

Highlights Report 2024

From science to impact

Joint
Research
Centre

European Commission Joint Research Centre

The JRC Highlights Report 2024 focuses on the impact of key JRC contributions in 2024 and celebrates these achievements with external actors directly involved. It shines the spotlight on 11 highlights, and provides key facts and figures for the organisation. This Highlights Report stands an invitation to encourage the reader to learn more about the rest of the JRC's work.

Key message

The JRC Highlights Report 2024 focuses on the impact of key JRC contributions in 2024 and celebrates these achievements with external actors directly involved.

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Foreword by Ekaterina Zaharieva

European Commissioner for Startups, Research and Innovation

Let me introduce you to the EU's scientific powerhouse! The Joint Research Centre blends technical expertise, data-based insights and excellent research to drive effective policymaking and innovation. I am overseeing the JRC's work as part of my portfolio and it is my great pleasure to share with you 11 of the most significant contributions made by the JRC in 2024.

The 11 highlights illustrate how the JRC drives meaningful change across a wide range of policy areas. The variety of the quotes that accompany each highlight are an affirmation of the JRC's positive impact on citizens, the economy and society at large.

The JRC works at the **intersection of science and policy**. Several of the achievements in this report demonstrate how vital the JRC is in supporting EU institutions throughout the full policy cycle. Be it in the nuclear or the non-nuclear domains, the JRC successfully anticipates the policy needs, integrates the various

perspectives and supports policymakers on the technical implementation and monitoring of progress.

I am sure that you will find the examples of **JRC innovation** in this report as fascinating as I do, from life-saving cancer treatments using nuclear-targeted alpha therapy to an early alert mechanism fuelling the clean industrial transformation. The JRC helps us innovate and test the performance and safety of new technologies that can drive progress across industries, economies and societies. It opens the door to new solutions and pushes the boundaries of scientific research and human endeavour.

From tackling global challenges to supporting better policymaking, these highlights are proof that the JRC is powering the solutions of tomorrow. As we look ahead, I am confident that the JRC will continue to be a cornerstone of EU policymaking and innovation. In the face of unprecedented global challenges, science must drive the policies that will define our future.



Quotes by the Board of Governors

“The members of the JRC’s Board of Governors commend the JRC on the successful delivery of the priorities defined by the JRC’s Work Programme 2023-2024. JRC researchers continue to excel in very challenging times, providing independent, evidence-based knowledge and science supporting EU policies to positively impact society.”

“We, the members of the JRC’s Board of Governors, consider that securing a viable budget is essential for the JRC to uphold excellence in research to better serve the European Commission, Member States, Horizon Europe associated countries and the international community at large.”

“The Board is pleased to note that the JRC’s essential role in providing evidence for policy is mentioned in the mission letters of all Commissioners-designate for the next college mandate. This gives JRC a stronger legitimacy to support the work of the entire Commission across all policy areas and also brings certain challenges.”

“The Board remains convinced that efforts invested in outreach are crucial for the JRC in gaining the recognition its work deserves, and engaging in effective scientific partnerships.”

Read the observations of the Board of Governors in full on [page 32](#)



Introduction by Bernard Magenmann

Acting Director-General, Joint Research Centre, European Commission

Welcome to the JRC's 2024 Highlights Report!

2024 was a momentous year of change for the JRC. In addition to being my first year as Acting Director-General, 2024 was also a year of prioritisation for the JRC. To support this prioritisation, we engaged in strategic discussions with key partners and reflected collectively on our future path. As a result, the scientific activities outlined in the 2025-2027 Work Programme are aligned with and ready to deliver on the political priorities of the new European Commission mandate.

It has been a great pleasure for me to help the JRC navigate these changes and to welcome Commissioner Zaharieva in her new role overseeing the JRC under her portfolio Startups, Research and Innovation. The Highlights Report is an opportunity to celebrate some of the JRC's key achievements for 2024 and to provide a snapshot into some of its recent work.

The 11 achievements highlighted in this report reflect the **breadth and the depth** of the JRC's work. From digital transformation to environmental sustainability or health crises, the JRC provides the foundations for EU policymaking, utilising its cutting-edge research and rigorous expertise to tackle some of the most complex challenges of our time. Its multidisciplinary teams and plethora of excellent laboratories allow the JRC to approach problems from multiple perspectives, ensuring more comprehensive and effective outcomes. This report illustrates how the JRC transforms its scientific excellence into real-life impacts for society and the economy at large – and this is something that fills me with pride.

Collaboration is one of the JRC's core values and it also shines brightly in this report. Internally, the JRC's multi-site structure, spanning five countries, facilitates collaboration among researchers and scientists from diverse backgrounds across Europe. But this report also demonstrates the openness and strong links that the JRC



enjoys externally with a web of connections throughout society.

It is impressive to see the variety of our stakeholders reflected through those who provided quotes for each of the 11 highlights – they include citizen representatives, national institutes, industry associations and government officials, from different EU countries and beyond. This vibrant ecosystem of partnerships is a hallmark of the JRC's work, ensuring an exchange of knowledge between disciplines and across borders, for the benefit of society. This Highlights Report is the chance to put the spotlight on some of these joint achievements, and for me to personally thank each and every one of these individuals for the impactful collaboration.

I also take this opportunity to thank the Board of Governors for their valuable strategic oversight and guidance. It is thanks to them that the JRC can achieve its goals and fulfil its mission effectively and responsibly.

The JRC's role in advancing scientific knowledge and fostering collaboration across borders to deliver effective policymaking is more critical now than ever. I encourage you to explore some of the JRC's work in this report and hope that you feel as inspired as I do about the immense potential of science-driven solutions to address tomorrow's challenges.



Work Programme 2025-2027

Available shortly after the Work Programme is officially adopted in 2025.



Scan the QR code to visit
JRC scientific portfolios
(https://joint-research-centre.ec.europa.eu/scientific-portfolios_en)

Empowering a clean and competitive EU industry

Balancing decarbonisation, depollution and competitiveness is at the heart of the EU's Clean Industrial Deal. For many years, the JRC has helped to support a clean and competitive EU industry. The JRC's launch of the new Innovation Centre for Industrial Transformation and Emissions (INCITE) in June 2024 - as part of the revision of the Industrial Emissions Directive (IED) - marked a significant step in Europe's clean industrial transformation. JRC analysis on future grid capacity and its annual assessment of clean energy technologies have also helped to identify opportunities to strengthen the EU's competitiveness.

IMPACT ON THE ECONOMY

Mediates with industry and civil society to co-create environmental norms





Barbara Freund

German Federal Ministry for the Environment and Nature Conservation

INCITE will act as a “crystal ball” for change managers in industry as well as policymakers. Emerging techniques that might change a whole sector need to be identified very early. And this calls for a strong focus on the future in the Sevilla Process.



COORDINATED THE SEVILLA PROCESS SINCE ITS INCEPTION

The Sevilla Process is a participatory stakeholder process that crafts the environmental norms to be met by large industrial installations in the EU. It relies on a structured and transparent exchange of information and analysis where Member States, industry, civil society and services of the European Commission come together to draw up and review Best Available Techniques (BAT) reference documents. Those documents underpin how public authorities grant industrial operating permits to over 70 000 large industrial installations in the EU. The JRC has organised and coordinated the Sevilla Process since it entered into force in support of the implementation of the IED. The steering of this cooperative process of co-creating environmental regulation applying to large agro-industrial activities has given the JRC a central role in helping EU industry cut its polluting emissions and contributing to a 40-75 % reduction of the main air pollutants over the last 15 years.

LAUNCHED INCITE TO ACCELERATE INNOVATION

Building on this well-established Sevilla Process, the JRC launched INCITE¹ in 2024 in cooperation with the Directorate-General for Environment (DG ENV). INCITE is a key component of the revised IED and aims to facilitate the uptake of innovative technologies that can lower emissions in the industrial sector. INCITE scans the horizon to identify emerging cutting-edge industrial environmental techniques and processes. If these environmental innovations are deemed ready for roll-out at industrial scale, they are fed into the well-established Sevilla Process. This information-sharing is crucial to support frontrunners, help stimulate investment and facilitate the uptake of innovative approaches, as Barbara Freund from the German Environment Ministry explains in her quote. By acting as the EU's central reference point on innovative industrial techniques in

¹ <https://innovation-centre-for-industrial-transformation.ec.europa.eu>

Europe and beyond, INCITE plays a vital role in boosting cooperation and accelerating the industrial transformation.

ASSESSED THE EU'S POSITION IN THE CLEAN TECHNOLOGY RACE

The JRC also coordinates the Clean Energy Technology Observatory (CETO), which was launched in 2022 by the directorates-general for Research and Innovation (DG RTD) and for Energy (DG ENER). CETO monitors EU research and innovation activities on clean energy technologies. It assesses the competitiveness of the EU clean energy sector and its positioning in the global energy market. The series of CETO reports² provide a crucial repository of techno- and socio-economic data on the most relevant technologies. They serve as primary source of data for the Commission's annual progress

² https://setis.ec.europa.eu/publications-and-documents/clean-energy-technology-observatory/ceto-reports-2024_en

reports on the competitiveness of clean energy technologies.

PROPOSED SOLUTIONS TO LOWER ENERGY PRICES

To support a competitive and clean industry, the EU must be clear about how the growing deployment of renewables will affect the current and future grid capacity. The JRC investigated the different grid expansion scenarios in its study on redispatch and congestion management³. This report, mentioned in Prof. Mario Draghi's report on competitiveness, highlighted that uncoordinated renewable energy deployment could lead to significant grid congestion. This congestion is projected to result in costs ranging from EUR 11 to 26 billion by 2030 and from EUR 34 to 103 billion by 2040. To address this issue, the study proposes measures that could help lower electricity prices and enhance the competitiveness of European industries.

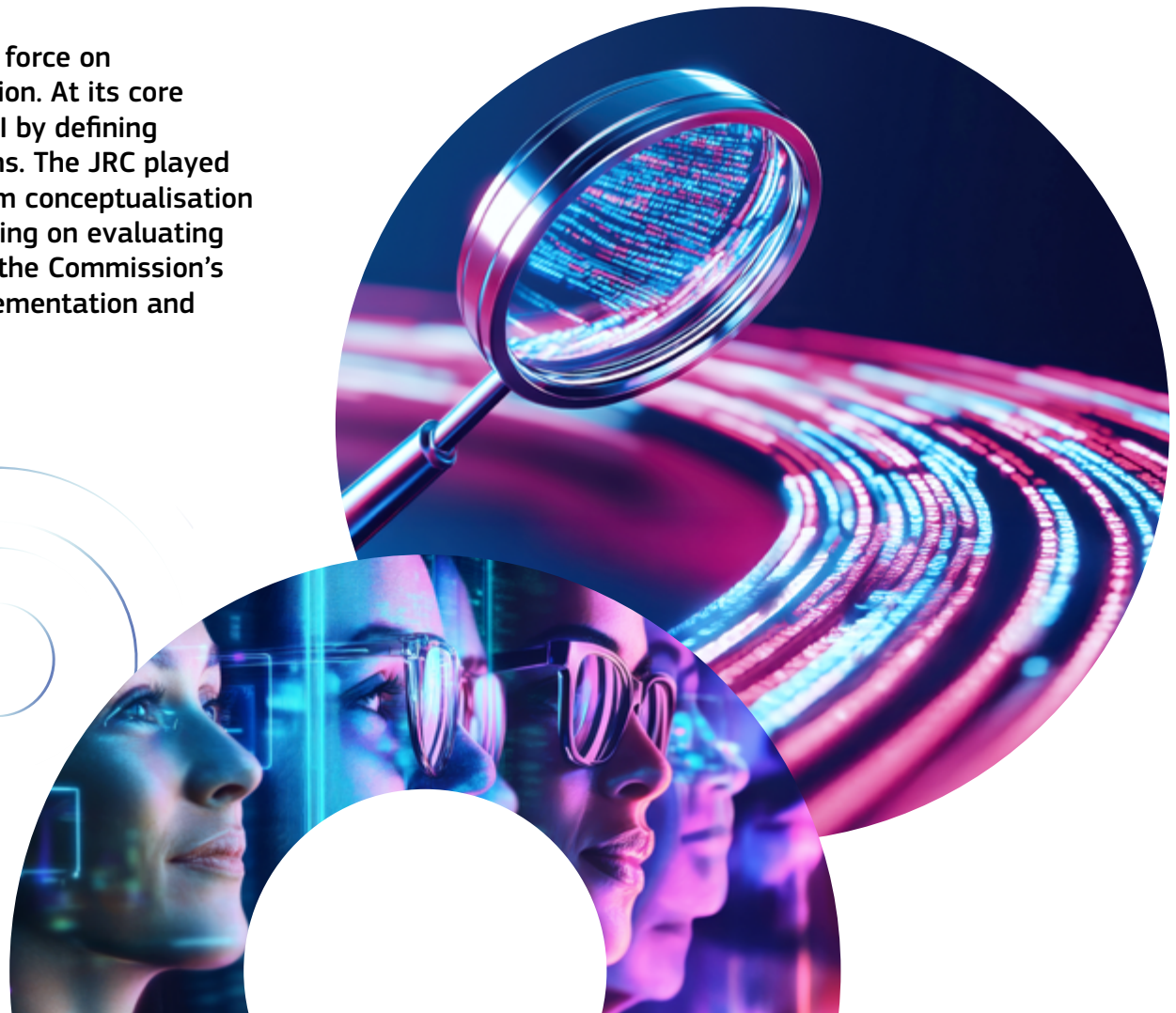
³ <https://publications.jrc.ec.europa.eu/repository/handle/JRC137685>

Supporting safe and trustworthy artificial intelligence

The Artificial Intelligence (AI) Act, which entered into force on 1 August 2024, sets a global standard for AI regulation. At its core is the aspiration for the EU to lead the way in safe AI by defining trustworthiness requirements for high-risk AI systems. The JRC played a key role in the entire policy cycle of the AI Act, from conceptualisation to implementation. The JRC has also been collaborating on evaluating the risks of various general-purpose AI models with the Commission's European AI Office, which is responsible for the implementation and enforcement of the AI Act.

IMPACT ON THE ECONOMY

Informed the positions of all three EU institutions, supporting the entire policy cycle on the AI Act





MEP Brando Benifei

EP Co-Rapporteur for the AI Act

Shaping the AI Act was a complex but crucial journey - balancing innovation with fundamental rights. The JRC's expertise provided essential scientific grounding, guiding us through negotiations and ensuring a future-proof framework. This Act sets a global standard for safe, trustworthy AI.



SUPPORTED THE ENTIRE POLICY CYCLE

The JRC actively participated in the full policy cycle of the AI Act, providing early research that contributed to the definition of the problem and agenda setting. Its neutral scientific support informed the positions of all three EU institutions and was critical for the trilogue phase of the negotiations. MEP Brando Benifei (Italy, S&D), co-rapporteur for the European Parliament on the AI Act, explains the JRC's important role in his quote. The JRC also contributed significantly to the standardisation process underpinning the regulation and is still actively engaged in the implementation phase in collaboration with the European AI Office.

PIONEERED AI RESEARCH AND ANALYSIS

The JRC's AI Watch initiative⁴, launched in 2018 in collaboration with the Directorate-General for Communications Networks,

⁴ <https://ai-watch.ec.europa.eu>

Content and Technology (DG CNECT), was the first knowledge service to monitor the development, uptake and impact of AI in Europe. This initiative was instrumental in framing and formulating the Commission's first legislative proposal on AI. Other important JRC scientific contributions include research on the social impact of AI and state-of-the-art expertise on algorithmic systems, a sector which is monitored by the European Centre for Algorithmic Transparency (ECAT)⁵.

LED ON STANDARDISATION AND TERMINOLOGY

The AI Act defines high-level requirements to make high-risk AI systems safe. The act is underpinned by standards that specify the technical means needed to meet these requirements. The JRC undertook the technical steering of standardisation groups to ensure their work is aligned with the needs of the regulation. JRC analysis and feedback on the draft standards clarified

⁵ <https://algorithmic-transparency.ec.europa.eu>

the key elements of the regulation from a scientific point of view and enabled experts from industry, civil society and academia to shape their technical contributions to the standards. The JRC continues to support the development of key standards dealing with AI risk management, AI trustworthiness and cybersecurity, to be ready when the obligations start to apply in August 2026.

In addition to supporting standardisation aspects, the JRC helped define key terms in the AI Act with an impact on the scope of the regulation. It also played a strong role in guaranteeing its alignment with international standards such as those set by the Organisation for Economic Cooperation and Development (OECD).

ENGAGED WITH GENERAL-PURPOSE AI

The JRC also collaborates with the European AI Office on general-purpose AI. It undertakes scientific research to evaluate a variety of AI models and helps with the classification of AI models with systemic risks. On a more practical level, the JRC experiments with general-purpose AI by offering its own staff the opportunity to conduct research on and with generative AI via the GPT@JRC platform. The corporate GPT@EC tool, which was launched in 2024 for all European Commission staff, is based on the successful GPT@JRC platform.

PROMOTED A HOLISTIC APPROACH

Building on its strong longstanding collaboration with DG CNECT, the JRC also provided relevant scientific evidence to more than nine other Commission departments involved with digital policy. In this way, the JRC helps to facilitate a coherent and holistic approach to achieve a fair digital transition in the EU.

Making the battery value chain safe and sustainable

Batteries are a key component of the EU's green and digital transitions. The new EU Battery Regulation aims to make the battery value chain more sustainable. To support this goal, the JRC contributed to the preparation and negotiation of the regulation and will continue to provide technical support for its implementation from 2024 onwards. Among its many contributions, the JRC mapped the value chain, developed harmonised rules and standards for battery performance and safety, and created methodologies to assess sustainability, including life cycle carbon footprint and circularity.

IMPACT ON THE ECONOMY

Built consensus on the regulation between different actors and policy areas





Claude Chanson

former General Manager at RECHARGE (European battery industry association)

The development of a battery industry ecosystem is essential for the EU's strategic autonomy. The excellent collaboration between the JRC and industry has provided a solid basis for a scientific but pragmatic approach to assess the multiple new sustainability measures of the Battery Regulation.



DELIVERED LONGSTANDING POLICY SUPPORT

The JRC initiated activities on batteries in 2011. This expertise has enabled the JRC to support the Commission at all stages of the policy cycle for the EU Battery Regulation, from its formulation in 2020 to adoption in 2023 and now to full implementation. In its neutral role as science and knowledge provider, the JRC worked closely with different policy DGs to provide technical support and build consensus on the regulation. Claude Chanson from Recharge, the European battery industry association, explains in his quote how helpful the JRC was in bringing a scientific but pragmatic approach to the Battery Regulation.

MONITORED THE VALUE CHAIN AND TECHNOLOGIES FOR RECYCLING

The growing demand for batteries has led to an increased demand for the raw materials they require - such as cobalt,

lithium, nickel and copper - and which are often sourced from non-EU countries. The JRC provides material flow analyses and forecasts of supply and demand for these raw materials, particularly through its foresight report⁶ and Raw Materials Information System⁷. This helps the EU anticipate fluctuations, identify potential vulnerabilities and mitigate the risk of shortages.

The JRC also assesses battery technologies and market developments to boost the EU's competitiveness. It tracks new processes and techniques and evaluates their environmental impacts, costs and resource use. This knowledge is also used to estimate the potential long-term effects of the circularity provisions of the Battery Regulation.

⁶ <https://publications.jrc.ec.europa.eu/repository/handle/JRC132889>

⁷

UNDERTOOK PERFORMANCE AND SAFETY TESTS NEEDED FOR STANDARDS

The Battery Regulation is the first EU legislation to adopt a life-cycle approach, addressing sourcing, manufacturing, use and waste management in a single policy document. To support the implementation of this regulation, the JRC performs experiments at its battery testing laboratory to evaluate battery safety and performance. This work has been essential in developing standards for the battery industry.

BOOSTED CIRCULARITY

In 2024, the JRC published a new series of studies on circularity and battery life-cycle⁸, which focused on the collection, classification and recycling of waste batteries as well as the recovery rates of

⁸ <https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/how-old-batteries-can-help-power-more-sustainable-eu-2024-12-12>

different materials. The JRC has plans for additional technical studies to support the implementation of the Battery Regulation.

Maximising the sustainability of batteries, by extending their life cycle, boosting their recycling, and reducing their life cycle carbon footprint, is essential for protecting the environment and preventing possible shortages in the supply chain. The regulation is a key achievement of the European Green Deal, which advances the circular economy and strengthens the EU's strategic autonomy.

Maintaining Europe's nuclear competitiveness, safely

Nuclear power is a source of low-carbon energy. The safe operation of existing and future nuclear power plants is vital for all. The JRC provides independent, technical and scientific support to facilitate the development, demonstration and deployment of innovative nuclear technologies, notably for small modular reactors (SMR). Its nuclear work supports the relevant policy DGs and the new European Industrial Alliance on SMRs that was launched in 2024. The JRC ensures the EU remains competitive and a key active partner in international cooperation on nuclear power.

IMPACT ON SOCIETY

Oversees the safe development and deployment of SMRs across Europe





Bertrand Morel

Director of R&D department, Orano Group (member of the SMR Industrial Alliance)

2024 marked a year of increased collaboration with JRC, driven by the goal to accelerate molten salt reactor (MSR) technology development. The JRC's contribution to advanced reactor deployment leverages their top-tier nuclear infrastructure and expertise to generate safety-critical data for reactor licensing and advancing the associated fuel cycle.



SUPPORTS THE SAFE AND SECURE DEPLOYMENT OF SMRs

SMRs have the potential to help EU countries decarbonise their energy systems. They are presented as a safe nuclear energy option due to their enhanced safety features, the use of passive systems, modular designs and the '3S by design' principle: safety, security and safeguards early at the design stage. These aspects are central to SMR designs, ensuring robust accident prevention, reduced radioactive risk, and protection against misuse or sabotage. The licensing and regulatory approval of SMRs require stringent safety assessments and adherence to international standards.

The JRC plays a critical role in evaluating SMR safety claims by providing simulation tools and data for advanced fuels, conducting independent analyses, verifying performance metrics and assessing compliance with EU safety frameworks.

The JRC also fosters collaboration among member states, ensuring that SMRs meet the highest safety and sustainability standards. These efforts aim at strengthening public trust and regulatory confidence, paving the way for the broader safe deployment of SMRs in the global energy mix in Europe and worldwide.

CONTRIBUTES TO THE EUROPEAN INDUSTRIAL ALLIANCE ON SMRs

With the aim of accelerating the development, demonstration and deployment of concrete SMR projects in Europe, the European Industrial Alliance on SMRs⁹ was launched in 2024. The JRC is a fully recognised partner of the Alliance, alongside three other DGs: DG ENER, DG RTD and DG Internal Market, Industry, Entrepreneurship and SMEs (DG GROW).

⁹ https://single-market-economy.ec.europa.eu/industry/industrial-alliances/european-industrial-alliance-small-modular-reactors_en

As part of the governing board, the JRC supports the Alliance through its active participation in the general secretariat and in different technical working groups. The support helps to establish a strategic action plan and technology roadmaps for the safe deployment of SMRs across Europe. Dr. Bertrand Morel from Orano Group, a member of the Alliance, explains in his quote the JRC's important contribution to the safe development of innovative reactor systems, including molten salt reactors (MSR) and other SMRs.

SUSTAINS INTERNATIONAL NUCLEAR COOPERATION

Finally, the EU has in place long-standing agreements for cooperation with international organisations covering nuclear safety. The JRC maintains a link with the most relevant international organisations on nuclear safety: the International Atomic Energy Agency (IAEA), the OECD's Nuclear

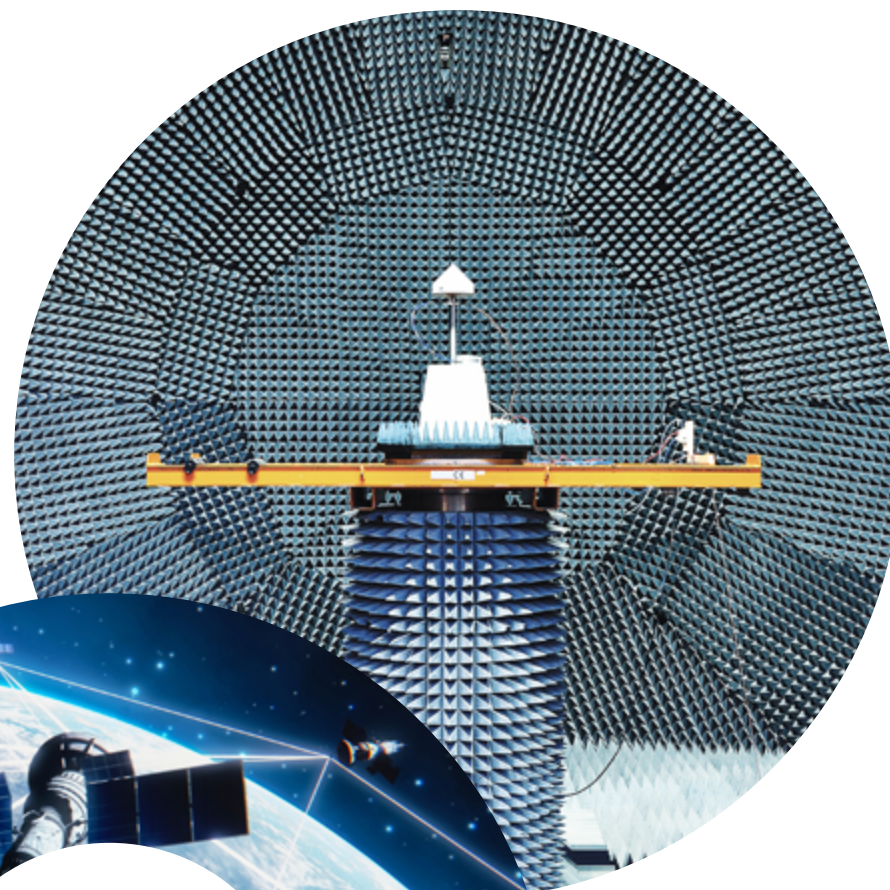
Energy Agency and the Generation IV International Forum. It also contributes to drafting and reviewing the IAEA's nuclear safety standards and guideline documents for advanced reactors (such as SMRs) to ensure maximised safety from the start of the design phase.

Enhancing EU secure communications in space

Faced with increasing geopolitical and cybersecurity threats, it is imperative for the EU to have a sovereign, space-based secure connectivity system. Building on its strong experience with Galileo and Copernicus, the JRC now actively supports the EU space programme's third pillar for secure connectivity - the Infrastructure for Resilience, Interconnectivity and Security by Satellite (IRIS²). The concession agreement for the development, deployment and operation of IRIS² was signed in December 2024. The JRC's contributions to IRIS² include technical analysis, definition of mission requirements, and the launch of new testing facilities.

IMPACT ON THE ECONOMY

Helps protect against cybersecurity threats and supports EU strategic autonomy





Davide Calonico

Research Director at Italy's national metrological research institute (INRIM)

Together we will build a quantum connection between our national institute INRIM and the JRC. The expertise and role of the JRC will lead to a further development of the Italian quantum backbone - a key infrastructure delivering precise atomic time, allowing secure and reliable communication for space and security applications.



PROVIDES TECHNICAL SUPPORT TO IRIS²

The EU's IRIS² is a strategic asset to achieve space sovereignty in the face of commercial satellite constellations, such as Starlink. IRIS² has been conceived as a public-private partnership with financial support from the EU, the European Space Agency (ESA) and the industry consortium SpaceRISE (Space Consortium for a Resilient, Interconnected and Secure Europe)¹⁰. When it reaches its full operational capacity by the end of 2030, this multi-orbital constellation will comprise approximately 300 satellites deployed in low-Earth and medium-Earth orbits to provide worldwide space-based secure connectivity services to governmental and commercial users. IRIS² will also integrate governmental capacity from geostationary satellites already deployed by EU Member States as part of the EU Governmental Satellite Communications programme.

¹⁰ https://defence-industry-space.ec.europa.eu/eu-space/iris2-secure-connectivity_en

Since 2022, the JRC has supported the DG for Defence Industry and Space (DG DEFIS), ESA and the EU Agency for the Space Programme (EUSPA) in the definition of the IRIS² mission requirements and the technical negotiations with the SpaceRISE industry consortium selected to build, deploy and operate the IRIS² system. It also participated in the Tender Evaluation Committee for the IRIS² concession agreement as an expert member. The JRC has been a key contributor to the technical analysis on the adoption of 5G non-terrestrial network standards for IRIS².

Following the signing of the IRIS² concession agreement in 2024, the JRC will continue working with DG DEFIS, ESA and EUSPA on the implementation of the IRIS² programme over the coming years. Support activities will primarily focus on contributions to the IRIS² technical specifications, the development of 5G communications standards for IRIS² and collaborating with ESA and SpaceRISE in technical reviews during the development and deployment of the IRIS² system.

SUPPORTS QUANTUM FOR SPACE

Quantum technologies are gaining prominence in the context of space applications. To ensure that EU policymaking decisions are scientifically informed, the JRC carries out studies on selected quantum technology topics, studying the technology principles, practice, use-cases, applications and products.

WILL HOST A NEW RESEARCH LAB

As part of the JRC's support to IRIS², a new experimental research infrastructure will be set up - the JRC Digital Connectivity Lab. This new research facility will encompass all of the JRC's experimental activities on satellite navigation and space/terrestrial connectivity. It will also enable the testing of quantum key distribution technologies and services that are to be assessed and validated for certification so that users can be confident that these will not be vulnerable to attacks. The JRC Digital Connectivity Lab will be hosted at the JRC's Ispra site, with

the start of operational activities planned for 2025. This research facility will also be connected to Italy's quantum backbone network for receiving quantum and timing signals. Davide Calonico from Italy's national metrological research institute (INRIM) explains the importance of this development in his quote. The connection to the Italian quantum backbone and the testing lab for quantum communications equipment will be part of the European Quantum Communications Infrastructure, which is planned to be integrated with IRIS².

Boosting citizen engagement to strengthen EU democracy

Democracy cannot be taken for granted - it must continuously be promoted and reinforced. For the 2024-2029 Commission, 'protecting our democracy' has become one of the seven core priorities, with every Commissioner charged in their mission letter with creating 'a true and lasting legacy of participative democracy'. Thanks to its solid knowledge base and network of experts and practitioners, the JRC has helped guide policymakers and public administrations in delivering more citizen engagement and participatory democracy within the EU.



SUPPORT AT NATIONAL LEVEL

Assists six Member States in their capacity building efforts to increase citizen participation





Simona Zacharová

Plenipotentiary of the Slovak Government for the Development of Civil Society

To create truly effective and targeted policies it is crucial to integrate both scientific knowledge and citizen engagement into the process. The invaluable guidance provided by the JRC in the field of participation to our newly established Participatory Unit strengthens our efforts to promote more inclusive and efficient governance.



GUIDED REGULATORY ACTION

The EU has taken significant steps to strengthen its democratic foundations, including a renewed focus on citizen engagement and participatory democracy. In this context, the Commission adopted the 'Defence of Democracy' package in December 2023, aiming to harmonise approaches across the EU for addressing threats to democracy. The package included a recommendation to Member States on promoting civic engagement and effective participation in the public policy-making process¹¹. The JRC helped develop the section on citizen participation, provided the scientific underpinning, and set out the conditions necessary for Member States to conduct high-quality processes on citizen participation.

¹¹ [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=pi_com:C\(2023\)8627](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=pi_com:C(2023)8627)

EMPOWERED MEMBER STATES ON PARTICIPATORY DEMOCRACY

To facilitate the implementation of this recommendation by Member States, the Commission's Competence Centre on Participatory and Deliberative Democracy¹² led by JRC, developed in 2024 a comprehensive training package for public administrations. This training package enables national administrations to effectively design and use the results of citizen engagement exercises. It was successfully piloted in two Member States and is now being rolled out through the EU Academy.

The JRC has also helped public administrations develop projects for the Commission's Technical Support Instrument (TSI), the EU programme that provides Member States with tailor-made technical expertise on designing and implementing reforms. In 2024, with the support of

¹² <https://cop-demos.jrc.ec.europa.eu>

the JRC, six Member States (Portugal, Slovakia, Ireland, Romania, Finland and Czechia) submitted a TSI on building capacity to increase the impact of citizen participation in EU member countries. This is in line with the EU's goal of enhancing the capacities of public administrations. In her quote, Simona Zacharová explains how the Slovak government has benefitted from the JRC's invaluable guidance on participatory policymaking.

SUPPORTED SEVERAL DGS ON CITIZEN ENGAGEMENT

The JRC's expertise regarding citizen engagement has also benefitted several of the Commission's DGs. It advised DG ENV on the pollinators initiative, helping to set up a Youth Citizen Assembly on Pollinators Decline, which was funded by the European Parliament as a pilot project. The JRC also co-drafted with DG Communication (DG COMM) the Corporate Guidance on Citizen Engagement. This serves as a reference document for the Commission in terms

of principles, methods and the practical implementation of citizen engagement exercises and was made available to the public in 2024.

ADVISED ABOUT INNOVATIVE ONLINE DELIBERATION

Building on its experience supporting citizen engagement for the Conference on the Future of Europe (2021-2022), the JRC helped the Commission with its new online deliberative platform that was launched in February 2024. The platform allows citizens to voice their ideas and concerns, for example in the context of EU Citizens' Panels. The JRC contributed to the platform's design and overall online citizen engagement features, ensuring that citizens' ideas are translated into concrete policy actions at the EU level.

Assessing drought risks, monitoring agricultural conditions

Droughts are getting more severe and more frequent in Europe and worldwide. Adopting a forward-looking, proactive approach is essential to mitigate the impacts and enhance societal resilience. The JRC provides accurate, timely data to help assess and anticipate multi-sectorial drought risks. In 2024 the JRC's research improved understanding of current and emerging risks, while offering actionable information on ongoing and expected droughts. The JRC's advanced monitoring of agricultural conditions and of soil health also informed food security assessments in Europe and beyond.



SUPPORT AT NATIONAL LEVEL

Helps national authorities on crisis preparedness and societal resilience





Andreja Sušnik

Slovenian Environment Agency

The frequency of agricultural drought in Slovenia has been increasing over the past few decades. The JRC's work, particularly through the European Drought Observatory and the World Drought Atlas, provides essential data and insights to help policymakers and communities anticipate, assess, and address the growing challenges of drought.



MONITORS AND ASSESSES DROUGHT RISKS

The JRC delivers continuous, near-real-time drought information and data through the European and Global Drought Observatories¹³, which are part of the Copernicus Emergency Management Service¹⁴. The first edition of the JRC's European Drought Risk Atlas, published in 2023, was a significant step towards impact-based drought assessment, addressing key socio-economic sectors and ecosystems.

Building on this atlas, the JRC co-led with the United Nations Convention to Combat Desertification (UNCCD) the development of the first-ever World Drought Atlas in 2024¹⁵, which was also supported by several scientific partners and institutions. This atlas serves as a key resource for

¹³ https://joint-research-centre.ec.europa.eu/european-and-global-drought-observatories_en

¹⁴ <https://emergency.copernicus.eu>

¹⁵ <https://worlddroughtatlas.org>

policymakers to take proactive action to manage drought risks. Dr Andreja Sušnik confirms in her quote how this work helps address the growing challenges of droughts in Slovenia and worldwide.

TRACKS AGRICULTURAL CONDITIONS AND PREDICTS CROP YIELDS

Since 1992, the JRC's Monitoring Agricultural Resources (MARS) Bulletins have been monitoring agricultural conditions and providing in-season yield forecasts. The JRC MARS Bulletins¹⁶ are used by farmers and governments to respond proactively to potential crises along the food chain. They inform the DG for Agriculture and Rural Development (DG AGRI) policy interventions relating to the common agricultural policy (CAP) by helping for instance to assess Member State requests to the agricultural reserve as a result of extreme weather. The JRC MARS Bulletins are considered a critical

¹⁶ https://joint-research-centre.ec.europa.eu/monitoring-agricultural-resources-mars/jrc-mars-bulletin_en

service in the context of the EU's crisis preparedness and management tools, which are linked to informing the European Food Security Crisis preparedness and response mechanism (EFSCM).

INFORMS FOOD SECURITY ASSESSMENTS OUTSIDE EUROPE

The JRC develops and runs the global Anomaly Hot Spots of Agricultural Production (ASAP)¹⁷ platform, an early warning system that signals possible agricultural production anomalies that could affect food security. Thanks to the latest generation of satellite data and meteorological model outputs, it provides near real-time agricultural drought conditions warnings at the subnational level. In 2024, the ASAP system was upgraded with pre-operational yield forecasts¹⁸ based on machine learning, in collaboration with

¹⁷ <https://agricultural-production-hotspots.ec.europa.eu>

¹⁸ <https://agricultural-production-hotspots.ec.europa.eu/download.php>

the Food and Agriculture Organization (FAO) and the University of Valencia.

CONTRIBUTES TO SOIL HEALTH MONITORING

Soil damaged by droughts will lose its ability to absorb water effectively, exacerbating the risk of floods. In collaboration with the European Environment Agency, the JRC delivered a comprehensive assessment of the state of soil degradation across the EU in the 2024 State of Soils in Europe report¹⁹. The report sets out the scale of the problem facing Europe today and aims to reinforce and build capacities among the soil research community. It draws on the excellent data collected by the JRC and the EU Soil Observatory (EUSO)²⁰, which was presented in EUSO's Soil Degradation Dashboard.

¹⁹ <https://publications.jrc.ec.europa.eu/repository/handle/JRC137600>

²⁰ <https://esdac.jrc.ec.europa.eu/euso>

Shaping the 2040 climate targets

The complexity of climate change and the breadth of its impact requires an objective, scientific, evidence-based approach to policymaking. As an independent body, the JRC provides unbiased assessments of policy options. The JRC's continuous efforts to advance scientific understanding and emissions inventories have helped the EU and the global community meet ambitious targets aimed at mitigating climate change. In 2024, the JRC's analysis underpinned the Commission's recommendation for a 90% emissions reduction goal by 2040 to ensure EU climate neutrality by 2050.



GLOBAL IMPACT

Ensures policymakers understand the trade-offs and synergies based on comprehensive modelling and data





Sandrine Dixson-Declève

Honorary President, The Club of Rome - Executive Chair, Earth4All

Sound climate policy must be guided by facts, not short-term politics. The JRC has delivered accurate data, reliable models and expert analysis for many years. Its contribution to advancing scientific awareness and advising on actionable pathways has been immense, for the EU but also for the global community.



ENSURED LONG-TERM CONTINUITY AND COHERENCE

For more than two decades, the JRC has worked to advance the EU and global climate agendas. It aims to increase awareness about the global status of greenhouse gas emissions (GHG) and the potential pathways to climate neutrality. The JRC has provided the scientific foundation for many of the EU's climate policies, delivering targeted evidence on specific aspects of climate change. Sandrine Dixson-Declève from the Club of Rome confirms in her quote the JRC's immense contribution to inform sound climate policy decisions, for the EU and beyond.

For the 2040 climate target, the JRC was involved from the onset and was extremely helpful in connecting the dots between the different policy areas. The JRC acted as a central hub for integrating different perspectives and policy options. This facilitated the creation of a common knowledge base whereby the various DGs could interact based on the same baselines,

scenarios, and models. The JRC's central role also ensured continuity and coherence in the sequence of EU regulations.

SUPPORTED WITH DIVERSE MODELLING TOOLBOX

The JRC has developed a unique and comprehensive modelling toolbox to support EU policies towards climate neutrality and position the EU at the forefront of modelling capacity for climate diplomacy. For the main 2040 climate target options, JRC's scientists carried out a macro-economic assessment of the socio-economic impacts using the JRC-GEM-E3 applied general equilibrium model²¹. This covers the interactions between the economy, the energy system and the environment, considering also the distributional concerns. In addition to assessing the socio-economic impacts, JRC scientists also explored the possible technological pathways to decarbonise the EU's energy system by 2040, thanks

²¹ https://joint-research-centre.ec.europa.eu/scientific-tools-and-databases/jrc-gem-e3-model_en

to the JRC-developed economic model POTEnCIA (Policy-Oriented Tool for Energy and Climate Change Impact Assessment)²². A third example from the JRC's modelling toolbox that was used for the 2040 climate target was the Forest Carbon Model JRC-CBM²³. This forest carbon model enabled policymakers to assess the impact and contribution of land use and forest sinks under the various 2040 scenarios.

CONSIDERED BROADER SOCIETAL IMPACTS

The JRC also helped policymakers consider the broader impacts of the various policy options for a 2040 EU climate target. For example, scientists analysed the higher demand for raw materials which could be expected as a result of the different technological pathways. The potential

²² <https://web.jrc.ec.europa.eu/policy-model-inventory/explore/models/rmodel-potencia>

²³ <https://op.europa.eu/en/publication-detail/-/publication/016a8f3a-6c74-11ed-9887-01aa75ed71a1>

territorial impacts of a 2040 climate target were also assessed via the JRC's Emissions Database for Global Atmospheric Research (EDGAR)²⁴. Indeed, EDGAR's national GHG emissions inventories helped the Directorate-General for Regional and Urban Policy (DG REGIO) anticipate the exposure of different EU regions to the various policy options, which were then included in the Commission proposal's impact assessment. The JRC also provided ample evidence to policymakers about the cost of inaction, if no EU 2040 climate target was agreed upon.

Taking advantage of its interdisciplinary teams and research, the JRC was able to offer comprehensive modelling and scenarios that helped policymakers understand the trade-offs and synergies between the different policy options for the EU's 2040 climate target.

²⁴ <https://edgar.jrc.ec.europa.eu>

Preventing a future health crisis

Antimicrobial resistance (AMR) is a silent crisis, claiming 35 000 European lives each year. AMR occurs when bacteria adapt to resist antibiotics. This allows the tougher bacteria to survive and grow stronger. The JRC has played an essential role in helping the EU to better understand and fight against the ongoing AMR health crisis. In 2024, the JRC developed new methodologies to detect antibiotic residues in animal feed and has monitored waterways for potential AMR-triggers such as antimicrobial drugs or pesticides. The JRC will continue to pursue cutting-edge research and support the global momentum against the growing AMR threat.

GLOBAL IMPACT

Developed methodology to detect tiny amounts of antibiotics to anticipate and mitigate risks





Jacob Diamond

Programme Specialist for Water Quality and Ecohydrology UNESCO, Intergovernmental Hydrological Programme

Antimicrobial resistance (AMR) is a global public health threat, but its spread through the environment remains a mystery. The JRC's open-science approach focused on policy outcomes is leading EU and global partners to better understand and limit the rise of AMR, particularly in wastewater and rivers.



BOOSTED DETECTION IN ANIMAL FEED

One of the ways that super resistant bacteria can pass to humans is through animal feed. To mitigate this risk, a delegated EU regulation, which was steered by DG Health and Food Safety (DG SANTE), entered into force in May 2024. This secondary legislation, which limits the presence of antibiotics in animal feed, builds on the JRC's expertise in food and feed analysis. The JRC developed and validated cutting-edge analytical methods capable of detecting tiny amounts of 24 antibiotics in animal feed²⁵. National control laboratories across the EU will have until May 2025 to adopt these detection methods at national level. Enhancing our ability to detect antibiotics at 'as low as achievable' levels is an important step in helping to limit the risks of a rise in AMR.

²⁵ <https://publications.jrc.ec.europa.eu/repository/handle/JRC136836>

MONITORED WATER TO BETTER PREDICT AMR TRENDS

Monitoring waterways is another extremely useful way of identifying potential risks before they reach us²⁶. The JRC examines rivers, lakes and other surface waters to track the presence and concentration of antibiotics, azoles or other substances which are used for medical treatment or as pesticides and can strengthen bacteria. This data is gathered in the surface water Watch List (the most recent report can be found here²⁷) as part of the Water Framework Directive.

JRC scientists are also working on common standards for the safe re-use of wastewater for irrigation purposes. This is important to prevent antibiotics from leaking into the environment. The JRC has produced reference material to reliably measure

²⁶ <https://academic.oup.com/femsec/article/97/11/fiab140/6384828>

²⁷ <https://publications.jrc.ec.europa.eu/repository/handle/JRC137626>

antibiotics in wastewater so it can be safely reused, for example in farming. The JRC also maintains the EU Wastewater Observatory for Public Health and assists the DG for Health Emergency Preparedness and Response (DG HERA) by providing scientific, technical and logistical support.

DRIVES GLOBAL ACTION

AMR is an important EU priority, but it also stands as one of the most pressing global health threats of our time, as explained by Jacob Diamond from UNESCO in his quote. The JRC-developed methods constitute a significant contribution to and advancement of the concerted global effort to combat antimicrobial resistance and preserve the well-being of both animals and humans. In the context of the United Nations General Assembly (UNGA) in New York in September 2024, a political declaration was reached that committed UN member countries (which includes EU Member States) and the EU to stepping up action against AMR. The JRC will continue to support this global effort with cutting-edge science and its

high-tech labs to address the AMR threat in a holistic way.

PURSUES CUTTING-EDGE RESEARCH

In addition to detection and monitoring, the JRC will also continue to explore alternative solutions. For example, the JRC's important work on bacteriophages for example, viruses that specifically attack and kill bacteria, supports the implementation of alternative therapies. In March 2024, a JRC overview report on phage therapy served as a basis for discussion at the European Parliament.

Helping Europe beat cancer

Turning the tide against cancer is a major EU health priority. As the science service of the Commission, the JRC has contributed significantly to Europe's Beating Cancer Plan. The recently released European Quality Assurance (QA) Scheme for Breast Cancer Services is an important milestone towards improving early detection and care throughout Europe. Furthermore, the JRC's pioneering research and successful results on nuclear treatment for prostate cancer (published in the Lancet Oncology) was another major milestone, acknowledging and anchoring the JRC's important work in this field.

IMPACT ON SOCIETY

First formulated the novel concept of applying radioactive substances in targeted cancer therapy





Dorota Dudek-Godeau

Polish National Institute of Public Health - National Research Institute

The testing of the European Quality Assurance scheme showed its potential in reducing inequalities and improving patient outcomes thanks to the use of evidence-based quality indicators. The JRC's role was crucial in coordinating the pilot sites and stakeholders, ensuring the European QA scheme is adaptable across European healthcare systems.



PROVIDED LONG-STANDING CANCER SUPPORT

The JRC has supported Europe's efforts, mainly with DG SANTE, in fighting cancer for many years. In the early 1990's, the novel concept of applying radioactive substances for targeted cancer therapy was first conceived by the JRC. Indeed, the JRC had ideal conditions when it integrated its sophisticated laboratory facilities for nuclear research with a broad range of expertise in chemistry, physics and biology. The JRC's independence from commercial interests ensured a focus on patients.

But the JRC's knowledge management services have also played a key role. The European Cancer Information System (ECIS), launched in 2018, is the reference for monitoring and projecting the burden of cancer in Europe. ECIS data clearly shows the urgent need to improve cancer screening, diagnosis and care. Guidelines and quality assurance schemes such as those for breast cancer services address this need. To foster independent scientific

alignment and coordination, the JRC also launched the Knowledge Centre on Cancer in 2021. Finally, in 2022 the European Cancer Inequalities Registry was launched and endorsed by Commission President Ursula von der Leyen. It is a flagship initiative of Europe's Beating Cancer Plan to identify, summarise and communicate on disparities and inequalities between Member States and regions.

NEW QUALITY ASSURANCE SCHEME FOR BREAST CANCER SERVICES

The new JRC-led quality assurance scheme, endorsed in November 2024, defines a common set of quality requirements for breast cancer services²⁸. This scheme, designed to be implemented on a voluntary basis, covers the entire care pathway from screening to palliative care. Feasibility testing of the scheme in 20 entities across 9 countries was a resounding success, as

²⁸ <https://cancer-screening-and-care.jrc.ec.europa.eu/en/ecibc/breast-quality-assurance-scheme>

explained by Dr Dorota Dudek-Godeau from the National Polish Institute of Public Health - National Research Institute. Healthcare providers compliant with the requirements will be able to apply for certification. Widespread EU adoption of the scheme would reduce the cancer burden, improve the homogeneity of cancer care services offered in the EU and offer reassurance to women and patients that the screening and care being offered is of good quality. It marks a concrete step towards improving early detection and breast cancer care throughout the EU.

PIONEERED NEW HIGHLY EFFECTIVE NUCLEAR TREATMENT FOR PROSTATE CANCER

From 2013 to 2014 the JRC and the University Hospital Heidelberg together achieved a breakthrough with the development of 225Actinium-PSMA617 (225Ac-PSMA) for the treatment of prostate cancer. This radionuclide therapy (targeted alpha therapy), initiated at the JRC, has had significant impact in bolstering progression-

free and overall survival rates for metastatic castration-resistant prostate cancer - the lethal form of prostate cancer progression. It was clinically tested on 488 patients on four continents. The remarkable results of the study, which was co-led by the JRC, was the largest investigation of the antitumor effect and toxicity of 225Ac-PSMA to date. This study was published in 2024²⁹ in the world-leading clinical oncology research journal, Lancet Oncology. The JRC's pioneering research work, as well as its support to hospitals and cancer centres on targeted alpha therapy treatment, have been important contributors to Europe's Beating Cancer Plan.

²⁹ [https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(23\)00638-1/abstract](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(23)00638-1/abstract)

Making cities more sustainable

As urbanisation and climate change accelerate in the EU, cities are under pressure. Over 75% of the EU's population lives in urban areas, which also account for about 70-80% of the EU's GHG emissions. The JRC has made significant strides in helping cities become more sustainable, thanks to its crucial support to the New European Bauhaus, the EU Cities Mission and the Global Covenant of Mayors. It has also helped with future-looking research and vital monitoring data, for example on GHG emissions and air quality.



SUPPORT AT REGIONAL LEVEL

Supported data monitoring and community building to empower cities





Rose Power

Southern Regional Assembly, Ireland

It's about being bold, being brave, being innovative, and having a huge level of ambition to create projects that will be genuinely transformative for all of the citizens in our towns and cities across Ireland. And the New European Bauhaus gives us that approach.



TRANSFORMED THE NEW EUROPEAN BAUHAUS INTO A VIBRANT COMMUNITY

The New European Bauhaus (NEB) is an important pillar of the European Green Deal and which the JRC has helped to coordinate. NEB helps stimulate bottom-up local engagement by encouraging citizens, local governments, businesses and other stakeholders to come together to co-create sustainable solutions and thereby shape the future of neighbourhoods and cities. Since the launch of the NEB in 2020, the JRC has helped to grow this community into an EU wide movement of over 1 500 members, connecting many different regions across Europe. The vibrancy of the NEB community was evident at the second edition of the New European Bauhaus Festival that took place in Brussels last April, with over 5000 participants. Rose Power from Ireland confirms in her quote the importance of the NEB approach and its positive impact at the local level.

HELPED ANCHOR THE NEW EUROPEAN BAUHAUS IN THE EU

As a testament to NEB's success, the EU established a new and unique funding tool in 2024: the New European Bauhaus Facility 2025-2027³⁰. This multi-annual financial instrument will ensure a solid continuation of the JRC's excellent work in helping to revitalise neighbourhoods across Europe. In addition, the JRC will become an example of sustainability and innovation with the construction of the European Commission's first net-zero emissions building at its Sevilla site.

SUPPORTS CITIES IN THEIR AMBITION TO REDUCE EMISSIONS AND INCREASE RESILIENCE

The JRC provides research, data, guidance and methodologies to cities striving to reduce emissions and adapt to climate change. Through its scientific support to

³⁰ https://new-european-bauhaus.europa.eu/funding/new-european-bauhaus-facility_en

the Covenant of Mayors and the EU Cities Mission, the JRC plays a key role in helping cities achieve ambitious sub-national climate targets. It monitors progress and assesses the impact of local action to decarbonise cities, increase resilience of territories, fight energy poverty and become climate-neutral as soon as 2030.

HELPS FORECAST THE IMPACT OF TEMPERATURE CHANGES

In 2024, the JRC undertook the first pan-European assessment of the current and projected excess mortality resulting from temperature change³¹. Published in the Lancet journal, this study informed policymakers and authorities about foreseen challenges to public health systems, particularly during periods of extreme heat and cold.

³¹ [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(24\)00179-8](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(24)00179-8)

































SUPPORTED AIR QUALITY MONITORING AND MODELLING

Over the past 20 years, the JRC has also analysed air pollutants, worked on innovative measurement techniques and supported national laboratories. This work contributed to the development of a standard European method for air pollution measurements. This method is now included in the EU Ambient Air Quality Directive, published in 2024.

The latest edition of the JRC's Urban PM2.5 Atlas³² provided accurate data about the sources of the air pollutant responsible for most of the well documented premature deaths: particulate matter smaller than 2.5 micrometres (PM2.5). Thanks to the JRC's air quality tool, Covenant of Mayors cities can now evaluate synergies and trade-offs between air quality and climate policies.

³² <https://publications.jrc.ec.europa.eu/repository/handle/JRC126221>

Reference Links


























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	CLIMATE 21. JRC-GEM-E3 model (https://joint-research-centre.ec.europa.eu/scientific-tools-and-databases/jrc-gem-e3-model_en)		CLIMATE 22. POTEnCIA Model (https://web.jrc.ec.europa.eu/policy-model-inventory/explore/models/model-potencia)		CLIMATE 23. JRC Forest Carbon Model (https://op.europa.eu/en/publication-detail/-/publication/016a8f3a-6c74-11ed-9887-01aa75ed71a1)		CLIMATE 24. EDGAR Database (https://edgar.jrc.ec.europa.eu)		ANTIMICROBIAL RESISTANCE 25. JRC Report on detection methods in animal feed (https://publications.jrc.ec.europa.eu/repository/handle/JRC136836)
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	CITIES 31. Study of temperature-related mortality (https://www.thelancet.com/journals/lanp/article/PIIS2468-2667(24)00179-8)		CITIES 32. Urban PM2.5 Atlas (https://publications.jrc.ec.europa.eu/repository/handle/JRC126221)						

The 25 main building blocks guiding the JRC's work

JRC Portfolios

European Commission Priorities

- A new plan for Europe's sustainable prosperity and competitiveness
- A new era for European Defence and Security
- Supporting people, strengthening our societies and our social model
- Sustaining our quality of life: Food security, water and nature
- Protecting our democracy, upholding our values
- A global Europe: Leveraging our power and partnerships
- Delivering together and preparing our Union for the future

 <p>PORTFOLIO 1 Just, competitive and sustainable green transition</p>	 <p>PORTFOLIO 2 Energy solution</p>	 <p>PORTFOLIO 3 Pathways to climate neutrality</p>	 <p>PORTFOLIO 4 Nuclear safety – technology and skills</p>	 <p>PORTFOLIO 5 Small modular reactors and innovative reactor systems</p>
 <p>PORTFOLIO 6 Future transport, mobility and related infrastructure</p>	 <p>PORTFOLIO 7 Sustainable materials and products for a circular, resilient and competitive Europe</p>	 <p>PORTFOLIO 8 Digital transformation: technologies, cybersecurity and socio-economic impact</p>	 <p>PORTFOLIO 9 Artificial intelligence and data</p>	 <p>PORTFOLIO 10 Drivers of competitiveness</p>
 <p>PORTFOLIO 11 Strategic technologies for economic security and innovative industrial ecosystems</p>	 <p>PORTFOLIO 12 Blueprints for a strong European Health Union</p>	 <p>PORTFOLIO 13 Synergies for a stronger EU in space, security and defence</p>	 <p>PORTFOLIO 14 Societal resilience, systemic disruptive events and risks: Enhancing anticipation, preparedness, and response</p>	 <p>PORTFOLIO 15 Science for security and law enforcement</p>
 <p>PORTFOLIO 16 Nuclear safeguards</p>	 <p>PORTFOLIO 17 Demographic resilience and effective migration strategies</p>	 <p>PORTFOLIO 18 Economic, social and territorial intelligence and impact</p>	 <p>PORTFOLIO 19 Zero pollution, biodiversity restoration and natural capital accounting</p>	 <p>PORTFOLIO 20 Transition to more competitive resilient and sustainable food systems in an EU and global context</p>
 <p>PORTFOLIO 21 Coherent policies through Earth observation intelligence</p>	 <p>PORTFOLIO 22 Climate adaptation and water resilience</p>	 <p>PORTFOLIO 23 Innovation for democracy and public governance</p>	 <p>PORTFOLIO 24 Science for Global Gateway and neighbourhood policy, including enlargement</p>	 <p>PORTFOLIO 25 Foresight, support to science and innovative policymaking</p>

Key facts and figures

JRC at a glance

Established in 1957 under the Euratom Treaty, the Joint Research Centre's (JRC) focus has expanded significantly over time.

In addition to its longstanding expertise in the nuclear field, the JRC now offers scientific expertise and competences from a wide range of disciplines to support almost all EU policy areas.



Our purpose

The JRC provides independent, evidence-based knowledge and science, supporting European Union policies to positively impact society.

Our scientific evidence

3000+

open data sets.

~60

top class physical research infrastructures.

100+

models used for instance for impact assessments, monitoring policy implementation, fraud detection in trade and early warning of natural disaster risks.

Our values



TRUST

We trust each other and are a reliable scientific partner for policymakers.



COLLABORATION

We embrace new partnerships through our portfolios, inside and outside the JRC.



TRANSPARENCY

We share our journey with each other and our science with the world.

Scientific excellence & integrity

The JRC prides itself on its scientific excellence and integrity. We deliver our science through cross-cutting portfolios, which enable us to integrate work across scientific and policy domains. The portfolios are the core of our work programme, in which we support the Commission's political priorities, putting science into many of the Commission's work programme initiatives. In 2020 we adopted a framework for scientific integrity and research ethics.

5%

JRC publications among top 1% world most-cited.

~30%

JRC publications among top 10% world most-cited.



Our portfolios
(https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/jrc-portfolios-z_en)

Our people

The JRC aims to recruit, train, motivate and retain highly qualified staff to ensure its effective and efficient operation as well as the promotion of equal opportunities and diversity.

~2700

employees.

70%

staff engaged in research.



JRC vacancies
(<https://recruitment.jrc.ec.europa.eu>)

Our partners

The JRC is part of a vibrant ecosystem of partnerships, including:

- European Commission services and EU Agencies
- Member States
- academia
- Horizon Europe participant countries
- leading national research organisations *e.g. in USA, Japan, South Africa*
- international organisations *e.g. OECD, UNEP, FAO, WHO.*

Our strengths



ANTICIPATION focuses on what is coming at us and on being able to provide the scientific underpinning for future policy initiatives.



INTEGRATION means building links between the different scientific and policy areas in the Commission and beyond, to address complex challenges no single science area could face on its own.



Last but not least, **IMPACT** is about assisting policymakers to track and assess the impact of their policies.

Our budget



~600 EUR million

~130 EUR million
in contracts with third parties

The JRC receives funding from three EU programmes:

- **Horizon Europe** Framework for Research and Innovation
- **Euratom Research** and Training
- **Decommissioning** and Waste Management

The JRC generates revenues through support to the Commission services and contract work for third parties such as industry or regional authorities.

Observations by the Board of Governors

The members of the JRC's Board of Governors commend the JRC on the successful delivery of the priorities defined by the JRC's Work Programme 2023-2024. JRC researchers continue to excel in very challenging times, providing independent, evidence-based knowledge and science supporting EU policies to positively impact society. We, the members of the JRC Board of Governors, reiterate our confidence in the JRC to continue delivering outstanding research in the coming period, thereby underpinning the work of the new Commission in driving towards a sustainable, resilient and competitive European Union.

In this respect, the Board is pleased to note that the JRC's essential role in providing evidence for policy is mentioned in the mission letters of all Commissioners-designate for the next college mandate. This gives JRC a stronger legitimacy to support the work of the entire Commission across all policy areas and also brings certain challenges. The Board recalls that the JRC has faced several challenges under the current Multiannual Financial Framework (MMF 2021-2027) notably the cuts to the

EURATOM budget, inflationary pressures, and a reduced capacity to invest in research infrastructure. On top of that, policy issues are becoming increasingly complex, the volume of data is growing exponentially, and the pace of change is accelerating. JRC needs to be equipped to rise to these challenges.

In this respect, the Board wishes to reiterate its continuing support of the JRC in view of the negotiations for the new Multiannual Financial Framework (2028-2034) and the next generation of research programmes. We, the members of the JRC Board of Governors, consider that securing a viable budget is essential for the JRC to uphold excellence in research to better serve the European Commission, Member States, Horizon Europe associated countries and the international community at large. Reiterating our call for increasing the EURATOM budget for direct actions, the Board recalls that sound and independent EU level expertise on nuclear technologies and maintaining up to date infrastructures, competences and skills in the nuclear domain are vital.

Reflecting on some of the achievements accomplished in 2024, the Board congratulates JRC on the launch of the European Innovation Centre for Industrial Transformation and Emissions (INCITE) as the EU's benchmark for identifying and evaluating the environmental performance of innovative industrial techniques for a cleaner and more competitive industry.

The Board similarly appreciates JRC's efforts that led to the establishment of the New European Bauhaus Facility, a unique funding tool that aims to revitalise neighbourhoods.

The Board also commends the JRC's key role in driving the EU's strategic foresight work. As global trends are intensifying, the Board emphasises the importance of JRC's work in crisis management - from anticipation and preparedness to situational awareness, prevention, disaster risk reduction, emergency response and recovery.

Just as important, the Board compliments the notable research undertaken to contribute to ensuring the EU's economic security, including

but not limited to, critical raw materials, clean energy supply, export control and dual-use research, and screening and analysing outbound investments.

Emphasising the importance of nuclear science and technologies, the Board follows closely the implementation of the JRC's strategy for its nuclear activities, as well as the execution of the Nuclear Decommissioning and Waste Management Programme.

Finally, having encouraged an increased outreach to stakeholders, particularly the Member States, the Board commends the JRC for following up on this commitment. The Board remains convinced that efforts invested in outreach are crucial for the JRC in gaining the recognition its work deserves and engaging in effective scientific partnerships.

While looking forward to providing continued guidance and support, the Board endorses this Highlights Report and reaffirms its appreciation of the work of the JRC.

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For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex: <https://eur-lex.europa.eu>.

Open data from the EU

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

Science for policy

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society



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