The JRC's 2023 science for policy report: [Towards a fair and sustainable Europe 2050: Social and economic choices in sustainability transitions](#) explores possible and necessary changes

⁵ Reliability of performance information: The JRC relies on a quality management system which adheres to the ISO 9001 standard, gathering best practices on transparency, reliability and quality. The system is based on well-defined processes, integrating the requirements of the Commission's internal control framework and EMAS. The JRC is certified by an external certification body and is subject to regular reviews, updates and internal auditing. Control activities on JRC's key performance data include ensuring traceability by verification of evidence and an editorial review board which ensures the quality, appropriate categorisation and registration of output data. Furthermore, unless noted otherwise, all JRC publications mentioned in this report are public.

in the European social and economic systems as the European Union engages in managing sustainability transitions towards 2050.

Supporting Council Conclusions on promoting the use of science in policymaking

The JRC, together with DG RTD, has contributed to discussions on the Council Conclusions on Science for Policy adopted by the EU-27 research ministers on 8 December 2023. The impact of JRC's work is reflected in the Conclusion's use of JRC-promoted concepts including 'science-for-policy ecosystems', and its calls for specific actions, namely the use of the Technical Support Instrument for capacity building for evidence-informed policymaking - an instrument whose use for science for policy has been initiated by the JRC and which is situated beyond the area of research and innovation policy.

The JRC's support to **the 2023 Commission work programme** included in particular:



The European Green Deal

- **Reform of the Energy Market Design.** The JRC assessed the impacts and proposed options for the revision of the internal electricity market rules through its energy system modelling toolset. Its 2023 [report](#) evaluated different options for redesigning the European electricity market. At the request of DG ENER and the European Agency for the Cooperation of Energy Regulators, the JRC prepared a study of locational price signals in the Internal Electricity Market. The study investigated trajectories for the European electricity markets with a focus on new market structures and grid reinforcement remedial actions.

JRC contribution to the 2023 UNEP Emissions Gap Report

In November 2023, the United Nations Environment Programme presented the [2023 Emissions Gap Report](#). The report provides an updated view on the trends of global greenhouse gas emissions under a reference set of hypotheses aiming to be a key input for the forthcoming Global Stocktake exercise. The JRC wrote several chapters of the report and provided data and projections. It used the [JRC Global Energy and Outlook](#) scenarios and the [JRC Emissions Database for Global Atmospheric Research](#) latest data.

- **Revision of waste framework directive.** The JRC contributed to the revision of the food waste and textiles aspects of the initiative. It supported the impact assessment with the economic modelling tool MAGNET (modular applied general equilibrium tool) providing a detailed analysis of the economic, social and environmental impacts. The JRC also assessed environmental benefits linked to food waste reduction with tools developed for the consumption footprint indicator, relying on the application of Life Cycle Assessment. It published two reports presenting the evidence to the initiative. Furthermore, it contributed to the impact assessment with material flow modelling and a techno-scientific assessment of impacts of the management options for used and waste textiles.
- **Legislation on new genomic techniques.** The JRC provided feedback on the impact assessment accompanying this legislative proposal, including the public consultation and its final report. The JRC was also consulted on the drafting of the staff working documents prepared for the Regulatory Scrutiny Board. With regard to the challenges and limitations

of the detection of new genomic techniques products, the JRC published two reports and a smaller case study in support of the impact assessment accompanying the proposal.

Launch of the EU Observatory on Deforestation and Forest Degradation

In December 2023, the JRC launched the web platform of the [EU Observatory on deforestation and forest degradation](#). The launch of the observatory, developed and run by the JRC, is instrumental in helping to protect and restore the world's forests. The observatory is structured around three main components: global forest monitoring, production and trade of commodities, and EU tools for forest monitoring. It plays a role in uncovering the potential of forests by making publicly available a first-ever global map of forest cover at 10m resolution for year 2020.

- **The legislative framework on sustainable food system.** In close cooperation with DG SANTE and DG AGRI, the JRC prepared the initiative's impact assessment which obtained a positive opinion with reservations from the Regulatory Scrutiny Board in July 2023. The proposal for a legislative framework for sustainable food systems is an element of the Farm to Fork Strategy. Planned initially for Q3 2023, the initiative – and hence the publication of the impact assessment – has been postponed to a future date. Nonetheless, in 2023, the JRC published several [technical reports](#) supporting adoption of sustainability innovations by operators in the EU food supply chain.
- **Accelerate the green/digital transition of Europe's key industrial ecosystems.** The JRC supported the development and implementation of European Research Area Action 12, namely, the role of technology infrastructures and on the contribution of standardisation to the valorisation of research and innovation within the framework of the industrial technology roadmaps.



A Europe fit for the digital age

Launch of the European Centre for Algorithmic Transparency

The Digital Services Act gives the Commission exclusive supervisory and enforcement role over transparency obligations concerning algorithms used by very large online platforms and search engines. In support of this act, [the European Centre for Algorithmic Transparency](#) was launched. It is hosted by the JRC in close cooperation with DG CNECT. The Centre provides scientific and technical expertise to support the enforcement of the Act and further research into the impact of algorithmic systems deployed by online platforms and search engines.

- **European critical raw materials act.** The JRC was involved in the preparation of the initiative since its inception, including for the preparation of its impact assessment. The initiative introduced the concept of strategic raw materials, including on the basis of the supply and demand projections included in the JRC's foresight report. The [foresight report](#) explored potential vulnerabilities and dependencies of 15 technologies in five strategic sectors for the EU economy: renewables, electric mobility (e-mobility), industry, information and communications technology, and aerospace and defence.

Exploring the power of generative AI for science and policy making

In 2023, the JRC developed an internal Generative AI platform ([GTP@JRC](#)) to enable its staff to safely explore the potential applications of generative AI, and research their limitations

and risks. The JRC platform supports a variety of Generative AI models, both open-source and commercial, with new models being added regularly. Approximately, 2000 Commission staff members are currently testing the tool. The insight gained from this testing will help the development of use-cases for best ways to integrate this technology for tasks, such as translating, proofreading, summarising, and generating coherent and grammatically accurate texts, as well as specific scientific applications.

- **Screening and registration of asbestos in buildings.** The JRC supported the legislative proposal on asbestos screening and registration in buildings by investigating, in the context of the Renovation Wave Strategy, the wider benefits of coordinating energy efficiency upgrades in existing buildings with asbestos removal and specifically including regions under high seismic risk. In 2023, the JRC published a [policy report](#) identifying vulnerable EU regions considering asbestos presence and seismic risk.

Supporting Antitrust investigations in the digital domain - the Apple case

The JRC provides scientific expertise to support specific antitrust case analysis. In 2023, Apple was obliged to propose a set of commitments aiming to address the Commission's concerns regarding Apple's conduct in connection to Apple Pay. The Commission argued that Apple had violated EU competition rules by limiting access of third-party mobile wallets developers to the necessary iOS hardware and software used for contactless payments with mobile devices in shops. The JRC provided in-depth cybersecurity technical studies and analysis concerning Apple Pay supporting all stages of the ongoing antitrust investigation.



An economy that works for people

- **Business in Europe: framework for income taxation.** The JRC has contributed to the impact assessments underpinning the initiatives on faster and safer relief of excess withholding taxes, a head office tax system for SMEs and the Business in Europe: Framework for Income Taxation package for large corporations. It worked with DG TAXUD on the scope of these initiatives, tax revenues implications and their macroeconomic impact. For that purpose, it used the recently updated CORTAX (corporate taxation) model – a Computable General Equilibrium model - designed to analyse corporate tax reforms in the EU-27, UK, USA and Japan.

Financial risks from climate change and nature degradation

In 2023, the JRC provided inter-institutional support to the European Central Bank (ECB) and the European Systemic Risk Board (ESRB) to advance the understanding of nature-related financial risks and their potential impact on financial stability. JRC's findings have been pivotal in informing the report of the ECB/ESRB Project Team published in December 2023. The JRC assessed how climate change affects companies in the EU, including financial firms. The JRC also focused on the dependency and exposure of the EU financial system on ecosystem services and biodiversity and contributed by further developing the analytical basis for more targeted and effective policy action.

- **Digital Euro.** The JRC assessed the potential impact of a retail-only digital euro on banks' balance sheets and profitability under different scenarios, as well as the macroeconomic implications of the introduction of a digital euro. Both analyses showed the importance of

capping digital euro holdings to mitigate potential impacts on financial stability by limiting changes to bank's balance sheets profitability. In particular, limiting the Digital Euro take-up would reduce the macroeconomic consequences of a potential bank run to a level which is similar to the case of a cash-only economy.



A stronger Europe in the world

- **Observatory of Critical Technologies to strengthen EU strategic autonomy (OCT).** With the experience of supply chain disruptions during the pandemic and the new geopolitical challenges, the Commission, through DG DEFIS and the JRC, has set up the OCT, as part of the Action Plan on Synergies between Civil, Defence and Space Industries. On the basis of extensive investigations of the JRC, among other stakeholders, the OCT prepared a set of nine thematic reports on subjects related to electronic components and building blocks for autonomous systems. The aim of these reports is to serve the development of roadmaps supporting the addressed technologies and strengthening their supply chains in order to achieve a higher level of EU strategic autonomy for its critical technologies.
- **EU space strategy for security and defence.** The JRC provided scientific support for secure navigation and communication capabilities, including for developing defence-grade secure navigation capabilities (Galileo PRS Public Regulated Service).

Relation between climate change and demography

At the request of VP Šuica, the JRC prepared in 2023 a report [Demography and climate change: EU in the global context](#). The JRC carried out an analysis of trajectories of emissions and population to raise awareness of the role of demography in the context of the policy and political debates on climate change and environmental sustainability in the EU and at the global level. The report provided scientific evidence on the implications of global population growth for emissions and explored the possible consequences of population ageing in Europe for the EU's climate targets.

- In 2023, the JRC contributed with its technical support, including training and capacity building activities to the **implementation of several international agreements concerning nuclear security, safeguards and non-proliferation** including, where appropriate, the Iran nuclear agreement, nuclear safeguards and security research and development (with Japan and the USA), the EU Chemical, Biological, Radiological and Nuclear Centres of Excellence and the Commission support to the International Atomic Energy Agency in the area of nuclear safeguards and nuclear security.

Implementation of the Carbon Border Adjustment Mechanism (CBAM)

The JRC [conducted a study](#) to estimate greenhouse gas emission intensities for imported goods from four energy-intensive industries (iron and steel, fertilisers, aluminium, and cement). This fed into the preparation of default values for supported the implementation of the CBAM Regulation (EU) 2023/956. The JRC's research helped businesses to submit their first report under the Regulation in which default values play a specific role, in particular when importers do not have all the necessary information.



Food fraud: How genuine is your honey?

In 2023, the JRC, together with OLAF participated in a coordinated EU action '[from the hives](#)' led by DG SANTE. 16 EU Member States plus Switzerland and Norway took part in this testing campaign. During this campaign 320 honey consignments - imported from 20 countries - were randomly sampled by the JRC which identified that 46% of the samples were suspicious to be adulterated, which means non-compliant with the general provision of the [EU Honey Directive](#). The scientific results of the campaign were published in the JRC report on [EU coordinated action to deter certain fraudulent practices in the honey sector](#).

- **Revision of the combating child sexual abuse Directive.** In 2023, the JRC developed new digital forensic techniques in support of law enforcement authorities. These techniques aid in processing large amounts of multimedia data, with the aim of helping investigators geo-localise where a video was made, and to stamp Child Sexual Abuse multimedia products found in the 'dark net'. The JRC also worked in collaboration with EUROPOL on the deployment of technical tools such as Electric Network Frequency, based on automated image analysis, to detect and trace abuses.

Addressing multiple threats at a crime scene

Nuclear or other radioactive materials constitute a radiological hazard when encountered out of regulatory control. When such material occurs at a crime scene in combination with conventional explosives (e.g. in the form of a dirty bomb), a significant threat has to be dealt with by the first responders. In 2023, JRC organised a dedicated workshop involving DG HOME, Europol and law enforcement experts from EU Member States, which resulted in the first-ever harmonised training program considering these specific challenges.

- In 2023, the JRC further contributed to building a future **European Health Union**. It took up the challenge of implementing the Council Recommendations on cancer screening, in alignment with the Europe's Beating Cancer Plan and Horizon Europe Mission on Cancer. It expanded its European Systems for monitoring cancer burden and inequalities. Its knowledge base on health promotion and disease prevention added a new tool on nutritional quality of packaged foods and beverages and, it spearheaded innovations, both nuclear and non-nuclear, in new health technologies including theranostics.

New European Breast Cancer Quality Assurance Scheme (QA scheme)

The [QA scheme](#), tested in 2023 in real-life settings, is another milestone in the fight against breast cancer. To raise the bar of essential cancer care in the EU, the JRC developed this scheme to cover the complete patient care pathway. In 2023, JRC tested the QA scheme in 20 entities from 9 Member States (Belgium, Germany, Italy, Latvia, Netherlands, Poland, Romania, Slovenia and Spain). This proved the feasibility of the Scheme and all 20 entities expressed their interest to implement it.



Promoting citizen engagement in public policymaking

In December 2023, the European Commission adopted [Recommendation on promoting the engagement and effective participation of citizens and civil society organisations in public policy-making processes](#). The JRC's Competence Centre of Participatory and Deliberative Democracy provided arguments and principles that had been included in the proposal. In cooperation with DG JUST, it supported development of the citizen engagement elements of the proposal and provided services, guidance and tools to build capacity on citizen engagement in policymaking.

- In 2023, the JRC carried out research to improve evidence-informed policymaking, developing practical toolkits to factor values and identities in the process. In its [technical report](#) on climate change **disinformation** the JRC investigated detection of persuasion techniques and framing dimensions. Furthermore, the JRC used multi-lingual clustering in combination with summarisation and keyword extraction using large language models, e.g. in its weekly 'fighting the fallacies' newsletters. With regard to COVID-19, the JRC published a three-year [trend analysis](#) of COVID-19 mis/disinformation narratives.
- The JRC partnered with DG REGIO to advance the goals of Cohesion policy by designing a new **tool for monitoring and analysing competitiveness in EU regions**. In 2023, the JRC's [Competence Centre on Composite Indicators and Scoreboards](#) provided the scientific expertise to develop a methodologically sound and reliable composite indicator, the [EU Regional Competitiveness Index 2.0](#). Composite indicators are statistical models that synthesise complex multidimensional policy phenomena into conceptually and statistically meaningful performance metrics.



Responding to crisis and emergencies

The JRC has a long experience in supporting the management of crises and emergencies. Since February 2022, **Russia's war of aggression against Ukraine** has been testing Europe's economic and social resilience at a moment when it is undergoing profound transformations. In this context, the JRC in 2023 among others:

- produced regular maps on the situation in Ukraine, updated regularly and covering Ukraine and its six neighbouring countries;
- produced a comprehensive analysis of displacement from Ukraine with focus on population movements and protection seeking in EU. An interactive dashboard was also developed and integrated as a [thematic section in the Atlas of Migration](#);
- produced an [analysis](#) of solidarity towards the persons displaced from Ukraine in the context of the activation and renewal of the Temporary Protection Directive;
- provided technical assistance to DG ENER in steering specific radiation dispersion benchmarks with ECURIE competent authorities on assumed accident scenarios of Ukraine's nuclear power plants;
- co-authored a [report on Comprehensive Resilience Ecosystem](#) examining the effects of hybrid threats, as well as resilience building measures on society as a whole;
- contributed to the security of gas supply stress-test scenarios for the 2023/2024 winter storage season and supported Ukraine in its efforts to adopt the EU acquis in the area of security of gas supply;
- carried out technical dialogue with the State Standards of Ukraine on construction standards, in anticipation of the reconstruction phase and a future membership to EU;

- established collaboration with Ukrainian authorities on best available techniques and the Sevilla process, in support of Ukraine's efforts to transpose and implement the [Industrial Emissions Directive \(2010/75/EU\)](#);
- provided regular real-time estimates of the fiscal impact that people fleeing the war in Ukraine had in their host Member States;
- provided advice for the finalisation of the Science, Technology and Innovation for SDGs roadmaps that were [approved](#) by the Ukrainian Board of the Ministry of Education and Science in December 2023;
- worked on the integration of Copernicus Sentinel-based high resolution crop mapping in crop production estimation in Ukraine (MARS bulletins) and assessed war impacts and recovery planning in the agricultural sector;
- At the Ukrainian government's initiative, the JRC developed New European Bauhaus values were integrated as a voluntary standard in a one-stop digital platform to monitor and manage all stages of Ukraine's post-war reconstruction projects.

In 2023, the JRC also took several **energy crisis and supply chains actions**, including:

- the JRC, in cooperation with DG ENER, contributed to the definition of intermediate gas storage filling targets by providing data and undertaking modelling analyses;
- the JRC and NATO Energy Security Centre of Excellence co-organised the Coherent Resilience 2023-Baltic tabletop exercise aiming to support the Baltic States and partnering nation's national authorities in increasing resilience of maritime energy infrastructure and transportation network in the Baltic Sea against hybrid threats;
- for the purposes of the Net-zero Industry Act, the JRC co-developed, with DGs GROW, ENER and CLIMA, the staff working document on investment needs for strengthening the EU's net-zero technologies manufacturing capacity;
- the JRC delivered a set of thematic reports on subjects related to electronic components and building blocks for autonomous systems, as well as on vulnerabilities in the semiconductor supply chain;
- the JRC supported the creation of the semiconductors supply chain monitoring system foreseen by the Chips Act by providing analytical support for determining EU dependency on foreign jurisdictions and monitoring supply chain disruptions.



Scientific excellence, impact and efficiency

In 2023, a panel of nine independent experts from different European universities carried out the interim evaluation of the JRC under Horizon Europe and the Euratom research and training programme 2021-2025. The evaluation yielded positive results, highlighting the JRC's relevance, high-quality work, and agility in addressing new challenges ([Final report of the evaluation panel](#)). The JRC was recognised for its central role in formulating and implementing policies in areas such as the COVID-19 crisis, the Green Deal, supply chain management and emergency management. The panel recommended to the JRC to strengthen its cooperation with Member States and enhance communication and outreach activities. To this end, the JRC has devised a new communication strategy to connect with the Member States public administrations. Other panel's observations reiterated the recommendations made by the 2022 ex-post evaluation panel, such as continue developing

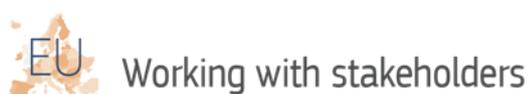
the capacity on foresight and digital transition, stronger focus on the social dimension and institutions, introducing further self-assessments and introduce criteria for prioritising work under high demand. The JRC considered these points under its 2030 revitalised strategy. The positive assessment was supported by stakeholders in other DGs, the Committee of the Regions, and by Members of the JRC's Board of Governors who provided confidential interviews during the evaluation.

The JRC's research impact is recognised among the wider scientific community in fields such as environmental science, social sciences, nuclear physics, and engineering. In 2023, the JRC's studies were quoted in scientific peer-reviewed literature at a rate of 2.3 times the global average, with a substantial portion (49%) of its 967 publications appearing in the top 10% most cited journals. In addition to scientific impact indicators, the JRC assessed its performance through use cases and comprehensive impact case studies to demonstrate the practical application of its work in policymaking and beyond. For 2023, 496 instances of JRC's work used for designing or implementing specific policies were recorded in its reporting system, such as modelling for impact assessments or developing harmonised practices. Five new impact case studies showed how over time the JRC helped monitoring progress towards international and EU biodiversity goals; shaping the way deforestation and forest degradation are monitored at international and European scale and contributed to batteries regulation in the EU. In addition, independent experts assessed the impact of these activities, generally concluding that the JRC has made significant contributions advance EU policy goals.

In 2023, 75 projects and activities engaged in novel research avenues across the JRC as part of the Centre for Advanced Studies, Collaborative Doctoral Partnership and Exploratory Research Programmes contributing to more than 20 different publications.

New European Bauhaus Compass

In 2023, the Commission published the [New European Bauhaus Compass](#), an evaluation tool developed by the JRC that helps understand to what extent a given project is embodying the NEB approach. The Compass proposes directions for the development of NEB projects and lays the foundation for more detailed assessment tools. It describes the three core values of the initiative and traces the path for a project to become truly “NEB”. The Compass was presented together with the [New European Bauhaus Progress Report](#) on the occasion of a joint press conference with the European Parliament.



In 2023, the JRC strengthened and enhanced its relations with the EU institutions and bodies, Member States and Associated Countries and other stakeholders, through various outreach actions and collaboration activities:

- In 2023, the JRC worked closely with the Swedish and the Spanish Presidencies of the Council of the European Union and organised several meetings with Council Working Parties, including a visit to JRC sites in Geel and Ispra.
- The JRC participated in workshops and delivered presentations at various European Parliament committee meetings e.g. on monitoring wildfires and the influence of

social media on the development of children. The Members of the Parliament visited the Ispra and Seville sites, including the European Centre for Algorithmic Transparency and the EU Reference Laboratory for alternatives to animal testing. It also collaborated with the European Parliamentary Research Service.

- The JRC continued providing input to the European Economic and Social Committee section meetings and study groups, on topics such as participative democracy, Artificial Intelligence, dual food quality and resilience. The JRC was also actively involved in the launch of the Committee's work on the EU Blue Deal.
- In close consultation with the Committee of the Regions, the JRC organised the [closing event of the Science meets Regions project](#) aiming to boost evidence-informed policymaking at local and regional level. JRC work on the [Vulnerability Dashboards](#) raised strong interest from the Committee, as did the work on SDG indicators.
- Networking activities with the JRC National Contact Points, were intensified, and the Annual Meeting was re-established in presence, alongside the four-monthly coordination meetings and regular info-sessions.
- JRC undertook a programme of official visits to Member States to strengthen our relations and to disseminate the culture of evidence-based policymaking.

On the international level:

- The JRC and the US Department of Energy's Argonne National Laboratory released in 2023 a set of [Transatlantic Technical Recommendations](#), as a deliverable to the EU-US Trade and Technology Council, aimed at making electric vehicle charging infrastructures fit for future challenges, taking into account the effects of widespread e-mobility on electric energy grids. This guidance will help set harmonised standards and remove trade barriers, while contributing to the integration of renewables, ensuring stability of power grids and greening the road transport.
- The JRC and Japan's National Institute of Science and Technology Policy signed an agreement in the field of foresight. The Arrangement, which was included among the deliverables of the [EU-Japan Summit](#) held in Brussels in July 2023.
- Cooperation has been deepened with the Western Balkans. Smart Specialisation Strategies have been implemented in Montenegro and in Serbia, as fundamental tools to harness the potential of R&I as a vector of socio-economic transition of the region, promoting participatory governance and interregional cooperation.



Communication

The JRC's communication actions help to increase the credibility of EU's policies based on scientific evidence and to position the JRC as the science and knowledge service of the European Commission. To this end, the JRC makes use of a diverse portfolio of communication and dissemination channels, ranging from visits and events targeting policymakers, to a rich online offering of news, virtual content and social media.

In 2023, the JRC started to move from a demand-driven, reactive communication approach towards a proactive, strategic approach, relying on communication priorities set by the senior

management. The JRC established a rolling mid-term planning process for strategic communication to create more sustained, creative communication actions in close coordination with other Commission services. In 2023, the JRC established key impact evaluation criteria such as those referred in the annex 2.

The new intranet based on Sharepoint Online was launched in December 2023 for more structured communication and better integration in the Commission's intranet. Throughout the year, staff were kept informed and engaged to ensure a smooth transition. The Communication unit also developed training courses to help scientists improve their communication and dissemination techniques.

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

Unlike other DGs, the JRC owns and manages buildings and related infrastructure on all of its sites, in except Brussels ⁽⁶⁾ and in Seville ⁽⁷⁾. The main infrastructure works delivered in 2023 included:

- **in Geel:** the construction of fences around building 040, the renewal of the site's perimeter cabling and HV cables and designing the renovation of the conference centre in line with the New European Bauhaus;
- **in Ispra:** several building renovation projects, continuation of the construction works for the new trigeneration plant and restoration works of the sewers system;
- **in Karlsruhe:** Wing M 2.0 launch of three tendering packages for the finalisation of the technical installation works, including extensive market advertisement campaign;
- **in Petten:** structural repairs of building 313 and refurbishment of the medical centre were completed in 2023. The installation of heat pumps in buildings 308/309 was completed for building cooling;
- **in Seville:** after the signature of the contract with the winner of the Architectural Design Contest in early 2023, the feasibility and basic design phases have been completed. This has enabled the submittal of the urban permit request and to launch the first phase of the tender for the construction of the future building. The implementation of the second dynamic collaborative space in the current offices was completed as planned.

Due to the rise in energy costs and inflation in 2023, the budget allocated to cover operational expenses grew significantly, leading to a decrease of nearly 20% in funding for infrastructure investments. As a result, some infrastructure projects have been delayed, while others have been scaled down (e.g. expansion PV panels and refurbishment of buildings in Ispra and the conference room in Seville). The scarcity of available work force contributed to delays in completing some projects (e.g. conference centre in Geel). The lack of offers for one of the

⁽⁶⁾ Shared building with DG RTD, managed by the Office for Infrastructure Brussels (OIB).

⁽⁷⁾ Rented building.

tendering packages for the finalisation of Wing M in Karlsruhe, delayed the procedure of approval by the Budgetary Authority⁸.

In 2023, the JRC reduced its overall energy consumption ⁽⁹⁾, contributing to the Commission's goal of reducing energy consumption and greenhouse gas emissions. The JRC's efforts resulted in a decrease in greenhouse gas emissions⁽¹⁰⁾ and helped mitigate the escalating energy costs. Infrastructure investments (e.g. renovations, improvement of insulation, clean energy production) aim to improve the JRC energy performance over time.

A new contract for the 'Navette' service for the Ispra site was signed after the unilateral decision to abruptly terminate the contract by the previous contractor. This timely action ensures seamless site access facilitating, amongst others, convenient connections to major Milan airports and train stations for both staff and visitors.

By opening 17 of its unique and world-class laboratories to the public, the JRC engages across Europe with scientist from academia, research organisations, industry and SME to increase its collaboration, test and cross-fertilise novel solutions to current problems. Up to date, the JRC collaborated in this initiative via 61 open calls with more than 160 consortia representing close to 120 institutions from 25 EU and HE-associated countries, involving close to 550 experts ⁽¹¹⁾.

1.1.3. 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 Commission's **intellectual property (IP) portfolio**, including the European Emblem. It also is responsible for raising awareness of IP issues with the Commission staff and setting out principles and procedures for IP management. In 2023, use of AI tools by Commission staff led to many questions on AI and Copyright. The Central IP Service worked, together with other Commission services, on a set of questions on AI and Copyright for EC staff, now accessible online. Three meetings of the IP corresponds network were held.

The Central IP Services continued to promote **the use of EURECA** (EU intellectual property Resource Catalogue), the corporate platform for IP management designed by the JRC. In particular the management of incoming licences on IP assets was promoted. The total number of Commission services that have entered at least one IP asset into EURECA remained 31, but more than 950 assets have now been uploaded to the EURECA platform. The management of the portfolio of patents and trademarks required a similar number of

⁽⁸⁾ European Parliament and Council.

⁽⁹⁾ ~30% energy reduction observed during the period March 23 – December 23, compared to the average of the same period between 2017 – 2022 (according (EU) 2022/1369).

⁽¹⁰⁾ Reduction in environmental footprint of approximately 3,500 tons of CO₂-equivalent.

⁽¹¹⁾ Data provided from 2017 until 2023.

actions as in previous years, around 800, including the filing of patent and trade mark applications, registration procedures and payment of annuities and renewal fees.

In 2023, **644 new requests for IP legal advice** were received, 60% of which concerned copyright protected assets. IP assets that raised most questions were written works (184), followed by software (109). 78 questions concerned databases/data/datasets. The Central IP Service furthermore replied to 67 requests concerning the EU Emblem.

The **19 training sessions on intellectual property issues** in EU Learn were attended by 657 Commission staff, 34 persons per training on average. The training programme for the EP attracted 78 colleagues in five sessions, an average attendance of 15 persons per training. Compared to 2022, the number of Commission (723) and Parliament (195) staff trained was lower. No specific trainings for Agencies or EU bodies were scheduled in 2023.

1.2. EUROPEAN COMMISSION GENERAL OBJECTIVE 1: THE EUROPEAN GREEN DEAL

Figure 3 provides an overview of how the JRC is structuring its work and setting specific objectives in support to Commission general objective 1 – the European Green Deal. JRC contribution to this objective is done through the decommissioning, as well as by the JRC work done in support of evidence-based policymaking, as presented in the previous section.

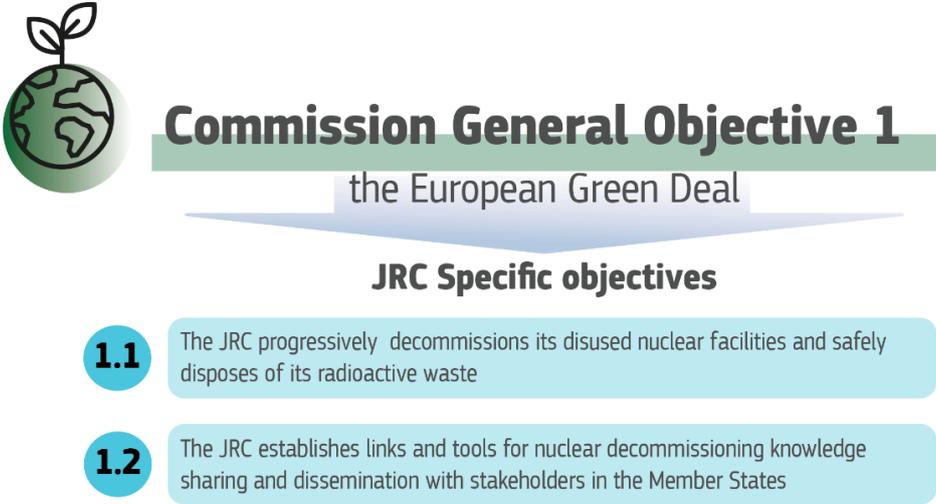


Figure 3. JRC support to Commission general objective 1.

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

Decommissioning and waste management are an integral part of the life-cycle of JRC's nuclear research facilities. They fulfil the final aim of returning the land used to a 'green-field status'. JRC decommissioning activities are included in an instrument under the Multiannual Financial Framework 2021-2027, the 'Nuclear Safety and Decommissioning Programme'. Four nuclear sites of the JRC, have different levels of

advancement/implementation of decommissioning and waste management. The objectives of all four nuclear JRC sites include safe conservation, pre-decommissioning, decommissioning and waste management covering a variety of obsolete large installations.

- The 2023 progress at **Ispira site** on the three main work streams (nuclear material, waste management and decommissioning) included activities in procuring off-site radioactive waste treatment services, such as the signature of a contract for thermal treatment of incinerable waste, the supercompaction of a first batch of radioactive drums, decommissioning activities in the Essor complex and the submission of the license application for the decommissioning of the Essor reactor, as well as the approval for decommissioning of a hot cell facility.
- At **Karlsruhe site**, the preparation of glove boxes for dismantling and further increasing amount of low-level waste characterisation progressed. Some of the waste could not be removed as planned to the external German waste treatment and storage facility KTE due to new limitations of the acceptance criteria. Efforts were given to improve the clearance process to release waste from control to reduce waste volume disposal. Development of the long-term decommissioning concept, in view of the transfer of operation to the new laboratory wing M, was initiated.
- At **Petten site**, the first specific contracts to remove and dispose some batches of historical waste still present on site were discussed within the framework contract with the Dutch operator (Nuclear Research and Consultancy group) and are expected to be signed in 2024. The decommissioning plan and costs evaluation of the High Flux Reactor was updated and agreed by the Dutch Nuclear Safety Authority.
- At **Geel site**, based on the established inventory of nuclear material, investigating transport options for removal of the material was successfully completed and the transport could take place according to planning.

With regard to some delays, described in the performance tables, linked to poor performance of the contractors (e.g. termination of the contract for the construction of the grouting station in Ispira), the JRC in 2023 tried to reinforce its selection and award criteria to select more financially and technically sound companies. Regarding delays linked to the interaction with external actors not under JRC's control (like the Nuclear Safety Authorities), the JRC increased its interaction with these actors to strengthen the mutual trust and speed up approval processes. These delays do not critically impact the final deadline of the programme.

1.2.2. Specific objective 1.2: The JRC establishes links and tools for nuclear decommissioning knowledge sharing and dissemination with stakeholders in the Member States

Knowledge sharing is the second component foreseen in the nuclear JRC Decommissioning and Waste Management Programme (D&WMP) under the Multiannual Financial Framework 2021-2027. It aims at contributing to the dissemination of knowledge on the decommissioning process to all Member States. Progress made in respect of this objective is

to be measured by the number of ‘knowledge products’¹² created and their dissemination). The main JRC 2023 activities with regard to this specific objective included continuous generation of knowledge products and the progressive consolidation of a dissemination platform through the setting up of the future platform as a service. The main knowledge products produced by the JRC in 2023 include:

- Final Waste Package design and qualification report,
- 3D Information Management System operational decommissioning tool report,
- Interim Storage Facility design and licensing report, and
- Technical report on a 3D modelling and application on a nuclear site under decommissioning.

These knowledge products are presently hosted on a dedicated page on [the EU Science Hub](#). This page has on average 40 monthly unique views. In 2023, the JRC presented the platform and the overall concept of knowledge management proposed in several events including the Biennial Forum of the International Decommissioning network, the International Atomic Energy Agency (IAEA) Consultancy Meeting on Knowledge Management for Decommissioning and the IAEA Development of an International Nuclear Decommissioning taxonomy meeting.

The second version of the knowledge sharing platform was not completed as the new framework contract providing for the necessary implementation was not procured in 2023. The delay in the publication of the call for tender was due to a limited human resources available and the need to identify which part of the knowledge management services could be provided by the existing IT framework contracts. The platform is now expected to open in Q4 2024.

¹² Knowledge products are considered to be tangible outputs of prepared knowledge, such as documents, services, events, media, that enable action of selected users. Knowledge products are one of the key outcomes of knowledge management process since they convey knowledge in an actionable manner.

2. INTERNAL CONTROL AND FINANCIAL MANAGEMENT

Assurance is provided on the basis of information on the efficiency and effectiveness of internal control systems and governance processes. The management monitors the functioning of the internal control systems on a continuous basis and carries out an objective examination with internal and external auditors. The results are explicitly documented and reported to the Director-General. The following reports / documentation have been considered:

1. management reports of sub-delegated authorising officers,
2. the contribution of the Director in charge of Risk Management and Internal Control, including the results of internal control monitoring at DG level,
3. the reports of the *ex post* supervisory controls performed on a sample of the JRC's financial and procurement transactions,
4. the limited conclusion of the internal auditor on the state of control, and the observations and recommendations reported by the Internal Audit Service,
5. the observations and the recommendations reported by the European Court of Auditors.

The systematic analysis of the available evidence provides sufficient guarantees as to the completeness and reliability of the information reported and results in the full coverage of the budget delegated to the Director-General of the JRC.

This section covers the control results and other relevant elements that support management's assurance. It is structured into 2.1. Control results, 2.2. Audit observations and recommendations, 2.3. Effectiveness of internal control systems, and resulting in 2.4. Conclusions on the assurance.

2.1. Control results

This section reports on the control results used by management to support the assurance on the achievement of the internal control objectives¹³. The JRC's assurance building and materiality criteria are outlined in annual activity report annex 5. The annual activity report annex 6 outlines the main risks together with the control processes to mitigate them and the indicators used to measure the performance of the relevant control systems.

⁽¹³⁾ 1) Effectiveness, efficiency and economy of operations; 2) reliability of reporting; 3) safeguarding of assets and information; 4) prevention, detection, correction and follow-up of fraud and irregularities; and 5) adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multiannual character of programmes as well as the nature of the payments (FR Art 36.2). The 2nd and/or 3rd Internal Control Objective(s) (ICO) only when applicable, given the DG's activities.

The JRC finances its **research activities** through the voted budget and supplementary credits as presented in Annex 7, detailing the JRC's financing sources for 2023. In addition, the JRC finances its research activities through the following activities:

- **competitive activities** are defined as the provision by the JRC of scientific and technical services to other bodies both within the European Institutions and for third parties. They are performed in line with the Council Decision No 89/340/EEC authorising the Commission to put the JRC's services and installations at the disposal of third parties, public or private, against payment and in line with the Council Conclusions No. 94/C 126/01 on the role of the JRC requiring that additional revenue be generated through competitive activities. The total cashed payments (revenue) actually achieved for JRC services in 2023 was €101.0M (26.4% of the institutional budget¹⁴).

- During 2023, 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 III (Art. 3.2 of the Internal Rules) with other Directorates-General of the European Commission. 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 58 % 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.

In 2023, EUR 36 383 458 (representing 8,5 % of its total financing sources in C1 commitments) and EUR 29 000 000 (representing 6,75% of total in payments, were allocated by the JRC to **decommissioning activities** under the new Nuclear Safety and Decommissioning Programme in the MFF 2021-2027. The JRC's decommissioning and waste management (D&WM) programme was started in 1994. 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: Ispra, Karlsruhe, Petten and Geel.

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 2023 is described in Annex 7.

¹⁴ The institutional budget means 'budget for JRC (direct actions) under the Framework Programme for Research'.

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 competitive 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 Annex 7). 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.

In line with the 2018 Financial Regulation (FR), the JRC's assessment for the new reporting requirement is as follows:

- Cases of "confirmation of instructions" (FR art 92.3) - none
- Cases of financing not linked to costs (FR art 125.3) - none
- Financial Framework Partnerships >4 years (FR art 130.4) - none
- Cases of flat-rates >7% for indirect costs (FR art 181.6) - none
- Derogations from the principle of non-retroactivity (FR art 193) - none.

2.1.1. Effectiveness of controls

a) Legality and regularity of the transactions

The JRC uses internal control processes to ensure sound management of 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.

1) Control objective

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 indicators used to measure the performance of the control systems, are outlined in Annex 6.

2) Assessment of the control results

- **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 106 exceptions and non-compliance events were recorded in the central register in 2023, 15 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 2023 with 24 159 transactions and 17 799 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). The JRC reports all its exceptions and non-compliance events in such a way to help the different actors understand what rules was (will be infringed), why did this happen (or should happen), what can be done to avoid repetition, reducing the impact on the effectiveness of the internal control system. 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 (\geq EUR 500 000) and for most contracts procedure negotiated that are based on the FR 2018, Annex 1, point 11 ⁽¹⁵⁾. In 2023, 147 files were submitted to the PPAG; 89 files were screened by the PPAG, representing a value of approximately EUR 341 million ⁽¹⁶⁾. No procedures received an unfavourable opinion but the PPAG had to declare itself non-competent for two files. In one case, the file was cancelled before the formal PPAG opinion (based on the PPAG questions) as the AOS became aware of several shortcomings that could not be corrected. In the other case, the PPAG realised that the AOS had already taken his decision and decided, according to its rules, not to issue a formal opinion. 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.

⁽¹⁵⁾ 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.

⁽¹⁶⁾ 58 were not selected by the sampling system (representing a value of roughly EUR 7,6 million)

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 %**.

Table 1 Results of 2023 ex post controls.

Sampled transactions	Sample size: number	Sample size: value (EUR)	% of total value of transactions	Detected error rate (% of total)
Payments	112	27 089 352	10.5 %	0 %
Procurement	68	9 975 611	3.5 %	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 151 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.

- **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 'Managing Income from Competitive Actions') 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 2023 the JRC's financial circuits led to a correction of 12.7 % of the forecast of revenue transactions and 9.2 % of recovery orders (i.e. invoices). These errors were prevented by the effective *ex ante* controls.

This demonstrates that the controls carried out on the competitive activities contribute to the legality and regularity of the JRC's revenue operations.

3) Overview of the JRC risk profile

The 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.

4) Table 2: Estimated risk at payment and at closure

Based on all the above, the JRC presents in the following Table 2 an estimation of the risk at payment and risk at closure for the expenditure managed during the reporting year:

Table 2: Estimated risk at payment and at closure (amounts in EUR million)

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

Table X : Estimated risk at payment and at closure (amounts in EUR mios)

DG JRC	Payments made	Relevant expenditure	Estimated risk (error rate %) at payment		Estimated future corrections and deductions		Estimated risk (error rate %) at closure	
	m EUR	m EUR	m EUR	%	m EUR	%	m EUR	%
Procurement	251.65	252.10	1.26	0.50%	0.13	0.05%	1.13	0.45%
Experts	6.18	6.18	0.03	0.50%	0.00	0.05%	0.03	0.45%
Administrative	0.38	0.38	0.00	0.50%	0.00	0.05%	0.00	0.45%
DG total	258.22	258.67	1.29	0.50%	0.13	0.05%	1.16	0.45%

The estimated overall risk at payment for 2023 expenditure, 0.5% (despite the fact that the detected error rate was 0 %), is the AOD's best conservative estimate of the amount of relevant expenditure during the year, not in conformity with the contractual and regulatory provisions applicable at the time the payment was made. This expenditure will subsequently be subject to ex-post controls and a proportion of the underlying errors will be detected and corrected in subsequent years, corresponding to the conservatively estimated future corrections for 2023 expenditure, 0.05%.

The difference between those two, results in the estimated overall risk at closure ⁽¹⁷⁾, 0.45%. There is no change compared to 2022.

(17) This is the AOD's best, conservative estimation of the expenditure authorised during the year that would remain not in conformity of applicable regulatory and contractual provisions by the end of implementation of the programme.

For an overview at Commission level, the departments' estimated overall risk at payment, estimated future corrections and risk at closure are consolidated in the AMPR.

5) Preventive and corrective measures

As regards the corrections carried out in 2023, the JRC has in place an effective mechanism for correcting errors, through ex-ante and ex-post controls, resulting in preventive and corrective measures, amounting to EUR 199 531.37 and EUR 205 057.17 respectively. This is similar to last year.

b) Fraud prevention, detection and correction

The JRC has developed and implemented its own anti-fraud strategy since 2012, based on the methodology provided by OLAF. It is updated every three years or when necessary and was last updated in December 2020 following a fraud risk assessment. Its implementation is being monitored and reported to the management through annual reports. All necessary actions except one have been implemented. The work on this action will be continued at corporate level, in the framework of the revised Commission anti-fraud strategy action plan ⁽¹⁸⁾, and JRC will contribute to it. Its completion is expected by the end of 2024

The JRC also contributed to the revision of the Commission anti-fraud strategy Action Plan of July 2023, through the participation in the Fraud Prevention and Detection working group. JRC is the co-lead for action 26 and support for actions 1 and 2. Moreover, JRC has nominated staff for the monitoring of the implementation of the CAF's action plan where necessary. There is only one case for financial recommendations issued by OLAF in 2022. The JRC analysed, together with OLAF and the Legal Service, the possibility to recover the amount recommended by OLAF and to defend that recovery in court, if necessary. The corresponding recovery procedure in 2023 has not led to a payment. Court proceedings are now being prepared by the Legal Service and will be initiated during the first half of 2024.

The results achieved during the year can be summarised as follows: (1) targeted awareness-raising actions for newcomers, financial officers and managers; (2) reinforced the JRC's 'Scientific Integrity and Research Ethics' framework, with full implementation of the JRC's Research Ethics Board, the Editorial Review Board, the JRC Scientific Integrity Counsellor, as well as guidelines and tools for responsible conduct of research; (3) contribution to Fraud Prevention and Detection Network (FDPNet) subgroups; (4) assessment of fraud risk in the JRC process-based risk management exercise. More details on the results achieved in 2023 can be found in Annex 7.

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

c) Safeguarding of assets and information

The JRC is spread over 6 sites in 5 different countries with around 35,000 fixed assets with a net book value of about 240 EUR million. The fixed assets are ranging from simple office

⁽¹⁸⁾ SWD(2023) 245 final, Commission Anti-Fraud Strategy Action Plan - 2023 revision

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 help 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 59.7 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 2023 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.

d) Reliability of reporting

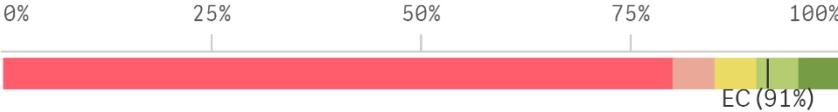
The main aim of accounting controls is to assure the quality and reliability of the accounts and underlying transactions through methodical checks on the accounting records (data) and timely communication and correction of the errors. The controls carried out in 2023 have followed the Annual Accounting Quality Plan, sent to DG BUDG along with the Accounting Risk analysis. The controls performed are additional to the ex-ante controls performed by Financial Verifying Agents and Sub Delegated Authorising Officers on each transaction, in compliance with the FR.

The controls on the General Ledger (GL) account of invoices were performed periodically according to the Accounting Quality plan. A vast majority of invoices is subject to one of the following controls: operational/administrative coherence, Legal Entity default GL, greatest amounts checked, asset risk-based analysis, random sample. The errors detected are either corrected in ABAC or by means of an accounting adjustment at the year end.

In February 2023, after the Accounting closure and the related accounting adjustment, a random stratified sample was extracted representing 37% of the amount of invoices and internal documents received. The errors detected on the sample —not corrected either in ABAC or by means of an accounting adjustment — have been duly extrapolated leading to an estimated accounting error rate of 0.20%, thus confirming the reliability of the accounts. It is important to highlight that all the errors mentioned above are of an accounting reclassification error and do not lead to irregular payments.

2.1.2. Efficiency of controls

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. During the course of the year one of the financial units faced a significant staff turnover. The replacement and necessary training of the newcomers took time which in turn negatively impacted the overall payments made within the legal deadlines during the year.

Timely Payments	JRC Score	EC Score
	94%	99%

The competitive cashing indicator (as a percentage of the institutional budget) has slightly increased from 26.3 % of last year to 26.4 %, remaining significantly higher than the target of 15 %. The JRC has reached a positive conclusion on the efficiency of competitive cashing indicator.

2.1.3. Economy of controls

1. 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. 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 costs of control related to 'procurement in direct management mode and of financial transactions' in 2023 was EUR 9 973 864 which represent 3.86% of the total value of 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 2023 to 3.9 % of total associated payments. For further detail please see Annex 7, Table 7.4.

2. Revenue operations through competitive activities

The overall cost of control related to 'revenue operations from competitive activities' in 2023 was EUR 273 932, which represents 0.20 % of total competitive project value for the year (EUR 139 933 682). The overall cost of control indicator has decreased slightly from last year's value of 0.21 %. For further detail please see Annex 7, Table 7.4.

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 Annex 6 RCS 'Managing Income from Competitive Actions'. 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, 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..

2.1.4. Conclusion 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 its control system and reached a positive conclusion on the cost-effectiveness of the controls for which it is responsible. The error rates and the cost of controls remain below the materiality threshold and the timeliness of payments is significantly higher than the target. 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.

2.2. 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.

1) EC Internal Audit Service (IAS) engagements

The JRC has no critical recommendations from the Internal Audit Service, nor was any new very important one issued during the reporting period. There are no very important recommendations under implementation. One, stemming from the audit on JRC's support to EU policy and knowledge management, has been assessed by the IAS as adequately

implemented and closed. The **Internal Auditor, in its limited conclusion**, stated that the JRC internal control systems in place for the audited processes are effective. Further details are presented in Annex 7.

The IAS finalised a consultancy engagement on the construction and completion of the Wing M in Karlsruhe (which was initiated upon the initiative of the auditee) which contributes to the implementation of appropriate mitigating actions. An audit on the new nuclear decommissioning instrument in JRC, launched in 2022, is ongoing; this instrument is part of a dedicated funding programme in the Multi-annual Financial Framework 2021-2027, separate from the research budget. Finally, the JRC replied to surveys launched by IAS in the frame of three engagements ⁽¹⁹⁾.

2) ECA audits

The JRC has no critical or very important findings from the European Court of Auditors (ECA) audits, and no overdue actions. In general, during ECA audits, the JRC is an associated DG together with other Commission services, as it disposes of a wide range of expertise in many of the scientific areas underpinning the policy (measures) being audited, monitors the implementation of many policy measures and provides technical support to the stakeholders concerned. ECA found no errors in the sampled JRC transactions as part of the **Statement of Assurance** for 2022. Therefore, the ECA's annual report 2022 contained no reference to the JRC in respect of the error rate. In 2023, the ECA reviewed 2 JRC transactions and no errors were found.

2.3. 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.

Directorate-General 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 Commission's internal control framework and its own integrated management system (IMS) 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 has assessed its internal control system during the reporting year and has concluded that it is

⁽¹⁹⁾ Namely: multi-DG audit on the protection of confidentiality of information at corporate level (auditees: DG HR, DG DIGIT and SG), multi-DG audit on the assessment of HR needs in the Commission at corporate level (auditees: DG BUDG, DG HR and SG) and limited review of SUMMA in preparation for 'going live' (auditee: DG BUDG)

effective and the components and principles are present and functioning well overall, but some improvements are needed as minor deficiencies were identified related to:

1. Procurement supervision and contract execution.
2. The capacity of monitoring data of some contractual arrangements has to be enhanced.
3. The implementation of HR policies to improve JRC capacity to attract and retain talents.

The improvements and/or remedial measures implemented or envisaged are already documented in action plans and are being followed-up.

2.4. Conclusions on the assurance

This section reviews the assessment of the elements already reported above (in Sections 2.1., 2.2. and 2.3.), 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.

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

2.5. Declaration of Assurance

Declaration of Assurance

I, the undersigned,

Director-General of DG Joint Research Centre

In my capacity as authorising officer by delegation

Declare that the information contained in this report gives a true and fair view ⁽²⁰⁾.

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, 31/03/2024

(signed)

Stephen Quest

⁽²⁰⁾ True and fair in this context means a reliable, complete and correct view on the state of affairs in the DG/Executive Agency.

3. MODERNISING THE ADMINISTRATION

3.1. Human resource management

The JRC aims to recruit, train, motivate, and retain highly qualified staff to ensure the effective and efficient operation of the DG, as well as the promotion of equal opportunities and diversity. JRC has developed and implemented its 'HR Pathways' in 2023, setting the main priorities for HR and people management for the coming years. Recruitment, diversity, and staff development are the cornerstones of this plan. In addition, the JRC equality mainstreaming plan addresses how the JRC applies the highest standards in terms of equality for its staff, and supports diversity and inclusion.

The JRC has made significant progress in outreach and showcasing itself as an attractive employer, resulting in a 67% increase in applications for CA FGIV positions and a 31% increase in applications for scientific traineeships. Efforts to improve awareness of the JRC as an attractive employer have also led to a doubling of applications from under-represented Member States for CA FGIV jobs and a substantial increase in applications for scientific traineeships.

To improve the geographical balance and share of women amongst our staff, we have also introduced diversity scorecards, carried out twice a year bilaterals with Directors and targeted outreach efforts to under-represented Member States. Gender balance initiatives have resulted in a significant improvement in the gender balance of middle management, with 8 first female appointments to middle management made in 2023. Leadership development programs and targeted outreach efforts to under-represented Member States have been introduced to further improve geographical balance and share of women amongst the staff.

The JRC has also conducted an analysis of the recruitment process for Contractual Agents to identify blocking points and has taken actions to tackle these, with a focus on better planning and anticipation. Efforts to improve career perspectives for all staff include dedicated events on career development opportunities and increased transparency relating to Contract Agent careers.

1 January 2023 also marked the entry into force of a new organisational structure of the JRC in order to better align it with its core ambition of anticipation, integration, impact and to equip it for the upcoming challenges. This organisational transformation went very smoothly. This transformation has contributed to increased cross-directorate collaboration and a more holistic and integrated scientific support for policy. Additionally, efforts have been made to enhance collaboration through the launch of the Agile 20% initiative and team events for JRC staff.

The latest Commission-wide staff opinion survey took place at end of 2023. It provided an opportunity for JRC to highlight the achievements since the previous staff survey, to enhance staff engagement and maintain the high level of staff wellbeing. The JRC's staff engagement index was 69%, a slight drop from 2021 (71%) and less than the Commission average of

73%. Once the detailed results come out in March 2024, JRC will develop actions to address priority areas highlighted in the 2023 survey.

With the Collaborative Doctoral Partnership, the Exploratory Research Programme and the Centre for Advanced Studies, the JRC is complementing its scientific competence base with motivated experts, postdoctoral researchers and doctoral candidates from specific thematic fields relevant for upcoming science and policy challenges.

The JRC has continued to maintain a healthy social dialogue with staff representatives and collaborated closely with the communication unit to promote HR news and initiatives internally and externally. In 2023, the internal communications channels were reviewed and enhanced, with a new internal communications newsletter set-up, a new format for the monthly HR newsflash. The move from Connected to SharePoint Online (SPO) was also an opportunity to restructure our HR contents on SPO.

3.2. Digital transformation and information management

Digital Transformation

In 2023 the JRC has carried out preparatory work for the migration towards Welcome. Following the transfer of the physical network management to DIGIT Brussels users will migrate in early 2024. followed by the progressive migration of JRC staff located in Ispra.

The Delta project, designed to host non-specific ICT services needed by JRC scientists, has been finalized and migration will start in 2024.

The JRC ICT Governance is now embedded in a global Digital Governance with a focus on cybersecurity and forward-looking aspects to ensure that the digital transformation is business-driven.

Many services have been adapted to cope technological evolution and business needs, with the Virtual desktop infrastructure (VDI) becoming fully operational and on-boarding hundreds of users. The aim is to offer JRC scientific communities a seamless digital landscape and flexible, future-proof services.

Information and IT security rules

In 2023, the JRC successfully collaborated intensively with DIGIT.S to enhance its ICT security capability and maturity, resulting in the encoding of updated security plan into GovIS2 ⁽²¹⁾ and GRC ⁽²²⁾ for proper reporting to the Information Technology Cybersecurity Board (ITCB).

Progress was made in fulfilling the ITCB objectives, including the implementation of Multi-Factor Authentication and EU Login for sensitive non-classified (SNC) systems. As a result,

⁽²¹⁾ GovIS2 is the Commission's corporate IT portfolio management tool that provides IT governance capabilities at local (DGs) and corporate (Commission) levels, by acting as a central repository for IT projects, operations, information systems and services.

⁽²²⁾ Governance, Risks and Compliance access control tool

the majority of JRC systems are now compliant, in preparation for full compliance with the main 2024 ITCB objective.

These achievements were closely monitored by the JRC ICT Executive Committee and JRC Senior management through dedicated Key Performance Indicators.

Additionally, the JRC contributed to the Commission's ICT Security awareness-raising campaign and created a mandatory Cyber awareness-raising programme for all JRC newcomers.

Data, Information and knowledge Management

With respect to the implementation of the Information Management Steering Board (IMSB) work programme, the JRC handed over to the OP the EC Data Catalogue action, while it went on running the EC Data Advisory (DA) service one.

Concerning the DA service the key deliverables for 2023 have been met or are being met with a slight delay. The JRC developed and is implementing a draft guide on the EC data governance and policies at DG-level, defined a stakeholder list, a FAQ, a data glossary and a roadmap.

JRC started to implement its Data Strategy in 2023, focussing on centralising data acquisition and extending data support for obtaining data from other DGs. The JRC Data Support has evolved to provide a broader support for data-related matters. In collaboration with DIGIT, JRC developed the Semantic Text Analyser (SeTA), an AI tool for information discovery.

In July 2023, the **EU Academy** developed into a fully operational corporate learning platform, offering first-hand knowledge and high-quality educational resources produced by EU institutions. With over 1,000,000 active learner accounts and 3,000 learning content items, the EU Academy is a success story.

Trainings, presentations and information sessions were organised on **records management** policy to raise awareness on Business Continuity measures in the records management domain. Within the scope of the Commission Digital Preservation Strategy, the JRC continued inventorying the existing and legacy systems' preservation needs and started assessing the new information systems, as from their inception phase. Finally, as from 2023, all the JRC information systems integrated with HAN (Hermes-Ares-NomCom) started to implement the sensitive personal data flag to the Ares documents automatically registered by them.

The JRC strives to ensure rigorous implementation of the **data protection** rules. The awareness raising campaign by the JRC Data Protection Coordinator (DPC) included tailored presentations to teams / units / management, but also to newcomers. The JRC conducted a review of all JRC data protection records as necessary. In relation to data subject rights and personal data breaches, the JRC has dealt with several requests, aiming to provide swift replies that addressed the concerns of data subjects, and the respect of their rights, both in terms of data subject requests and in the event of data breaches. The JRC has relied on

available procedures, templates and tools to ensure compliance with the regulation regarding agreements with external processors and joint controllers, and will continue to do so in 2024.

3.3. Sound environmental management

In 2023, while carrying out relevant scientific activities, the JRC has worked to reduce energy and resource consumption on a continuous basis, in line with the corporate European Commission EMAS scheme ⁽²³⁾ and as reflected in the 2023 EMAS Global Annual Action Plan ⁽²⁴⁾. The JRC is fully committed to contributing to the Commission's overall environmental efforts through the implementation of the *Greening the Commission* Communication. In this regard, the JRC has raised awareness on the Communication and implemented the following actions.

On **buildings and working space** and in line with the actions under specific objective 7.2, the JRC: 1) continued to assess and reduce when possible energy use for scientific activities, in particular laboratory experiments (e.g. decrease energy load in laboratories); 2) took energy efficiency measures, such as substituting fossil with renewable energy (e.g. additional 145 kWhp of photovoltaic plants installed in JRC-Ispra) or optimising operation of the technical installations (e.g. JRC-Geel made an optimisation of the BMS for the air compressor running conditions); 3) Renovated and/or built efficient and sustainable buildings (e.g. JRC-Ispra's Near Zero Building Energy Building ⁽²⁵⁾ completed and progress done on the refurbishment of building 48) or, in the case of JRC-Seville, continue encouraging the landlord to carry out energy saving investments and actions.

On **staff and experts business travel**, in addition to the corporate measures already decided at the level of the Commission in terms of budget reduction, the JRC continued to perform an ex-post monitoring for staff travels (via MIPS ⁽²⁶⁾) to take stock of the progress made: the JRC has reduced travel-related emissions in 2023 by about 45% ⁽²⁷⁾ compared to 2019.

On **greener mobility**, the JRC continued to increase the number of service bicycles on site (e.g. increase of service bicycles in JRC-Ispra to 159, of which 45 are electric bikes) and maintained its fleet of hybrid/electric service cars.

To contribute to the **EU Green Deal**, the JRC promoted a circular economy by raising awareness on green public procurement. It has also implemented further actions to preserve biodiversity (e.g. JRC-Geel BioBlitz project enabling the identification and location of species present on the site using a mobile app; contribution of JRC-Ispra to the European Butterfly Monitoring Scheme ⁽²⁸⁾).

⁽²³⁾ The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report, and improve their environmental performance.

⁽²⁴⁾ 2022 EMAS Global Annual Action Plan

⁽²⁵⁾ Building *Europa Science Experience*.

⁽²⁶⁾ No tool available at present to monitor travels of external experts (the Commission is working on a solution based of the AGM tool).

⁽²⁷⁾ Total CO2 emissions from staff mission in 2019: 4,776,033; in 2023: 2,624,816 (MIPS Green Deal report, data retrieval on 04.01.2024).

⁽²⁸⁾ Through a weekly monitoring scheme to detect and monitor the butterfly community on site.

Finally, in 2023, the JRC pursued its efforts to disseminate **best practices and environmental outcomes** of scientific initiatives among its staff and the Commission EMAS Network. For example, the JRC has been among the winners of the internal events prize since the beginning of the EMAS Sustainable Events Competition ⁽²⁹⁾.

3.4. Examples of economy and efficiency

The main JRC initiative introduced in 2023 is the so-called “License to Buy”. The **License To Buy** is a new certification program attesting that operational staff making use of financial resources have a minimum level of knowledge and judgement. This allows them to efficiently carry out their tasks in procurement, contract management or administration of experts' expenses, as expected by Authorising Officers and as established in the FR ⁽³⁰⁾. Alongside this the JRC is the Business Domain Owner for the **eProcurement** initiative, where the year saw good progress in a number of areas. The pre-award tools (mainly PPMT, Funding & Tenders opportunities Portal) were ready to meet the new eForms regulation that entered into force on 25th October. PPMT has been developed so it now provides full support for publication of contract notices on Tenders Electronic Daily (TED), the official EU portal for EU procurement. The call data, documents and Q&A are available from the F&T Portal. The vast majority of EU Institutions, Bodies and Agencies have onboarded to the eProcurement pre-award tools: 14 Directorates General of the European Parliament, the Council, as well as most committees, executive and decentralised Agencies and Joint Undertakings. During the year the roll out of the eContracting solution in the European Commission and Executive Agencies took a great leap forward: large framework contracts are onboarded with more to follow in the coming years. The end-to-end handling of direct contracts made good progress in 2023 and is now almost ready for full roll out. Change management is key to support this transition period and several activities were organised during the year: this included user groups, newsletters, information sessions, intensive training as well as ongoing helpdesk support.

⁽²⁹⁾ SQuare series (2021), JRC Virtual Picnic (2022), JRC Science Summit to shine (2023).

⁽³⁰⁾ Art. 74.7 FR (“...staff responsible for budget implementation shall have the necessary professional skills”).