



Joint Research Centre

# Annual Activity Report

## 2018

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## THE DG IN BRIEF

The Joint Research Centre (JRC) is the European Commission's science and knowledge service. It supports EU policies with independent scientific evidence throughout the whole policy cycle in a variety of key areas from agriculture and food security, to the environment and climate change, as well as nuclear safety and security and innovation and growth. It provides the cross-sectoral support required by policymakers to tackle increasingly complex societal challenges, combined with the capacity to respond rapidly to policy needs. In close collaboration with the other European Commission Directorates-General (DGs), it delivers both on the priority topics and its long-term obligations, as specified in existing EU legislation and contracts.

The JRC's work also has a direct impact on the lives of citizens through contributing with internationally highly ranked research outcomes to a healthy and safe environment, secure energy supplies, sustainable mobility and consumer health and safety.

The JRC was established following the Treaty on the European Atomic Energy Community (EURATOM) and now draws on over 60 years of scientific experience, continually building its expertise and sharing know-how with EU countries, the scientific community and international organisations through strategic partnerships. It works in collaboration with over a thousand organisations worldwide whose scientists have access to JRC facilities through various collaboration arrangements.

**The JRC provides independent scientific evidence for EU policies.**

The JRC creates, manages and makes sense of scientific knowledge and anticipates emerging issues that need to be addressed at the EU level. Its knowledge centres bring together experts and knowledge from within and outside the European Commission to inform policymakers and its competence centres provide analytical tools which can be applied to any policy area. It develops innovative tools and makes them available to policymakers and the research community at large. It explores new and emerging areas of science and hosts specialist laboratories and unique research facilities.



Today, the JRC is funded by the EU's framework programme for research and innovation, Horizon 2020, and by the EURATOM Research and Training Programme in the nuclear field. The JRC contributes to the overall objectives<sup>1</sup> of the Horizon 2020 programmes while fully aligned with the political guidelines of President Juncker's Commission.

The JRC is organised in two directorates with corporate responsibilities for strategy, work programme coordination and resources and support services, respectively, and eight scientific directorates of which two are cross-JRC directorates for knowledge management and competences. The JRC directorates are

spread across six sites in five different countries within the EU.

Unlike other Directorates-General of the Commission, the JRC manages scientific infrastructures and nuclear facilities.

<sup>1</sup> JRC objective for non-nuclear work under the Horizon 2020 is 'to provide customer-driven scientific and technical support to Union policies, while flexibly responding to new policy demands'. JRC objective under the Euratom programme is 'the pursuit of research, knowledge management and training activities with an emphasis on nuclear safety, security and safeguards'.

## EXECUTIVE SUMMARY

The Annual Activity Report is a management report of the Director-General of the JRC to the College of Commissioners. Annual Activity Reports are the main instrument of management accountability within the Commission and constitute the basis on which the College takes political responsibility for its decisions, as well as for its coordinating, executive and management functions, as laid down in the Treaties<sup>2</sup>.

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

The long-term Strategy 2030, established in 2016, is transforming the JRC. The organisation is engaging with policymakers, involving citizens, becoming more outward and forward-looking, seeking fresh talent and forging strong partnerships.

In 2018, for the first time, the JRC's expertise was deployed in screening the indicators of almost every spending programme proposed for the next Multiannual Financial Framework. While it continued to play an instrumental role in key initiatives such as cybersecurity and the Energy Union, it also became an important partner in policy implementation in areas like dual quality food, vehicle emissions and the European Semester.

The JRC is continuously exploring how to better understand and evolve at the science-policy interface. In light of the progress recorded, 2018 was a breakthrough year for the JRC's Knowledge Management activities. Its six Knowledge Centres and six Competence Centres are now recognised as important tools for policymakers in the Commission, just like its reports synthesising the current state of our knowledge on challenging policy issues, such as artificial intelligence or soil degradation.

The JRC's anticipatory capacity was boosted by the next generation JRC reports, also dubbed #Facts4EUFuture reports, of which the first one 'Artificial Intelligence - A European Perspective' was published in December. Together with the new monthly bulletins called 'Trends4EU', drafted with the Commission's in-house think-tank, the European Political Strategy Centre (EPSC) and distributed to all top senior management, they move the JRC's anticipatory support one level higher.

Collaboration with the Member States, partner countries and international partners is key to the operation of the JRC. In 2018, the highlights included assessing the impact of changes to the Common Agricultural Policy with France, exploring alternative energy security scenarios with Estonia, expanding cooperation and capacity building with South Africa, reinforcing JRC contributions to United Nations (UN) initiatives, engaging Western Balkans and south-eastern European countries over macro-regional strategies, and deploying innovative nuclear safeguards together with the International Atomic Energy Agency (IAEA) among others.

In 2018, its work was published in top scientific journals such as 'Nature' and 'The Lancet' and nearly 40 % of them appeared in the top 10 % most-cited journals. It also continued to experiment with innovative approaches such as its Centre for Advanced Studies and the Collaborative Doctoral Partnership scheme.

The JRC's strategic goal to be a people-centred and lean organisation was implemented by launching a new talent management programme, creating new opportunities for mobility catering for different needs, taking a litmus test of staff engagement and

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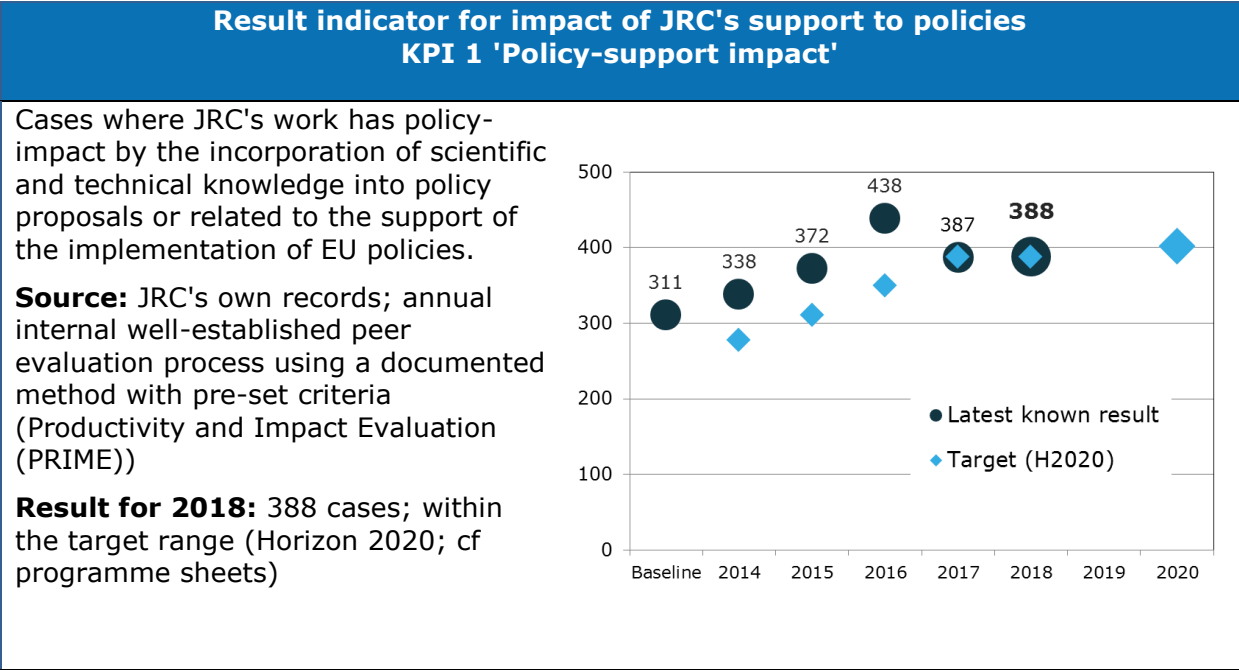
<sup>2</sup> Article 17(1) of the Treaty on European Union

listening through surveys and social dialogues. At the same time the JRC is spearheading an innovative approach for its information and communication technology (ICT) environment. This is a long-term strategy of ensuring more efficient, secure and business-aligned ICT systems. Success has also been achieved in identifying synergies in financial management, including at the corporate level by leading the e-Procurement project.

Finally, ensuring the adoption of the 2019-2020 Euratom Research Programme and bringing decommissioning and waste management into a single new legal act under the next Multi-annual Financial Framework was a major achievement, shared also by the Secretariat-General and the Directorates-General for Research and Innovation and for Energy.

### b) Key Performance Indicators (KPIs)

The JRC maintains a comprehensive indicator framework to monitor the performance and evolution of the organisation. The framework is built around three perspectives measuring output and impact, organisational efficiency and aspects of the working environment. A bi-monthly dashboard enables continuous performance monitoring and supports the monitoring of progress towards the objectives defined in JRC's Strategic and Management Plans; for an overview, see Annex 14. The Strategic Plan 2016-2020 sets out five of them as JRC's key performance indicators (KPIs).

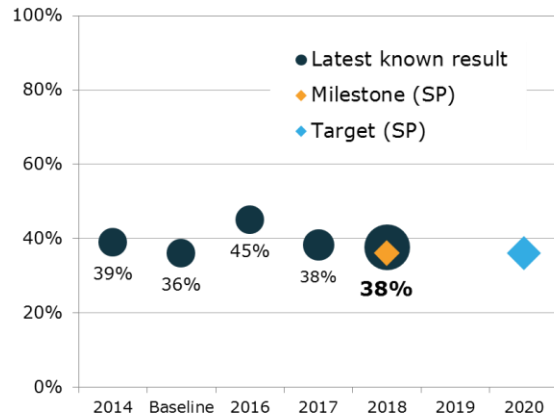


**Result indicator for scientific excellence**  
**KPI 2 'Proportion of peer-reviewed publications in the top 10 % most-cited journals'**

Reflects the degree to which JRC publishes the results of its research in highly-cited peer-reviewed scientific journals, in particular, journals ranked amongst the top 10 % most-cited journals by science journal ranking (SJR<sup>3</sup>) and often jointly with external scientists.

**Source:** Abstract and citation database of peer-reviewed literature Scopus (Elsevier publishing company)

**Result for 2018:** 38 %; normal variation around the target value (36 % milestone)

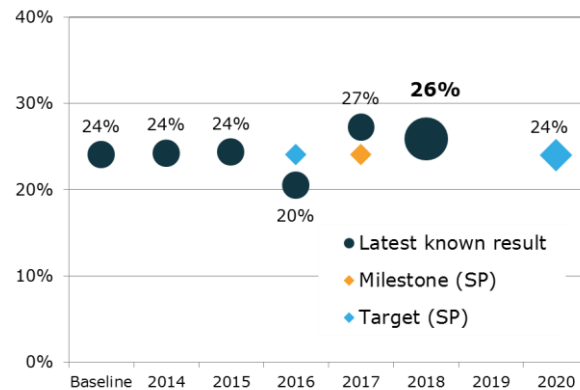


**Result indicator for scientific collaboration and networking**  
**KPI 3 'International collaborations'**

The proportion of peer-reviewed scientific articles jointly produced with scientists from non-EU countries.

**Source:** JRC own records; internal review process

**Result in 2018:** 26 %; normal variation within the target range (24 % ± 3 %)



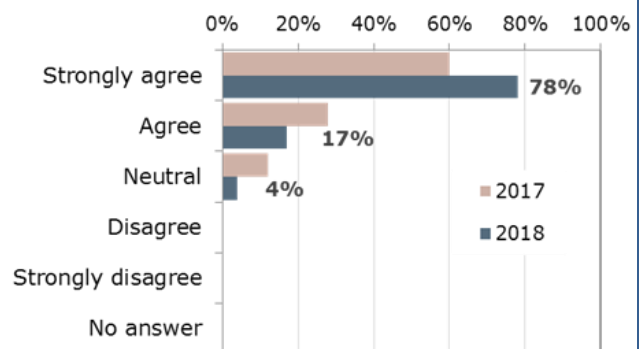
**Result indicator for partner satisfaction**  
**KPI 4 'Weighted average of overall customer satisfaction'**

The JRC has designed a new approach to collecting feedback from the beneficiaries of its work/partners replacing a decentralised approach by a standardised survey. A pilot survey was carried out in 2017, extended to 2018.

**Source:** JRC survey 2018

**Result in 2018:** 95 % of respondents very satisfied or satisfied. As this is a pilot survey, no values for the indicator nor targets are available yet.

*Overall, you are satisfied with how the JRC managed the project.*



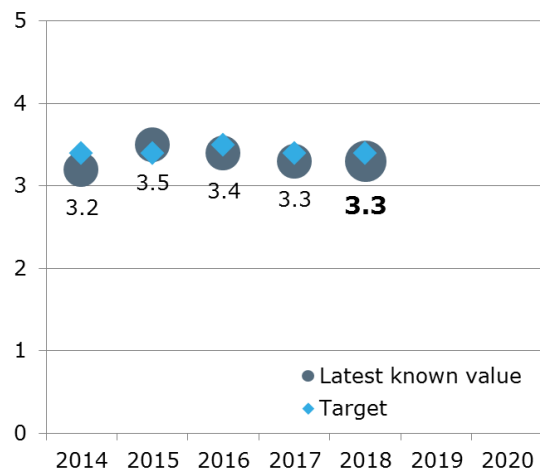
<sup>3</sup> Scimago Journal & Country Rank

## Result indicator for effective and reliable internal control system KPI 5 'Implementation of internal control principles in the JRC'

The indicator's numerical value represents the average of scores, range between 1 ('Fully disagree') and 5 ('Fully agree'), obtained from the annual survey that was carried out in the reporting year to assess the staff perception of the state of internal control in the JRC and to appraise if the internal control systems are effective.

**Source:** JRC Internal Control survey

**Result in 2018:** The value 3.3 is slightly below the target (3.4). However, the staff perception on the degree of implementation of the ICF, and previously of the IC standards, in the JRC remains stable. The JRC adopted the revised Internal Control Framework (ICF) in 2018.



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

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

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

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

In conclusion, management has reasonable assurance that, overall, suitable controls are in place and working as intended; risks are being appropriately monitored and mitigated; and necessary improvements and reinforcements are being implemented. The 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 DG and the Commissioner on management matters, also the main elements of this report and assurance declaration have been brought to the attention of Commissioner for Education and Culture, Youth and Sports, Tibor Navracsics, who is also responsible for the JRC.

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

As the science and knowledge service of the European Commission, and as defined in its legal basis<sup>4</sup>, the JRC contributes to the Commission's political priorities and Europe 2020 goals with independent evidence throughout the whole policy cycle. JRC's research enables the Commission's policy departments to achieve their goals, thus ultimately enabling the Commission to attain its general objectives in different policy areas<sup>5</sup>. These are the operating principles of the JRC, as illustrated in Figure 1-1. Also, the JRC makes a direct contribution to achieving the Commission's general objectives by ensuring tools, research, knowledge and services are available to the Member States and globally, as well as the research community at large.

In 2018, the JRC's expertise was deployed in screening the indicators (performance framework) of almost every spending programme proposed for the **next Multiannual Financial Framework**, thus helping to ensure an appropriate data planning and robust indicators. The JRC's expertise was of great value for developing the impact assessments and evaluations in the frame of **Better Regulation**: models ran by JRC have supported 10 impact assessments, such as for the Communication on modernising and simplifying the Common Agricultural Policy and for proposals for Horizon Europe, the future EU research and innovation programme.

The JRC continued to play an instrumental role in key initiatives such as **cybersecurity** and the **Energy Union**, and was an important partner in policy implementation in areas such as **dual quality food, vehicle emissions** and the **European Semester**.

2018 was also a breakthrough year for the JRC's knowledge management activities. Its six Knowledge Centres and six Competence Centres (see a full list overleaf) are now recognised as invaluable tools for policymakers in the Commission. The JRC's role was further strengthened by the new Data Strategy@EC Action Plan, where the JRC is in charge of two important actions namely the Data Catalogue and the Data Advisory, and its reports synthesising the current state of our knowledge on complex policy issues such as **soil degradation** or **artificial intelligence (AI)**.

The JRC has achieved its strategic goal of becoming an important partner to the policy DGs.

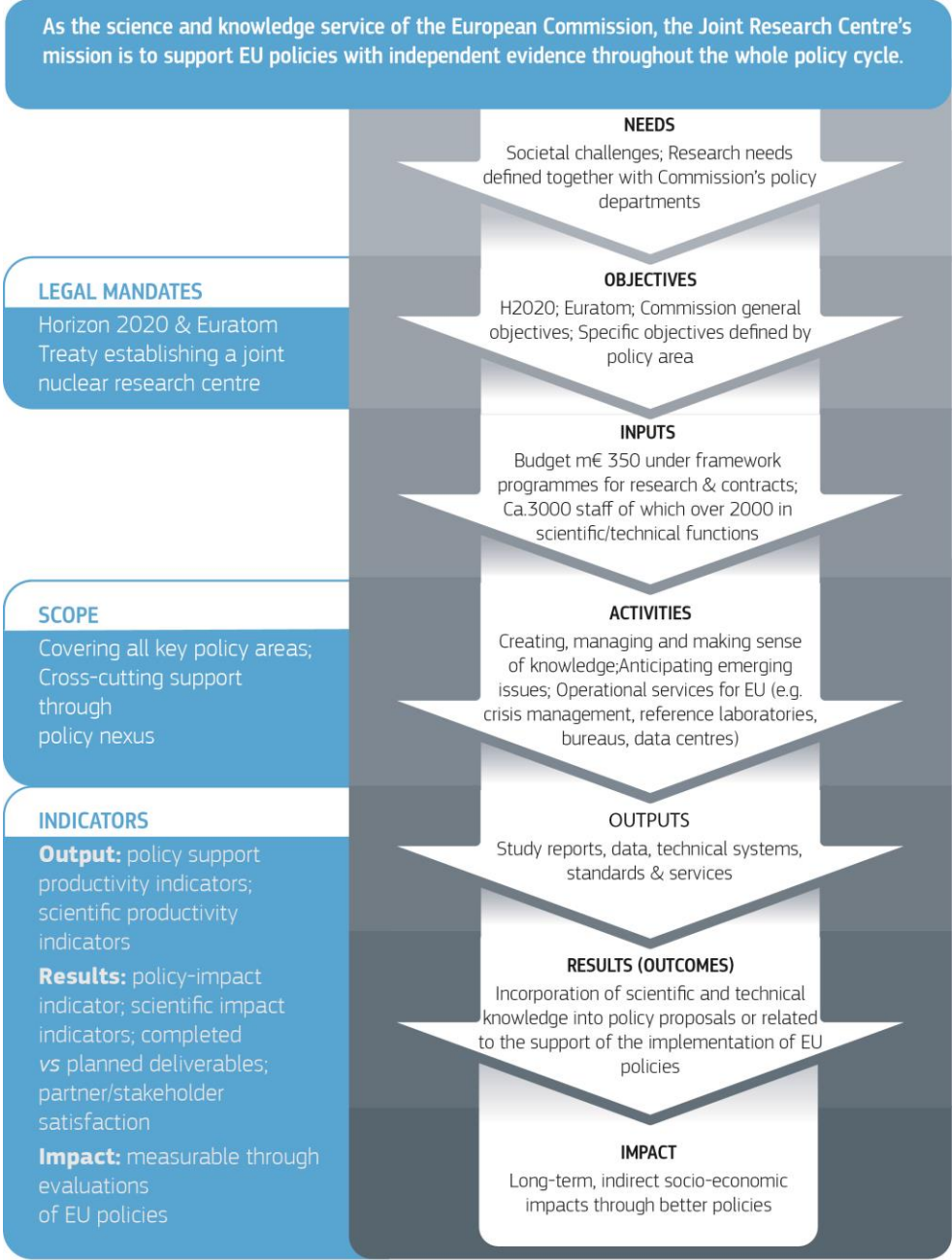
The 'Artificial Intelligence - A European Perspective' report, published in December 2018, is the first of the next generation JRC reports, also dubbed #Facts4EUFuture reports. It presents a European view of AI based on independent research and analysis by the JRC, to inform the debate at the European level and anticipating the priorities of a new Commission.

Furthermore, the JRC's **megatrends hub** provided a dynamic collective intelligence system to support forward-looking thinking, while the new Centre for Advanced Studies explored topics, such as the influence of migration and education on **demographic trends** in Europe, the **impacts of digital transformation on humans and societies**, and innovative use of **big data in economic forecasting**.

<sup>4</sup> Specific objective 17 of Horizon 2020: the JRC provides demand-driven scientific and technical support to Union policies, while flexibly responding to new policy demands. Euratom Research and Training Programme (specific objectives 9-13): the JRC has the objective to improve nuclear safety, security and radiation protection, and to contribute to the long-term decarbonisation of the energy system in a safe, efficient and secure way.

<sup>5</sup> Where JRC's research is relevant, it thus contributes also to the positive trends of Commission-wide indicators.

Exploring such new approaches to deliver on emerging areas has carved a niche for JRC in providing more anticipatory support to the Commission. Including the monthly bulletins called 'Trends4EU' that are drafted with the Commission's in-house think-tank, the European Political Strategy Centre (EPSC) and sent to all the Commission's top senior management, lifted the JRC's **anticipatory capacity** to a higher level.



**Figure 1-1.** JRC's intervention logic, illustrating the operating principles of the JRC.

## **JRC's Knowledge and Competence Centres – bringing scientific knowledge and tools to the policymakers**

**The Knowledge Centre for Territorial Policies (KCTP)** gathers, manages and makes sense of the vast amount of knowledge available on European cities and regions to help boost their competitiveness, preserve their diversity, and improve the quality of life of their citizens.

**The Knowledge Centre on Migration and Demography (KCMD)** provides evidence and knowledge for EU policies related to migration and demography. Supporting the European Agenda on Migration, the focus is on analysing comprehensively and systematically developments on a global scale and their societal impact on the EU in the medium to longer term.

**The Knowledge Centre for Disaster Risk Management (DRMKC)** provides better knowledge, stronger evidence and a greater focus on transformative processes and innovation to improve our understanding of disaster risk, to build resilience and risk-informed approaches to policymaking, and contribute to smart, sustainable and inclusive growth.

**The Knowledge Centre for Bioeconomy (KCB)** collects, structures and makes accessible data and information on the bioeconomy from different sources, pulling together the knowledge and expertise needed to assess the status, progress and impact of the bioeconomy.

**[New in 2018] The Knowledge Centre for Food Fraud and Quality (KC-FFQ)** aims to create a formalised science/policy interface to support initiatives for safe-guarding the quality and authenticity of agri-food products and protecting the integrity of the food chain. It complements the activities of the EU Food Fraud Network.

**[New in 2018] The Knowledge Centre on Global Food and Nutrition Security (KC-FNS)** makes the existing information and tools available to EU policy makers and stakeholders; identifies priority topics to foster better knowledge and collaboration around these; promotes the European Commission role in generating new knowledge, and supporting relevant international initiatives.

**The Competence Centre on Composite Indicators (COIN)** develops methodologies to construct robust composite indicators that help policymakers shape policy and monitor progress. COIN is renowned worldwide for its expertise on statistical methodologies and technical guidelines.

**The Competence Centre on Microeconomic Evaluation (CC-ME)** helps to enhance the EU policy process through ex post causal evaluation and impact assessment. It also provides advice on data collection and evaluation design, capacity building on counterfactual methods, micro-econometric analysis and counterfactual impact evaluation.

**The Competence Centre on Text Mining and Analysis (CC-TMA)** addresses policymakers' need for timely access to relevant information that is often buried in large amounts of textual data. TMA is relevant to virtually all policy areas and the centre provides the skills and expertise needed: computational linguistic research, applied IT and support.

**The Competence Centre on Modelling (CC-MOD)** leverages modelling capacity and competences across the Commission and beyond. Starting with a Commission-wide modelling inventory, it supports the proper documentation, use, and reuse of models, further helps in identifying common approaches to quality and transparency of model use, and establishes a community of practice on modelling.

**[New in 2018] The Competence Centre on Foresight (CC-Foresight)** provides direct strategic and future-oriented input into EU policymaking; increases the uptake of foresight and forward-looking approaches; and continuously advances the in-house foresight capacity, methods and tools to make it more practical for decision making processes. One of its prominent outputs is The Megatrends Hub, a dynamic collective intelligence system assessing a set of 14 global megatrends that are relevant for the future of Europe.

**[New in 2018] The Competence Centre on Technology Transfer (CC-TT)** complements other JRC activities in the broader domain of support to innovation policies and make available operational experience and understanding of the technology transfer process, for example, for the practical implementation of smart specialisation strategies and for a deeper understanding of the role of technology transfer in innovation ecosystems.

**Collaboration with the Member States, partner countries and international partners** takes many different forms. In 2018, the highlights included assessing the impact of changes to the Common Agriculture Policy with France, exploring alternative energy security scenarios with Estonia, expanding cooperation and capacity building with South Africa, reinforcing JRC contributions to UN initiatives, engaging Western Balkans and south-eastern European countries over macro-regional strategies, and deploying innovative nuclear safeguards collaboratively with the International Atomic Energy Agency (IAEA) among others. Implementing the two-year plan on closing new strategic partnerships at the JRC level is half-way executed and the framework for a new 2020-2021 plan is being prepared. The **'Science meets Parliament/Science meets regions' Pilot Project** has created a wave of interest in the Member States and preparatory actions for 23 events spanning across the EU were set up, the first one being held in December 2018.

The **JRC continues to match expectations**. In 2018, it produced nearly 1300 studies, technical systems, data sets and databases, standards and operational services of implementing the EU legal obligations. It achieved the targets for policy-related outputs set out in the Horizon 2020 programmes and defined under the specific objectives for JRC direct actions (see Horizon 2020 programme statements<sup>6</sup>), and positively contributed to the implementation of the Horizon 2020 programme and the Euratom Research and Training Programme. Some 390 new cases were recorded involving the incorporation of its scientific and technical knowledge into policy proposals and when it directly helped in implementing EU policies<sup>7</sup>. This is one of JRC's key performance indicators, which is closely monitored. Examples of these cases are available in Table 1-1.

The JRC's **scientific productivity, scientific excellence and impact on science** show improved performance during the Horizon 2020 programme<sup>8</sup>. The JRC continues to perform well, with 680 peer-reviewed research papers published, of which 38 % are in the top 10 % most-cited journals and featuring many articles in very high-impact journals such as 'Nature' and 'The Lancet'. Also, the JRC's research is increasingly receiving attention and visibility as demonstrated by alternative metrics.

The JRC generates **EU added value** through *i.a.*:

- providing the Commission with the required independent evidence for formulating, monitoring and evaluating policies;
- positioning the Commission on equal footing with stakeholders and Members States regarding technical knowledge;
- leading EU-wide processes defined in the legislation, saving administrative costs at Member State level, such as the Integrated Pollution Prevention and Control (IPPC) Bureau for industrial emissions;
- EU-wide and global harmonisation and standardisation, contributing to the health and safety of citizens, security, protection of the environment and EU's competitiveness;
- sharing knowledge, enabling the Member States and Candidate Countries to tap into best practises and rich data sources; and
- operational services that allow the EU to take action in, e.g. crises situations.

This report contains a number of examples of such activities.

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<sup>6</sup> Since the activities of the JRC are funded through the Horizon 2020 spending programme, all policy-related outputs are expenditure related outputs.

<sup>7</sup> JRC's internal well-established and documented evaluation process. One instance of policy-impact is supported by one or more JRC outputs. This is one of the JRC's key performance indicators.

<sup>8</sup> According to a 2017 study, between 2007 and 2015 the JRC produced ca. 7000 scientific publications and achieved double the world average in the number of publications in the top 10 % journals. In the recent years, the JRC's share of top 1 % highly cited publications (field-normalised) is more than three times the world average. A new study is underway; Jonkers K, Del Rio JC, Meyer N. 2017. The research performance of the European Commission's Science and Knowledge Service, Joint Research Centre (2007-2015) - A bibliometric analysis, internal JRC report. Brussels

## JRC's research creates EU added value

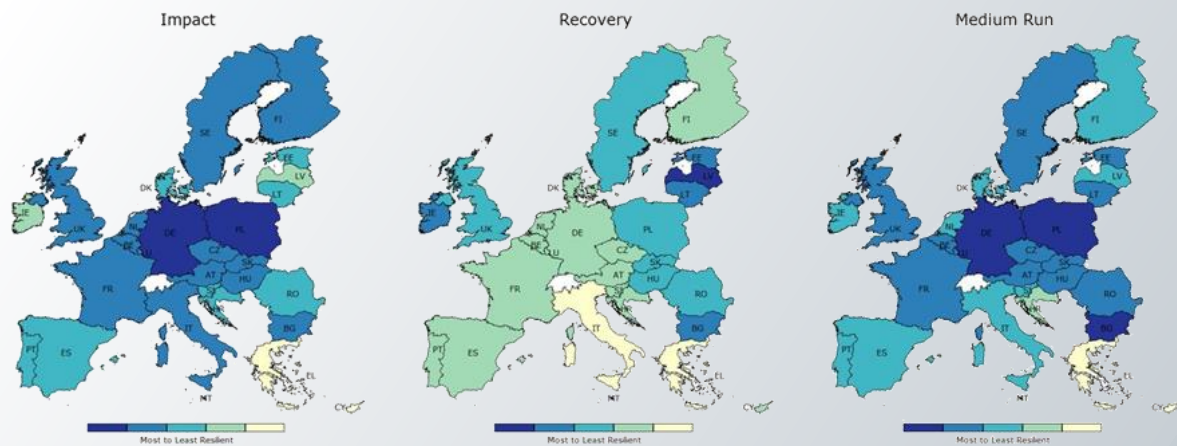
### Mapping factors for recovering from financial and economic crisis

The financial and economic crisis that started in 2007 was felt across the EU but its impact was uneven. The JRC has looked at what made some countries more resilient than others. It measured the degree of economic and societal resilience of each Member State during and after the crisis, and identified particular country characteristics linked to resilience.

The analysis is based on the JRC conceptual framework for resilience, which places at its core the wellbeing of individuals, thus going beyond the merely economic growth perspective and involved testing over 200 characteristics, ranging from indicators of life quality to macroeconomic policies to digital development.

The results (Figure 1-2) show that some countries more resilient in the short run do not necessarily recover or adapt better in the medium run. Different characteristics can make a difference in the levels of resilience to the crisis. In particular, high values of pre-crisis government expenditures on social protection turn out to be the most important feature in predicting the country's absorptive capacity (short run). When focusing on the medium run, the countries with more stable political environment are performing better. Business environment is critical to successfully overcome a crisis and 'bounce forward'.

Overall, the JRC concluded that mere 'shock absorption' may not be the only possible or best strategy looking forward. Instead, adaptation and transformation have helped some countries use the crisis as an opportunity.



**Figure 1-2.** Impact (short run), recovery and medium run indicators in the EU 28. Shades of blue indicate high resilience, shades of green medium resilience and shades of yellow low resilience. ©EU 2018

### Boosting digital literacy, a key role for schools

In 2018, the European Commission launched the Digital Education Action Plan to promote better use of digital technologies for teaching, and improved digital competences among students and teachers. In this context, the JRC has developed a SELFIE tool that enables schools to better embed digital technologies into teaching, learning and student assessment. After a successful pilot in 2017, involving 650 schools in 14 European countries, the full version of SELFIE was released in 2018 in all 24 official EU languages for all schools to use free of charge.

SELFIE gathers – anonymously – the views of students, teachers and school leaders on how technology is used in their school. The information is used to generate a report on strengths, weaknesses and potential areas for improvement, which in turn helps initiate the dialogue within the school and action plan to improve the use of digital technologies. The Digital Education Action Plan foresees the scaling up of SELFIE to one million users by the end of 2019.

## JRC's research creates EU added value

### **A well-functioning European nuclear safeguards system**

The European Commission operates an effective regional nuclear safeguards system, implemented by the Directorate-General for Energy, in a close partnership with the International Atomic Energy Agency (IAEA).

The safeguards system relies on JRC's scientific and technical expertise. The JRC researches and develops safeguards tools and methods, analyses samples in its own nuclear facilities and laboratories, delivers verification and containment technologies, and assists in-field and trains Euratom and IAEA nuclear safeguards inspectors on the nuclear safeguards measurement methods and the use of advanced and specialised equipment.

The JRC has developed and deployed an innovative nuclear safeguards approach that combines more than ten different measurements, identification and surveillance methods within a smart and user-friendly analysis interface. This new system provides an efficient and effective safeguards means for EU inspectors and benefits also nuclear facility operators.

Applied for safeguarding the plutonium transfer and storage in a major EU facility, the new safeguards approach allows reliable remote monitoring saving resources and time consuming operations for both inspectors and the facility operator. A similar approach was developed and deployed by the JRC in a gas centrifuge uranium enrichment plant and could be used for the operations on spent nuclear fuel before final disposal in the future.

### **Helping the affected regions with transition to clean energy**

The decline in coal use and production presents a significant economic and social challenge for a number of regions across the EU. If not carefully planned and managed, the closure of coal mines can result in decades of structural unemployment, social deprivation and a significant burden on public finances. In the context of the Clean Energy for All Europeans package, the European Commission launched the 'Coal Regions in Transition' initiative in 2017 to help the affected regions with transition to clean energy.

The JRC has supported the pilot phase of this initiative with a study on socio-economic transformation in the region of Upper Nitra in Slovakia. Several well-established methodological approaches were applied for the initial analysis of various economic and social impacts of the mine closure in Upper Nitra and its implications for the energy transition and the security of energy supply. It also included a proposal of a possible strategic approach based on smart specialisation and its application on research and innovation strategies in lagging regions. The report served as a basis for discussions about the foreseen phase-out of coal mining in Slovakia between the Commission services and the national authorities.

## **JRC works with the Member States - Greece**

The Greek Ministry of Finance requested assistance to set up and run improved fiscal modelling operations that allow better use of micro-data and microsimulation tools to inform policy decisions. The JRC supported the Greek Tax Policy Unit with specific tools for simulation and evaluation of reforms of the tax-benefit system. The main tool used is the EU-wide microsimulation model EUROMOD. This was accompanied by training and technical assistance on the management and use of micro-data shared by the Greek tax authority for tax simulation purposes.

## JRC's research creates EU added value

### **World-class JRC research infrastructure can be used by the research community and industry**

Open access to the JRC research infrastructures initiative was launched in 2017 to allow, under certain conditions, the research community, public authorities and industry in EU Member States, candidate countries and Horizon 2020 Associated Countries to make use of the JRC's world-class research infrastructures such as the nanobiotechnology and the energy storage laboratories, the installations for testing the vulnerability of buildings to earthquakes and other hazards (European Laboratory for Structural Assessment) and nuclear research laboratories including the particle accelerators.

Access is mainly granted for projects relevant to the European Commission's strategic priorities and of importance for European standardisation, integration and cohesion, sustainable growth and competitiveness. It is based on a peer-review selection process following calls for proposals.

The open access scheme has stimulated interest from across Europe. By the end of 2018, 58 proposals from 87 institutions from 24 countries have been accepted, giving access to more than 200 individual users including industry and SMEs, and six projects have already been completed. The pilot will gradually be extended to include another 26 facilities.

### **Supporting reflection on Sustainable Development Goals**

The Sustainable Development Goals (SDG) are a collection of 17 global goals set by the United Nations. The EU is committed to implement the 2030 Agenda in cooperation with its partners and has adopted a sustainable development package. In 2018, the JRC has contributed to the drafting of the European Commission Reflection Paper on **the Sustainable Development Goals (SDG)**, through a qualitative foresight analysis of drivers and scenarios on achieving the SDGs, and through results of quantitative analysis (i.e. work on soil erosion and soil organic carbon and coal regions in transition study) which have fed into the Paper's Second Annex, 'The EU's Performance on Sustainable Development Goals'. The JRC works closely with international partners such as United Nations agencies (UN DESA, UNCTAD, UNESCO), World Bank, and the Government of Japan. As partner of The World in 2050 (TWI2050) global research initiative the JRC provides the fact-based knowledge to support the policy process and implementation of the SDGs.

### **Monitoring sugar in food products**

The EU aims to reduce added sugars in food and drink by a minimum of 10 % by 2020. JRC scientists have compiled a report that indicates the sugar content of several food and drink categories available on the EU market. This data provides a baseline for monitoring the progress on food product reformulation across EU.

## **JRC cooperates with international organisations - UN**

In February 2018, the JRC co-organised with UNESCO an information session at the UN Headquarters in New York to present the collective contributions of the two organisations to the implementation of the Sustainable Development Goals (SDG) on water, as well as other water-related goals and targets. Delivering the SDGs is a priority for the EU and the international community. The JRC also presented the Global Surface Water Explorer, the first ever global mapping of surface water based on 30 years of satellite data.

As a research organisation, the JRC faces **challenges** related to keeping pace with rapid development in science, maintaining and developing the right competencies to fulfil its mission.

The new emphasis on cross-cutting research and delivering integrated syntheses builds on excellent scientific credentials that need to be retained to ensure that scientific advice is based on the best available evidence. Several mechanisms are in place to replenish the excellence base and to adapt to new challenges such as the exploratory activities and staff development programmes.

The JRC's transformation from a traditional research-making organisation into a manager of scientific knowledge for EU policies has also required that the JRC adapt to its new role and new ways of working across the whole Commission<sup>9</sup> and acquire new competencies. Since adopting the JRC Strategy 2030, it has introduced new organisational structures such as the cross-JRC directorates and the Knowledge and Competence Centres. It has explored the skills needed for effective interaction with policymakers and provided tailored training and short-term exchange programmes. A dedicated, peer-reviewed set of indicators has been devised for monitoring the implementation of the strategy used effectively to re-align both JRC scientific and administrative actions, for instance, to promote cross-JRC collaboration. Following a 'Strategy engagement' staff survey in 2018, concerted efforts are being made to promote the awareness of staff of how their daily work contributes to the strategy and to the JRC values.

In 2018, the JRC dealt with a number of **complex and sensitive issues** involving challenging legal and financial aspects: the preparation for the next Multi-annual Financial Framework, the extension of the Euratom Research and Training Programme and a new decommissioning programme, the new instruments, negotiating new strategic partnerships, changes in legislation of the countries hosting JRC sites and the entry into force of the new General Data Protection Regulation (GDPR).

Being exposed to **external factors such as changing political priorities and social context** can have a significant impact on the take-up of the JRC's research results. The JRC mitigates these effects through close collaboration with partner DGs and through appropriate adaptation in its work programme for reflecting new needs.

For the organisation to deliver meaningful scientific results requires operating an effective management system. To this end, the JRC administration achieved this year efficiency gains in resources management as described under sections 2.1 and 2.2.6. Additionally, following the Commission policy on ICT security, the new JRC ICT governance structure and architecture were established. It is expected that this new structure will create important synergies over the next five years, and provide protection against cyber threats. Cyber threats constitute one of the major risks across the Commission.

Finally, the JRC has in place effective quality management and control systems, and as a result, **no risks materialised** in 2018 (cf. materiality criteria, Annex 4).

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<sup>9</sup> cf. Commission corporate data, information and knowledge management strategy (SWD(2016)333 final and C(2016)6626 final)

**Table 1-1.** Examples of cases where JRC's work has policy-impact by incorporation of its scientific and technical knowledge into policy proposals and when it directly helped in implementing EU policies. The total number of such cases, identified through JRC's internal productivity and impact evaluation, constitutes the value for the key performance/result indicator 1 'policy-support impact'. More examples can be found in Annex 15 (Table 15-1).

## Description

### **Contribution to CAP2020+ legal proposal and to its associated Impact Assessment with environment / climate data and analysis**

The JRC covered e.g., GHG emissions, biodiversity – landscape features, soil erosion, carbon sequestration, water use. Five impact indicators (out of 12 for the environment / climate objectives) are expected to be provided by the JRC.

### **Risk assessment of nanomaterials and nanotechnologies used in food and feed**

JRC supported the European Food Safety Authority (EFSA) by guidance on human and animal health aspects of the risk assessment of nanoscience and nanotechnology applications in the food and feed chain. This guidance helps applicants prepare complete applications for nanotechnology use and risk assessors to evaluate nano applications' safety.

### **New EU Directive on the promotion of the use of energy from renewable sources (RED Recast, 2018/2001)**

EU legislation fixes a minimum requirement for GHG savings for biofuels and solid/gaseous biomass. The 'default' and 'typical' values in Annex V and VI calculated by the JRC attribute GHG savings to all commercially available biofuels and bioenergy pathways relevant in Europe, thus determining their eligibility to financial support and incentives.

### **Peer review of the nuclear stress tests in Belarus**

JRC supported DG Energy in implementing the EU nuclear safety stress tests in Belarus following a joint declaration of a high-level meeting (2011) on comprehensive risk and safety assessments of nuclear plants.

### **The Nuclear Safety Directive's Topical Peer Review on ageing management of nuclear power plants**

JRC nuclear safety experts contributed to the Topical Peer Review on ageing management of nuclear power plants required by EU Nuclear Safety Directive.

### **Supporting the Bioeconomy strategy**

A study on the techno-economic and profitability analysis of food waste biorefineries at European level contributed to drafting the EU Bioeconomy strategy.

### **Evaluation of the European Fund for Strategic Investments**

The Economics Department of the European Investment Bank (EIB) together with the JRC carried out a quantitative analysis to evaluate the macroeconomic impact of the investments supported by the EIB Group within the EU-28.

### **Providing up-to-date estimates and trends on Venezuela's migration crisis**

At the request of the European External Action Service (EEAS), the JRC analysed the Venezuelan migration crisis by describing key aspects of the crisis and presented up-to-date estimates of the number of people displaced in the absence of timely and reliable official data.

## 1.1 Commission General Objective 1 'A New Boost for Jobs, Growth and Investment'

Specific objectives 1.1 to 1.9 (contributing to H2020 Specific Objective 17):

**A well-informed European policymaking, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards,** in the following areas:

(Specific objective 1.1)	Agriculture and rural development
(Specific objective 1.2)	Education, culture, youth and sport
(Specific objective 1.3)	Environment
(Specific objective 1.4)	Maritime affairs, fisheries and aquaculture
(Specific objective 1.5)	Health and food safety
(Specific objective 1.6)	Regional policy
(Specific objective 1.7)	Research, science and innovation
(Specific objective 1.8)	Transport
(Specific objective 1.9)	Employment, social affairs, skills and labour mobility

Collective and coordinated efforts at European level continue to be needed to put Europe on the path to renewed economic prosperity. As the first of the 10 Juncker priorities, Commission work in this area covers a variety of policies, a number of which the JRC contributed to in 2018.

Informing the correlation between external trade and employment, ensuring EU leadership on technologies critical to e-mobility, ensuring a sustainable growth of the EU blue economy, promoting swifter innovation-to-market translation, preventing land degradation and the loss of vital soil services, and supporting the European cultural heritage are all but a few examples of Commission activities that the JRC backed with its expertise in 2018.

Short reports under the following headlines are included in Annex 15:

- EU exports to the world support 36 million jobs across Europe;
- Ensuring EU leadership in batteries innovation and manufacturing;
- Helping keep marine pollution at bay;
- Match-making for faster innovation to market;
- Land degradation threatens the well-being of people and the planet;
- Science and innovation supporting the European cultural heritage;
- Knowledge Gateway on Health Promotion and Disease Prevention;
- Change your diet to save both water and your health;
- Critical raw materials: are we circular yet?
- EU coal regions: opportunities and challenges ahead;
- The e-vehicle market in Europe is slowly gaining momentum; and
- Reporting cancer burden statistics and trends across Europe.

Reports on outputs identified in the 2018 Management Plan and the indicators defined in the Strategic Plan are available in Annex 12.

**Supporting Member States and the Commission in tackling food quality and food fraud issues**

In recent years, studies in some Member States had uncovered differences in the composition or characteristics of certain branded foods, but based on different approaches, their results were not readily comparable. A new harmonised methodology makes recommendations for the selection of products, their sampling and testing and data interpretation. It can be used to assess objectively the differences between food products offered on the Internal Market. It was developed by the JRC in close cooperation with food supply chain stakeholders, Member States experts, and relevant Commission services. It also served as a basis for a pan-European testing campaign which was launched end of 2018.

The issue of **dual quality foods** in the single market was discussed in April 2018 in a European Parliament event gathering industry and consumer representatives, politicians, and policymakers to assess progress and explore the way forward. At this occasion, Tibor Navracsics, Commissioner for Education, Culture, Youth & Sport, responsible for the JRC, announced the new EU harmonised testing methodology for comparing food quality characteristics. He also presented the work of the JRC-operated Knowledge Centre for Food Fraud and Quality.

The **Knowledge Centre for Food Fraud and Quality** was launched in March 2018 as a network of experts within and outside the Commission, providing EU policymakers and national authorities with access to up-to-date scientific knowledge on food fraud and food quality issues. It notably coordinates market surveillance activities, operates an early warning and information system on food fraud, links information systems of Member States and the Commission, and generates country-specific knowledge.



**Figure 1.1-1.** JRC scientists produced the first EU-wide analysis on the most frequently occurring beach litter. Plastic bottle caps and cigarette butts but also crisp packets, sweet wrappers, strings, fragments of plastic objects and cotton buds constitute the top ten of the most frequently found items, which account for nearly 70 % of the total rubbish found on European beaches. These findings directly fed into the Commission proposal for new EU rules on single-use plastics presented in May 2018. © jaochainoi – Adobe Stock.com

**Figure 1.1-2.** The JRC monitors crop growth, including the short-term effects of weather on crop production. For 25 years, the JRC's 'MARS' Bulletins bring independent and timely forecasts on crop yields in Europe to inform the management of the European agricultural market. ©@Monkey Business – Adobe Stock 2018



## 1.2 Commission General Objective 3: 'A Resilient European Energy Union with a Forward-Looking Climate Change Policy'

Specific objectives 3.1 to 3.3 (contributing to H2020 Specific Objective 17 and to EURATOM Research & Training Programme Specific Objectives 9, 10, 11, 12 and 13):

**A well-informed European policymaking, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards, in the following areas:**

(Specific objective 3.1)	Climate Action
(Specific objective 3.2)	Energy
(Specific objective 3.3)	Safe and secure use of nuclear energy

The EU's energy and climate policy aims to promote the transition towards a competitive low-carbon and resilient economy that helps in slowing down global warming and mitigating its effects while ensuring affordable, secure and sustainable energy for businesses and households.

In 2018, the JRC's contributions to climate change policy covered both mitigation and adaptation efforts, notably through economic and climate modelling/assessments, monitoring and analysing emissions from different sources, assessing climate change impacts (economic and non-economic), vulnerability, resilience, and adaptation options. On energy specifically, the JRC contributed to carrying out security, safety, risk and techno-economic assessments of the EU's energy supply, assessing the resilience of the EU power grid to natural hazards, promoting nuclear safety, and supporting the implementation of renewable energy and energy efficiency legislation.

Short reports under the following headlines are included in Annex 15:

- Sustained climate action brings multiple benefits;
- Assessing climate change impacts for a resilient Europe;
- Supporting Member States and neighbouring countries to increase their level of security of gas supply;
- Setting the course for energy efficiency;
- Supporting the EU in meeting renewable energy objectives;
- Supporting the implementation of EU nuclear safety policy;
- Forest fires in Europe, Middle East and North Africa 2017;
- Is snow load on roofs increasing with global warming?
- Sharing nuclear safety best practices;
- Global wheat yields at risk due to ozone pollution;
- Credible accounting of mitigation in managed forests; and
- Drought and water crisis in southern Africa explained.

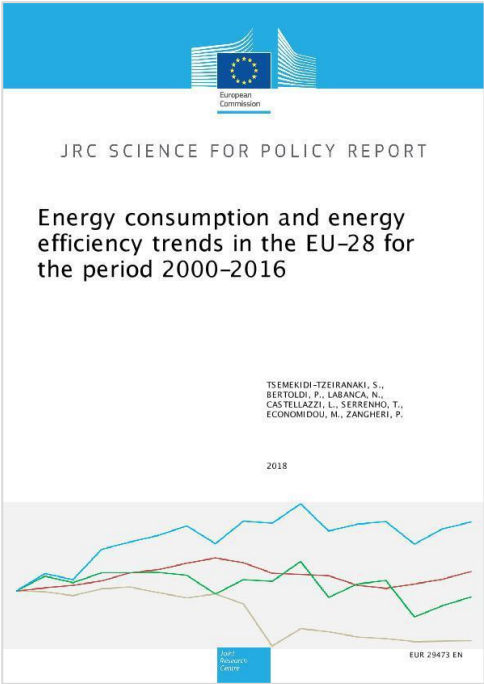
Reports on outputs identified in the 2018 Management Plan and the indicators defined in the Strategic Plan are available in Annex 12.

**Sustained climate action brings multiple benefits**

The EU has long been spearheading the global efforts to mitigate climate change. A recent update of the JRC's Emissions Database for Global Atmospheric Research (EDGAR) shows that global fossil CO<sub>2</sub> emissions are still rising (+ 23 % in 2017 with respect to 2005), although not in Europe (- 16 % compared to 2005). Man-made methane emissions are also on a non-sustainable path (17% increase from 1990 to 2012). The JRC found that without specific measures to reduce overall methane emissions from the energy, waste, wastewater and agriculture sectors there could be between 40 000 and 90 000 more premature deaths globally by 2050, due the impact that methane has on ozone concentrations.

Indisputably, sustained climate action at global level is urgently needed. In its Global Energy and Climate Outlook (GECO) 2018 report, the JRC quantified the actions needed to limit temperature rise to 2°C, a level where both natural ecosystems and human economic activities can survive: halve total global greenhouse gas emissions in 2050 compared to 1990 levels, expand the use of renewables to half the world's energy system, and increase the role of electricity energy consumption. Aiming for 1.5°C would require even larger reductions, particularly in the 2020-2040 period, as also confirmed by the IPCC special report, co-authored by one of the JRC scientists. The GECO 2018 also indicates that such actions would still produce global economic growth despite the increased investment needs. This analysis underpins the Commission's long-term strategy for the evolution of the EU's energy and climate objectives published in November 2018 in preparation for the UNFCCC process. The corresponding macro-economic and employment analysis also features directly in the in-depth assessment that complements the Communication Long-term Strategic Vision: A Clean Planet for All.

Beyond global warming control, climate action has many side benefits. By combining climate, energy, atmospheric chemistry, and economic models, it also improves air quality, prevents deaths and help us grow more foodenhances food production, as reported by JRC authors in Nature Communications journal. An integrated policy approach maximizes benefits for climate, energy and health and unlocks the potential to reach several Sustainable Development Goals. The First Clean Air Outlook, to which JRC researchers contributed with a macroeconomic cost-benefit analysis captures these co-benefits.



**Figure 1.2-1.** JRC's work throughout 2018 continued paving the way towards achieving the Energy Union Strategy objective of 'putting energy efficiency first'. An analysis on Energy Consumption and Energy Efficiency Trends in the EU-28 noted progress in reducing energy consumption in the EU over the 2000-2016 period but highlighted that while in 2014 the EU already met its 2020 final energy consumption target, consumption grew again in 2015 and 2016, moving away from the 2020 objective.  
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## 1.3 Commission General Objective 4: 'A Deeper and Fairer Internal Market with a Strengthened Industrial Base'

Specific objectives 4.1 to 4.3 (contributing to H2020 Specific Objective 17):

**A well-informed European policymaking, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards,** in the following areas:

(Specific objective 4.1)

Internal market, industry, entrepreneurship and SME

(Specific objective 4.2)

Customs risk management policy and the fight against fraud

The internal market is key to boosting growth and jobs. The areas with the highest growth potential are services, networks and the digital economy. Industry accounts for over 80 % of Europe's exports and private R & I and almost 25 % of jobs in the private sector. The EU's internal market policy focuses on helping to turn the EU into a smart, sustainable, and inclusive economy by implementing the industrial and sectoral policies under Europe 2020.

In 2018, JRC's activities contributing to strengthening the internal market included standardisation, reference measurements and product safety, support for industrial sectors to enhance their environmental efficiency, energy performance, climate resilience and GHG emissions reductions, resource efficiency and the circular economy, and more.

Short reports under the following headlines are included in Annex 15:

- JRC ramps up its leading role in vehicle emissions oversight;
- New test methods for plastic and rubber product safety;
- Minimum quality requirements for water reuse in agriculture;
- New EU emission standards for waste treatment and guidance for industrial installations;
- Supporting Member States and the Commission in tackling food quality and food fraud issues;
- Supporting customs policies and the fight against customs fraud;
- JRC experts share insight on updated EU Bioeconomy Strategy;
- Distribution of bumblebees across Europe;
- First global seafood consumption footprint published;
- Predicting the spread of invasive pest threatening EU forests;
- Record high profits for EU fishing fleet, 2018 report finds; and
- Securing raw materials for the future.

Reports on outputs identified in the 2018 Management Plan and the indicators defined in the Strategic Plan are available in Annex 12.

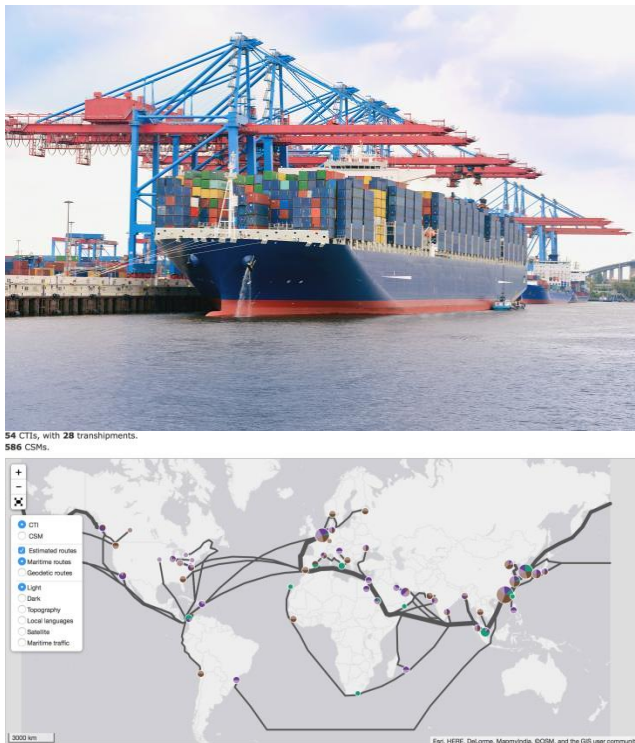
### JRC ramps up its leading role in vehicle emissions oversight

Achieving significant CO<sub>2</sub> and pollutant emissions reductions in the transport sector remains a challenge, in particular in the context of the Commission's strategy for a climate neutral Europe by 2050.

The regulatory initiatives to address this – recent examples include the new Type Approval Framework and the certification procedure for heavy duty trucks – are expected to pave the way to significant improvements in vehicle emissions performance. According to a JRC study published in 2018, continuous monitoring is critical for ensuring the implementation of and compliance with the new vehicle emissions legislation. In this context, the JRC has been assessing vehicle emissions control technologies and vehicle emissions performance both in laboratory and on-road. Among other tools, and to improve the methodology and support Member States led investigations, it put to good use testing protocols and new emission measurement methods to identify anomalies in emissions patterns potentially caused by defeat devices.

These tests are part of a set of activities that will prepare the JRC to take up the role of checking – on behalf of the Commission – the compliance of vehicles with the type approval regulation and the real drive emissions limits.

Besides its role in monitoring compliance, the JRC continued preparing the ground for a future regulatory initiative for certifying CO<sub>2</sub> emissions and fuel consumption for other types of heavy duty vehicles, namely buses and coaches. Following a test campaign to investigate the possibility of extending the existing methodology for trucks to coaches and buses and to check the representativeness of the CO<sub>2</sub> emissions calculations made by the official simulator VECTO, the JRC confirmed the practical feasibility of an ex-post verification method based on transient, on-road tests for buses and coaches, even though further testing is still needed.



**Figure 1.3-1.** The JRC in collaboration with the Directorate-General for Taxation and Customs Union and European Anti-Fraud Office (OLAF) has developed a prototype data analysis and visualisation system that allows customs officers to efficiently use information on the status and movement of shipping containers. This prototype is used systematically by customs officers around Europe in their daily work and to analyse millions of import declarations to detect potential fraud cases (pilot study). The JRC also supports OLAF in the implementation of a system based on the same technology and on the mapping of data and best practices in the EU.

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## 1.4 Commission General Objective 9: 'A Stronger Global Actor'

Specific objectives 9.1 to 9.3 (contributing to H2020 Specific Objective 17 and to EURATOM Research & Training Programme Specific Objectives 9, 10, 11, 12 and 13):

**A well-informed European policymaking, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards,** in the following areas:

(Specific objective 9.1)

Global safety and security

(Specific objective 9.2)

International cooperation and development

Today's interconnected and interdependent societies are facing unprecedented global challenges and transnational security threats, such as climate change, extreme poverty and instability. However, this also opens up new opportunities for more sustainable development, equity and peace. For Europe, it also represents the opportunity to show leadership and promote its values and vision on current and future global challenges.

To that effect, in 2018 the JRC has significantly increased its cooperation and capacity building activities with the African continent, not least on critical themes such as food security, or desertification. Improved connectivity with Asian countries is also an area where much progress has been made. The JRC is also addressing CBRN-E threats and emergency preparedness at a global level. Last but not least it continues contributing valuable climate and environmental expertise that extend way beyond EU borders.

Short reports under the following headlines are included in Annex 15:

- Stepping up cooperation with Africa;
- Iran-EU: supporting the implementation of the Joint Comprehensive Plan of Action;
- Study and online tool measure how well Europe and Asia are connected;
- JRC shares insight with international community on emergency preparedness and response;
- Enhancing the framework against CBRN-E threats;
- New World Atlas of Desertification shows unprecedented pressure on natural resources;
- Observing the Arctic provides benefits beyond climate change insights;
- JRC work supports redefining the quantity in the new SI (System of Units);
- Global Report on Food Crises sheds light on 2017 status;
- JRC launches largest database on cities;
- Global hotspots for potential water disputes;
- Contributing to IAEA symposium on international safeguards;
- JRC analysis assists response to Laos dam collapse;
- Carbon offsetting and reduction scheme for international aviation; and
- Six steps to achieving the Sustainable Development Goals.

Reports on outputs identified in the 2018 Management Plan and the indicators defined in the Strategic Plan are available in Annex 12.



**Figure 1.4-1.** JRC has developed a test kit to verify the performance of Explosive Trace Detection (ETD) equipment at the airports. The test kit is now used across European airports and has become a de facto standard for the performance assessment of ETD equipment.

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### **New World Atlas of Desertification shows unprecedented pressure on natural resources**

Twenty years after the last edition, the JRC published a new edition of the World Atlas of Desertification, which unfortunately shows that pressures on land and soil have increased dramatically. This new and much more advanced edition of the Atlas gives policymakers comprehensive and easily accessible evidence-based insights into land degradation, its causes and potential remedies to tackle desertification and restoring degraded land.

The Atlas provides examples of how human activity drives global change processes threatens food security, intensifies climate change and leads to people being displaced from their homes. The main findings show that population growth and changes in our consumption patterns put unprecedented pressure on the planet's natural resources that can lead to land degradation - now one of the world's most pressing environmental problems and a major societal challenge as land degradation reduces the productive capacity of the land, which means that it affects our capacity to produce food.

Today more than 50 % of the land on the Earth is under pressure from human-induced transformation processes, and 23 % is under serious pressure that has already led or will lead to land degradation. The economic cost of land degradation is estimated to be in the order of tens of billions of euros annually.

Total groundwater depletion is estimated to have doubled over the period 1960 to 2000. In 2012, an overall increase of 2.5 % in soil erosion (per year), driven by changes in land use, was estimated. Globally, it is estimated that the productivity of the land has already gone down in over 12 % of the vegetated land of the Earth.

While land degradation is a global problem, it takes place locally and requires local solutions. Greater commitment and more effective cooperation at local level are necessary to stop land degradation and biodiversity loss. Further agricultural expansion, a leading cause of land degradation, could be limited by increasing yields on existing farmland through adapted and sustainable land use practices, shifting to plant-based diets, consuming animal proteins from sustainable sources and reducing food loss and waste.

The Atlas also contains a large number of facts, forecasts and global datasets that can be used to identify important biophysical and socio-economic processes that, on their own or combined, can lead to unsustainable land use and land degradation.

## 1.5 Commission General Objectives 1, 3, 4 and 9<sup>10</sup>

Specific objective 10:

**In order to ensure the most relevant and timely scientific support to the European policymaking, the JRC will effectively and efficiently coordinate its activities related to the management of the JRC WP cycle, of the relations with policy DGs and other policy and scientific stakeholders and knowledge management.**

Coordinated cross-cutting actions keep the JRC focussed and help in delivering its services effectively and efficiently. They help JRC strengthen its dialogue and engagement with e.g., inter-institutional partners, the EU Member States and the Horizon 2020 Associated Countries or the scientific stakeholders. In 2018, many strategic actions reached the implementation stage or became operative.

The two-year plan to strengthen strategic partnerships has got off to a good start with 45 % result at the JRC level. Several **new agreements** were concluded with international partners such as the National Centre for Climate Change Strategy and International Cooperation (NCSC) in China and the collaboration arrangement with the Brazilian Ministry of Science, Technology, Innovations and Communications (MCTIC) that was extended. Within the EU, the JRC and the French National Institute for Agricultural Research (INRA) signed a strategic partnership agreement in the fields of agriculture and climate change, formalising long-standing scientific cooperation.

In the run-up to the next **Euratom research & training programme**, the JRC together with the DG for Research and Innovation carried out a targeted stakeholders consultation and mapped out the needs with research stakeholders and representatives of Member States. JRC staff represented the Euratom in technical matters when required and managed the relevant agreements e.g., between the Japan Atomic Energy Agency and Euratom and the Euratom-US DoE. The JRC also coordinates the EC Support programme to IAEA in the field of nuclear safeguards with 39 active tasks and reporting 4 completed ones in 2018. High-stake events were organised with European organisations such as the European Institute of Innovation and Technology (EIT) and its Knowledge Innovation Communities (KICs). The African dimension was strengthened by e.g., organising a pan-African capacity-building seminar bringing together 150 African scientists and policymakers on evidence-informed policymaking in Pretoria (SA), back-to-back to the General Assembly of African Academy of Sciences and the Science Forum South Africa.

The launch and implementation of the **'Science meets Parliament/Science meets regions' Pilot Project** has created a wave of interest in the Member States. Financed by the European Parliament, the project expands the previous *ad hoc* initiatives across the whole of the EU and creates a systematic framework for them. In the course of 2018, the preparatory actions were set up, and 23 events spanning across the EU were selected, the first one being held in December 2018.

Through the **Collaborative Doctoral Partnership** (CDP) scheme, the JRC seeks to establish strategic collaborations with universities that have an international reputation in science and technology and provide doctoral studies. Following complex negotiations in 2018 the first collaboration agreements were signed with the University of Ljubljana, University College Dublin and KU Leuven and the first PhD positions published. A new **JRC Academy** aimed at bringing together under a single portal, the JRC education and training activities to share knowledge with various stakeholders outside JRC, commenced in September and the relevant training suitable for online delivery was identified.

<sup>10</sup> SO10 and SO 11 relate to the following four Commission General objectives: 1 - A New Boost for Jobs, Growth and Investment; 3 - A Resilient Energy Union with a Forward-Looking Climate Change Policy; 4 - A Deeper and Fairer Internal Market with a Strengthened Industrial Base; 9 - Europe as a Stronger Global Actor

The **Exploratory Research** (ER) programme provides an opportunity for blue sky thinking as recognised in the JRC Strategy 2030 and in line with the mandate for fostering exploratory research at JRC in Horizon 2020. In 2018, the programme became fully operational with a variety of projects and activities, all proposed through a bottom-up approach, covering 2% of JRC's resources and increasingly in emerging areas of societal concern, exceeding JRC's respective targets for 2018. The **Centre for Advanced Studies** (CAS) that seeks to ensure that the JRC effectively supports the Commission services in addressing upcoming challenges has established projects in new areas to JRC such as demographic projections, human-robot interaction, personalised policymaking and the use of Big Data for economic forecasting. Interdisciplinary research and out of the box thinking was further fostered through the **JRC Art and Science Programme** and 'Resonances' festivals. The summer school on Big Data triggered great interest among the artist, scientist and policymaker communities.

The **opening of JRC physical research infrastructures** addresses different research and industrial requirements and contributes to innovation. By the end of 2018, the JRC launched 14 calls for 12 different research infrastructures. A total 58 proposals from 87 institutions and 24 countries have been accepted, providing access to more than 200 users. Six projects were completed in 2018.

The JRC has continued **developing its role as a knowledge broker** for the Commission, striving to deliver the best available scientific evidence in support of EU policymaking and communicating it in a comprehensible manner. The new role involves mapping, collating, analysing and checking the quality of policy-relevant data, information and knowledge, and co-managing the knowledge demand together with the policy DGs, so as to identify upfront the right scientific questions in relation with policy priorities. Two new Knowledge Centres were launched on food fraud and quality and on global food and nutrition security, as well as new Competence Centres on foresight and technology transfer. The role of the JRC is further strengthened under the new Data Strategy@EC Action Plan where the JRC is in charge of two actions, the Data Catalogue and the Data Advisory (see section 2.2.3). New training initiatives on writing about science for policymakers, citizens and stakeholders, and on delivering evidence-for-policy have therefore been rolled out, in support of the general objective of well-informed European policymaking.

Specific objective 11:

**To ensure the highest quality of its policy support, the JRC will effectively and efficiently maintain scientific excellence in its core competences**

All targets for indicators related to scientific publishing were met. 71 % of JRC scientific publications were published in peer-reviewed journals and proceedings, the indicator value exceeding its target; 38 % of JRC's peer-reviewed articles were published in the top 10 % of the most-cited journals thereby exceeding the set target; and 76 % of JRC's peer-reviewed publications resulted from collaborations with scientists from other organisations and 26 % of JRC's peer-reviewed publications were co-authored with organisations from countries outside the European Research Area, both exceeding the set targets.

Moreover, with 680 peer-reviewed publications (listed in SCI-e and SSCI, data from JRC's own records system) the JRC meets its targets under Horizon 2020.

Reports on the outputs defined in the 2018 Management Plan and the indicators defined in the Strategic Plan are available in Annex 12.

## 2. ORGANISATIONAL MANAGEMENT AND INTERNAL CONTROL

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

The first subsection reports the control results and all other relevant information that support management's assurance on the achievement of the financial management and internal control objectives. It includes any additional information necessary to establish that the available evidence is reliable, complete and comprehensive, appropriately covering all activities, programmes and management modes relevant for the JRC.

The second subsection deals with the other components of organisational management: human resources, better regulation principles, information management, external communication and infrastructure.

### 2.1 Financial management and internal control

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

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

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

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

This section reports the control results and other relevant elements that support management's assurance. It is structured into (a) control results, (b) audit observations and recommendations, (c) effectiveness of the internal control system, and resulting in (d) conclusions as regards assurance.

#### 2.1.1 Control results

This section reports and assesses the elements identified by management that support the assurance on the achievement of the internal control objectives<sup>11</sup>. The JRC's

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<sup>11</sup> Effectiveness, efficiency and economy of operations; reliability of reporting; safeguarding of assets and

assurance building and materiality criteria are outlined in the AAR Annex 4. Annex 5 outlines the main risks together with the control processes aimed to mitigate them and the indicators used to measure the performance of the control systems. Annex 10 provides extensive reporting on the components of the financial management and internal control.

The JRC finances its research activities through the voted budget and supplementary credits as presented in the Table 2.1.1-1 and Figure 2.1.1-1, detailing the JRC's financing sources for 2018.

In addition, the JRC finances its research activities through the following activities:

- contractual activities (formerly called competitive activities), in line with the Council Decision C126 of 26 April 1994 on the role of the JRC that requires that additional revenue be generated through contractual activities (up to 15 % of the institutional budget<sup>12</sup>). The reader is referred to Annex 10.3 for more information on the JRC's 'revenue operations'.
- scientific support activities to other Commission services may be implemented by means of 'cross-sub-delegations' under which the JRC receives the right to use budgetary resources of other Directorates-General and Services of the Commission. The reader is referred to Annex 10.1 for more details on cross-sub delegations received and co-delegations.

In 2018, the JRC had EUR 25 918 500 (representing 4.8 % of its total financing sources in payments) allocated to **decommissioning activities**. The JRC's decommissioning and waste management (D&WM) programme was started in 1999 under the coverage of COM(1999)114 'Communication from the Commission to the European Parliament and the Council – Historical liabilities resulting from nuclear activities carried out at the JRC under the Euratom Treaty – Decommissioning of obsolete nuclear installations and waste management'. As also explained in Annex 13, this programme aims to dismantle former, obsolete EURATOM nuclear installations (historical liabilities) as well as to plan for (and execute in the future) the long-term dismantling of installations which are still in use (future liabilities). Four JRC sites are involved i.e. Ispra, Karlsruhe, Petten and Geel.

During 2018, 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 also provided cross-sub-delegations to other DGs of the European Commission. In addition, the JRC has put in place horizontal and vertical co-delegations<sup>13</sup> (art. 3.2 of the Internal Rules) with other Directorates-General of the European Commission. The services and amounts concerned for sub-delegations (both cross and co-delegations) are summarised in Annex 10.1. 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 55 % 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.

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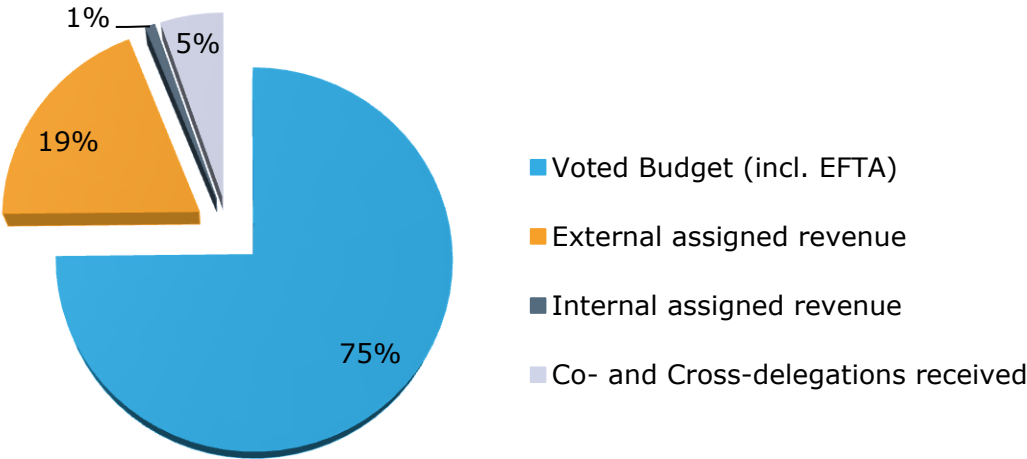
information; prevention, detection, correction and follow-up of fraud and irregularities; and adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multiannual character of programmes as well as the nature of the payments (FR Art 36.2).

<sup>12</sup> The institutional budget means 'budget for JRC (direct actions) under the Framework Programme for Research'.

<sup>13</sup> In accordance with Art. 3.2 of the Internal Rules (Decision C(2015) 1423 final of 05/03/2015 on the Internal Rules on the implementation of the general budget of the European Union (European Commission section) for the attention of the Commission department).

**Table 2.1.1-1.** Financing sources for 2018.

ABB Activities	Description	Payment appropriations (in EUR)
10 01 and 10 02	Horizon 2020 (2014-2020) - The EU Framework Programme for Research and Innovation	259 722 929
10 01 and 10 03	Euratom (2014-2018) - Research and Training Programme of European Atomic Energy Community complementing the Horizon 2020 Framework Programme	111 695 400
10 05	Decommissioning - The Decommissioning Programme pursuant to Article 8 of the Euratom Treaty	25 918 500
EFTA States Contribution		6 060 231
<b>Voted budget (total of above 4 headings)</b>		<b>403 397 060</b>
<b>External assigned revenue</b>	<b>Supplementary credits from Association Agreements to H2020 and Euratom</b>	<b>22 156 648</b>
	<b>Contractual income</b>	<b>80 777 611</b>
<b>Internal assigned revenue</b>		<b>4 326 836</b>
<b>Co- and cross-delegations received[1]</b>	<b>Co-delegations</b>	<b>11 772 442</b>
	<b>Cross delegations</b>	<b>16 608 593</b>
<b>Grand total financing sources 2018 in payments<sup>14</sup></b>		<b>539 039 190</b>



**Figure 2.1.1-1.** Financing sources in payment appropriations.

<sup>14</sup> More information on co- and cross-delegations can be found in Annex 10.1.

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 5.

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 5. The type of procurement procedures carried out by the JRC during 2018 is described in Annex 10.2.

The JRC has a mandate to carry out revenue generating operations through contractual activities (formerly called competitive activities), which may be defined as the provision by the JRC of scientific and technical services to other bodies both within the European Institutions and for third parties. Annex 10.3 provides details on the JRC's mandate, the type of such contracts and information on the contracts signed during 2018.

The additional income generated through contractual activities is used for purchasing scientific equipment and services, hiring temporary staff, and for financing part of the JRC's infrastructure used for these tasks. A RCS covering the JRC's income from contractual activities is available in Annex 5.

The financial circuits in the JRC are based on the 'four eyes principle', which ensure that, before any operation is authorised, all aspects of the operation (both operational and financial) are verified by at least one member of staff other than the person who initiated the operation. In 2018, the JRC financial circuits were revised to simplify the workflows and reflect a new organisational structure. The new version of financial circuits entered into force in January 2018. In 2018, the JRC had 4 types of financial circuits models in place which are described in detail in Annex 10.4. The type of financial circuits chosen is determined by the nature of the financial transaction which is undertaken, as well as by geographical considerations. Circuit 1 is the model which is used for the majority of transactions at the JRC, in which there is a clear segregation between the operational and financial roles, respectively, and financial agents are hierarchically independent from the authorising officer. Transactions relating to decommissioning, scientific activities and income-generating activities fall under the financial circuit 1. In any event, all staff having the role of financial agents are based in the financial units of the Support Services (previously 'Resources') Directorate.

Based on the results from the Table 2.1.1-2, the JRC concludes that the control results are factual, complete and reliable.

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 2.1.1-2).

**Table 2.1.1-2.** Overall control results conclusion table.

Internal Control Objectives	Procurement in direct management mode	Revenue operations through contractual activities	Non Current Assets & Inventories
Legality & regularity	Average error rate <sup>15</sup> below 0.5 %	Average error rate below 0.5 %	Positive conclusion
Cost-effectiveness of controls	Positive conclusion (Costs/total payments executed) = 5.46 %)	Positive conclusion (Costs/total contractual project proposal) = 0.25 %	N/A
Anti-fraud strategy (AFS)	Area covered by the AFS	Area covered by the AFS	N/A
Other control objectives: safeguarding of assets	N/A	N/A	Positive conclusion
<b>Totals coverage</b>	<b>EUR 233 190 314<sup>16</sup></b>	<b>EUR 80 777 611<sup>17</sup></b>	<b>EUR 258 712 208</b>
<i>Links to Annex 3</i>	<i>Table 2 – Payments made</i>	<i>Table 7 – Revenue cashed</i>	<i>Table 4 - Assets</i>

### 2.1.1.1 Effectiveness

#### 2.1.1.1.1 Legality and regularity of the transactions

The JRC has set up internal control processes aimed to ensure the adequate management of the risks relating to the legality and regularity of the underlying transactions, taking into account the multiannual character of programmes as well as the nature of the payments and revenue concerned.

The control objective is to ensure that the JRC has reasonable assurance that the total amount of any financial operation authorised during the reporting year, which would not be in conformity with the applicable contractual or regulatory provisions, does not exceed 2 % of the authorised payments or revenue concerned. To reach this conclusion, the JRC reviewed the results of the key controls in place (as described below). For each item, materiality is assessed in accordance with Annex 4.

The main risks together with the control processes aimed to mitigate them and the indicators used to measure the performance of the control systems, are outlined in Annex 5.

#### a. Procurement in direct management mode

Financial management and control of 'Procurement in direct management mode'

<sup>15</sup> For the estimation of the average error rate the reader is referred to Table 2.1.1.1-2.

<sup>16</sup> For the purposes of cost of controls the total amount includes all payments initiated and verified at JRC level. This is different from the figure for payments in the "summary key data" which only considers payments authorised by the JRC.

<sup>17</sup> This value represents the revenue cashed from contractual activities in 2018, which is an amount different from the total revenue and income cashed reported in Annex 3 Table 7. The latter includes other revenue sources (such as HFR related) and other contributions and refunds received.

(Annex 5 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:

- 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**

Control overrides or deviations from standard policies and procedures are tracked and recorded as reports in the register of exceptions. When signalling an exception or a non-compliance event, managers are required to report on any envisaged corrective measures and/or follow-up actions. The follow-up of the exceptions and other non-compliance events is part of the regular reporting of the authorising officers by sub-delegation to the authorising officer by delegation. The register of exceptions is regularly reviewed to determine whether the frequency or the nature of the exceptions registered should prompt a revision of the JRC's procedures.

In total 68 exceptions and non-compliance events were recorded in the central register in the JRC in 2018 and 17 of these were classified as exceptions, being the majority non-compliance events, i.e. errors. The exceptions were linked to deviations from standard financial and procurement procedures which cannot be directly associated with a material loss. They were mainly associated with decisions to deviate from the original contract provisions i.e. extension of contract duration or derogation to procedures. Decisions taken by the management which led to exceptions were justified in terms of operational objectives, e.g. business continuity or efficiency. The non-compliance events were in their vast majority associated with *saisine a posteriori* situations where the budgetary commitment was made after the legal commitment.

To put the exception reporting into context, the JRC dealt in 2018 with 28 084 transactions and most of them (20 568) were payments. The exceptions and non-compliance events amount to 0.24 % of the total number of transactions, meeting the target set in the Management Plan (less than 1 % of transactions subject to exception).

The reporting year showed a stability in the number of non-compliance events registered.

### **The Public Procurement Advisory Group**

The Public Procurement Advisory Group (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 negotiated procedure contracts based on the Financial Regulation 2018 (hereafter FR), Annex 1, point 11. 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.

In 2018, 209 files were submitted to the PPAG; 122 of them were not selected by the sampling system (representing a value of roughly EUR 18 million) and 87 files were

screened by the PPAG, representing a value of approximately EUR 180 million. In the vast majority of cases (84 files, representing 97 %), this scrutiny resulted in a favourable opinion being issued, which maintains the positive trend in the past years<sup>3</sup> procedures were or will be relaunched after having received unfavourable opinions or because they were withdrawn before the formal opinion.

During 2018, the PPAG was informed about 2 files not submitted to the PPAG for review, although their submission would have been compulsory. Those two files relate to very specific situations for which exceptions were duly registered.

This demonstrates that the PPAG is an effective *ex-ante* instrument for avoiding procedural errors and ensuring the respect of the procurement principles, thus preventing complaints by tenderers in those procedures.

### **Accounting controls**

The main aim of accounting controls is to assure the quality and reliability of the accounts and underlying transactions through methodical checks on the accounting records (data) and timely communication and correction of the errors. The controls carried out in 2018 have followed the Annual Accounting Quality Plan. 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 Financial Regulation.

The controls on the General Ledger (GL) account of invoices were performed on a sample of payment transactions equivalent to 76 % of the monetary value of invoices and internal documents registered by the JRC.

Errors for 'Assets wrongly treated as expenses' found in the sample and having an impact on the accounts amounted to EUR 2.4 million and these were duly corrected. The estimated errors on the remaining invoices and documents not sampled (24 %) is estimated at EUR 0.8 million.

Errors where a wrong economic outturn category (operational vs administrative expenditure) was chosen, amounted to a net EUR 50 857 and these were considered immaterial and thus not subject to a required correction as per EC accounting closure guidelines but documented for internal and audit purposes. Additional checks on the administrative expense category revealed a total amount of EUR 1.1 million. Corrections were done and the correct administrative GL account was chosen. This latter type of error has no impact on the accounts.

Considering the correction of errors carried out and that the sample has been taken using a risk-based methodology, the overall estimated error rate is less than 0.4 % thus confirming the reliability of the JRC's accounts. It is important to highlight that all the errors mentioned above are of an accounting reclassification error and which do not lead to irregular payments.

There are no more open recommendations in the context of Directorate-General for Budget's validation of local systems as these have been satisfactorily closed during 2018.

### **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.

The JRC's *ex-post* controls strategy is implemented using a representative stratified sampling methodology at site/sector level (1 file for payments lower than EUR 1 000; 2

to 3 files for payments between EUR 1 000 and EUR 15 000; 4 to 5 files for payments between EUR 15 001 and EUR 60 000; 4 to 5 files for payments between EUR 60 001 and EUR 135 000; 3 to 4 files for payments above EUR 135 000 and 2 files for payments corresponding to the 10 highest value time). The sampling is done at JRC site level (Brussels, Geel, Petten, Karlsruhe, Seville and Ispra) with an additional split for Ispra to cater for the two Ispra finance and procurement sectors. The two Ispra sectors are subject to the review of an additional *ex-post* controller, as a result of the importance in size and the number of files sampled.

In 2018, *ex-post* controls were carried out on 120 sampled payments<sup>18</sup> and 79 associated procurement files related to legal commitments (including specific contracts on framework contracts) entered in the course of the year. The procurement procedures are also subject to the *ex-ante* verification of the PPAG and during the reporting year procurement procedures of approximately EUR 180 million were screened by the PPAG.

Whilst a variety of formal errors were noted, no systematic errors or weaknesses in the JRC's control system were observed and no procurement issues were identified. The findings relate mainly to the lack of certain formalisation aspects in the finalisation of the procedures which did not lead to a financial loss for the JRC and *saisines a posteriori* situations, of a small financial value, where the budgetary commitment was made after the legal commitment. The only quantifiable error detected was the incorrect registration of payment delay of 30 days (instead of 60) which led to the incorrect payment of late interest to a supplier which resulted in an immaterial error of less than EUR 581. The JRC's detected error rate is 0 % confirming the trend of the past years and indicating that there are no issues concerning the JRC's procurement and payments activities. The *ex-post* findings have been discussed with the units concerned and an agreement on both the findings was reached. Corrective actions will be taken and the formalisation aspects noted from the *ex-post* supervisory controls will be included as part of the ongoing training courses and lessons learnt, thus leading to continuous improvement in the procurement process.

**The JRC's detected error rate from the *ex-post* controls is 0 %, confirming absence of issues concerning its procurement and payment activities.**

Details of the 2018 *ex-post* controls exercise can be found in Table 2.1.1.1-1.

**Table 2.1.1.1-1.** Results of 2018 *ex-post* controls.

Sampled transactions	Sample size: number	Sample size: value (EUR)	% of total value of transactions	Detected error rate (% of total)
Payments	120	29 576 528	12.6 %	0 %
Procurement	79	11 871 287	5.1 %	0 %

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 %**.

**Assurance statements from sub-delegated authorising officers**

The authorising officer by delegation (AOD) has the overall responsibility for budget execution. For the AOD to be able to efficiently exercise these duties, (s)he is assisted by competent staff; the authorising officers by subdelegation (AOSD). Once a year, the latter have the obligation to submit an assurance statement, reporting to the AOD on financial and management information, including the results of controls of their related activities.

<sup>18</sup> Includes payments carried out by JRC using cross sub-delegations received.

Assurance statements were provided by the JRC's AOSD in compliance with the reporting requirements detailed in the 'Charter of tasks and responsibilities of authorising officers by sub delegation'<sup>19</sup>. The 131 officers concerned include all of the JRC Deputy Directors-General, Directors, the Heads of Unit and Deputy Heads of Unit (exercising AOSD roles) and a few non-management AOSD. All officers provided an assurance statement and all of them have assured the Director-General that in exercising their duties:

- they have effectively managed the risks associated with their activities;
- they were not aware of any matters of importance which might compromise the sound management of appropriations or prevent the attainment of objectives;
- they have filed under their authority exceptions/non-compliance events linked to not respecting standard procedures, rules and regulations, if any;
- a request for written confirmation<sup>20</sup> has never been formulated;
- they have not noted incidents which could damage the reputation of the organisation.

The large majority of AOSD have completed the trainings in internal control (72 %), risk management (83 %) and the expenditure life cycle (88 %), and those of the others who remain the JRC have committed to participate during 2019. Training on ICF tailored to the JRC was available from June 2018.

Changes in the AOSD in 2018: 4 authorising officers ceased to act as such, out of whom 2 left the JRC; 22 new were appointed. Out of the 22 staff members that declared taking up new functions and duties in 2018, the 12 officers who should receive (predecessor existed) a complete report in writing on the situation, risks and problems related to their functions, did. 12 AOSD were appointed as DHoUs where no predecessor existed.

## **b. Revenue operations through contractual activities**

The JRC generates income through providing, under contract, scientific and technical services to customers both within and outside the European Institutions. All income and expenses for contractual activities are subject to ex-ante controls and to the JRC financial circuits, involving a segregation of duties between the initiating and verifying functions.

Financial management and control of the JRC's revenue operations through contractual activities (Annex 5 RCS No 2) is grouped around three phases: 1) contract proposal (assessment and valuation of proposal), 2) contract preparation (from signature of contract to forecast of revenue<sup>21</sup>) 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 (as mentioned above under the description on the Procurement controls), i.e. exception reporting, PPAG controls for supplies/services procured for carrying out contractual activities, accounting controls, ex-post controls on related payments and procurement, and the AOSD statements. None of these controls unveiled errors with impact on compliance of the revenue transactions.

During 2018, as a result of the JRC's financial circuits, 9 % of the forecast of revenue transactions and 5 % of recovery orders<sup>22</sup> (i.e. invoices) have been subject to correction.

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<sup>19</sup> With particular reference to sections 4.1, 4.3 and 4.8

<sup>20</sup> In accordance with the requirements of Article 92.3 of the Financial Regulation 2018

<sup>21</sup> Forecast of revenue (FOR) transactions are estimate of amounts receivable in the context of the JRC's contractual activities, resulting in provision of commitment appropriations (FR Art. 183.2).

<sup>22</sup> The term 'recovery orders' for the JRC contractual activities refers to the issuing of invoices to its customers and it is not related to the recovery orders issued to recover erroneous amounts due.

These errors did not materialise due to the effectiveness of the *ex-ante* controls carried out.

Support to Commission services is the main source of income and recovery orders issued to these services are subject to verification and approval. Furthermore, the paying Commission services can perform additional verification or audits on financial reports submitted by the JRC. With respect to indirect actions an independent auditor verifies the financial statements prior to submission for reimbursement. During 2018, the independent auditor certified 7 financial statements submitted to the policy DGs, for a total amount of EUR 7.2 million. None of these independent controls unveiled errors with impact on legality and regularity of the revenue transactions.

According to the Financial Regulation, the commitment appropriations inscribed for administrative arrangements with other Commission Services are valid for 5 years. In 2018, EUR 71.8 million have been generated in commitment appropriations. During the same period EUR 69.3 million have been used. The remaining appropriations have to be used within the next 4 years and any unspent appropriation will be cancelled at the beginning of 2023. The JRC monitors the annual utilisation of these funds through a specific reporting tool.

It can be concluded that the controls carried out on the contractual activities contribute to the legality and regularity of the JRC's revenue operations.

### **c. Conclusion on the assessment as regards legality and regularity**

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

In the context of the protection of the EU budget, at the Commission's corporate level, the DGs' estimated overall amounts at risk and their estimated future corrections are consolidated. For the JRC, the estimated overall amount at risk at payment<sup>23</sup> for the 2017 expenditure is EUR 1.1 million, despite the fact that the detected error rate was 0 %, the JRC estimated its Average Error Rate (AER) to be 0.5 %, the latter being a more conservative and prudent approach. This is the AOD's best, conservative estimation of the amount of relevant expenditure<sup>24</sup> during the year (EUR 215 million) not in conformity with the applicable contractual and regulatory provisions at the time the payment is made.

**The JRC concludes that the internal control systems it implements provide sufficient assurance to adequately manage the risks relating to the legality and regularity of the underlying transactions.**

This expenditure will be subsequently subject to *ex-post* controls and a sizeable proportion of the underlying error will be detected and corrected in successive years. The conservatively estimated future corrections<sup>25</sup> for the 2018 expenditure are EUR 0.1 million. This is the amount of errors that the JRC conservatively estimates to

<sup>23</sup> To calculate the weighted average error rate (AER) for the total relevant expenditure in the reporting year, the detected error rate has been used.

<sup>24</sup> 'Relevant expenditure' during the year = payments made, minus new pre-financing paid out plus previously paid pre-financing which was cleared in the reporting year.

<sup>25</sup> Even though to some extent based on the 7 years historic average of recoveries and financial corrections (ARC), which is the best available indication of the corrective capacity of the *ex-post* control systems implemented by the JRC over the past years, the AOD has used historic average. The JRC did not consider it necessary to do an adjustment due to the nature and insignificance in terms of the amount of the coding error.

identify and correct from controls that it will implement in successive years. The difference between those two amounts leads to the estimated overall amount at risk at closure of EUR 1 million.

Details of the JRC's estimated overall amount at risk at closure and estimated future corrections can be found in Table 2.1.1.1.1-2.

**Table 2.1.1.1.1-2. Estimated overall amount at risk at closure**

JRC	Payments made in 2018 (EUR)	Minus New <sup>26</sup> prefinancing (EUR)	Plus Cleared <sup>27</sup> prefinancing	= 'relevant expenditure' <sup>28</sup> for 2018 (EUR)	Average Error Rate ( <i>weighted AER</i> ; %) <sup>29</sup>	estimated overall amount at risk at payment (EUR)	Average Recoveries and Corrections ( <i>adjusted ARC</i> ; %)	estimated future corrections (EUR)	<b>estimated overall amount at risk at closure (EUR)</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Programme Budget line, or other relevant level		<i>As per ABAC DWH BO report on prefinancing</i>	<i>As per ABAC DWH BO report on prefinancing</i>	= (2)-(3)+(4)	<i>Detected error rates, or equivalent estimates</i>	= (5) x (6)	<i>based on 7Y-avg historic ARC (as per ABAC DWH BO report on corrective capacity)<sup>30</sup></i>	= (5) x (8)	= (7) - (9)
Total payments	213 551 302 <sup>16</sup>	(2 084 153)	3 386 868	214 853 986	0.5 %	1 074 269	0.05 %	107 427	966 843

<sup>26</sup> New PF actually paid by out the DG itself during 2018 (i.e. excluding any PF received as transfer from another DG)

<sup>27</sup> PF actually having been cleared during 2018 (i.e. their 'delta' in 2017 'actuals', not their 'cut-off' based estimated 'consumption')

<sup>28</sup> For the purpose of equivalence with the ECA's scope of the EC funds with potential exposure to L&R errors, also our concept of 'relevant expenditure' includes the payments made, subtracts the new pre-financing paid out and adds the previous pre-financing actually cleared during 2018. This is a separate and 'hybrid' concept, intentionally combining elements from the budgetary accounting and from the general ledger accounting.

<sup>29</sup> Since the detected error rate is 0 %, the JRC estimated its average error rate (AER) by taking a most conservative and prudent approach and estimating it to be at 0.5 %.

<sup>30</sup> Even though to some extent based on the 7 years historic average of recoveries and financial corrections (ARC), which is the best available indication of the corrective capacity of the *ex-post* control systems implemented by the JRC over the past years, the AOD has used historic average. The JRC did not consider it necessary to do an adjustment due to the nature and insignificance in terms of the amount of the coding error.

### **2.1.1.1.2 Fraud prevention and detection**

The JRC has developed and implemented its own anti-fraud strategy (AFS) since 2013, elaborated on the basis of the methodology provided by OLAF. At the end of 2017, the JRC's anti-fraud strategy and its action plan were updated to contribute to the Commission's anti-fraud strategy update and take into account the latest OLAF's methodological guidance in this respect.

In principle, the controls aimed at preventing and detecting fraud are similar to those intended to ensure the legality and regularity of the transactions. Still, each year the JRC assesses the risk of fraud in the context of its process-based risk management exercise. Activities and operations that are assessed to be potentially vulnerable to a higher risk of fraud are subjected to more in-depth monitoring and control.

The main focus of the action plan is on the integration of the anti-fraud component in the organisation's business processes and on an awareness-raising campaign, including training, in the area of anti-fraud and ethics. During 2018, JRC offered tailored ethics training to its staff, with 120 participants 21 % of which newcomers. Scientific quality and integrity of results were discussed in the JRC Management meeting in October 2018, and a quiz was launched testing the participants' awareness of situations of conflicts of interest and the potential solutions.

As part of the annual assessment of the functioning of the JRC internal control systems (presented in section 2.1.3), with respect to the ethical climate, the anti-fraud awareness of staff was measured via the survey on internal control against a target of 4, using the rating scale of 1 for fully disagree to 5 for fully agree or equivalent. This assessment resulted in a rating of 4.6 for management (4.5 in 2017) and 3.1 (3.8 in 2017) for other staff; to be noted that 18 % of staff (other than management) replied 'Don't Know'.

At the end of 2018, 2 IDOC<sup>31</sup> cases involving the JRC were pending and 2 were definitively closed. None of these cases have impact on the JRC assurance.

In conclusion, the anti-fraud measures already in place, including the controls performed through *ex-ante* and *ex-post* controls, did not identify any cases of fraud or potential fraud in 2018.

### **2.1.1.1.3 Other control objectives: safeguarding of assets**

The JRC is spread over six sites in five different countries with a total number of fixed assets of about 50 000 with a net booking value of about EUR 200 million. The fixed assets are ranging from simple office furniture to complex scientific and laboratory equipment, including nuclear facilities and buildings.

The following measures are put in place to counterbalance the main risks potentially affecting the JRC sites, i.e. accidents, unauthorised access, intentional acts against safety and security including against the protection of sensitive documents. Regular safety inspections are being carried out on JRC sites regarding laboratory facilities and hazardous materials, by the JRC itself, external consultants and visits by national authorities. Organisational measures are implemented to ensure that access to JRC sites and critical assets are controlled. Personal security clearances are issued to those staff required to deal with classified information. Certification of laboratories and directorates to internationally recognised quality management standards helps to offset risks and ensure compliance with norms and regulations.

The JRC assets comply with the following criteria: a) acquisition value above EUR 5 000, b) controlled by the JRC, c) expected to be used during more than one reporting period.

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<sup>31</sup> Investigation Disciplinary Office of the Commission

Items with an acquisition value below the EUR 5 000 threshold are booked as expenses in the accounts. Nevertheless the JRC records sensitive items below this threshold in the Inventory System (ABAC ASSETS) to have control over them.

The organisation of asset management in the JRC is determined by the nature of the activities. There is a management centre per operational site, having functions as Inventoried Items Manager/Gestionnaire des Biens Inventoriés (IIM/GBI). Each site has a Write-Off Committee that supervises the site asset management activities and issues an annual activity report. The JRC asset manager and the JRC accountant provide support and coordination to the operational sites and liaise with the Commission Services in matters concerning asset management.

While the triennial controls do not constitute a FR requirement anymore (after the 2018 revision), the JRC continues to carry out such physical localisation checks of inventoried items every three years.

The JRC owns stock with a value of EUR 51 million (as reported in the JRC's Balance Sheet in Annex 3, Table 4).

The JRC site in Geel produces reference materials for sale. A specific IT tool, PROFIT, is used for the management of stock and sales of reference materials. The valuation of the JRC stock is carried out, according to International Public Sector Accounting Standards (IPSAS) rules at the net realisable value, which is estimated to be lower than the production cost. The stocktaking in 2018 was carried out in accordance with the approved sampling procedure using a method which had not been subject to a finding from ECA during their Statement of Assurance (DAS) audits.

The JRC has a stock of nuclear fissile materials for research purposes in its sites in Geel, Karlsruhe and Ispra. A dedicated accounting tool is used to ensure that all requirements of the Euratom agency are met which guarantees the correctness of the stock movements of these materials.

The Central Workshop Store in Ispra manages a stock of raw-materials, using the store management application COSWIN, which is used in the scientific laboratories and for site management purposes.

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.

#### **2.1.1.2 Efficiency**

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.

##### **a. Procurement in direct management mode**

A quantitative estimation of the volume of errors prevented and detected is not available, therefore it is not possible to quantify the related benefits, other than the EUR 255 155 recovered as a result of these controls (Annex 3, Table 8). The main benefit is that the controls performed ensure that errors are detected and corrected and that potential litigations or contestations from tenderers are kept to a minimum.

In consequence, as it is not possible to determine the cost-effectiveness of controls by comparing costs with benefits, it is necessary to consider the efficiency indicators retained. To do so, the JRC has defined efficiency measures for the controls associated with the three main stages, the first 2 stages performed ex-ante and the third stage, ex-post:

- For procurements, an estimated EUR 5 534 634 were invested in controlling 372 procurement procedures for contracts with a total value of EUR 211 196 334. Thus 2.62 % of the total contract value was dedicated to control. This covers all types of procurement, ranging from low-value contracts, for example purchase of low-value laboratory equipment, to high value extremely complicated contracts such as in the area of satellite images. The cost of control on procurement has increased by 3.7 % compared to last year which is complemented by an increase in the number of procurement procedures closed during the year. The procurement procedures are to a large extent a regulatory requirement which cannot be curtailed. In addition, the JRC considers that the necessity of these controls is undeniable, because as shown by the risks outlined in Annex 5 (RCS No 1), a significant proportion of the appropriations would be at risk in case they would not be in place.
- For financial circuits an estimated EUR 7 198 217 were invested in controlling 28 025 financial transactions worth EUR 233 190 314. Thus 3.09 % of the total payment amount was dedicated to control. Despite the increase the average cost of staff, the overall cost invested in controlling financial transactions has decreased by 7.68 % which is complemented by the fact that the number of financial transactions is similar to last year. Each financial transaction costs an estimated EUR 257, which is 3.74 % lower when compared to 2017.

The timeliness of payments for 2018 (93 %) score a slightly below the target (95 %) and is steady at the same average of the last 2 years. The average is heavily affected by the late payments occurring in January (timeliness of 77.8 %) and February (timeliness of 85.5 %) due to the carry-over activities. Constant efforts are made to ensure that the vast majority of the payments are made within the legal time limits.

#### **b. Revenue operations through contractual activities**

The costs of controls incurred for the three main phases of the JRC's revenue operations through contractual activities have been estimated. The criteria for the calculation and the indicators used are shown in in Annex 5 RCS No 2. As mentioned in the previous section, it is not possible to quantify all of the costs and benefits of controls. Estimating the intangible benefits is particularly problematic. The JRC has, nonetheless adopted the following efficiency indicators for the controls associated with the three stages of the revenue process which are performed *ex-ante*:

For the contract proposal phase, an estimated EUR 22 940 was invested in assessing the risk and reviewing 124 contractual project proposals with a total value of EUR 80 291 704. Thus 0.03 % of the total contractual project proposal value was dedicated to carrying out a risk assessment and management review, with a cost of EUR 185 per proposal. For support to Commission contracts an additional 0.02 % of the total contractual project proposal value is incurred for high-level management review. The third party work (TPW) type of contracts incurred an additional 0.15 % of the total contract value for requesting up-front payments. The latter additional cost has led effectively to no default on TPW contracts.

For the contract preparation phase, an estimated EUR 11 470 was invested in reviewing the contract wording and ensuring these are in line with standard clauses, which represents 0.01 % of the total value of the signed contractual contracts with a cost of EUR 93 per contract. For the financial circuits carried out on forecasting of revenue, an estimated EUR 29 138 was invested in controlling 210 forecasts of revenue (FORs) worth EUR 80 291 704. Thus 0.04 % of the total forecast of revenue amount was dedicated to control with an estimated cost of EUR 139 per FOR transaction.

For the contract implementation phase, an estimated EUR 91 159 was invested in monitoring budget consumption of the contractual contracts and reviewing the recovery orders (ROs) issued, which represents 0.11 % of the RO values.

When required, an independent auditor carries out *ex-ante* audits on Framework Programme (FP) contracts with a reimbursable direct cost higher than EUR 325 000. Each audit has a fixed cost of EUR 1 500 and the total costs of the audits in 2018 amounted to EUR 10 500 representing 0.15 % of the value of contractual projects audited.

An *ex-post* control process, specifically for contractual activities, was established for the first time during 2018. An estimated EUR 8 140 was used to review 16 contracts representing 0.01 % of the cashed income from contractual contracts.

**The JRC concludes positively on the cost-effectiveness of its revenue operations and on the efficiency of the contractual cashing indicator.**

The contractual cashing indicator (as a percentage of the institutional budget) has decreased from 23.51 % of last year to 21.68 %, which remains significantly higher than the target of 15 % and clearly evidencing the efficiency of the controls performed. The JRC has reached a

positive conclusion on efficiency of contractual cashing indicator.

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

### **2.1.1.3. Economy**

#### **a. 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 5 RCS No 1.

The overall cost of control related to 'procurement in direct management mode' in 2018 was EUR 12 741 569, which represent 5.46 % of the total payments executed by the JRC during the year. The overall cost of control decreased by 3 % compared to 2017 (in which cost decreased by 5 % relative to 2016).

Cost of control – supervisory: For supervisory *ex-post* measures, an estimated EUR 89 288 were invested, which represents 0.04 % of the total payments executed by the JRC during the year.

#### **b. Revenue operations through contractual activities**

The overall cost of control related to 'revenue operations from contractual activities' in 2018 was EUR 201 744, which represents 0.25 % of total contractual project cashed value for the year. The overall cost of control indicator has increased slightly from last year's indicator value of 0.22 %, due to an increase in low value transactions for open labs and the implementation of the *ex-post* control exercise.

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 5 (RCS No 2).

### **2.1.1.4 Conclusions on the cost-effectiveness of controls**

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

The error rates and the cost of controls remain below the targets, and the timeliness of payments is close to the target. The timeliness is heavily affected by carry-over activities not linked to controls.

### 2.1.2 Audit observations and recommendations

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

#### 2.1.2.1 IAS audits

##### 2.1.2.1.1 New audits during reporting period

The final reports on the 4 audits carried out during 2018 were issued in December 2018/January 2019 and action plans are being drafted. There are 5 very important and 4 important recommendations, all of which were accepted by the JRC (see Table 2.1.2.1-1). No critical recommendations were identified.

**Table 2.1.2.1-1.** Recommendations in new audit reports (December 2018/January 2019)

New audits	Recommendations by rating	
	Very important (VI)	Important (I)
Nuclear Decommissioning & Waste Management programme (D&WMP)	1	1
HR management - recruitment of temporary scientific staff	2	1
Intellectual Property Rights (IPR)	2	2
Synergies and efficiencies Review	0	0
<b>Total</b>	<b>5</b>	<b>4</b>
<b>Grand total</b>	<b>9</b>	

The two recommendations in the audit on 'D&WMP' relate to HR management (VI) and IT tools supporting the implementation of the programme (I). The JRC is reviewing existing competences and will elaborate an HR plan in the field of D&WM, for addressing the IAS recommendations. Furthermore, the existing IT tools will be mapped to allow synergies assessment. The JRC action plan was approved by the IAS.

The audit 'HR management - recruitment of temporary staff' recommends establishing consolidated recruitment plans (VI), improving the monitoring tools (VI) and better document the recruitment process (I). The JRC has adopted a tool for competency mapping after a pilot phase, and has analysed competency requirements per policy area allowing it to identify existing competences as well as recruitment needs. While the JRC is further analysing how to improve its indicators for monitoring the timeliness of recruitment, the existing indicator (and its time series) provides a control instrument for the overall process. The JRC action plan was approved by the IAS.

The audit 'Intellectual Property Rights' (IPR) addressed the IPR service of the Commission, hosted by the JRC, with recommendations on IPR management (VI),

operating procedures (I), the IPR network in the DGs (I), and an IPR software and IT solutions ((VI) jointly with DG Informatics). On the IPR management, the IAS recommended the completion of a dynamic Intellectual Property inventory which now stands at more than 50 % completion (EURECA). While the existing Vademecum on IPR, provides a scheme for IPR management, it will however be replaced by a more dynamic tool, to incorporate various aspects of IPR assets. The IAS also requested that the JRC seeks simplification of the decision-making process when licencing out or registering IP assets; during 2018 the JRC already initiated the appropriate discussions with other DGs in this respect. On the IPR software and IT solutions, the JRC together with DG Informatics will elaborate appropriate guidelines for establishing a Commission policy for regulating the dissemination of EU-owned software. A complete action plan is under IAS review.

The audit 'Synergies and efficiencies review' did not address the JRC in its findings or recommendations. The JRC was included in this review because it manages eProcurement which is part of the Commission's synergies and efficiencies' processes.

No cross-cutting (systemic) risks were identified in the audits.

#### 2.1.2.1.2 IAS follow-up audits

In 2018, of 14 open recommendations, more than half (8) were submitted to the IAS for review, out of which 5 were closed as adequately and efficiently implemented. One audit was closed (document management<sup>32</sup>) with the completion of 2 remaining (important) recommendations, and another 3 (important) recommendations were closed (audit on competitive activities). 2 further recommendations (on ICT security) were submitted for review. There are currently no long overdue very important or important recommendations.

**Table 2.1.2.1-2.** State of play as at 31/1/2019 of recommendations implemented and submitted to the IAS for review in 2018.

JRC Recommendations Implementation <sup>33</sup>	Important	Very important	Closed by the IAS	Under IAS review
Document management	2	0	2	0
Intra-muros contractors	1	0	0	1
ICT security	0	2	0	2
Competitive activities	3	0	3	0
<b>Total</b>	<b>6</b>	<b>2</b>	<b>5</b>	<b>3</b>
<b>Grand total implemented and submitted for review</b>	<b>8</b>			

<sup>32</sup> Issued by the former JRC Internal Audit Capability

<sup>33</sup> By implementation means that the JRC has completed all mitigating actions agreed and has submitted these actions to the IAS for review. The outcome of the IAS review could be:

- a) to close the recommendation as adequately and efficiently implemented,
- b) to reopen it as non-efficiently implemented or
- c) to reopen and downgrade it (applicable to 'very important recommendations' only).

On 'Document management', a strategy to deal with paper archives and access rules has been established. This strategy has been deemed as effective and adequate by the IAS, which closed this audit.

On 'Competitive activities', the three recommendations which were closed, concern the 'planning process', the 'administrative management' and the 'guidance and supporting IT tools'. Only one action (definition of competitive income target) is pending with a deadline for the end of 2019 in order to complete the full mitigation of risks identified in this audit. This action is on track.

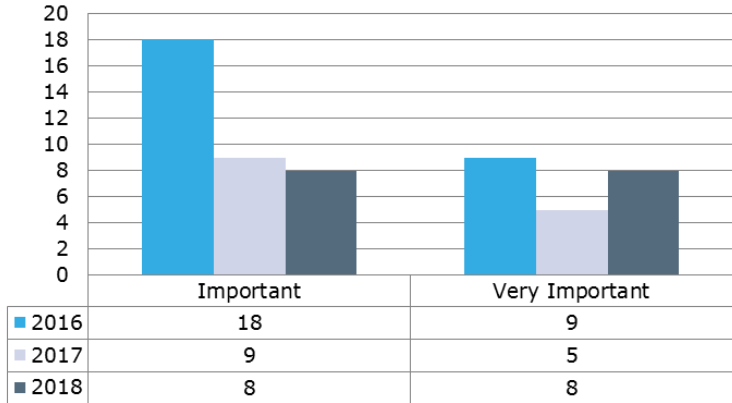
On '*intra-muros*' contractors, a strategy has been defined as required by the IAS. This recommendation has been submitted to the IAS for review.

On 'Document management', a strategy to deal with paper archives and access rules has been established. This strategy has been deemed as effective and adequate by the IAS, which closed this audit.

On 'ICT Security', important progress was made during 2018 which led to submitting two recommendations for review. Additionally, a great part of the actions for the pending recommendations were completed. The deadlines for the two pending very important recommendations had to be postponed because of their complexity and partial dependence on actions not under JRC control. Overall, 80 % of the audit actions have been implemented. JRC has taken steps to secure the existing IT systems while working on a longer-term systemic solution. An ICT security policy and revised KPIs were adopted in 2018. In early 2019, an ICT reference architecture was adopted after an extensive analysis and consultation of all stakeholders. This progress could not be reviewed and taken into account by the IAS since the recommendations are not marked by the JRC as 'fully implemented'.

**2.1.2.1.3 Audits under implementation**

On 'Scientific project management' (one very important recommendation and 3 important ones), a working group has started to develop a common project management methodology for the JRC (which is at the core of the different recommendations). The JRC's ability to monitor the execution of the work programme has been enhanced with a monitoring tool at the level of deliverables in the JRC's project information system (JRC Project Browser). The quality of scientific outputs is monitored via quality assurance and customer surveys (for deliverables under administrative arrangements).



**Figure 2.1.2.1-1. Overview of open audit recommendations in the JRC<sup>34</sup>.** This takes into account the new recommendations issued in January 2019 (5 VI and 4 I recommendations).

<sup>34</sup> Cut-off day for each year n is the last day of January of the year n+1, eg cut-off day for 2018: 31/01/2019

## **2.1.2.2 ECA audits**

### **2.1.2.2.1 ECA's Annual Report**

As part of the Statement of Assurance (DAS – Declaration d'Assurance) for 2017<sup>35</sup>, the ECA reviewed two JRC transactions for which, no finding was reported. The JRC is therefore not quoted in the ECA's annual report<sup>36</sup> 2017.

In 2018, the ECA reviewed five JRC transactions. For three of them (one on Horizon 2020 agreement/grant implementation, one on office supply contract and one on salary) the review was concluded and closed with no findings. For the rest of the transactions the review is ongoing.

#### **2.1.2.2.2 Follow-up of ECA recommendations**

During 2018, the JRC:

- continued its contribution as an associated DG, together with other Commission services, to the implementation of two recommendations of SR No 14/2014 'How do the EU institutions and bodies calculate, reduce and offset their greenhouse gas emissions'. Both recommendations were implemented by the end of 2018, as scheduled.
- completed the implementation of two important recommendations issued through the SR No 14/2018 on 'The EU Chemical, Biological, Radiological and Nuclear (CBRN) Centres of Excellence: more progress needed'. This audit constituted a follow-up audit of the actions taken to implement the recommendations in the SR No 17/2014<sup>37</sup>. The SR 14/2018 issued six recommendations, for two of which JRC was assigned as lead DG<sup>38</sup>. The two important recommendations referred to updating the CBRN web-based portal and ensuring that best practices and guidelines are accessible through it.
- took over from DG Agriculture and Rural Development and implemented a recommendation stemming from SR No 24/2014 'Is EU support for preventing and restoring damage to forests caused by fire and natural disasters well managed?'. The recommendation concerned setting out common basic criteria to differentiate forest areas to be classified according to the fire risk, which the JRC established together with other DGs and the United Nations Food and Agriculture Organisation (FAO).

There are no other pending recommendations where the JRC is a lead service.

#### **2.1.2.2.3 Special Reports issued by ECA in 2018**

The JRC is an associated DG together with other Commission services in a number of audits for which a Special Report (SR) was issued in 2018:

1. No 16 'Ex-post review of EU legislation: a well-established system, but incomplete'. The JRC is the lead DG for conducting gap analyses of the ability to generate, collect and (re)use the data required for sound evidence-based ex-post reviews.
2. No 23 'Air Pollution: Our health still insufficiently protected'. The JRC is an

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<sup>35</sup> Finalised during the first half of 2018

<sup>36</sup> 2018/C 357/01

<sup>37</sup> 'Can the EU's Centres of Excellence initiative contribute effectively to mitigating chemical, biological, radiological and nuclear risks from outside the EU?'

<sup>38</sup> For the other four, the JRC was an associated DG.

associated DG to thirteen actions of the seventeen issued by this SR.

3. No 24 'Demonstrating carbon capture and storage and innovative renewables at commercial scale in the EU: intended progress not achieved in the past decade'. The JRC is not associated to any of the recommendations issued by this SR.
4. No 33 'Combating desertification in the EU: a growing threat in need of more action'. The JRC is an associated DG to one of the three recommendations issued, namely 'Understanding land degradation and desertification in the EU, Establish methodology and relevant indicators, collect and analyse relevant data according to this methodology'. For the other two recommendations issued by the ECA, the JRC will support other EC services<sup>39</sup>.

#### 2.1.2.2.4 Ongoing audits

ECA is also carrying out the following audits for which JRC is involved as an associated DG:

1. Commission's support to research and innovation for energy storage,
2. EU cross-border healthcare access,
3. System of Environmental-Economic Accounting (SEEA),
4. Nuclear safety,
5. Demonstrating carbon capture and storage and innovative renewables at commercial scale in the EU,
6. Biodiversity on landfarm, and
7. Birds, bees and bugs – Biodiversity.

Additionally, the JRC was sampled<sup>40</sup> by the ECA in the framework of the following engagements:

1. 2014 Staff Regulations Revision (lead DG Human Resources and Security), and
2. Public Participation in EU Law-Making (lead Secretariat-General).

Finally, in the framework of the review of the 'EU's response to the Dieseltgate scandal'<sup>41</sup>, the JRC has provided the technical explanations and other requested input.

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

During 2018, the JRC enhanced its qualitative performance through the endorsement of appropriate measures to mitigate risks. All recommendations reviewed by the IAS in 2018 and at the beginning of 2019 were closed.

While the involvement of the JRC in ECA audits increased considerably in 2018, none of the findings has an impact on assurance.

An effective follow-up to all audit recommendations is in place by the JRC management system. The audit follow-up activities are regularly monitored and reported to JRC management.

**Audit recommendations issued by the IAS and the ECA do not have a material impact on the assurance. For deficiencies identified by the IAS, appropriate mitigating measures have been put in place.**

For 2018, the IAS reported in its limited conclusion that '...the internal control systems in place for the audited processes are effective, except for the observations giving rise to the 'very important' recommendations...' and pointed to high risks '...due to the combined

<sup>39</sup> DG Environment (lead), DG Agriculture and Rural Development, DG Research and Innovation and DG Climate Action

<sup>40</sup> The JRC is not audited.

<sup>41</sup> [https://www.eca.europa.eu/Lists/ECADocuments/BRP\\_Vehicle\\_emissions/BRP\\_Vehicle\\_emissions\\_EN.pdf](https://www.eca.europa.eu/Lists/ECADocuments/BRP_Vehicle_emissions/BRP_Vehicle_emissions_EN.pdf)

effect of 8 'very important' recommendations, from different IAS audits, which point to major internal control deficiencies in several audited processes'.

Out of the 8 very important recommendations noted by the IAS in its limited conclusion, 5 were issued in January 2019, 1 on 'Scientific project management' is on track (due for end of 2019) and 2 on 'ICT security' audit had to be postponed (see figure 2.1.2.1-1 below) even while significant progress has already been made.

Given the actions outlined above, the agreed action plans for the recently issued recommendations (with one action plan under review by the IAS), mitigating controls in place, and absence of cross-cutting risks, the JRC considers that the identified risks do not have a material impact on the declaration of assurance.

### **2.1.3 Assessment of the effectiveness of the internal control systems**

The Commission has adopted an Internal Control Framework (ICF)<sup>42</sup> based on international good practice, aimed to ensure the achievement of policy and operational objectives. In addition, as regards financial management, compliance with the ICF is a compulsory requirement.

As from 2018, all DGs have to assess the effectiveness of their internal control systems on the basis of the new framework.

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

To ensure a smooth and efficient transition to the new framework, the JRC has developed and implemented a plan to fully integrate the revised framework with the existing JRC Integrated Management System (IMS). Such integration, allows the JRC to combine requirements from different sources, such as ICF, ISO standards and legal requirements, in one management approach. Actions undertaken include an awareness-raising campaign, renewed trainings and communication to staff through a revamped internal control section on the Connected@JRC platform.

In line with internal control principle 17, the JRC performed an annual assessment of the functioning of its internal control systems which involved an analysis of the effectiveness of the seventeen principles constituting the ICF. The JRC carried out the assessment following the methodology established in the DG Budget 'Implementation Guide of the Internal Control Framework of the Commission'. The internal control team therefore identified internal control strengths and deficiencies using evidence from a variety of sources including: self-assessments (internal control monitoring criteria<sup>43</sup>, internal control implementation survey, assurance statements from sub-delegated authorising officers), discussions with staff in key functions and weaknesses spontaneously reported by staff, results from risk assessments carried out during the year, supervisory reports, ongoing monitoring of the JRC anti-fraud strategy, findings from ECA, IAS and audits in the frame of the IMS, JRC register of exceptions/non-compliance events and results of the *ex-post* controls. The IAS's limited conclusion on the state of internal control in JRC was taken into account as well. The severity of each identified deficiency was evaluated considering its impact on the presence and/or functioning of the relevant principle. The

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<sup>42</sup> C(2017)2373 final, 19.4.2017

<sup>43</sup> Set of pertinent indicators selected for each IC principle (with associated baselines and targets) and enclosed to the JRC Management Plan 2018. Some of these indicators derive from the Commission's staff survey.

assessment was then carried out: 1) at principle level, balancing the detected deficiencies and strengths; 2) at component level, based on the analysis of the results at principle level; and 3) at overall level of the internal control system (based on the analysis of the results at component level).

The functioning of the internal control system has been closely monitored throughout the year by the systematic registration of exceptions (under Principle 12). The underlying causes behind these exceptions have been analysed and corrective and alternative mitigating controls have been implemented when necessary.

The results of the assessment are that 11 principles are functioning well, and 6 require some improvements 3 of the latter are associated with IAS findings of 'high risk' related to: HR management, concerning competences and recruitment indicators (principle 4); the lack of adequate IT security tools and software (principle 11); and the absence of corporate guidance in the fields of scientific project management and IP assets (principle 12). More details are available under section 2.1.2.1.

Room for some improvement has been identified with respect to ethical climate and awareness of JRC values (principle 1), to some elements of business continuity (principle 10), and to the new GDPR rules (principle 13) to ensure JRC's full compliance, as mentioned under section 2.2.3.

The deficiencies identified relate to single characteristics of the concerned principles and their impact on the functioning of the internal control system is compensated by other controls in place thus increasing the likelihood that the JRC achieves its objectives. Therefore they do not have an effect on either the assurance or the overall conclusion of the state of the JRC internal control.

The JRC has assessed the internal control system during the reporting year and has concluded that the components and principles are present and functioning as intended. In addition, on Principles 1, 4, 10, 11, 12 and 13, even though they are present and functioning overall, some improvements are needed as some deficiencies were identified related to the above described topics.

**The JRC concludes that the internal control components and principles are present and functioning as intended.**

## 2.1.4 Conclusions as regards assurance

This section reviews the assessment of the elements reported above (in Sections 2.1.1, 2.1.2 and 2.13), the sub-conclusions above, and draws conclusion supporting the declaration of assurance and whether it should be qualified with reservations.

The information reported in Section 2 stems from the results of management and auditor monitoring contained in the reports listed. These reports 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:

- JRC's internal controls systems provide sufficient assurance to adequately manage the risks relating to the legality and regularity of the underlying transactions;
- JRC has implemented appropriate *ex-ante* and *ex-post* controls, to the extent that they remain cost-effective;
- 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;

- JRC's internal control systems provide sufficient assurance with regards to the achievement of the other internal control objectives; and
- Resources were used for the intended purposes, sound financial management was applied, and the non-omission of significant information was ensured.

On 18 February 2019, the JRC organised a meeting with participation from the relevant actors involved in reaching a conclusion towards the reasonable declaration of assurance, under the chair of the Director in charge of Risk Management and Internal Control. The purpose of this meeting was to analyse and to discuss in detail the evidence collected based on the elements supporting assurance. The group concluded that a) there are improvement areas which are or will be addressed with appropriate actions (as mentioned in section 2.1.3 above), and which have been brought to the attention of the Director-General, and b) that on the basis of the analyses made and on the information available, no evidence justifying a reservation could be found.

### **Overall conclusion**

In conclusion, management has reasonable assurance that, overall, suitable controls are in place and working as intended; risks are being appropriately monitored and mitigated; and necessary improvements and reinforcements are being implemented. The Director-General, in his capacity as authorising officer by delegation has signed the Declaration of Assurance.

## DECLARATION OF ASSURANCE

*I, the undersigned,*

*Director-General of the Joint Research Centre*

*In my capacity as authorising officer by delegation*

*Declare that the information contained in this report gives a true and fair view<sup>44</sup>.*

*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 and 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, 29 March 2019*

*Signed*

*Vladimir Šucha*

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<sup>44</sup> True and fair in this context means a reliable, complete and correct view on the state of affairs in the DG.

## 2.2 Other organisational management dimensions

### 2.2.1 Human resource management

In accordance with the Commission's change agenda<sup>45</sup> and the JRC Strategy 2030, the JRC has adopted modern, flexible, people-centred and effective human resource (HR) management practices. In particular, after an important reorganisation in 2016 to facilitate the implementation of the new strategy, the JRC has significantly invested in talent management and well-being of staff.

The JRC implements the **Commission's talent management strategy** by actively contributing to the Commission-wide HR actions on staff engagement and talent management, leveraging on the two transversal HR policies:

- promotion of staff mobility as a natural part of career development, as mobility contributes to excellence in management, personal development and motivation and a collaborative corporate culture, and
- promotion of diversity and inclusion, to improve the performance of the organisation in all aspects by enabling distinct views and approaches to be expressed and ensuring that the Commission is representative of the citizens it serves.

In 2018, **staff mobility** was promoted through a dedicated JRC mobility scheme that was launched at the end of 2017. Several calls for temporary mobility programmes were published, including job shadowing within the JRC, short-term exchanges with other DGs and with research organisations outside the Commission. Furthermore, to support staff in finding career opportunities fitting their profile and aspirations, a first JRC career day was organised, the JRC internal career guidance service was reinforced and calls for open positions were published internally. Within the mobility scheme, an internal online platform serves as a 'first-stop-shop' providing an overview of mobility opportunities available to the JRC staff.

The **promotion of qualified female staff to management positions** continued to be a priority for the JRC. Indeed, the support offered to internal female candidates through various targeted initiatives – a dedicated talent management programme concluded in 2017, individual coaching and mentoring, awareness-raising and networking initiatives – produced first results in 2018; the number of internal female candidates applying to middle management positions doubled compared to 2017. Regarding the JRC target to appoint 7 female Heads of Unit by end of November 2019, one female Head of Unit was appointed and one was nominated to start 1 January 2019.

Following the 2016-2017 pilot talent management programme for female officials, the second phase was launched in 2018, open to all permanent staff with a certain level of responsibility and it will be concluded in 2019.

To support the JRC's new role as a manager of knowledge and to increase the service delivery capacity at the science-policy interface, staff's skills for effective interaction with policymakers were enhanced through trainings and the short-term exchange programme. In general, these requirements were widely reflected in the JRC's learning and development approach for 2018.

**In 2018 the JRC has strengthened its service delivery capacity at the science-policy interface through targeted learning and development programmes.**

To implement the Commission's **health and well-being strategy** and the related action

<sup>45</sup> The Commission's change agenda refers to the Juncker Commission's 10 political priorities 2015-19 incorporated in the JRC Strategy 2030.

plan 2017-2020, the health aspects (physical and mental health and physical activities, in line with the Commission Fit@Work policy) were promoted by awareness-raising events, workshops and training courses for a healthier life/work balance. Progress in well-being (working environment, work-life balance and social integration) was monitored through a dedicated indicator stemming from the EC staff survey carried out in 2018. The survey showed a very positive development as 66 % of JRC staff felt that the organisation cares about their well-being at work, an increase of 3 % compared to 2016 result, well above both the JRC target (50 %) and the corporate average (52 %).

The JRC's investment in human resources management and implementing the improvement actions identified after the previous staff survey, were positively reflected in the 2018 overall **staff engagement index** from the EC staff survey. The engagement index for the JRC increased to 68 % from 62 % in 2016, close to the 2018 corporate average value of 69 % set as a target. In addition, the JRC organised an internal survey exploring staff engagement after introduction of the new strategy and the reorganisation in 2016. The additional 'Strategy engagement' survey focused on aspects related to the renewed mission and the vision for 2030. The result was very positive, the engagement index reaching 75 % and thus being consistent with the corporate staff survey results.

Finally, **the HR Modernisation project**, as laid down in the Commission Communication on synergies and efficiencies<sup>46</sup>, was rolled out in 2018. Centralised HR services in the Commission are now delivered by the DG Human Resources and Security Account Management Centres (AMCs) which serve clusters of DGs. Given the size and set-up of the JRC, with 6 sites in 5 different countries, it was decided that one AMC (HR.AMC.8) serves the JRC only. Within each DG, the HR Business Correspondent (BC) coordinates strategic HR matters, prepares the related decisions of the DG's management and defines the DG specific HR strategy and related priority actions. As from 1 July 2018, the Director for Strategy, Work Programme and Resources was appointed as the JRC HR BC; a dedicated sector directly attached to the Director was created for supporting this process exclusively.

Reports on outputs defined in the 2018 Management Plan and on objectives and indicators set up in the Strategic Plan are available in Annex 2.

## 2.2.2 Better regulation (only for DGs managing regulatory acquis)

N/A

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<sup>46</sup> Synergies and Efficiencies in the Commission - New Ways of Working (SEC(2016)170)

### 2.2.3 Information management aspects

Two years into the Commission's corporate strategy for data, knowledge and information management<sup>47</sup>, the JRC has become one of the leading DGs in pursuing the strategy's objectives.

Its actions support the Communication's second and third pillars, which focus on improving collaboration and sharing of information and knowledge, and maximising the use of data for better policymaking such as the European Semester process. In collaboration with other Commission Services, the JRC started in 2018 to act as an internal consultancy service for other Directorates-General, offering a one-stop-shop on collaboration and knowledge management.

The JRC led the EC Knowledge Week - Brokering knowledge for policy – a Commission-level event that showcased achievements and future challenges in knowledge management and foresight domains, coupled with learning opportunities aimed at promoting knowledge management and knowledge sharing at the Commission. The Week was kicked off by the 3-day International Conference on Future-oriented Technology Analysis 'FTA 2018 - Future in the making', with a rich variety of events delving into the best practices and future orientations of the fast developing areas of knowledge management. More than one thousand participants from 46 DGs and agencies signed up for 25 workshops and master-classes and other events with more than 80 experts in the field of knowledge management for policy.

In 2018, the JRC consolidated its Knowledge and Competence Centres, and established four new ones:

- The Knowledge Centre on Food Fraud and Quality (KC-FFQ) aims to create a formalised science/policy interface to support initiatives for safeguarding the quality and authenticity of agri-food products and protecting the integrity of the food chain. It complements the activities of the EU Food Fraud Network.
- The Knowledge Centre on Global Food and Nutrition Security (KC-FNS) makes the existing information and tools available to EU policymakers and stakeholders; identifies priority topics to foster better knowledge and collaboration around these; promotes the European Commission's role in generating new knowledge, and supporting relevant international initiatives.
- The Competence Centre on Foresight (CC-Foresight) provides direct strategic and future-oriented input into EU policymaking; increases the uptake of foresight and forward-looking approaches; and continuously advances the in-house foresight capacity, methods and tools to make it more practical for decision-making processes. One of its prominent outputs is The Megatrends Hub, a dynamic collective intelligence system assessing a set of 14 global megatrends that are relevant for the future of Europe.
- The Competence Centre on Technology Transfer (CC-TT) complements other JRC activities in the broader domain of support to innovation policies and makes available operational experience and understanding of the technology transfer process, for example, for the practical implementation of smart specialisation strategies and for a deeper understanding of the role of technology transfer in innovation ecosystems.

Another important development is the JRC's contribution to elaborating a Commission Corporate Data Strategy Action plan, aimed at transforming the Commission into a data-driven organisation. The JRC will play an important role in this process, by coordinating a Commission-wide inventory and classification of data assets, preliminary to the

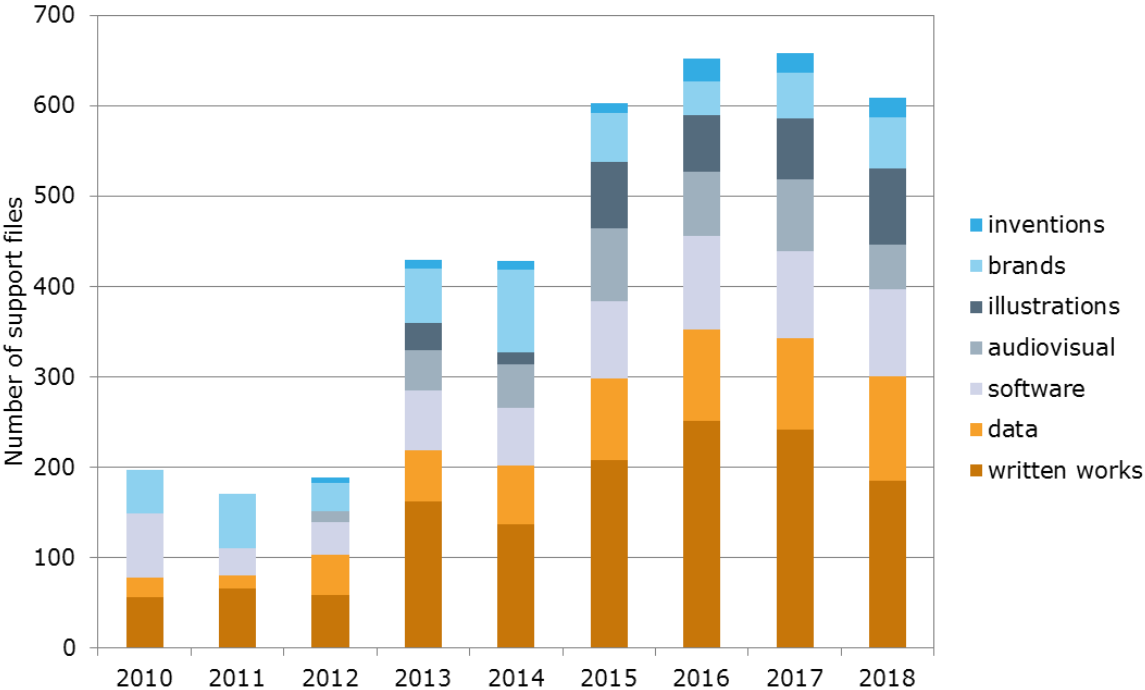
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<sup>47</sup> Adopted in October 2016 with Communication C(2016)6626

establishment of a single Commission Data Catalogue. The JRC will also coordinate the setup of a single entry point for advisory services on data topics to be used by the Commission.

Throughout the development of its knowledge management for policy, the JRC has increased its standing in the field. Now it is in well-positioned to deliver both internal and external training and capacity building, thus supporting the Commission's data, information and knowledge management strategy's fourth pillar (creating a culture of knowledge sharing and learning).

Besides the many actions on knowledge management, the JRC manages the intellectual property (IP) portfolio of the European Commission and supports the different Commission departments with legal advice on IP issues. In particular, it advises if and how intellectual property owned by third parties can be used by Commission staff without infringing third party rights. In 2018, JRC handled new 542 requests for legal advice on IP issues including 17 from the European Parliament, and solved 529 cases.



**Figure 2.2.3-1.** JRC's IP support activities by type of asset. Note that the number of requests and the underlying IP right do not numerically match since one request may pertain to more than one IP right.

Regarding e-Domec implementation, JRC has continued pursuing its effort in opening files' visibility at the Commission-level based on its applicable rules reviewed and enforced in 2017. The JRC work programme planning and monitoring IT system (JRC Project Browser) has been adapted to allow other Commission DGs to track more easily JRC projects they co-finance. However, the planned system integration with HAN has not been completed due to other priorities and was postponed to 2019.

To ensure compliance with the new Internal Data Protection Regulation, the JRC organised a stocktaking exercise at establishing an updated inventory of data processing operations. A separate stock-taking exercise was carried out to assess issues related to transfers of personal data to international organisations and regarding restrictions of data subjects' rights. The JRC Data Protection Coordinator made an assessment of compliance with general principles (Art. 4 Reg. 2018/1725), particularly in relation to lawfulness, data minimisation and storage limitation. As a consequence, the JRC has initiated

improvements in handling personal data protection appropriately at process level and to address the bottlenecks in dealing with outstanding issues. An awareness-raising campaign was organised, and it provided a good level of knowledge about the rules and procedures to follow.

Reports on outputs recorded in the 2018 Management Plan and on objectives and indicators set up in the Strategic Plan are available in Annexes 2 and 12.

## 2.2.4 External communication activities

The JRC Strategy 2030 identifies three major target groups for external communication: EU political level, the scientific community and the public at large. It aims to improve its relations and outreach with each of these groups to place the JRC at the heart of EU policymaking, to ensure that it can cooperate with the best talents and to provide transparency to citizens on the use of their taxes, as well as contributing to communicating the relevance and the added value of EU and its policies.

In 2018, the focus of the communication activities was on demonstrating the value of the JRC's work to EU policymakers and the public at large. In this context, some of the existing communication products were revamped, strengthening their narrative on EU value added. Cooperation with other DGs was improved to underline the JRC's value in particular communication activities, and the JRC's contributions were highlighted in corporate communication campaigns. Public outreach activities were strengthened via innovative tools such as cooperation with museums, organising public events with appealing new formats, training scientists for public speaking and writing for non-scientific audiences, featuring the JRC at various public events and further enhancing social media activities.

JRC continued close coordination with policy DG communicators, Cabinets and the Spokespersons' Service not only to produce silo-bridging news based on JRC science but also offering insights into how it shapes EU policy that serves citizens.

JRC's activities have been widely reported in the media and it has increased its social media outreach by ca 50 % since 2017. Overall statistical data is displayed in Figure 2.2.4-1.

Examples of JRC communication actions:

1) **ARTEFACTS exhibition** is a collaboration between the Berlin Museum für Naturkunde, the photographer J. Henry Fair and the JRC. Opened in October 2018, it illustrates how science and politics work together to identify solutions to urgent environmental issues of our time. The exhibition uses art to involve citizens in a discussion about EU policies and the scientific evidence behind them, demonstrating the value in our everyday lives. Visitors have the opportunity to speak with JRC scientists about the complexity of searching for social and political solutions, share experiences and contribute ideas. The project also encompasses a digital version of the exhibition as well as a virtual reality experience.

2) **JRC's Exhibitions** in the European Parliament building in Strasbourg, and at a Bulgarian Presidency event in Sofia in May.

3) In 2018 the **JRC alumni network** grew from 323 registered members to 435 and the first event brought to Brussels 38 participants from 14 countries. Regional subgroups were created to foster networking of the JRC-alumni community in their regions which was warmly welcomed.

Reports on outputs defined in the 2018 Management Plan and on objectives and indicators set up in the Strategic Plan are available in Annex 2.



## Social media



Over **26 k** followers  
Nearly **1.5 k** posts  
Over 9.21 million impressions and  
36.65K engagements



Over **14 k** followers  
Nearly **450** posts  
Over 4.33 million impressions and  
10.54K engagements



Over **30 k** followers  
Nearly **450** posts  
Over 2.66 million impressions and  
12.09K engagements



Nearly **1700** followers  
**40** videos published  
91K views and  
483 interaction



## Web



Over **2 million** visits from  
nearly 1.6 million unique visitors



Over **4 million** page views,  
including nearly 3 million unique  
page views



## Events



**179** events, including  
**70** 'high level' events



Nearly **8500**  
participants in total



## Media



**132** JRC web news  
pieces published



Over **3300** articles  
mentioning the JRC



Nearly **2200**  
JRC newsletter subscribers

**Figure 2.2.4-1.** JRC's social media and web, events and media outreach in numbers.  
© European Union

## 2.2.5 Infrastructure

### 2.2.5.1 Infrastructure development

Unlike other DGs, the JRC owns and manages buildings and related infrastructure on all its sites, except Brussels. Therefore, the JRC Strategy 2030 foresees the development of a single, consolidated, multi-year plan for the development of fit-for-purpose infrastructure across all its sites and Directorates. At the end of 2018, the JRC endorsed the 'JRC Site Development Vision 2030' and related plans for each site. For the office buildings, the Directives on Energy Efficiency and Energy Performance of Buildings constitute the reference standard when setting development objectives.

The main infrastructure works delivered as scheduled in 2018 on the Ispra site were standard refurbishment actions on various buildings. In Petten, 2018 saw the preparation of a building for hosting the future Creative Hub, a collaborative space to stimulate creative thinking. In Karlsruhe, nearly 35 % of the total surface is now compliant with the national minimum standards, in terms of energy efficiency based on Article 5 of the Directive.

The target for the surface area of newly delivered buildings and buildings demolished and refurbished in line with Directive 2012/27/EU is set at 3 % annually. The 2018 JRC result (0.9 %) is below the target; however, new energy efficient buildings in Karlsruhe and Ispra are currently under construction and will generate a significant boost when delivered in 2020.

### 2.2.5.2 Decommissioning and Waste Management Programme

The JRC has to manage its nuclear liabilities and decommission its nuclear installations once they have been definitively shut down. Decommissioning of nuclear installations is a complex and lengthy process that goes beyond the duration of multiannual financial frameworks and in most cases exceeds two decades. For this reason, a dedicated Decommissioning and Waste Management Programme (D&WMP)<sup>48</sup> was launched in 1999<sup>49</sup> in an effort to set the necessary framework to progressively eliminate historical liabilities and restore nuclear sites devoid of any radiological risks. The planning and budget of the programme are periodically reviewed to align the progress of projects with the priorities and needs of the programme.

In 2018, progress was made on waste management and characterisation facilities, decommissioning and clearance of obsolete facilities and equipment (see Annex 13 for details). A progress report to be sent to the Council and the European Parliament covering the period 2013-2018 is under preparation.

To further improve the management and governance of the programme, in June 2018 the Commission put forward a new proposal for a Council Regulation for the next Multi-annual Financial Framework which establishes a dedicated funding programme for 2021-2027. The new funding programme covers both the JRC D&WMP and the Commission's financial support to Bulgaria and Slovakia. It intends to optimise synergies and knowledge sharing and to fulfill the relevant obligations. Also, it will give the JRC the mandate to explore an optional transfer of liabilities to the Member States hosting JRC sites.

The complete reports on the main outputs for 2018 for the four relevant JRC sites can be found in Annexes 2 and 13.

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<sup>48</sup> Currently funded under Title 10 – Direct Research

<sup>49</sup> Communication from the Commission to the European Parliament and the Council - Historical liabilities resulting from nuclear activities carried out at the JRC under the Euratom Treaty - Decommissioning of obsolete nuclear installations and waste management COM (1999) 114

### 2.2.5.3 Supplementary research programme for the High Flux Reactor in Petten

The High Flux Reactor (HFR), located at the JRC site in Petten (NL), is owned by the Commission, which puts it at the disposal of interested Member States. As a result, its operation has been supported by a series of supplementary research programmes.

The main objectives of the supplementary research programme are:

- to ensure the safe and reliable operation of the HFR, for guaranteeing the availability of the neutron flux for experimental purposes, and
- to allow efficient use of the HFR by research institutes in a broad range of disciplines, e.g., the safety of nuclear reactors, medical isotopes, nuclear fusion, fundamental research and waste management, including the study of safety issues of nuclear fuels for reactor systems.

The supplementary research programmes have been running since 2012 under Council decisions, with the most recent covering the period 2016-2019<sup>50</sup>.

While the HFR is mainly used for the commercial production of radio-isotopes, it also serves as a training facility which allows doctoral and post-doctoral fellows to perform research activities through national or European programmes.

According to Article 4 of the Council Decision 2012/709/Euratom, the Commission reports to the Council and the European Parliament on the implementation of the supplementary research programme. In 2018, the report covering the period 2014-2015 was issued (an intermediate report for the period 2012-2013 had already been issued).

### 2.2.6 Examples of initiatives to improve the economy and efficiency of financial and non-financial activities of the DG

As part of a strategy to improve the efficiency of key processes in the JRC, a bottom-up campaign was conducted in the spring of 2017 that generated 145 ideas from staff for **simplification**, all of which were intended to facilitate the daily work of colleagues. In 2018, progress was made, and examples of the many results recorded are:

- As from 1 January 2019, the JRC can use the Commission's AGM (Advanced Gateway for Meetings) tool to ensure increased efficiency and actual savings on time spent in organising expert workshops.
- Regarding site management, the simple transition of smaller videoconference rooms directly to conference services has increased the number of suitable rooms available and is a further incentive not to travel if the meeting can be organised virtually.
- A further practical example has been the ability to use the staff badge to register the time present at the Ispra site.
- A major development regarding knowledge management is the 'find an expert' tool launched in 2018 which enables searches of skills and expertise across the Connected platform.
- The development of an easy-to-use corporate on-line calendar has facilitated the planning of corporate events and meetings.
- Regarding transport, an app was developed that enables colleagues to be alerted

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<sup>50</sup> Council Decision (Euratom) 2017/956 of 29 May 2017 on the adoption of the 2016-2019 high flux reactor supplementary research programme to be implemented by the Joint Research Centre for the European Atomic Energy Community

of their departure time.

- Concerning finance and procurement, a one-stop-shop for all purchases was implemented, which is a step towards modern finance and procurement IT infrastructure and making JRC's procurement tool a part of the eProcurement suite of the Commission.

While the original campaign on simplification elicited many ideas, the longer-standing effect has been the development of a more user-centric reflex behind tools and systems and the **JRC's Integrated Management System (IMS)** now provides the framework for continuous improvement.

Besides the simplification and improvement actions generating JRC internal efficiencies, thanks to its strong expertise in procurement the JRC contributes to creating efficiency gains at the corporate level. It leads the **eProcurement project** which is one of the major projects of the Commission programme to deliver a Single Electronic Data Interchange Area (SEDIA) for all participants or recipients involved in EU grants and procurements, in compliance with the financial regulation. In 2018, electronic submission and the opening of offers was rolled out to all DGs and executive agencies, the validation of participants of eSubmission calls for tenders was centralised in the Research Executive Agency, the Funding & Tenders Portal was released, and procurement templates were harmonised. More details can be found in Annex 10.