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ANNEX

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**to the**

**Commission Implementing Decision**

**adopting the Joint Research Centre's work programme for 2021-2022 under Decision of the Council on establishing the specific programme implementing Horizon Europe – the Framework Programme for Research and Innovation, and Council Regulation (Euratom) establishing the Research and Training Programme of the European Atomic Energy Community for the period 2021-2025 complementing Horizon Europe – the Framework Programme for Research and Innovation**

## ANNEX

### **The Joint Research Centre's work programme for 2021-2022**

#### **I. Introduction**

As the European Commission's science and knowledge service, the Joint Research Centre (JRC) supports Commission services by providing evidence for smarter policies.

This annex to the Commission implementing decision presents the JRC's work programme for 2021 and 2022. The 2021-2022 work programme:

- supports the Commission's political priorities and high-level objectives, and the Commission's 2021 work programme;
- contributes to the key strategic orientations of the Horizon Europe Strategic Plan for 2021-2024 as stated therein and implements the specific programme implementing Horizon Europe concerning the direct actions of the JRC;
- contributes to the general and specific objectives of the Euratom research and training programme 2021-2025, namely to undertake nuclear research and training activities focusing on the continuous improvement of nuclear safety, security and radiation protection, as well as to complement the achievement of Horizon Europe's objectives inter alia in the context of the energy transition.
- takes account of the consequences of the COVID-19 pandemic and the steps the Commission has taken in its aftermath, including the EU recovery plan (COM(2020) 456 final);
- is funded either by institutional resources (i.e. operational funding for the JRC under Horizon Europe and its complementary Euratom programme), additional funding from Commission services or funds managed by the Commission on behalf of and in agreement with the Member States;
- is the first of four work programmes foreseen in the 'lifetime' of Horizon Europe.

#### **II. Supporting the Commission's political priorities**

The JRC supports the Commission's political priorities and high-level objectives. It provides data and analysis to help design new policy initiatives and legislative proposals and to monitor existing ones. At the crossroads between science and policy, it provides the multidisciplinary and cross-sectoral policy support that policymakers need to tackle increasingly complex economic, social, environmental and technical challenges. The JRC works with Commission services responsible for all EU policy areas, in line with its expertise and available resources. It will maintain close exchanges with the policy DGs and other EU institutions to ensure synergies with ongoing initiatives.

About 60% of its support is for policies that enable the twin green and digital transition, with almost half of its total support contributing to the Green Deal. Political priorities 3-6 account for almost 30% of JRC's support: 7% for an economy that works for people (priority 3), 10% for a stronger Europe in the world (priority 4), 8% for promoting our European way of life (priority 5) and 3% for a new push for democracy (priority 6). The rest is attributed to cross-cutting activities.

## ***Political priority 1 - A European Green Deal***

The European Green Deal will transform every aspect of our economy, environment and society - from the energy we use and the air we breathe to the food we eat, the way we live, work, travel, produce and consume products, and will shape our built environment. It will enable climate neutrality by 2050 focusing on adaptation, on protecting and preserving our environment, and on a new growth strategy for Europe. It will help create jobs and growth, making our economy sustainable and more innovative, resource efficient, circular and competitive.

This transition requires a coordinated and targeted mobilisation of Europe's scientific knowledge, research, innovation, investment and societal assets, institutions and capacities, targeted on the effective achievement of the objectives and targets set out in the Green Deal and the various strategies adopted under it. The JRC will play a key role in the transition by providing the scientific, technical and economic evidence base, as well as the foresight, modelling and monitoring necessary to enable the transformation. To that end, it will work in close coordination with relevant Commission services and with other partners at multiple governance levels both within and outside the EU. The JRC will assess potential trade-offs between economic, social and environmental objectives, and help embed environment and climate action into all policies through interdisciplinary research. It will work on various issues, including climate action, sustainable and smart mobility, energy, nuclear energy, a green, circular and sustainable economy, environmental pollution and protection, biodiversity, oceans and fisheries and aquaculture, agriculture and food systems. Through this work, the JRC will also contribute to a green transition at a global level. The new European Bauhaus initiative aims to bring the European Green Deal to life, hand in hand with the digital and social transformation. It will act as a hub for innovation and creativity to drive sustainable design across Europe and beyond, that is also appealing and affordable for citizens. The JRC will act as a coordinator and facilitator for the entire process. It will seek to translate the new European Bauhaus core values – sustainability, inclusion and quality of experience – into tangible results in various complementary areas such as built environment, innovation in industry and mind-set community building. The design phase will involve a broad participatory co-creation approach, drawing on the expertise and engagement of designers, architects, artists, scientists and entrepreneurs. The JRC's expertise in technological, economic, social, inclusion and behavioural aspects, financing, environmental footprinting, energy labels, certification, zero energy neighbourhoods, heating and cooling, smart buildings, interoperability, energy management, as well as its world-leading laboratories in the field of interoperability, batteries, photovoltaics, and mobility will also be placed at the disposal of the Bauhaus initiative.

The JRC's scientific expertise will underpin many Green Deal initiatives and will also anticipate future challenges, needs and transformations.

Examples of the JRC's support to the Commission's 2021 work programme (CWP 2021) include:

- 'Fit for 55' package. The JRC will support all climate and energy-related initiatives in this package that aim to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. Its support will include: projections of climate mitigation options and the cost of non-action; scenario building for the Emissions Trading Directive and the Effort Sharing Regulation; analysis related to energy efficiency and buildings (including heating and cooling); impact of circular economy on climate mitigation; the deployment of renewable energy sources; and how to reduce methane

emissions. It will also study the transformation of the electricity infrastructure and markets, the socio-economic and other impacts of their digitalisation, and the consequent need for interoperable solutions and the deployment of citizen energy communities, as well as, the socio-economic consequences, and measures to ensure resilient and continuous security of supply of gas and electricity systems. The JRC will continue developing its model-based capacity on climate, energy and transport policies to address future policy questions relevant in the transition from 2030 towards a climate neutral EU economy for 2050.

- Within the package, the JRC will help define CO<sub>2</sub> emissions standards for road vehicles and develop analytical techniques and software tools to support EU policies on CO<sub>2</sub> certification and reduction in the transport sector.
- The JRC will support energy efficiency and building related policies and provide support in the course of the revision of the Energy Efficiency Directive and the targeted revision of the Energy performance of Buildings Directive in the form of assessing technical, environmental, economic and social aspects of energy efficiency.
- Revision of the Energy Taxation Directive. The JRC will support the revision by providing modelling on distributional effects and by analysing various scenarios.
- A carbon border adjustment mechanism (CBAM). The JRC will support this initiative by producing modelling-based analyses on various alternative CBAM scenarios, including distributional impacts, and impacts for the steel sector and the wind power value chain.
- New Adaptation Strategy. The JRC will continue to advance the state of the art on adaptation-relevant research and analytical support for an array of actions under the new Adaptation Strategy, including the implementation of the Horizon Europe Mission on Adaptation.
- Sustainable products package. The JRC will support the Green Claims initiative through the continuous development and implementation of product and organisation environmental footprint methods, and in setting up the Environmental Footprint database. Its experience in developing product criteria will support the eco-design methodology of products, as input to the new Sustainable Products initiative, which will also include work on the Digital Product Passport, and its implementation. Additionally, the JRC will support other voluntary instruments for sustainable consumption and production, and greater circularity, such as product criteria for Green public procurement, the EU Ecolabel, as well as Sectoral Reference Documents for EMAS.
- Preserving and protecting biodiversity and the environment. The JRC is setting up a Knowledge Centre for Biodiversity to support the Commission reaching the 2030 targets and objectives set in the Biodiversity strategy. The centre will develop EU-wide ecosystem assessments to provide a baseline for the Commission to define additional specific targets for its post-2020 biodiversity policy. The JRC will provide the knowledge and evidence base to support its implementation of the EU nature restoration plan announced in the Biodiversity strategy for 2030. A new EU Soil Observatory will serve the soil-related requirements of the biodiversity objectives and of the forthcoming EU soil and land strategy. A new EU Observatory on Deforestation and Forest Degradation will provide up-to-date analyses of changes in

forest cover, trade and emerging threats to forests at a global level to better monitor and understand links between deforestation, forest degradation and trade. It will inter alia support the new Commission initiative aimed at minimising the risk of deforestation and forest degradation associated with products placed on the EU market.

- Action plan for the development of organic production: on the way to 2030. In order to facilitate the effective achievement of the Farm to Fork and Biodiversity strategies' 2030 target for organic farming, the JRC will provide scientific information on organic foods and their production as well as expertise on the analytical methods available for comparing organic and conventional food products.
- Zero pollution action plan concerning air, freshwater, marine and soil pollution, for which JRC provides essential support to the development and implementation of the Commission's environmental legislation. In particular, the integration of pollution-related scientific advice across several policy areas (e.g. on integrated nutrient management) and the strengthening of the outlook capacities will need further attention. The JRC will provide scientific support for the implementation of the actions of the Chemicals strategy for sustainability. It will support the implementation of the current chemicals legislation, contribute to the evolution of an evidence-based chemicals policy, evaluate real exposures to chemicals, identifying concerns for vulnerable populations and ecosystems, and further develop IPCHEM (Information Platform for Chemical Monitoring). In addition, JRC is providing geospatial intelligence for environmental compliance assurance and Earth Observation knowledge and tools for implementing environment and climate policies.
- Sustainable and smart mobility. The JRC will study the technical and human implications of future mobility patterns by investigating the links between connected and automated vehicles (CAVs) and smart infrastructures to achieve a safe and efficient road traffic. Research will also include the socio-economic aspects related to the introduction of CAVs, ranging from traffic efficiency and the related externalities to wider societal implications (e.g. jobs). Studies will include the more relevant vehicles, including remote piloted and automated aerial vehicles for urban application. It will also contribute to the proposal on post-Euro 6/VI emissions for cars, vans, lorries and buses by assessing the emission performance of new vehicle technologies and of vehicle emission screening techniques. In addition, the JRC will continue the development and management of the Transport Research and Innovation Monitoring and Information System (TRIMIS) to support EU transport policies with analyses and reports on transport R&I funding, technology and IPR trends, as well as with the assessment of the transport sector's economic performance.
- Farm to Fork Strategy. This strategy constitutes a paradigm shift in the EU food system and common agriculture policy (CAP). The CAP is central to delivering the European Green Deal and its transition to a sustainable agriculture, as it feeds people, protects and enhances the environment, mitigates and adapts to climate change, and sustains landscapes and rural livelihoods. It also strengthens the digitalisation agenda. The JRC's support to the CAP is therefore evolving in that its established methods are extended to areas such as socio-economic and environment/climate performance. Furthermore, the JRC supports the development of the Farm to Fork strategy actions in areas including its overall monitoring framework, the development of minimum mandatory criteria for sustainable food procurement, food

information to consumers, food waste, and sustainable wild capture fisheries, aquaculture and alternative protein sources. The JRC also supports this area under the remit of its scientific advice provision to the Common Fisheries Policy.

### *Political priority 2 - A Europe fit for the digital age*

The Commission is proposing actions to ensure that digital technologies help the EU develop its own vibrant, globally competitive, value-based and inclusive economy and society, paying attention to the implications in terms of social and distributional impact. Digital is the second component of the ‘twin transition’ in the EU’s political agenda and a potentially powerful enabler of the green transition. The Communication on a Europe fit for the digital age identifies five main streams for action: the European digital strategy, the industrial strategy, digital services, cybersecurity and consumers, and research.

The JRC will explore the interplay between cybersecurity, data protection and artificial intelligence (AI) in the context of the latest digital transformation developments. A new stream of work involves studying the impact of AI on human behaviour. The JRC will analyse the EU’s technological sovereignty from the standpoint of current and emerging digital technologies for security, defence, public safety and competitiveness. It will contribute to research that is fundamental for digital innovation and for guaranteeing the EU’s competitiveness and strategic autonomy. It will support innovation policy and technology transfer activities. Finally, the JRC will support the single market, for example through standardisation work and activities to support market surveillance and compliance.

Local policy design and delivery of customized innovative solutions are essential, building on territorial diversity and local strengths and needs. The JRC will help regions from Member States and associated countries designing and implementing innovation strategies, provide targeted support to enhance their innovation ecosystems and the cooperation framework of ecosystem actors, also in order to improve knowledge and technology transfer. The JRC will contribute to the industrial technology roadmaps, the territorial dimension of the European Research Area, and the mapping of ecosystems leading to development of ERA Hubs. The JRC and DG RTD will collaborate to ensure a stronger interaction between the revamped ‘Knowledge Exchange Platform’ and the second-phase of ‘Science Meet Regions’, with the aim of maximising the support to an informed decision making process at regional/local level on the European Research Area.

Examples of the JRC’s support to CWP 2021 initiatives include:

- The JRC will support the deployment of Common European Data Spaces with research on interoperability and measurement of data flows and the Data Act by researching business-to-government and business-to-business data sharing, and analysing the economics of sharing data in the automotive, agriculture and health sectors.
- Roaming Regulation. The JRC will work on the single market connectivity policies, supporting the Roaming regulation review processes with forecasting models and assisting the review of the monitoring system, market data collection and analysis, including the evolving M2M/IoT market.
- Platform workers – a new initiative to improve working conditions for platform workers. The JRC will analyse online surveys on working conditions and study factors such as the influence of algorithmic management on working conditions.

- The industrial strategy for Europe shifts from a value chain approach to an ecosystem approach. The JRC's analysis of the 14 industrial ecosystems found that green, digital and resilience goals linked to different industries are relevant in the next steps of the industrial strategy. The JRC will continue to give advice on better aligning these ecosystems (both internally within and externally between the ecosystems). It will also continue its work to decarbonise and increase the circularity and competitiveness of EU industry, assessing critical dependencies of EU strategic sectors and technologies (including clean energy and digital technologies and raw materials supply) and will further support existing tools (e.g. Important projects of common European interest) and networks (notably industrial alliances). The JRC will also support the analysis of the industrial ecosystems for defence, space and security (critical technologies and actors) to identify existing gaps, dependencies or risk of dependencies.
- Action plan on synergies between civil, defence and space industries. A new EU Observatory on Critical Technologies for civil, defence and space industry will be set up in line with point 4 of the Action Plan. This will help to identify opportunities for cross-fertilisations and synergies, prioritize funding, and define areas in which investment flagship projects could be launched. It will also contribute to other actions aiming at ensuring the resilience of the EU's critical supply chains. The JRC's research on the interplay between space, security, dual-use and defence technologies, and its activities on quantum technologies, will contribute to the preparation of the implementation plan.

### ***Political priority 3 - An economy that works for people***

Globalisation, digitalisation, the economic and financial crisis and the COVID-19 pandemic have challenged the EU's economic and social fabric in recent years, with different impacts across and within EU member states, and between women and men. Ambitions under this priority therefore include achieving a deeper and fairer Economic and Monetary Union, boosting investment and creating jobs, supporting upskilling and re-skilling of workforce, and shifting the European Semester's focus to green growth and sustainability.

The JRC will provide integrated analyses to inform policy-making in the economic, financial, employment and social fields. It will develop monitoring frameworks, providing policy makers with the bigger picture on economic, financial, employment, social issues and gender equality, assessing and following individual EU Member States' performance over time, thereby contributing to benchmarking Member States and evaluating convergence between them. It will further develop models for assessing the effects of tax-benefit reforms in Member States (Euromod), examining the impact of reforms of the international corporate tax system (Cortax), assessing and monitoring the macroeconomic outlook of European economies and the impact of policies (GM model), real-time assessment of the economic situation in the largest euro-area countries (nowcasting), macroeconomic regional and sectoral analysis (Rhomolo) and territorial impact assessment of policies and forecasts (Luisa). Finally, the JRC will contribute to the revamped European Semester aimed at recovery, competitive sustainability and integration of the SDGs.

Examples of the JRC's support to CWP 2021 initiatives include:

- Deepening the Capital Markets Union. The JRC will provide data on the degree of integration of capital markets between Member States to help monitor progress of the Capital Markets Union agenda.

- Sustainable finance. The JRC will support the financing of the Green Deal by providing technical information and analysis to underpin the implementation of the renewed sustainable finance strategy. This includes scientific evidence on how investments can be successfully redirected towards sustainable activities and how climate and environmental risks can be integrated into investors' decision-making processes.
- Establishment of an EU green bond standard. The JRC will supply data and analysis on green bonds, including on green bond markets in the EU to inform policymakers.
- Action plan on the European Pillar of Social Rights. The JRC's Social Scoreboard helps monitor the Pillar's implementation, including at regional level, and may be updated under the action plan. The JRC's pilot project on a multidimensional inequality monitoring framework which aims to build a common framework and language to monitor and analyse inequalities in the EU may provide further insights. The JRC modelling capacity (including Euromod and Rhomolo) can be used to assess initiatives under several of the Pillar's principles.
- Minimum income initiative. The JRC will assess scenarios of minimum income increases or introduction in the EU using the Euromod model, for example through estimates of the number of households affected, impact on poverty and inequality, budgetary costs and impact on labour supply of various scenarios. It will assess key performance indicators for minimum income systems, such as their adequacy and coverage.
- Completing the Banking Union: review of the bank crisis management and of the deposit insurance framework. The JRC supports the Commission's efforts to inform Council discussions on the creation of a European deposit insurance scheme by performing analyses, evaluating design options for the scheme, and calculating estimates of risk-based contribution to the scheme. The JRC develops quantitative technical analyses that can feed into the political discussion on the forthcoming review of the Bank Recovery and Resolution Directive (BRRD), notably by investigating the effect of a potential harmonisation of the insolvency ranking and the impact of the minimum bail-in requirement to enable the use of resolution funds.

#### ***Political priority 4 - A stronger Europe in the world***

Europe strives to strengthen its unique brand of responsible global leadership. It aims to be an assertive geopolitical player, the 'guardian of multilateralism' and to uphold and update the rules-based global order. This priority is closely linked to the European Green Deal, which aims to promote ambitious environment, climate and energy policies across the world. Through this priority, Europe aims to give new impetus to the relationship with the neighbourhood countries and the Western Balkans, where it sees the enlargement policy as an instrument for catalysing comprehensive national reforms, as well as with Africa (new comprehensive strategy).

The JRC's Africa work, fully in line with the objectives of EU cooperation with Africa, aims at providing scientific evidence to address the major challenges and opportunities facing Africa, promoting sustainable development as well as further strengthening the AU-EU Partnership.

The JRC will provide scientific evidence and use its scientific networks outside the European Union for science diplomacy and to support Europe's commitments on the global and



multilateral systems. This will be done in the framework of the EU global approach to research, innovation, education and youth and coherently with the policy priorities set in the EU Science & Technology Cooperation Agreements with third countries. The ongoing JRC support to the United Nations Conventions on Climate Change, Biological Diversity and Combating Desertification, as well as to the Non-Proliferation Treaty, the Comprehensive Test Ban Treaty and the UN Sendai Framework allows international requirements and standards to be set and increases global partnerships.

The JRC will also work on trade, security and defence, nuclear safety and crisis management. It will provide data and trend analyses in support of free trade agreement negotiations. The JRC's early warning systems, such as for floods, wildfires and droughts, crop yield forecasting and agricultural production anomaly detection, and its global disaster alert and coordination systems help both EU and non-EU countries prepare for disasters and manage crises worldwide. The JRC will continue to support the Joint Comprehensive Plan of Action.

Examples of the JRC's support to CWP 2021 initiatives include:

- Strengthening the EU's contribution to rules-based multilateralism. The JRC will support EU multilateralism by developing its cooperation with international partners such as WHO, UNEP, UNDRR and by supporting climate and water diplomacy in non-EU countries.
- Screening of foreign direct investments in the EU. The JRC will support this Commission-wide screening for selected sectors and technologies, i.e. through corporate ownership analysis.
- The Arctic dimension. The JRC will contribute to the review of the EU's Arctic policy and to the international policy framework. It will evaluate the societal impacts of a changing Arctic, and develop indicators for Arctic resilience and sustainable development.
- Western Balkans, Eastern and Southern Neighbourhood initiative to update the priorities and Association Agendas with each of the partners. The JRC will support capacity building for chemical, biological, radiological and nuclear (CBRN) risk mitigation in partner countries outside the EU, including Neighbourhood countries and the Western Balkans. The JRC will consolidate its role as a key knowledge provider and facilitator for smart specialisation worldwide (a made-in-EU methodology) closely linked with EU external policy. The JRC will also carry out socio-economic analyses in the agri-food sector, rural development, and the food chain in the Western Balkans, while monitoring and supporting their environmental transition.
- Research, innovation, education and youth. The JRC will collaborate with DGs RTD and EAC in implementing the Global Approach to Research, Innovation, Education and Youth through its broad network of partnerships around the world and its role as a recognised actor in science diplomacy. It will contribute in areas of expertise such as IPR, standardisation, open access and open science, and higher education.

### ***Political priority 5 - Promoting our European way of life***

Our European way of life is built on solidarity, equality and fairness.

The JRC will provide support for a sustainable reform of migration and asylum, considering both its internal and external dimensions. As announced in the New Pact on Migration and

Asylum (COM(2020) 609 final), the Commission's Knowledge Centre on Migration and Demography, run by the JRC, will support the evidence-based approach of the new pact, notably to increase anticipation and help to prepare EU responses to key trends. It will support the reform of the Common European Asylum System with data innovation, advanced modelling and detailed thematic analyses on asylum procedures and scenarios. It will further explore the relationship between migration and demography, and provide foresight analysis on the long-term economic impact of migration flows to support the design of evidence-based policies on legal migration and integration.

The JRC will support actions to increase security at the EU's external borders and strengthen collaboration with the European Border and Coast Guard Agency on research and innovation relevant for EU border security.

Modernising education, training and lifelong learning and developing transversal skills are key for promoting our European way of life. JRC research on key competences in a life-long learning perspective will be extended to green education and green skills.

Finally, the JRC will intensify its work on health, among other areas, in response to the COVID-19 pandemic. It will contribute to the European Health Data Space, and to the sustainability of EU health systems and health threats' prevention, preparedness and response.

Examples of the JRC's support to CWP 2021 initiatives include:

- European Health Data Space. The JRC will provide evidence on health data in terms of data quality, standardisation, interoperability, governance and analysis (including the use of artificial intelligence). Its cancer and rare diseases registries will serve as pilots for the initiative.
- Follow-up initiatives under the new pact on migration and asylum. The JRC will support DG HOME and the European Border and Coast Guard Agency with its expertise in technologies for border management and security.
- Biometric technologies to support the Schengen package. The JRC will provide support on the use of biometric technologies, the processing of biometric data, and the development of biometric performance benchmarks on EU large-scale IT systems. The JRC will provide a report on quality standards of facial images stored in the Visa Information System.
- Follow up initiatives to the EU Security Union Strategy. The JRC and DG HOME will improve collaboration on research and innovation relevant for the European Multidisciplinary Platform against Criminal Threats (EMPACT). The JRC will cooperate with Europol to provide support in the field of encryption for criminal investigation, protection of public spaces, and new technologies relevant for countering serious crime and terrorism.
  - EU Agenda to tackle organised crime (2021-2025) and initiative to effectively tackle child sexual abuse online. The JRC will provide support in the field of encryption for criminal investigation, it will host the Europol European Cybercrime Centre Decryption Platform.
  - EU Agenda on counter-terrorism. The JRC will support areas such as the protection of critical infrastructure, preventing radicalisation, standards for threat detection equipment for use in public spaces, explosive precursors and unmanned aerial systems (drones). It will also help determine how the EU Innovation Hub for internal security is organised.

- Follow-up to the European Education Area and the updated skills agenda. The JRC will support the European Education Area in light of the digital and green priorities. On digital skills, it will support the digital education action plan, and the work on SELFIE (Self-reflection on effective learning by fostering the use of innovative educational technologies) and digital competences. On the green priority, it is involved in two education activities on sustainability. Regarding the updated skills agenda, the JRC will notably work (with Cedefop) on the action on skills intelligence and with DG RTD on developing a Competency Framework for Scientists under Action 8 of the ERA Communication.

### ***Political priority 6 - A new push for European democracy***

‘Giving Europeans a stronger role in decision making’ starts with rethinking the way EU policies are prepared and decided. This means strengthening the EU’s capacity to anticipate and respond to societal challenges, and responds to them with policies informed by the best possible evidence while responding to values of citizens and regional/territorial characteristics, including demography. At the same time, growing complexities including increased uptake of social media and global information technologies, pose a threat to democracy. Destabilising messages are best fought at political level by conveying positive messages based on broad and more inspiring visions. Nevertheless, battling online disinformation and hate speech is part of the effort to protect ourselves from ‘those who wish to divide and destabilise our Union’.

Various JRC activities will help to strengthen the EU’s democratic foundations and to increase Europeans’ engagement in the EU project. The JRC will also help the Commission rethink the way EU policies are prepared and decided, and enable policymakers and legislators to deliver evidence-based policy that is close to the heart of Europeans by involving them more closely in the policy-making. The JRC will continue with its research that has already led to advanced AI-based tools to detect disinformation.

The JRC will help the EU respond to difficult demographic challenges. It will help it better understand the challenges and opportunities related to ageing, depopulation and migration in terms of possible economic impacts, service accessibility, public attitudes and political behaviour, for example.

Examples of the JRC’s support to CWP 2021 initiatives include:

- Transparency and democracy package. The JRC’s analysis on how social media changes people’s political behaviour will contribute to the initiative on greater transparency in paid political advertising, taking also into account the broader challenge of disinformation and foreign interference. Its work on detecting potential fraud in financial accounts through techniques such as Benford's law, and its research on the availability and level of detail of political party financial accounts across Europe will support the revision of the statute and funding of European political parties and European political foundations.
- Long-term vision for rural areas. The JRC will provide expertise on territorial analysis. It will further investigate territorial inequalities across the EU and their impact on health, ageing, gender equality, education and training, land use, employment, income, the urban-rural divide and migrants’ integration, and provide medium to long-term demographic foresights.

### III. Knowledge and competences for smart and informed policy making and capacity building

The JRC will contribute to the Commission's 'Better Regulation' agenda and foresight work, help find new ways of engaging with citizens and improve data and knowledge management. It will also support the Commission's initiatives linked to the COVID-19 pandemic.

The JRC will support the Commission's better regulation initiatives by providing guidance and advice on methods, modelling, and analysis for ex-ante assessments and ex-post evaluations. Its evidence-gathering activities will be transparent and inclusive, and it will engage citizens and target the academic community more clearly to improve the quality and reach of public consultations. The JRC will increase the uptake of observation-based evidence by looking at whether products and information from e.g. Earth Observation and the Copernicus Programme are fit for purpose.

Smart policies should be 'future-proof' in the sense of anticipatory governance (cf. Observatory of public sector innovation of the OECD), and the JRC is helping the Commission, in close exchange also with the EEAS, to achieve its ambition to put strategic foresight at the heart of the EU policy process. The publication of annual foresight reports will be key to moving the EU agenda forward, as they will identify emerging challenges and opportunities to steer the EU's strategic choices and animate foresight work in various areas (e.g. green jobs and the just digital/green transition), which will help to 'future-proof' the EU policy process.

Smart policies should be based on the best available data and information. The effective management of data, information and knowledge is therefore vitally important. Data and knowledge remain scattered, however, and acquiring new data and generating new knowledge needs to be well coordinated. The JRC will contribute to the Commission's data, information and knowledge strategies and provide tools to facilitate knowledge sharing and collaboration within the EU institutions. It will also continue to support the Commission's efforts to fight disinformation.

Smart policies should also be more attuned to people's concerns, which will require effective interaction and collaboration with the public. New ways of working with Member States, stakeholders and citizens can improve decision-making and implementation and ensure public support for EU policies. A permanent dialogue with citizens is also key to communicating more effectively across a whole continent in times of increasing fragmentation and disinformation. The JRC is experimenting with different engagement formats and is testing successful practices at EU level and scaling them up.

The COVID-19 pandemic has shown the need for fast, coordinated action, underpinned by scientific evidence. The launch and development of RE-OPEN EU has highlighted the ability of the JRC to quickly respond to emerging needs, using state-of-the-art tools and expertise not only to perform scientific research, but also to put those tools at the service of European citizens. The JRC also worked on the collection and use of mobile phone data from private European Mobile Network Operators to support the Commission's efforts to fight COVID-19. It also developed serum reference materials (positive controls) containing antibodies against COVID-19 which allow laboratories to check whether their assays provide correct (positive) results, i.e. if a patient has detectable antibodies against the virus.

The JRC will continue to support the fight against COVID-19, as well as the Commission's exit and recovery strategies. The JRC's work related to COVID-19 will focus on six strategic priorities: (1) epidemiological monitoring, modelling and reporting; (2) use of alternative data and digital technologies; (3) testing, genomics, diagnostics and health; (4) socio-economic

modelling and analysis; (5) travel, tourism and transport; and (6) citizen pulse. To support the European Semester and country-specific recommendations, the JRC will assess the economic and social impacts of the pandemic and related containment measures, covering macroeconomic, regional, sectoral and social factors.

Considering the challenges the EU faces with the current health and economic crisis, achieving a green and digital economy that leaves no place behind will require long-term geopolitical, socio-economic, green and digital resilience. As announced in the first annual strategic foresight report, the JRC will develop resilience dashboards that measure the vulnerabilities and capacities in the EU and Member States in four interrelated dimensions (social and economic, digital, geopolitical and green) and document their links with the SDG framework and related targets. The dashboards will be developed in collaboration with other Commission services and then negotiated with the Member States.

The JRC will help develop capacities in Member States, in regions, in associated countries and in other third countries. It will offer training and capacity building to officials and researchers. It will provide access to vast amounts of country-specific and regional data, and facilitate the exchange of best practices. It will open up its unique research infrastructure to complement national research capacities and develop synergies with EU Research Infrastructures to optimise the European Research and Technology Infrastructure ecosystem. It will strengthen strategic partnerships with the best organisations in the world, and with international, national and regional stakeholders.

The JRC will maintain an active dialogue with the network of national contact points in Member States and associated countries. The network will inform public bodies and scientific communities about the JRC's latest initiatives, events, and opportunities for collaboration. During and in the direct aftermath of the COVID-19 pandemic, the JRC will make sure that its key deliverables for Member States to overcome the various impacts of the pandemic are well known and can be taken up by the relevant national interlocutors.

As part of the EU's focus on the Western Balkans and the recovery package that includes regional investment initiatives, the JRC will support the Western Balkan regions by: (1) applying the smart specialisation methodology to design, implement and monitor innovation strategies; (2) supporting the European Green Deal implementation, including by assessing the potential of renewables, R&I capacities, supporting coal/carbon intensive regions, and supporting the transposition of EU environmental law; (3) capacity-building activities for technology transfer; (4) supporting transnational collaboration and linkages in the context of EU macro-regional strategies; and (5) data quality enhancement. In addition, responding to the COVID-19 emergency, testing material developed by the JRC is supplied to the region to ensure effective COVID-19 tests in the Western Balkans.

At international level, the JRC will forge partnerships in nuclear and non-nuclear fields with leading institutions in key priority countries (e.g. the USA, Brazil, China, India, Japan and South Africa), with the Western Balkans and Eastern and Southern Neighbourhood countries, with international organisations (e.g. the UN, OECD, the World Bank, IAEA) and regional bodies (e.g. the African Union Commission, CELAC, ASEAN). The aim is to ensure access to global knowledge to help enhance the EU's influence in the world. The JRC's international partnerships will help support strategic EU dialogues in areas such as nuclear non-proliferation, space, environment, energy, science, technology and innovation.

#### **IV. Contributing to the key strategic orientations of the Horizon Europe strategic plan for 2021-2024 and to the objectives of Euratom's research and training programme complementing Horizon Europe**

##### **Horizon Europe**

The Horizon Europe programme for 2021-2027 is based on a three pillar-structure supported by a part on 'Widening Participation and strengthening the European Research Area'. The JRC's non-nuclear direct actions are part of pillar II on 'Global Challenges and European Industrial Competitiveness'. The JRC's *intervention areas* according to the Horizon Europe Specific Programme are:

- strengthening the knowledge base for policy making;
- global challenges: health; culture, creativity and an inclusive society; civil security for society; digital, industry and space; climate, energy and mobility; food, bioeconomy, natural resources, agriculture and environment (in line with the HE clusters of pillar II);
- innovation, economic development, and competitiveness;
- scientific excellence; and
- territorial development and support for Member States and regions.

The Horizon Europe Strategic Plan defines four *key strategic orientations* for 2021 to 2024:

- promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations;
- restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment;
- making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems; and
- creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

The strategic plan also defines 15 impact areas, which support the key strategic orientations of the Horizon Europe.

Part V shows the contribution of JRC's work to the intervention areas, key strategic orientations and impact areas.

The Horizon Europe strategic plan states that 'the JRC work programme on [non-nuclear] direct actions will support European policy priorities and recovery actions. It will contribute to the key strategic orientations for research and innovation by generating supporting knowledge and strengthening the expected impacts'.

The JRC actively contributes to the **strategic planning** of Horizon Europe and the development of its actions and programmes. The JRC will in particular support the *missions* through the development of Key Performance Indicators that complement the key impact pathway for missions already foreseen, the design of the citizen engagement activities, and support on how to engage regions and cities in the implementation of the missions, building

on JRC's experience of regional smart specialisation strategies and the Covenant of Mayors initiative. The JRC will set up a new Knowledge Centre on Cancer to support the mission on Cancer (and the Commission's beating cancer action plan), and an EU Soil Observatory to support the mission on Soil Health and Foods. The JRC's Community of practice on Cities and its work on the Covenant of Mayors will support the mission on Climate-neutral and Smart Cities. The JRC will also provide expertise and knowledge for the missions on Ocean, Seas and Waters, and Adaptation to Climate Change through its work under pertinent portfolios.

The JRC's participation in **indirect actions** will further strengthen synergies between direct and indirect actions, including European Partnerships. It will ensure a better use of research results for policy making, for example by integrating research results and data in knowledge bases and maintaining them, validating test methods and methodologies, and providing advice, for example:

- the trends in efficiency of biomass use identified by the Horizon Europe projects will be integrated in the newly set up EU Observatory on Deforestation;
- all chemical exposure data resulting from the selected Horizon Europe projects will be shared on the JRC-operated Information Platform for Chemical Monitoring;
- relevant JRC tools and expertise in various global emission inventories, aerosol microphysical modelling and climate and air quality policy analysis will be made available for the Horizon Europe projects; and
- the JRC will provide access to its infrastructures and specialised laboratories, for example, the nano-biotechnology infrastructure platform and the JRC Living Labs, which will host the Horizon Europe projects that want to demonstrate and test energy and mobility applications.

### **Euratom**

The Euratom research and training programme (the Programme) for the period 2021-2025 is the main instrument to support nuclear research at European level pursuing the continuous improvement of nuclear safety, security and radiation protection as well as complementing the achievement of Horizon Europe's objectives inter alia in the context of the energy transition. The Programme is a crucial part of the Community's efforts to further develop technological leadership and promote excellence in nuclear research and innovation, in particular ensuring the highest standards of safety, security, safeguards, radiation protection, safe spent fuel, radioactive waste management and decommissioning in the nuclear field. The Programme provides research grants through competitive calls for proposals or to named beneficiaries (indirect actions, subject to a separate work programme) and funds research carried out by the JRC.

The Programme sets out a list of specific objectives for research activities in nuclear fusion and fission and for direct and indirect actions that look for complementarity between them. The Programme also seeks for synergies with Horizon Europe and other Union programmes, in particular in non-power applications and in education and training. The Programme's specific objectives are to:

- improve and support nuclear safety, security, safeguards, radiation protection, safe spent fuel and radioactive waste management and decommissioning, including the safe and secure use of nuclear energy and non-power applications of ionizing radiation,

- maintain and further develop expertise and competence in the nuclear field within the Community,
- foster the development of fusion energy as a potential future energy source for electricity production and contribute to the implementation of the European fusion roadmap, and
- support the policy of the Union and its Member States on continuous improvement of nuclear safety, safeguards and security.

The JRC's direct actions to achieve the first and the second specific objectives will aim to complement and create synergies with the indirect actions and with national programmes and to cooperate with international organisations; whereas contributing to the fourth objective will remain JRC exclusive action as will the activities related to nuclear safeguards, nuclear security and non-proliferation. Part V of this work programme shows the link between these objectives and the JRC portfolios.



## **V. JRC portfolios and projects supporting EU policies**

The following sections present the JRC's portfolios under the six Commission political priorities and list some of the objectives to which its work contributes.

### **1. A EUROPEAN GREEN DEAL**

#### **1.1 Climate action**

1.1.1 Economics of climate neutrality

1.1.2 Land Management for climate neutrality

1.1.3 Climate and energy diplomacy

1.1.4 Climate change impacts, adaptation and risk reduction

1.1.5 Climate-neutral cities and Covenant of Mayors

1.1.6 Green Deal for people

#### **1.2 Sustainable and smart mobility**

1.2.1 Green mobility

1.2.2 Smart mobility solutions to achieve a low-carbon, clean, efficient and safe transport system

#### **1.3 Energy**

1.3.1 Renewable energies and negative emission technologies and resources for the Green Deal

1.3.2 Energy efficiency and building renovation

1.3.3 Sustainable hydrogen value chains

1.3.4 Safe, high-performance, consumer-oriented and sustainable battery value chain

1.3.5 Electrification and smart energy sector integration

1.3.6 Secure, green and competitive gas

#### **1.4 Nuclear energy**

1.4.1 Nuclear research for energy transition

1.4.2 Promoting reversibility: from nuclear back to the green field

1.4.3 Broadening nuclear knowledge and competence

#### **1.5 Green and sustainable economy**

1.5.1 Strategic value chains: secure and sustainable raw materials

1.5.2 Sustainable and circular bioeconomy for the European Green Deal

1.5.3 Accelerating the decarbonisation of European industry

- 1.5.4 Socio-economic analysis in support of EU industrial policy measures for a clean and circular economy
- 1.5.5 Safe and clean construction
- 1.5.6. New European Bauhaus
- 1.5.7 European Integrated Pollution Prevention and Control Bureau
- 1.5.8 Product Bureau
- 1.5.9 Green economic activities and the circular economy of the materials
- 1.5.10 A green financing strategy
- 1.5.11 Reference materials for standardisation
- 1.6 Environment
  - 1.6.1 Chemicals strategy for sustainability
  - 1.6.2 Towards reverted biodiversity loss and healthy ecosystems
  - 1.6.3 Sustainable soil management for the European Green Deal
  - 1.6.4 Restoring and protecting the world's forests
  - 1.6.5 Clean water for a healthy planet
  - 1.6.6 Geospatial intelligence for environmental compliance assurance
  - 1.6.7 Mainstreaming sustainable development goals into EU policies
  - 1.6.8 Improving Europe's environmental footprint
  - 1.6.9 Ensuring zero air pollution with carbon-neutral ambition
  - 1.6.10 Water, energy, food and ecosystem NEXUS
- 1.7 Oceans and fisheries
  - 1.7.1 Oceans, coastal areas and the blue economy
- 1.8 Agriculture and food systems
  - 1.8.1 Food safety, sustainability and health
  - 1.8.2 The agri-food sector in a resilient economy and transition towards sustainable food systems
  - 1.8.3 Assessing the CAP's environmental, climate and health performance
  - 1.8.4 Enhancing agriculture's climate resilience
  - 1.8.5 Incentivising digital technology uptake in the farming sector
- 1.9 Research and innovation for the Green Deal
  - 1.9.1 Scientific and technical support to the Copernicus Programme and its evolution
  - 1.9.2 Smart specialisation and place-based innovation for transformation towards greener and smarter regions
  - 1.9.3 Innovation for Europe's Green Deal, focus on R&I and investments for a green and competitive economy

## 2. A EUROPE FIT FOR THE DIGITAL AGE

- 2.1 Digital economy and society
  - 2.1.1 Wireless communications and radio spectrum
  - 2.1.2 Artificial intelligence and digital transformation
  - 2.1.3 Data and platform economy
  - 2.1.4 Smart cities, complexity, and analysis platforms for engineering systems
  - 2.1.5 Learning and skills in the digital age
  - 2.1.6 Cyber security, privacy and digital identities
  - 2.1.7 Security and privacy in the transport sector
- 2.2 Single market
  - 2.2.1 Motor vehicles market surveillance
  - 2.2.2 Single market enforcement action plan
- 2.3 Innovation - Industry, entrepreneurship and SMEs
  - 2.3.1 Strategic autonomy
  - 2.3.2 Productivity, SMEs and scale-up
  - 2.3.3 Places and actors of the digital and green transitions
- 2.4 Earth observation and space
  - 2.4.1 Science, technology and innovation for EU GNSS
  - 2.4.2 Copernicus emergency management service
- 2.5 Aerospace and Defence industry
  - 2.5.1 Research, technologies and synergies in defence, aerospace and security
- 3. AN ECONOMY THAT WORKS FOR PEOPLE
  - 3.1 Economic and Monetary Union
    - 3.1.1 Anchoring and asserting the role of evidence in the European Semester and Recovery and Resilience Facility
    - 3.1.2 Towards a stronger and fairer Economic and Monetary Union
    - 3.1.3 Impact of policies on growth and innovation
  - 3.2 Fair and effective tax and benefit systems
    - 3.2.1 Modelling the redistributive and fiscal impact of tax and social benefit reforms
  - 3.3 Customs
  - 3.4 Social Europe and the future of work
    - 3.4.1 The future of social Europe
    - 3.4.2 The future of work
    - 3.4.3 Looking at the future of the middle class
  - 3.5 Territorial policy and cohesion
    - 3.5.1 Urban observatory on the future of cities and urban strategies

3.5.2 Places of the EU: territorial data, analysis and modelling - fostering cohesion and fairness

3.5.3 Global human settlement layer

3.5.4 Tourism

#### 4. A STRONGER EUROPE IN THE WORLD

4.1 Globalisation of the world economy

4.1.1 Free fair trade agreements

4.1.2 Assessing global corporate tax avoidance

4.2 External action

4.2.1 External dimension of migration

4.3 International cooperation and development

4.3.1 Green transition in ACP regions

4.3.2 Food and nutrition security and sustainable food systems

4.3.3 Africa Platform

4.3.4 Strengthening the EU's presence in the Arctic

4.3.5 Localising sustainable development goals

4.4 European neighbourhood and enlargement policies

4.4.1 A European future for the EU enlargement and neighbourhood region, including more global outreach

4.5 Security and crisis management

4.5.1 Disaster Risk Management Knowledge Centre

4.5.2 Crisis management

4.6 Global dimension of nuclear research

4.6.1 Strengthening global partnership in nuclear expertise

#### 5. PROMOTING OUR EUROPEAN WAY OF LIFE

5.1 Migration and asylum

5.1.1 Data and knowledge for migration and demography

5.2 Internal security

5.2.1 Hybrid threats

5.2.2 Border security solutions

5.2.3 Threat detection and security standards

5.2.4 Protection of public spaces

5.2.5 CBRN threats and risk mitigation

5.2.6 Digital forensic, investigation techniques for law enforcement

5.3 Skills, education and youth

5.3.1 Lifelong learning

- 5.4 Health
  - 5.4.1 Combatting cancer and other diseases
  - 5.4.2 European strategy on health-related data
- 5.5 Nuclear R&I for protecting citizens
  - 5.5.1 Nuclear R&I for protecting citizens
- 6. A NEW PUSH FOR EUROPEAN DEMOCRACY
  - 6.1 Protecting and supporting EU democracy
    - 6.1.1 Demography and democracy
    - 6.1.2 Evidence, policy and democracy
  - 6.2 Citizen and stakeholder engagement
    - 6.2.1 Citizen engagement
    - 6.2.2 Integrated developments for science communication
- 7. HIGH PERFORMING MODERN COMMISSION
  - 7.1 Knowledge and data management
    - 7.1.1 Knowledge management and collaboration
    - 7.1.2 Open science and FAIR data management
  - 7.2 Competences for better policymaking and regulation
    - 7.2.1 Competences for better policymaking and regulation
  - 7.3 Capacity building
    - 7.3.1 Exploring, building capacity, innovate

## **PRIORITY 1 - A EUROPEAN GREEN DEAL**

### **Policy area 1.1 – Climate action**

In its November 2018 Communication: A Clean Planet for all, A European strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy (COM(2018) 773 final) the Commission set out a vision of how to achieve climate neutrality by 2050. If the Commission's vision is made a reality by that date, Europe will be the world's first climate-neutral continent. The von der Leyen Commission placed climate action at heart of the European Green Deal (the EGD). This is supported by numerous proposals of legislative and non-legislative actions that should be adopted in the upcoming years. For example, in March 2020 the Commission proposed the first European Climate Law (COM(2020) 80 final). The law sets out a long-term plan for meeting the 2050 climate-neutrality objectives through all policies, in a socially-fair and cost-efficient manner. The Commission also intends to create a system for monitoring progress and to take further action if needed, to provide predictability for investors and other economic actors and to ensure that the transition to climate neutrality is irreversible. Other actions to be proposed during the tenure of this Commission include the European Climate Pact or additional legislation to reduce greenhouse gas emissions by 2030.

### **Portfolios:**

#### ***1.1.1 Economics of climate neutrality***

This portfolio supports the EGD's central elements of climate neutrality and just transition through economic analyses of the energy system and the overall economy both at global and EU level. It studies the overarching impacts of energy and climate mitigation policy options across economic structures, as well as on the energy and transport sectors until 2050 and beyond. Recovery strategies from the COVID-19 crisis will be analysed in this portfolio in the context of the EGD. The portfolio supports the Commission's services in updating the overall EU climate and energy framework in line with the 2030 Climate Target Plan.

#### **The portfolio:**

- (1) applies and develops analytical modelling tools to derive robust and policy-relevant output in the context of EU energy and climate policies;
- (2) analyses cross-sector policy options as part of the EGD;
- (3) assesses policies including the transport sector and all relevant greenhouse gases to inform policymaking; and
- (4) integrates different modelling frameworks to achieve a comprehensive quantitative assessments of available policy options.

**The projects:** EU energy scenarios; Global climate and energy scenarios; Economic analyses of mitigation; Transport sector contribution to greenhouse gas emissions (demand and multimodal networks effects); Overarching link to non-energy and non CO<sub>2</sub> GHG sources; and Sectoral integration assessment of complex energy systems.

**Policy DGs:** ENER, CLIMA, MOVE

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Climate change mitigation and adaptation

### ***1.1.2 Land management for climate neutrality***

The EGD sets an ambitious climate neutrality target for 2050. To offset the fossil fuel emissions that cannot be cut, agriculture, forestry and other land use sectors (AFOLU) need to become a net carbon sink, while ensuring ecological integrity. This requires identifying the appropriate mitigation measures needed to reduce the current emissions from agriculture and conserve the current carbon sink in forests. At the same time, more confidence on the GHG (greenhouse gas) emissions and removals from the AFOLU sector is needed to unlock its mitigation potential under the new EU climate legislation and under the Paris Agreement.

#### **This portfolio:**

- (1) supports the GHG monitoring, reporting and verification in the AFOLU sector; and
- (2) assesses the future mitigation potential of the AFOLU sector, including forestry scenarios and integrated AFOLU modelling.

**The projects:** GHG inventory monitoring and development in agriculture, and land use, land-use change and forestry (LULUCF) sectors; Forest mitigation, contribution to climate neutrality; and Integrated agriculture, forestry and land-use sector modelling.

**Policy DGs:** CLIMA

**JRC HE intervention area:** Global Challenges: climate, energy and mobility

**HE key strategic orientation:** KSO B - Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Enhancing ecosystems and biodiversity on land and in waters

### ***1.1.3 Climate and energy diplomacy***

By implementing the EGD, Europe aims to become a climate leader and share its experience of moving towards carbon neutrality and clean energy systems with other countries. The portfolio also supports the Commission's diplomacy efforts, with tasks including capacity building, modelling assessments and the provision of transparent and reliable information for policy DGs and the international negotiation process.

#### **The portfolio:**

- (1) applies and further develops analytical modelling tools to derive robust and policy-relevant output in the context of emission inventories and their verification, long-term climate strategies and renewable energy integration, as well as national non-EU and global pathways to climate neutrality;
- (2) provides outreach and capacity building, explicitly addressing and cooperating with experts outside the EU, in close collaboration with the relevant policy DGs;
- (3) produces policy-relevant outputs supporting international climate negotiations and renewable energy cooperation with neighbouring regions; and
- (4) engages in international research collaboration networks.

**The projects:** Verifying the progress towards (EU and global) climate ambition; Detecting unexpected and emerging signals from emissions and technologies; Power system development beyond Europe; Support to the Strategic Partnerships for the implementation of the Paris Agreement

**Policy DGs:** ENER, CLIMA, ENV

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Climate change mitigation and adaptation

#### *1.1.4 Climate change impacts, adaptation and risk reduction*

This portfolio is key to underpinning EGD actions, the EU adaptation strategy and Paris Climate Agreement, but also to supporting recent international agreements on disaster loss reduction (Sendai Framework for Disaster Risk Reduction 2015-2030) and development (Sustainable Development Goals). It integrates the three main aspects of the climate impact and adaptation assessment: climate, biophysical and economic modelling.

**The portfolio:**

(1) supports the European and global assessment of climate impact risks and adaptation.

**The projects:** Assessment of the costs of climate inaction; and Climate extremes and disasters.

**Policy DGs:** CLIMA, RTD, ENV, MARE

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Climate change mitigation and adaptation

#### *1.1.5 Climate-neutral cities and Covenant of Mayors*

The EGD recognises the role of cities in the decarbonisation of the EU economy. Cities are responsible for a large share of GHG emissions, but also possess the necessary resources to enable a transition to a low carbon society. In cities, civil society, including businesses can get involved and act together to create and share ideas, solutions and resources for the needed transformation. The portfolio provides technical and scientific support on methodologies for climate action plans, and on data collection for local GHG baseline inventories and risk and vulnerability assessments. Advanced cooperation through voluntary initiatives between the cities and businesses can increase the scale and pace of decarbonisation creating a virtuous cycle of energy transition with co-benefits for the environment and the citizens. The proposed Horizon Europe Mission on Climate-Neutral and Smart Cities will offer an opportunity to accelerate the transition in some pilot cities across the EU.

**This portfolio:**

(1) helps increase resilience of cities and their infrastructure to climate change through adaptation measures;

(2) supports the decarbonisation of cities through energy efficiency and renewable energy actions;



- (3) helps to raise the public's awareness and engagement on climate change and increase their uptake of climate change mitigation measures;
- (4) supports the Climate Pact initiative and the Covenant of Mayors initiative in Europe and globally; and
- (5) provides technical scientific support to the Horizon Europe mission on climate-neutral and smart cities.

**The projects:** The Covenant of Mayors; and the Climate-neutral smart cities transition.

**Policy DGs:** ENER, RTD

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Climate change mitigation and adaptation

### *1.1.6 Green Deal for people*

The portfolio will analyse the EGD's impact on society and support the development of policy options that ensure fairness and prosperity across the EU's regions and households, so that no one will be left behind. It will identify regional opportunities and threats in the energy and transport sectors and beyond (including energy poverty and vulnerability), and provide scientific and technical support to the transition of regions that may face employment and economic development risks. Another of the portfolio's aims is to quantify and qualify the needs for new skills and sustainable green competences.

#### **The portfolio:**

- (1) intends to become the point of reference for information and knowledge on the social aspects of the energy transition in support of the EGD, including gender aspects, energy and transport poverty and the distributional impacts of the green transition;
- (2) translates scientific evidence into energy, transport and climate policies for the EGD through knowledge synthesis;
- (3) effectively communicates EGD-related scientific knowledge to the public and specific target groups; and
- (4) uses and expands the existing modelling toolbox to assess the implications of the transition to a low-carbon and low-pollution society on macro-economic outcomes, labour market shifts and heterogeneous households with differing income and expenditure patterns.

**The projects:** Social aspects of the energy transition; Just transition for coal and carbon intensive regions; energy poverty and vulnerability; Developing a positive narrative for the energy transition; Green deal and employment; and the Labour Lab.

**Policy DGs:** ENER, CLIMA, EMPL, TAXUD, ENV, MOVE

**JRC HE intervention area:** Global challenges: climate, energy and mobility; Global challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Affordable and clean energy; Smart and sustainable transport

### **Policy area 1.2 - Sustainable and smart mobility**

Transport policy, including zero- and low-emission mobility, the intention to cut transport emissions, etc. has been a point of interest of the Commission for decades. The 2019 EGD communication (COM(2019) 640 final) includes a number of transport-related goals. The Commission intends to significantly boost multimodal transport, for example, and to increase the role of automated and connected multimodal mobility and foster the roll-out of alternative fuels infrastructure. Furthermore, as the price of transport should reflect the impact it has on the environment and on health, the production and deployment of sustainable alternative transport fuels should be ramped up. Last, but not least, transport-based air pollution, especially in the cities is to be tackled.

#### **Portfolios:**

##### ***1.2.1 Green mobility***

Projects in this portfolio address both the upcoming rules on pollutant emissions - including on currently unregulated pollutants, and EU CO<sub>2</sub> reduction policies for road transport and the rapid transition to low-carbon mobility. The portfolio supports the requirement to monitor Member States' progress in deploying infrastructures for alternative fuels, and helps efforts to develop testing procedures to assess the performance of electric vehicles. It focuses on accelerating the shift to sustainable mobility by working towards more stringent pollutant emissions and CO<sub>2</sub> standards for vehicles, and a wider deployment of alternative transport fuels and clean (near) zero-emission technologies.

#### **The portfolio:**

- (1) contributes to the development of new European technology and fuel neutral emission standards and explores the possibility of having a single set of standards for both light and heavy duty vehicles;
- (2) promotes the harmonisation of worldwide pollutant emissions standards and regulations for vehicles and machinery;
- (3) contributes to the development of test procedures to assess electrified vehicle performance in realistic use scenarios;
- (4) assesses testing methodologies for pollutant emission using portable emissions measurement systems;
- (5) participates in the EGD ambitious goal of climate neutrality by developing and using analytical techniques and tools supporting EU policies on CO<sub>2</sub> reductions from road transport and a rapid transition to a zero- and low-carbon mobility;
- (6) supports the deployment of alternative fuels infrastructure;
- (7) contributes to the assessment of in-vehicle battery performance and ageing for electrified vehicles; and
- (8) provides reviews of the development of technologies and the use of alternative fuels in the transport sector.

**The projects:** Hybrid and electric vehicles performance assessment and type approval procedures; International emission standards and certification procedures for vehicles; Low energy and greenhouse emissions neutral transport; Alternative fuels infrastructure scale-up; Vehicle European emission standards and type approval procedures; Blockchain for transport.

**Policy DGs:** CLIMA, GROW, MOVE, ENV

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Smart and sustainable transport

### ***1.2.2 Smart mobility solutions to achieve a low-carbon, clean, efficient and safe transport system***

The portfolio will take stock of progress towards the vision outlined in the JRC's flagship report on the future of road transport. Projects will assess how road transport can continue to support the achievement of the ambitious EGD targets and how it can become a low-carbon, clean, safe and efficient pillar of our future society. It also looks at the impact of vehicle connectivity and automation on the overall transport system, tries to anticipate any possible negative effects of their wide-scale introduction, and proposes alternative approaches and other transport modes in the future governance of the multimodal transport system that are likely to emerge in the near future.

#### **The portfolio:**

- (1) supports the understanding of the impacts of new mobility solutions and emerging mobility trends on the multimodal transport system;
- (2) develops a robust type-approval framework for connected and automated vehicles;
- (3) assesses the socio-economic impacts of future connected, automated and zero, as well as low-carbon mobility solutions;
- (4) encourages the public's engagement in transforming road transport and supports EU SMEs;
- (5) develops and applies innovative data-driven methodologies and tools to analyse transport and mobility; and
- (6) integrates different modelling frameworks within the portfolio to achieve a comprehensive assessment of future transport policies;
- (7) supports the work of the EU Platform and the EU Partnership on connected, cooperative and automated mobility operating under Horizon Europe.

**The projects:** JRC Living Lab for future mobility solutions; Transport networks modelling and analysis; Data science for mobility; Requirements and implications of a connected and automated mobility; European transport systems, technology watch, data and scenarios; and Monitoring transport infrastructures with connected and automated vehicles.

**Policy DGs:** GROW, MOVE

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Smart and sustainable transport

### **Policy area 1.3 – Energy**

The EU's energy policy aims to promote the energy transition to a competitive low-carbon and resilient economy and to ensure affordable, secure and sustainable energy for businesses and households. Along with other reports, the 2019 State of the Energy Union report (COM (2019) 175 final) sets out rules, political commitments and targets for a cleaner and greener world. The targets for 2030 include reducing greenhouse gas emissions domestically by at least 40% compared to 1990 levels, reaching a share of at least 32% in renewable energy and increasing energy efficiency by at least 32.5%. Energy, including supplying clean, affordable and secure energy also continues to play an important role in the 2019 EGD communication (COM(2019) 640 final).

#### **Portfolios:**

##### ***1.3.1 Renewable energies and negative emission technologies and resources for the Green Deal***

This portfolio aims to support renewable energies, their technologies and resources, relevant R&I roadmaps, as well as negative emission technologies, which will play a key role in ensuring the EU's climate neutrality by 2050. Activities include assessing the state-of-the-art, market barriers, and the resource potential of different clean and renewable energy supply technologies, paying particular attention to sustainability.

#### **The portfolio:**

- (1) supports techno-economic, market, and resource potential assessments for renewable energy and negative emission technologies feeding into the 55% GHG emission reduction scenarios by 2030 and climate neutrality by 2050 and assesses clean energy access for less developed regions (e.g. Africa) and islands;
- (2) supports the assessment of Member States' renewables and negative emission ambitions in the National Energy and Climate Plans by reviewing renewable energy measures;
- (3) supports renewables sustainability assessments underpinning the Renewable Energy Directive and other Commission and international priorities;
- (4) supports development of methodologies for assessing the greenhouse gas avoidance impact of future technologies and projects; and
- (5) carries out standardisation and pre-normative research for photovoltaics; etc.

**The projects:** Technology and market assessments for renewables and negative emission technologies; Photovoltaic energy sustainability and standards; and Bioenergy and alternative fuels assessment.

**Policy DGs:** GROW, ENER

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Affordable and clean energy

### ***1.3.2 Energy efficiency and building renovation***

The portfolio will provide scientific and technical support to ensuring implementation of all energy efficiency related aspects of the EGD and the revision of the EU legislative framework, including the Energy Efficiency Directive and the Energy Performance of Buildings Directive. This includes energy efficiency measures in all sectors and in particular in buildings in the framework of the Renovation Wave, an initiative which is also very relevant in the context of the EU COVID-19 Recovery Plan. In addition, the project will address energy efficiency in products and appliances in support of the Energy Labelling Regulation and the Ecodesign Directive, including ICT devices and data centres in the frame of the Code of Conduct. The portfolio will analyse key factors for the energy efficiency improvements of building stock establishing cost optimal minimum energy requirements in major renovated buildings and collecting harmonised data on building stock to provide usable information for local and national policy makers.

#### **The portfolio:**

- (1) supports the EGD implementation, in particular the revision of the EU legislative framework in the area of energy efficiency and building renovation including the possibility to investigate the life-cycle assessment;
- (2) supports the development of sustainable heating and cooling strategies, policies and technologies, energy efficiency measures in buildings and local production of photovoltaics energy;
- (3) analyses complex aspects related to energy efficiency and climate impacts on future requirements for building energy needs;
- (4) supports the implementation of the Energy Efficiency Directive and the Energy Performance of Buildings Directive; and
- (5) supports the assessment of the national resilience and recovery plans, their renovate components and their costs levels.

**The projects:** Energy efficiency and building renovation; Heating and cooling markets; Policy mix and behavioural spillovers.

**Policy DGs:** ENER

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Affordable and clean energy

### ***1.3.3 Sustainable hydrogen value chains***

This portfolio supports European and international standardisation efforts to facilitate the integration of hydrogen in the transport and energy systems. It will involve conducting pre-

normative research to support standardisation performed in dedicated laboratories, in the area of hydrogen production and high-pressure hydrogen storage systems.

**The portfolio:**

- (1) contributes to monitoring innovation and EU industry competitiveness;
- (2) supports programme development and implementation of the Fuel Cells and Hydrogen Joint Undertaking;
- (3) contributes to the assessment of sustainability hydrogen value chains;
- (4) identifies safety gaps related to hydrogen transport and distribution, storage and use;
- (5) contributes to fill-in the existing data gaps supporting policy and research efforts;
- (6) supports and helps set up a comprehensive European standardisation framework to incorporate hydrogen in the European energy system; and
- (7) provides open access the project's research infrastructures, Gas tank testing facility and Fuel cells and electrolyser testing facilities to academia and research organisations.

**The projects:** Hydrogen technology assessment for a decarbonised and sustainable Europe; Safety and performance of hydrogen systems and components; and Electrolysis and fuel cells for the EGD.

**Policy DGs:** ENER, GROW

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Affordable and clean energy

#### ***1.3.4 Safe, high-performance, consumer-oriented and sustainable battery value chain***

This portfolio will support EU technology innovation and development of safe and high-performance batteries, thereby helping build an integrated, sustainable and competitive EU industrial base in the battery sector. It covers both experimental and non-experimental battery research. It also follows developments in the battery field by monitoring and assessing available battery technologies.

**The portfolio:**

- (1) underpins the shift to batteries for transport and energy storage by characterising and helping improve performance and safety;
- (2) supports the development of a European value chain for batteries;
- (3) follows up the implementation of the battery R&I agenda;
- (4) identifies emerging battery technology and application areas; and
- (5) supports the development of sustainable and higher performance batteries, including as enablers for the uptake of e-mobility and to facilitate the competitiveness and sustainability of the European global battery sector under the European Battery Alliance etc.

**The projects:** Battery safety; Battery performance; and Technology monitoring and assessment for batteries.

**Policy DGs:** ENER, GROW, ENV

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Circular and clean economy

### *1.3.5 Electrification and smart energy sector integration*

This portfolio mobilises cross-Directorate desktop, experimental and analytical/modelling capabilities to deliver on the techno-economic and social challenges related to electrification and smart energy sector integration. The portfolio also collates complementary and mutually reinforcing projects that aim to support the EU recovery plan and deliver on the twin climate and digital transitions. Electricity is uniquely positioned to contribute to the COVID EU recovery plan and to enable the EU's climate-neutral, digital, circular competitive and fair economy. To this end, the electricity market designs and the power system risk preparedness practices crucially need to be reformed in order to guarantee a fair, resilient and future-proof electricity delivery.

#### **The portfolio:**

- (1) supports the COVID EU recovery plan and the European Green Deal and the Europe fit for the digital age political priorities;
- (2) supports electrification, interoperability and energy digitalisation standardisation, regulation and action plan via pre-normative laboratory research, H2020 Framework Programme projects, testing events and living lab experiments, with special focus on electromobility (particularly Vehicle-to-Grid), smart home and demand response integration; and
- (3) communicates and disseminates the projects' outcomes in scientific outlets and via information/communication platforms.

**The projects:** Sector integration and regulatory sandboxes; Digital energy interoperability and living labs; electricity market, transmission and distribution; system resilience and security of supply; analysing the multi-sectoral transition to low carbon infrastructure; JRC European interconnection for research innovation and entrepreneurship

**Policy DGs:** ENER, MOVE

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Affordable and clean energy

### *1.3.6 Secure, green and competitive gas*

The portfolio aims to analyse, systematically, and taking into account uncertainties, the role that gases, considering their sources, infrastructure, markets and integration, may play in the decarbonisation of the energy system and contribute to the EGD strategy.

**The portfolio:**

- (1) studies scenarios on the role that natural gas system play in the transition to the new decarbonised energy system while maintaining security of supply and resilience;
- (2) provides understanding of possible barriers to the integration of different gases in the energy system and the consequent need for a new gas market design (decarbonisation driven) and changes in the definition of the quality standards for gases;
- (3) supports the evaluation of efficient methods and technologies to measure, monitor and reduce methane emissions in the energy sector;
- (4) intends to find an optimal approach to assessing and financing the investments of energy projects, taking into consideration security of supply, climate, environmental, social, and technical factors;
- (5) assesses energy security in the Green Deal energy transition process according to the European legislation, in line with the plans of the member states, provide support to the implementation of European rules of security of gas supply, and help Member states adopting efficiently regional approaches.

**The projects:** Options and barriers to energy sector integration via gases; Assessment and financing of energy infrastructure in the EGD; Exploration of the possible futures of gases in the EU energy system; Methane emissions monitoring and abatement; and Security of energy supply in the energy transition.

**Policy DGs:** ENER

**JRC HE intervention area:** Global challenges: climate, energy and mobility

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Affordable and clean energy

**Policy area 1.4 – Nuclear energy**

According to the European energy security strategy (COM(2014)0330 final) electricity produced from nuclear power plants constitutes a reliable supply of electricity and plays an important role in energy security. In the Energy roadmap 2050 (COM(2011)0885 final), the Commission, has committed to further developing the nuclear safety and security framework to ensure the highest safety and security standards in the EU and globally.

The Communication ‘A clean planet for all’ (COM(2018) 773 final) estimates the share of nuclear energy at approximately 15% of primary energy consumption, which will make this type of energy the backbone of a European carbon-free power system by 2050. However, this does not affect Member States' responsibility for nuclear safety and security within their territories.

According to the 2015 Resilient Energy Union communication (COM(2015) 80) the EU must ensure that Member States use the highest standards of nuclear safety, security, radioactive waste management and non-proliferation. The EU must also protect citizens against ionising radiation and safeguard the nuclear and radioactive materials in its territory. The Euratom



Treaty (chapter 7) defines and enforces strict safeguard system throughout the Community to ensure that ores, source materials and special fissile materials are not diverted from their intended uses as declared by the users. Additionally, EURATOM is also a party to the safeguards agreements with the IAEA complemented by their respective Additional Protocols.

### **Portfolios:**

#### ***1.4.1 Nuclear research for energy transition***

The portfolio contributes to the Programme's objective by actively providing science and knowledge to support the EU policies and the Member States efforts to ensure the safety of long-term operation of current nuclear reactors, safety assessment and development of advanced and innovative reactor safety designs, including Small Modular Reactors (SMR), and innovative future systems, the use of accident tolerant fuel, nuclear waste minimisation, management and disposal, decommissioning, and non-electric energy technologies.

#### **The portfolio:**

- (1) contributes to development of safety related issues of future fuel cycle strategies and associated innovative reactor concepts;
- (2) contributes to understanding of basic mechanisms to predict the safety limits of current and innovative reactor concepts;
- (3) together with European stakeholders contributes to development of harmonised methodologies for safety analysis;
- (4) contributes to improvement of nuclear safety of the current European nuclear reactor fleet focusing on life time extension of ageing European nuclear reactors;
- (5) supports the European Commission and Member-states on the implementation of nuclear Directives and regulatory requirements;
- (6) achieves scientific understanding of underpinning physical and chemical processes occurring when spent nuclear fuel is exposed to groundwater;
- (7) studies ageing of irradiated fuel pin and resistance against mechanical loading occurring during accidents and characterizes the dispersion of radionuclides in case of fuel pin failure.

**The projects:** Safety and long-term operation of current reactors; Irradiated material study; Safety, human resources and policy support for nuclear energy; Waste management issues specific to small modular reactors and accident tolerant fuels; Spent fuel long term mechanistic release processes; Spent fuel ageing mechanisms; Advanced and modular nuclear system; Liquid metal cooled nuclear systems; Hydrogen value chain and nuclear; Plutonium management for more agility; etc.

**Policy DGs:** ENER, RTD

**Specific objective of the Euratom programme:** A. Safe and secure use of nuclear energy and non-power applications of ionizing radiation, D. Support the policy of the Union and Member States on continuous improvement of nuclear safety, safeguards and security

#### ***1.4.2 Promoting reversibility: from nuclear back to the green field***

This portfolio includes R&D activities to support to nuclear legacy wastes, decommissioning, environmental remediation and waste management of contaminated structure and sites after

end of operation or after severe accident situations. It covers both knowledge production and knowledge management domains.

**The portfolio:**

- (1) builds up JRC's foresight and assessments capabilities in nuclear decommissioning, remediation and waste management following severe accident events;
- (2) develops innovative analytical techniques for waste characterisation and radionuclide analysis with waste characterisation applications and for remediation purposes;
- (3) improves the sustainability of hot cell and other nuclear facility operations, by designing methods to eradicate legacy wastes in a simple, usable and exportable manner; and
- (4) supports the Commission and Member States in their development of harmonised strategies and methodologies for nuclear waste management and decommissioning.

**The projects:** The nuclear cycle back-end knowledge management; Stability, defueling and safe conditioning of damaged reactor cores; Innovative characterisation tools; Conditioning legacy waste; Creation of highly active nanoparticle filters for nuclear liquid waste decontamination.

**Policy DGs:** RTD, ENER

**Specific objective of the Euratom programme:** A. Safe and secure use of nuclear energy and non-power applications of ionizing radiation, B. Maintain and further develop expertise and competence in the Union, D. Support the policy of the Union and Member States on continuous improvement of nuclear safety, safeguards and security.

### ***1.4.3 Broadening nuclear knowledge and competence***

This portfolio aims to help broaden the nuclear knowledge and competence base. It also adds value to the other nuclear portfolios included in this Work Programme, thus contributing to innovation and valorisation of JRC research. The JRC will make its experimental infrastructure available to researchers from Member States organizations participating in its extended Open Access scheme.

**The portfolio:**

- (1) supports the JRC Open Access initiative with outreach activities, providing research facilities and competence free of charge to EU researchers and facilitating mobility;
- (2) develops synergies between Euratom's direct and indirect actions;
- (3) contributes to maintaining a high level of nuclear competence through education and training;
- (4) promotes reference measurements, the development of best practices and standardisation initiatives in the nuclear field; and
- (5) facilitates innovation through dissemination and exploitation of nuclear science and technology.

**The projects:** Innovative environmental materials testing and test miniaturisation; Dissemination of nuclear training and education; Nuclear knowledge management and dissemination; Nuclear outreach and dissemination; Advanced analysis methods for the characterisation of complex nuclear materials; Accelerator based nuclear data and associated applications in nuclear technology; Production and characterisation of targets for nuclear data

measurements; Actinide User Laboratory; Alpha spectrometry by time-of-flight; Space power applications etc.

**Policy DGs:** ENER, RTD, GROW, COMM

**Specific objective of the Euratom programme:** A. Safe and secure use of nuclear energy and non-power applications of ionizing radiation, B. Maintain and further develop expertise and competence in the Union, D. Support the policy of the Union and Member States on continuous improvement of nuclear safety, safeguards and security

### **Policy area 1.5 – Green and sustainable economy**

Green and sustainable economy is another important Commission's objective of the EGD communication (COM(2019) 640 final). The Communication notes that the EU has the collective ability to transform its economy and society to put it on a more sustainable path. It can build on its strengths as a global leader on climate and environmental measures, consumer protection, workers' rights and due diligence. The new circular economy action plan aims to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes, advance towards keeping its resource consumption within planetary boundaries, and therefore strive to reduce its consumption footprint and double its circular material use rate in the coming decade. The goal of the new policy framework will be to stimulate the development of lead markets for climate neutral and circular products, in the EU and beyond.

#### **Portfolios:**

##### ***1.5.1 Strategic value chains: secure and sustainable raw materials***

This portfolio will develop and manage knowledge to support security of supply and sustainable and toxic-free raw material value chains for selected strategic industrial sectors. Its projects will analyse raw material value chains in this context and strengthen the needed Raw Materials Information System.

#### **The portfolio:**

- (1) develops the knowledge base on key raw materials for strategic values chains through the raw materials information system to support the Commission policy needs related to security-of-supply and to sustainable supply;
- (2) conducts forecast and foresight analyses of material supply and demand for strategic value chains to assess opportunities for climate change mitigation and improvements in social conditions; and
- (3) evaluates the resilience of key strategic sectors and economic implications associated with the risk of supply disruptions for critical raw materials.

#### **The projects:**

- Raw Materials Information System; Sustainable and secure sourcing of raw materials for future competitive and low carbon European strategic value chains; Supporting the monitoring and evaluation of the European Innovation Partnership (EIP) on Raw Materials; the European expert network on critical raw materials; Support to secondary raw materials policy; and Support to the Battery Sustainability Regulation.

**Policy DGs:** GROW, ENV

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Circular and clean economy

### ***1.5.2 Sustainable and circular bioeconomy for the European Green Deal***

The JRC coordinates the Commission's Knowledge Centre for Bioeconomy and leads two of the EU bioeconomy strategy's (COM/2018/673) actions on enhancing the knowledge base and on building an EU bioeconomy monitoring system. This portfolio coordinates the related activities. It also directly contributes to other bioeconomy strategy actions including on cities/urban areas and on zero pollution, bio-remediation and microbiomes.

#### **The portfolio:**

- (1) coordinates the Knowledge Centre for Bioeconomy and the associated community of practice;
- (2) enhances the knowledge base on the bioeconomy and makes it accessible through the Knowledge Centre; and
- (3) builds an EU-wide, internationally coherent monitoring system to track economic, environmental and social progress towards a sustainable bioeconomy and makes it publicly available via its Knowledge Centre for Bioeconomy.

**The projects:** Knowledge Centre for bioeconomy coordination and knowledge management; Assessment of biomass supply and uses and monitoring the sustainability of the EU bioeconomy; Going circular: economic assessment of the bioeconomy contribution; Bio-based solutions for a toxic- and pathogen-free environment: towards zero pollution and Thermal monitoring for urban climate adaptation policies; Coronaviruses and environment: One health approach.

**Policy DGs:** RTD, ENV, CLIMA, SANTE, AGRI, GROW

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment; Global challenges: health

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Circular and clean economy, Good health and high-quality accessible healthcare

### ***1.5.3 Accelerating the decarbonisation of European industry***

This portfolio will support the Commission in its efforts to decarbonise the industrial sector in line with its 2030 and 2050 ambitions. Its main activities are aligned with the EU industrial strategy's objectives. It addresses other important topics of industrial relevance, such as potential bottlenecks and opportunities to strengthen the European supply chains for low carbon technology.

#### **The portfolio:**

- (1) identifies options for reducing energy, feedstock and the carbon footprint of energy-intensive industries while improving competitiveness;

- (2) maps European supply chains for low carbon technologies and analyses potential bottlenecks and opportunities for future developments; and
- (3) maps energy-intensive industry and other enabling infrastructure for the energy transition, collects and manages all associated information and data, and makes it available for further analysis.

**The projects:** Towards a decarbonised and competitive European energy-intensive industry; Low carbon strategic value chains; Energy and industry geography lab.

**Policy DGs:** GROW, CLIMA

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Affordable and clean energy

#### ***1.5.4 Socio-economic analysis in support of EU industrial policy measures for a clean and circular economy***

The EGD aims to make the EU economy clean, sustainable and circular. This portfolio supports this objective. It builds on the JRC's economic expertise to provide techno-economic analysis for environmental policies.

**The portfolio:**

- (1) provides scientific evidence on the economic and social impacts of EGD policy measures in the domain of clean and circular economy;
- (2) informs and contributes to economic policy discussions on the EGD, in terms of challenges and opportunities, policy trade-offs, and policy instrument choices;
- (3) enhances the evidence base by contributing to the generation of high-quality data that quantify the EU economies and their inter-linkages with the rest of the world; and
- (4) refines and applies a multi-purpose numerical economic model.

**The projects:** Methodological and data support on global input-output accounts and related socio-economic aggregates; Modelling socio-economic impacts of industrial policy options in support for a clean and a circular economy; Applied Environmental Economics; Trade and Supply Chain Analysis for a clean and circular economy.

**Policy DGs:** GROW, ENV, ESTAT, TRADE

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Circular and clean economy

#### ***1.5.5 Safe and clean construction***

This portfolio supports legislation and standardisation for the construction sector. It ensures that the design of new and renovated buildings is in line with the circular economy principles

and improves climate-proofing of buildings and their resilience to all types of hazards, including fires and earthquakes. It also addresses major EGD topics related to construction and buildings, and renovation of the building stock. The portfolio addresses various Green Deal topics dealing with construction and buildings, as well as renovation of the building stock, such as the ‘renovation wave’, the revision of the Construction Products Regulation (CPR), the Strategy for the built environment within the Circular economy action plan, and the new European Bauhaus initiative.

**The portfolio:**

- (1) provides scientific/technical support ensuring the implementation of all aspects of the EGD related to buildings and the construction industry;
- (2) provides foresight and evidence to Commission on further regulatory and standardisation needs for a comprehensive (holistic) approach to safe, resilient and sustainable construction and renovation;
- (3) supports regional policies on modernising and upgrading the built environment via interactive digital platform for dissemination and sharing of data, knowledge and tools for on-line impact analysis of renovation scenarios;
- (4) provides evidence for further opportunities to extend the scope of the EGD;
- (5) operates and provides open access to the ELSA Laboratory for research and demonstration projects relevant to the EGD.

**The projects:** Support to policies and standards for sustainable construction; Opening ELSA to scientists and industry for R&D; ELSA Laboratories: reaction wall and HOPLAB facilities; Impact of sustainability and energy efficiency requirements on building design and retrofit; Adoption and implementation of the Eurocodes in the Balkan region; Integrated techniques for the seismic strengthening and energy efficiency of existing buildings; Sustainable and efficient alternative plastic storage etc.

**Policy DGs:** GROW, ENV, REGIO, ENER

**JRC HE intervention area:** Global challenges: digital, industry and space; Global challenges: climate, energy and mobility; Territorial development and support for Member States and regions

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Circular and clean economy, Affordable and clean energy

### ***1.5.6. New European Bauhaus***

The New European Bauhaus aims to bring the EGD to life, hand in hand with the digital and social transformation. The portfolio will support the initiative to make the Green Deal a human-centred, positive and tangible experience for all citizens. It will support innovation and creativity to drive sustainability across Europe and beyond, offering to citizens an affordable enhancement of their quality of life. It seeks to translate the triangle of the new European Bauhaus core values (sustainability, inclusion and quality of experience) into tangible results in a number of complementary areas (built environment, innovation in industry and mind-set community building). The role of the JRC will be primarily to act as coordinator and

facilitator for the entire process based on the holistic expertise of the JRC in its function as the EC's science and knowledge service.

**The portfolio:**

- (1) intends to address the depth in the New European Bauhaus concept regarding inclusion-quality of experience-sustainability and on their integration;
- (2) identifies the most pressing needs that citizens in Europe face related to their living environments;
- (3) collects ideas that support the larger transformation;
- (4) co-defines the scope and scale of the New European Bauhaus initiative;
- (5) supports triggering a deeper territorial transformation;
- (6) disseminates the experience gained and the knowledge produced; and
- (7) supports the first edition of the New European Bauhaus Prizes etc.

**The project:** The New European Bauhaus.

**Policy DGs:** RTD, CLIMA, EAC, EMPL, ENER, ENV, GROW, REGIO, SG

**JRC HE intervention area:** Territorial development and support for Member States and regions.

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Circular and clean economy, Affordable and clean energy, Climate change mitigation and adaptation

### ***1.5.7 European Integrated Pollution Prevention and Control Bureau***

This portfolio supports the implementation of the current Industrial Emissions Directive, by drawing up and reviewing the best available techniques reference documents (BREFs). It also provides support in piloting the revision of the Industrial Emissions Directive and developing the EU action plan towards zero pollution ambition.

**The portfolio:**

- (1) draws up and reviews the BREFs necessary for granting environmental permits to over 52 000 installations in the EU;
- (2) provides ad hoc support for the revision of the Industrial Emissions Directive and for developing the EU action plan towards zero pollution ambition; and
- (3) establishes an Industrial Emissions Innovation Observatory.

**The project:** the European Integrated Pollution Prevention and Control Bureau.

**Policy DGs:** ENV

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Circular and clean economy

### ***1.5.8 Product Bureau***

This portfolio supports the implementation of key environmental EGD product policies, such as the Ecolabel Regulation, the Green Public Procurement Communication, the Ecodesign Directive and the Energy Label Regulation. It aims to reduce the environmental impact and increase the circularity of products and services.

#### **The portfolio:**

- (1) supports the Commission in implementation of product specific decisions under Regulation EC 66/2010;
- (2) supports the Commission in development of product specific green public procurement criteria;
- (3) supports the Commission in the implementation of product specific provisions under Ecodesign Directive 2009/125/EC and the Energy Labelling Directive 2010/30/EU; and
- (4) supports the further improvement, development and implementation of EU product policy, including methodology and circular economy aspects.

**The projects:** Scientific support to the EU ecolabel and green public procurement "SupELGPP 2018"; Product policy method and criteria development; Solar photovoltaics panels, inverters and systems; Developing and implementing a reparability scoring system for use in Ecodesign to support the transition towards a circular economy; Preparation of legislative sustainable products initiative; Horizontal institutional support activities for product policy, preparation for SPI support.

**Policy DGs:** ENV, ENER, GROW

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Circular and clean economy

### ***1.5.9 Green economic activities and the circular economy of the materials***

This portfolio provides science-based evidence for measuring the contribution of industry and other economic activities to the EGD's environmental objectives, and studies how to reduce emissions by avoiding waste and making better use of materials in the circular economy. It will identify criteria to evaluate the 'greenness' of economic activities as well as measures to unlock the full environmental improvement potentials and assess their impact.

#### **This portfolio:**

- (1) provides reference information for the EU-wide classification system for environmentally sustainable economic activities ('EU taxonomy') and for industry support schemes on resource efficiency
- (2) conducts research on circular economy of industrial and organic materials and how to harness the decarbonisation potential of circularity while avoiding pollution as much as possible;



- (3) supports the development of EU regulatory measures on waste management to facilitate a transition to a circular economy.

**The projects:** Support on end-of-waste criteria and by-products criteria; Support to the review of rules on sewage sludge; Harmonised collection of waste in the EU; High quality recycling; Support on sustainable finance taxonomy; Technical support on resource efficiency and the circular economy for European companies; Safety and agronomic efficiency criteria for by-products in EU fertilising products; Assessments of aspects relative to the management of waste oils and construction & demolition waste; Circular economy best practices and innovation; Circular economy actions on recycling; Circularity of batteries.

**Policy DGs:** ENV, FISMA, GROW

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Circular and clean economy

#### *1.5.10 A green financing strategy*

The portfolio provides scientific support for the key actions planned in the Commission's Action Plan: Financing Sustainable Growth and the European Green Deal Investment Plan.

**The portfolio:**

- (1) provides policy support to the Commission services, including in the context of the Sustainable Finance Platform, as well as interinstitutional support; and
- (2) carries out research on sustainable finance.

**The projects:** Sustainable Finance; Financial Instruments Ecolabel.

**Policy DGs:** FISMA, ENV, ENER

**JRC HE intervention area:** Innovation, economic development, and competitiveness

#### *1.5.11 Reference materials for standardisation*

Standardisation activities under this portfolio, including the development of reference materials (RMs), aim to ensure that analytical measurement results are correct and can be trusted. The RMs produced in this portfolio support EU rules in a number of sectors that require measurements, e.g. healthcare, security, environmental monitoring, food/feed safety and compliance, and compliance of industrial goods. Aside from RM development, other standardisation activities include developing guidance documents, contributions to documentary standards and training.

**The portfolio:**

- (1) develops reference materials of relevance to and supporting the implementation of EU legislation;
- (2) ensures worldwide access to and distribution of JRC reference materials;
- (3) provides customer support to JRC reference material users and offers trainings on their correct and efficient use;

- (4) contributes to the development of guidance documents and documentary standards aimed at harmonising measurement results; and
- (5) develops materials for laboratory performance checks and carries out proficiency testing in selected areas.

**The projects:** Reference materials for a toxic-free environment; Reference materials for health; Reference materials supporting the farm to fork strategy; and Reference materials for a clean and circular economy.

**Policy DGs:** SANTE, GROW, ENV

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

**- Impact area(s):** Circular and clean economy

### **Policy area 1.6 – Environment**

The Commission highlights the importance of the environment in its political priorities (the European Green Deal and various strategies). Preserving Europe's natural environment by addressing issues such as climate change, air, freshwater, marine and soil pollution, biodiversity, food security, deforestation and land degradation was raised by President von der Leyen in her Agenda for Europe. The President also noted Europe's need to move towards zero pollution ambition and the Commission's plan to present a Biodiversity strategy for 2030. The Commission's environmental ambitions are discussed throughout the EGD communication (COM(2019) 640 final) which resets the Commission's commitment to tackling climate and environmental-related challenges. It includes elements such as a zero pollution ambition for a toxic-free environment and preserving and restoring ecosystems and biodiversity.

### **Portfolios:**

#### ***1.6.1 Chemicals strategy for sustainability***

The portfolio responds to the EGD call for a chemicals strategy for sustainability to better protect the public and the environment against hazardous chemicals, with an emphasis on substances of high concern such as endocrine disruptors and other pollutants, such as microplastics, and to encourage the development of safe and sustainable alternatives. It aims to contribute to the evolution of an evidence-based policy informed by the latest scientific evidence.

#### **The portfolio:**

- (1) supports the implementation of the current chemicals legislation;
- (2) contributes to the evolution of an evidence-based chemicals policy;
- (3) support policy development/implementation concerning micro- and nano-plastics pollution;
- (4) supports the development, revision and implementation of EU legislation for advanced materials to ensure their safe use and manufacture, including sustainability aspects;

- (5) support regulators, industry and scientists from EU and neighbourhood countries on regulatory science, research and innovation in the domain of advanced (nano-)materials by providing open access to the JRC nano-biotechnology laboratory, and by organising training and capacity building; and
- (6) advances science on micro-and nano-plastics and advanced materials by exploratory research and collaboration with a Centre of Advanced Studies for the detection of nano-plastics.

**The projects:** Evidence-based chemicals policy; Micro- and nano-plastics: Towards a more reliable assessment of exposure and biological effects; Outreach activities to support research innovation and education in EU and near neighbouring countries including Western Balkans countries; Chemical assessment methodology for a toxic-free environment; Safe and sustainable advanced materials; Uptake of nano-plastics into organoids; Personalised immunological risk assessment technologies etc.

**Policy DGs:** GROW, ENV, SANTE

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B - Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Clean and healthy air, water and soil

### *1.6.2 Towards reverted biodiversity loss and healthy ecosystems*

This portfolio aims to address the challenges linked with biodiversity loss and healthy ecosystems by bringing together key biodiversity activities, and by strengthening the research-policy interface through a new Knowledge Centre for Biodiversity and Ecosystem Services.

**The portfolio:**

- (1) supports EU policy services by improving access to knowledge on biodiversity and ecosystem services via a dedicated Knowledge Centre for Biodiversity;
- (2) fills knowledge gaps by developing methods, models, indicators and services that support the EU Biodiversity strategy to 2030 in Europe and globally;
- (3) increases policy effectiveness under the Biodiversity strategy by mapping links between EU policies and biodiversity loss; and
- (4) strengthens the position of the EU in reversing global biodiversity loss by supporting the Convention on biodiversity and the Intergovernmental science-policy platform on biodiversity and ecosystem Services and by improving assessments of the European environmental footprint.

**The projects:** Global observatories for biodiversity and ecosystem services; Knowledge Centre for Biodiversity and Ecosystem Services; Alien species monitoring to protect European nature; Healthy ecosystems; Science and technology for pollinating insects; Biodiversity and protected areas management; Support to natural capital accounting and to monitoring indicators for EU policies; and A healthy mind in a healthy ecosystem.

**Policy DGs:** ENV, INTPA, ESTAT

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B - Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Enhancing ecosystems and biodiversity on land and in waters

### ***1.6.3 Sustainable soil management for the European Green Deal***

This portfolio is linked with the EGD's call for healthy, functional soils to ensure the overall wellbeing of the planet. Through the EU Soil Observatory, it builds on established competences, while addressing emerging policy concerns. Specifically, it intends to generate policy-relevant knowledge on soil functions, and threats for the EU and beyond, by producing and analysing data to support EGD goals. It will also support the Horizon Europe Mission on soil, health and food.

#### **The portfolio:**

- (1) transforms the way that society thinks about soil;
- (2) satisfies the cross-sectoral knowledge needs of policy DGs;
- (3) supports the implementation of the EGD by creating policy knowledge on the soil related aspects of the post-2020 Biodiversity strategy and CAP, the Farm to Fork Strategy, the Zero Pollution, the Climate and Energy Package, and the Circular Economy Action Plan.;
- (4) delivers an integrated monitoring and reporting system on soil health through a targeted EU Soil Observatory;
- (5) supports the EU commitment to achieve land degradation neutrality by 2030; and
- (6) supports Horizon Europe's Mission on soil, health and food.

**The projects:** Soils for healthy ecosystems and biodiversity; Healthy soils for an environment and climate friendly food system; IACS data sharing soil pilot; Soil condition from LUCAS Survey; Understanding the links between soil pollution and cancer.

**Policy DGs:** AGRI, ENV, ESTAT, RTD

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Clean and healthy air, water and soil

### ***1.6.4 Restoring and protecting the world's forests***

The EGD commits the EU to improving its forested area, both in terms of quality and quantity, in order to protect biodiversity, increase the absorption of CO<sub>2</sub> and ultimately help the EU meet its climate neutrality target by 2050. It also commits to fighting global deforestation linked to the EU's footprint. It also commits to fighting global deforestation including deforestation and forest degradation linked to the EU's consumption.

**The portfolio:**

- (1) establishes an EU Observatory on Deforestation and Forest Degradation; and
- (2) assesses and monitors the state and availability of EU forest resources etc.

**The projects:** Monitoring EU forests status and threats for effective adaptation; EU Observatory on deforestation, forest degradation, and associated drivers; Capacity for Copernicus REDD+ and forest monitoring services; Dry forest monitoring; and Assessing forest biodiversity and resilience from space.

**Policy DGs:** DEFIS, ENV

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Enhancing ecosystems and biodiversity on land and in waters

### *1.6.5 Clean water for a healthy planet*

The portfolio supports the EGD objective to restore ecosystems and approach zero pollution in Europe and beyond. Water is central to creating a toxic-free environment, and more action is needed to prevent and remediate pollution from industrial, urban and agricultural pollution with the ultimate goal of restoring and maintaining the natural functions of ground and surface water. The reuse of reclaimed water and related resources and energy recovery are part of the circular economy, and the EU legal framework also needs to address the associated circularity of risks. Water management and the recovery of resources from wastewater are other aspects of the circular economy that need EU legislation to enable sound and multifunctional investments. Water scarcity/quantity is also a part of the current water challenges, maybe even more so when we talk about water as a source of collaboration and not conflict. The portfolio will also support the implementation of the mission on Ocean, Seas and Waters in particular as regards its zero pollution targets and restoration and maintenance of natural functions of ground and surface waters and circular economy aspects of water.

**The portfolio:**

- (1) provides solutions to the current and future water crises to secure clean water for all focusing on building the necessary capacities in the EU-neighbouring countries and the Mediterranean;
- (2) supports water diplomacy and the related capacity building in the context of the global environment monitoring system for water and the UN World Water Quality Alliance;
- (3) creates the knowledge base promoting water reuse practices as part of the EGD so to facilitate the effective achievement of the EGD 2030 objectives and targets;
- (4) accesses the information stored in wastewater to untap new potentials for the digitalisation of water as post-COVID-19 response emerging from and related to the aftermath of the COVID-19 pandemic;
- (5) supports the implementation of the EU water acquis and related pieces of legislation while linking it to the transition to sustainable agriculture and food system (CAP,

Farm to Fork and Biodiversity strategies) as well as to the international water priorities set out by UN Agenda 2030; and

- (6) supports the implementation of the mission on ocean, seas and waters.

**The projects:** Clean water for the EU; and One water for all.

**Policy DGs:** ENV

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Clean and healthy air, water and soil

### ***1.6.6 Geospatial intelligence for environmental compliance assurance***

This portfolio supports the implementation and enforcement of a full range of environmental policies thereby contributing to the EGD environmental preservation and zero pollution objectives, notably: protected areas, fresh water use, and waste management.

**The portfolio:**

- (1) provides tailored science-based analyses and intelligence to support the implementation and enforcement of the environmental policies relevant to the EGD; and
- (2) scans the scientific horizon to identify, research, test, and encourage the uptake of new technologies, particularly geoscience technologies, that may support the implementation and enforcement of current and future environmental policies.

**The project:** Brokering geospatial intelligence related to existing EU environmental legislation.

**Policy DGs:** ENV

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Enhancing ecosystems and biodiversity on land and in waters

### ***1.6.7 Mainstreaming sustainable development goals into EU policies***

The portfolio builds a knowledge base to comprehensively and systematically assess to what extent EU policies support the achievement of SDGs. It also supports the Commission's goal to integrate SDGs into the European Semester cycle of economic and fiscal policy coordination.

**The portfolio:**

- (1) develops methods and tools to support a comprehensive and systematic assessment of EU policies with respect to SDGs;

- (2) contributes to the production and management of indicators for monitoring and assessing the implementation of the SDGs; and
- (3) supports coordination of SDG-related activities across the JRC.

**The project:** Methods and indicators to boost SDGs in EU policies.

**Policy DGs:** SG

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Sustainable food systems from farm to fork on land and sea

### ***1.6.8 Improving Europe's environmental footprint***

The portfolio aims to develop environmental modelling for supply chains (on both a macro and a micro level), in order to support production and consumption system analysis. It also supports specific research on methodological aspects of life cycle assessment, especially in terms of integration with other models (e.g. territorial, socio-economic and behavioural models) and in terms of integration with scenario analysis and foresight.

**This portfolio:**

- (1) develops methods, models and indicators for the environmental assessment of products, services, organisations, systems and supply chains;
- (2) assesses the environmental impact of production and consumption in Europe, including spill over and transboundary effects, with a focus on specific value chains like those of food systems); and
- (3) improves the use of life-cycle thinking and life-cycle assessment in better regulation.

**The projects:** Life-cycle assessment for policy support; Environmental footprint of products and organisations; Environmental impact of plastics; and Prospective life-cycle assessment for novel and emerging technologies for bio-based products.

**Policy DGs:** ENV, GROW, RTD, JUST

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Enhancing ecosystems and biodiversity on land and in waters, Clean and healthy air, water and soil

### ***1.6.9 Ensuring zero air pollution with carbon-neutral ambition***

This portfolio aims to support the EGD ambition to reach zero pollution for a toxic-free environment, with a particular focus on air. The portfolio is designed to ensure that planned other EU policy developments are in line with this zero air pollution ambition. It also aims to

help the Commission strengthen its rules for monitoring, modelling and air quality plans to help local authorities achieve clean air.

**The portfolio:**

- (1) assesses the coherence between the pathways for decarbonisation and air pollution reduction to zero, including considering the coherence of local decarbonisation measures under the Covenant of Mayors with air quality plans under EU legislation, and air measures taken in the framework of the Green City Accord;
- (2) assesses the coherence between the National Emission Ceiling Directive and the Ambient Air Quality Directives with a focus on national air pollution control plans (and their coherence with local air quality plans);
- (3) improves modelling tools to better support multi-level governance in air quality;
- (4) assesses the future European and international policies across sectors (mobility, energy, climate, air quality, agriculture), with a focus on air quality, environmental and health impacts at the regional to global scale;
- (5) addresses the socio-economic impact of improved air quality, reduced morbidity, increased life expectancy and induced GDP effects;
- (6) standardises and harmonises of air quality measurement and modelling methods in line with Air Quality policy requirements; and
- (7) strengthens provisions on air quality monitoring, modelling, action plans and pollution prevention.

**The projects:** Impacts of policy and technology pathways on air quality; Strengthening provisions on monitoring, modelling and action plans; Pressure on air – foresight; Economic analysis for clean air.

**Policy DGs:** ENV

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe’s ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

**- Impact area(s):** Clean and healthy air, water and soil

### ***1.6.10 Water, energy, food and ecosystem NEXUS***

The portfolio investigates cross-border and cross-sector interdependencies to improve management and governance. It integrates water, energy, agricultural and environmental modelling for Europe, Africa and the Mediterranean region. It aims to identify future challenges and solutions for effectively reaching the EGD 2030 objectives and targets, and practical pathways to succeed in the green transition. The portfolio also evaluates whether current policies are sufficient or need to be strengthened, especially in the aftermath of the COVID-19 pandemic.

**The portfolio:**

- (1) explores and establishes a knowledge base on measures related to water, agriculture, energy and ecology that help to reach the EGD targets in Europe, the Mediterranean and Africa;



- (2) evaluates a ‘current policy pathway 2050’ scenario under a changing climate against WEFE-related EGD targets for Europe; and
- (3) evaluates various ‘pathways 2050’ scenarios for Africa.

**The projects:** Water Energy Food Ecosystem Nexus 2050.

**Policy DGs:** ENV

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe’s ecosystems and biodiversity, and managing natural resources sustainably to ensure food security and a clean and healthy environment.

**- Impact area(s):** Sustainable food systems from farm to fork on land and sea

### Policy area 1.7 – Oceans and fisheries

European policies on maritime affairs and fisheries aim to ensure that marine resources are used responsibly while also helping to further develop the potential of Europe’s maritime economy. Common fisheries policy and integrated maritime policy objectives include sustainable and competitive fisheries, food supply, sustainable aquaculture and thriving coastal communities. They need to be aligned with the objective of ‘achieving a good environmental status’ of the Marine Strategy Framework Directive, as well as the EGD 2030 targets and objectives, notable those included in the EU biodiversity and Farm to Fork strategies and the zero pollution ambition. The EGD communication (COM(2019) 640 final) also considers that a sustainable ‘blue economy’ continues to play a central role in alleviating the multiple demands on the EU’s land resources and tackling climate change, and role of oceans in mitigating and adapting to climate change is increasingly recognised.

#### Portfolios:

##### *1.7.1 Oceans, coastal areas and the blue economy*

This portfolio addresses key EGD goals such as the EU climate ambition, zero pollution, clean energy, a circular blue economy, conservation of marine ecosystems and biodiversity, and the farm (ocean) to fork approach. It also addresses the link between land-freshwater-coast-marine interactions and related legislation such as the Water Framework Directive, and other oceans and blue economy related issues. The portfolio will link to the Horizon Europe mission area ‘Healthy oceans, seas, coastal and inland waters’.

#### **The portfolio:**

- (1) provides implementation support to the common fisheries policy, the Marine Strategy Framework Directive and the EU sustainable blue economy.

**The projects:** Sustainable fisheries and aquaculture; The blue economy; Marine litter and plastics; Monitoring, modelling and assessment of the environmental status of marine and coastal waters; and Tracing microplastics up the EU marine food webs.

**Policy DGs:** ENV, MARE

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe’s ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Sustainable food systems from farm to fork on land and sea; Enhancing ecosystems and biodiversity on land and in waters; Clean and healthy air, water and soil

### **Policy area 1.8 – Agriculture and food systems**

The EU’s common agricultural policy (CAP) is a partnership between agriculture and society, and between Europe and its farmers. Its goals include supporting farmers and improving agricultural productivity, ensuring a stable supply of affordable nutritious food; safeguarding EU farmers’ ability to make a reasonable living; helping tackle climate change and manage natural resources sustainably; maintaining rural areas and landscapes across the EU; and keeping the rural economy alive by promoting jobs in farming, agri-foods industries and associated sectors. In the EGD communication (COM(2019) 640 final), the Commission’s proposals for the CAP for 2021-2027 stipulate that at least 40% of the CAP’s overall budget must contribute to climate action.

#### **Portfolios:**

##### ***1.8.1 Food safety, sustainability and health***

This portfolio supports the Farm to Fork strategy. It uses the technical competence of the EU reference laboratories, knowledge centres and gateways to support activities such as market authorisation of essential inputs for plant and animal husbandry, ensuring the safety of the feed-food value chain, food waste reduction through intelligent packaging, supporting healthy diets and disease prevention, and protecting the public from misleading information.

#### **The portfolio:**

- (1) supports the implementation of the EU Action Plan – Fighting Food Fraud through the operation of the EC Knowledge Centre for Food Fraud and Quality, the design and execution of EU Coordinated Control Plans to establish the prevalence of fraudulent practices, and collaboration with fraud relevant actions carried out by Europol and OLAF;
- (2) supports the transition to an EU sustainable food system by providing knowledge and tools for policies to promote healthy and sustainable food preferences;
- (3) develops reference materials enabling reliable measurements of food and feed for authentication purposes, detection of GMOs, contaminants and residues;
- (4) investigates how to integrate safe use of chemicals in sustainable food systems assessment and develop new risk assessment strategies for pesticides to efficiently reduce the use of hazardous pesticides and accelerate the introduction of none or less toxic alternatives in an integrated pest management to achieve the Farm-to-Fork and Biodiversity targets.
- (5) supports the implementation of the EU policies on Food Contact Materials, including hosting and operating the corresponding EU Reference Laboratory; and
- (6) supports the implementation of the EU policies on GMOs in food and feed and on feed additives, both for authorisation and official control of the marketed products.

**The projects:** Knowledge Centre for food fraud and quality; Food safety; Market authorisation; Safety for sustainable food; Sustainable diets for healthy people, societies and the planet and mapping landscape suitability for honeybees; and Combination of mapping landscape suitability for honeybees and advanced chemical analysis of honey to target geographical regions vulnerable to honey fraud.

**Policy DGs:** SANTE, ENV

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

**- Impact area(s):** Sustainable food systems from farm to fork on land and sea

### ***1.8.2 The agri-food sector in a resilient economy and transition towards sustainable food systems***

This portfolio involves socio-economic analyses and modelling of the agri-food sector, looking at all aspects of sustainability and including the SDG indicator framework. It integrates quantitative modelling, combining holistic and sectoral approaches and behavioural parameters. The economic analysis will cover the domestic and international impacts of different Member State proposals related to the CAP strategic plans, and intends to provide an internal JRC coordination mechanism to maximise access to the scientific expertise on how to achieve a fair and just transformation of the EU food system. This area of activities will take into account the relevant aspects of the work also carried out by JRC on the sustainable food systems framework legislation, and any further related work of other Commission services in the area, so to ensure full consistency

#### **The portfolio:**

- (1) provides an annual EU market outlook (baseline) for the main agricultural products until 2030, as well as a systematic analysis of uncertainties in global markets;
- (2) analyses, evaluates and anticipates the impacts of policy measures related to the CAP, the EGD, the Farm to Fork strategy and the Biodiversity strategy on farmers, markets, food chain and environment with models and other methodologies;
- (3) quantifies through integrated model assessments the impacts of various drivers and policies;
- (4) provides available data in an accessible way; and
- (5) increases the understanding of the functioning of the value chain, and the issues of waste and consumer preferences for different products.

#### **The projects:**

- Food system and sustainability in the economy; Territorial aspects of agriculture in the EU; Perspectives and resource challenges for global agricultural markets; Agricultural policy impact analyses at micro and regional level; Integrated modelling platform for agro-economic and resource policy analysis; Modelling mitigation in food systems; Economic analyses of food supply chains; and Economic assessment of the dual quality of food products in the single market.

**Policy DGs:** SANTE, AGRI, GROW, ENV, CLIMA, RTD

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment.

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Sustainable food systems from farm to fork on land and sea

### *1.8.3 Assessing the CAP's environmental, climate and health performance*

This portfolio supports the implementation, monitoring and evaluation of the future CAP strategic plan regulation and the Farm to Fork and Biodiversity strategies. Through policy scenario testing, models and impact assessments, the projects will provide qualitative and quantitative information on the best measures to reach the EGD 2030 targets and objectives and CAP's specific objectives, namely: to manage natural resources sustainably; to improve ecosystem services and the preservation of habitats; and to contribute to climate change mitigation and adaptation.

#### **The portfolio:**

- (1) provides scientific support and tools for the implementation, monitoring and evaluation of the future national CAP strategic plans;
- (2) supports information collection, indicators and statistics development in support to the CAP performance monitoring and evaluation framework;
- (3) contributes to the achievement of the Farm to Fork strategy's targets and objectives for the transition to sustainable agriculture, the improved performance of the farming sector for the use of natural resources and to mitigate climate change, and contributes to the dietary shift towards healthy sustainable diets;
- (4) contributes to the implementation of the Biodiversity strategy's targets and objectives to achieve good environmental and biodiversity conditions for agro-ecosystems and the preservation of landscapes;
- (5) contributes to the design and implementation of European monitoring schemes for biodiversity (grassland) and landscape features; and
- (6) integrates the ecosystem services concept into agro-economic simulation model (e.g. CAPRI) to increase the Commission abilities in testing policy options yielding quantitative biodiversity information.

**The project:** Ecosystems services in agricultural land.

**Policy DGs:** AGRI, SANTE

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Sustainable food systems from farm to fork on land and sea

### *1.8.4 Enhancing agriculture's climate resilience*

This portfolio examines how the agricultural sector can increase its resilience and adapt to climate change. It builds on data analysis, indicators, and modelling to provide coherent support to the DGs concerned and promotes data sharing and reuse between policy areas. The priority activities for 2021-2022 provide continuity of support to CAP implementation, in particular for yields, production and impacts of exceptional circumstances. It can provide a link to the climate services and policy needs.

**The portfolio:**

- (1) provides operational support to the Commission services regarding the forecasted yields on sub-seasonal time scales;
- (2) develops a pre-operational service with information on the impacts of climate change on the agricultural sector and adaptation options on seasonal to multiannual time scales;
- (3) performs scenarios analysis of long-term climate change impacts and transformation of the agricultural sectors;
- (4) provides analysis of the impacts of climate change and socio-economic changes on the health of animals and plants; and
- (5) develops new climate analysis for African agriculture.

**The projects:** Crop production monitoring and forecasting; Farming sector climate resilience; Economic, environmental, and social impacts of animal and plant diseases in a changing climate; Generating massive in-situ crop data with computer vision and crowd-sourced street-level imagery; and AI-enhanced agro-climate service.

**Policy DGs:** AGRI, SANTE

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

- **Impact area(s):** Sustainable food systems from farm to fork on land and sea

### ***1.8.5 Incentivising digital technology uptake in the farming sector***

A governance system based on performance instead of compliance has been proposed for the new CAP, in line with higher and accountable environment and climate ambitions. This new approach encompasses a change in the role and design of the CAP-dependent Integrated Administration and Control System (IACS). This portfolio deals with the transformation and legacy of the former compliance controls, i.e. the land-based components of IACS involving the OTSC (on-the-spot-checks) instruments, checks/monitoring, LPIS (land parcel information system), geospatial application and cross compliance. It also covers exploratory research.

**The portfolio:**

- (1) redesigns IACS from the current punitive control system (LPIS and OTSC) into a proactive preventive system;
- (2) helps inventory and standardises the tools that allow a bilateral communication between farmer and administrations;

- (3) looks into ways IACS can become a data management system, useful for reporting the output and results indicators or for supporting farmers with informed field decisions regarding practices, inputs and rules;
- (4) carries out exploratory research on the methods to collect ground data with relevant agricultural information; and
- (5) strengthens the aspects of environmental and climate performance by compiling and analysing farm level support schemes.

**The projects:** Geodata and technologies for the common agricultural policy; Digital rural landscape lab; ‘Flora Fauna Green Rural Corridor Connect’ - Localizing and modelling wildflower-pollinator interactions in rural landscapes with citizen science and deep learning.

**Policy DGs:** AGRI

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment

**HE key strategic orientation:** KSO B: Restoring Europe’s ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment.

**- Impact area(s):** Sustainable food systems from farm to fork on land and sea

### **Policy area 1.9 – Research and innovation for the European Green Deal**

Mobilising research and fostering innovation are critical for achieving the EGD’s objectives. According to the EGD communication (COM(2019) 640 final) Horizon Europe, together with other EU programmes, will play a pivotal role in leveraging national public and private investments, as at least 35 % of Horizon Europe’s budget intends to fund new solutions for climate, which are relevant for implementing the EGD. The JRC is committed to contribute to the achievement of this target and will track its financial commitments using EU climate markers. It will also support additional EGD-related research and innovation with a call worth close to EUR 1 billion. Four out of the five agreed mission areas in Horizon Europe directly support the EGD: (1) healthy oceans, seas, coastal and inland waters; (2) climate-neutral and smart cities; (3) soil health and food; and (4) adaptation to climate change and societal transformation. The Commission also intends to bring together European scientific and industrial excellence to develop a very high precision digital model of the Earth. Research and innovation are to play an important role in supporting Europe’s recovery from the COVID-19 crisis.

#### **Portfolios:**

##### ***1.9.1 Scientific and technical support to the Copernicus Programme and its evolution***

This portfolio supports the EGD with services that are fit for the digital age. It will target thematic priorities associated with the EGD which represents around 80% of the scope of Copernicus services, and should include sectoral application in areas such as global and water resources, climate adaptation and GHG emission monitoring, etc. It will be fully integrated with the proposed Knowledge Centre on Earth Observation for EU policies.

#### **The portfolio:**

- (1) implements and evaluates the Copernicus Programme and ensure its appropriate evolution;
- (2) strengthens relationships with third countries and international organisations;

- (3) develops the standardisation and quality control of Copernicus products and its services;
- (4) enables effective uptake of Copernicus data and services in EU policy;
- (5) supports the development of a strategic research and innovation agenda for Copernicus and Earth observation;
- (6) undertakes targeted prototyping research activities to generate policy-relevant tailored products to include in the evolution of the Copernicus service elements;
- (7) ensures the efficient implementation of the global land component of the Copernicus land monitoring service, and its evolution to address new use needs and address the EGD and A stronger Europe in the world priorities.

**The projects:** Earth observation for Copernicus global land and support to Copernicus Programme; Copernicus ocean long-term observations for remote sensing applications; Knowledge Centre on Earth Observation and scientific and technical support to Copernicus, GMES & Africa; Research and innovation for Copernicus security service.

**Policy DGs:** DEFIS, INTPA

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Industrial leadership in key and emerging technologies that work for people

### ***1.9.2 Smart specialisation and place-based innovation for transformation towards greener and smarter regions***

This portfolio supports the development of smart specialisation at national and regional level, with a particular focus on lessons learnt from the first smart specialisation exercise. It supports national and regional authorities in implementing smart specialisation strategies, strengthens national/regional research and innovation systems and promotes international collaboration.

**The portfolio:**

- (1) evaluates the implementation of smart specialisation;
- (2) promotes the relevance of smart specialisation as a crucial vehicle for competitive sustainability;
- (3) provides customer-driven scientific and technical support to EU policies, while responding flexibly to new policy demands;
- (4) develops institutional capacity for evidence-based and mission-driven policymaking;
- (5) consolidates the position of smart specialisation as a crucial science-for-policy enabler for a robust and realistic integration;
- (6) identifies common areas of specialisation between the EU and other territories; and
- (7) supports the design of investments from next generation EU and funds under the EU Cohesion Policy.

**The projects:** Smart specialisation platform for sustainability; Digital innovation hubs; Blue growth; and Smart specialisation for sustainable transformation.

**Policy DGs:** REGIO, MARE, CNECT, RTD, GROW

**JRC HE intervention area:** Territorial development and support for Member States and regions.

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Industrial leadership in key and emerging technologies that work for people

### ***1.9.3 Innovation for Europe's Green Deal, focus on R&I and investments for a green and competitive economy***

This portfolio aims to present a broad view of the relevance of innovation for achieving competitive sustainability. It will cover all sectors, with a special focus on energy and transport. It covers general R&I competitiveness, and monitoring and analyses of progress towards the EGD goals, as well as support to the Strategic Energy Technology Plan, the annual Competitiveness Progress Report on the energy sector, foresight EGD-related activities and the mapping of technology trends and R&I capacities in the field of transport.

#### **The portfolio:**

- (1) produces maximum operational and policy-targeted synergies for the relevant agendas;
- (2) becomes the reference portfolio in support of science-to-policy analyses regarding R&I investments and other indicators that are essential for monitoring progress in competitiveness and technology development, of the clean energy and mobility sectors;
- (3) starts from the latest state-of-the-art scientific data and knowledge, developing and deploying the relevant tools and analyses and sharing them in a policy relevant format; and
- (4) effectively communicates scientific knowledge for policy support towards and via the relevant stakeholders and using the appropriate tools.

**The projects:** Energy and mobility research, innovation and competitiveness for the EGD; Foresight for the EGD; Strategic energy technologies information system; Transport research and innovation monitoring and information system; Global industrial research and innovation analyses 2020-21; Industrial innovation strategy and coordination; Economic complexity for industrial competitiveness.

**Policy DGs:** GROW, ENER, MOVE, RTD

**JRC HE intervention area:** Innovation, economic development, and competitiveness

**HE key strategic orientation:** KSO C - Making Europe the first digitally enabled circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.

- **Impact area(s):** Affordable and clean energy, Smart and sustainable transport



## **PRIORITY 2 - EUROPE FIT FOR THE DIGITAL AGE**

### **Policy area 2.1 - Digital economy and society**

Continuously evolving internet and digital technologies are increasingly permeating every aspect of our economy and society, offering numerous opportunities, but also bringing about new challenges. The European approach to digital transformation means empowering and including every citizen, strengthening the potential of every business and meeting global challenges with our core values. The 2020 Communication – Shaping Europe’s digital future (COM(2020)67 final) aims to ensure that digital solutions help Europe find its own way towards a digital transformation that works for the benefit of all people and respects European values. Another 2020 Communication – A European strategy for data (COM(2020) 66 final) – aims to make the EU a global leader in a data-driven society. Creating a single market for data will make it possible for data to flow freely within the EU and across sectors, benefitting businesses, researchers and public administrations.

### **Portfolios:**

#### ***2.1.1 Wireless communications and radio spectrum***

This portfolio addresses the challenges of the digital single market and Digital Europe. It includes experimental and theoretical studies on radio spectrum, wireless communications and strategic autonomy. The portfolio will also act as the Commission's centre of technical competence in modern spectrum management. Collaboration is assured with portfolio Electrification and smart energy sector integration, where interference with lower frequencies intrinsic to electric vehicles and their charging infrastructure plays a role.

#### **The portfolio:**

- (1) researches and supports modern spectrum management and dynamic spectrum sharing;
- (2) researches and standardises activities on cooperative, connected and automated mobility;
- (3) assesses the safety, security and performance of commercial 5G networks, including investigation into electromagnetic field exposure in 5G networks; and
- (4) supports the JRC initiative on strategic autonomy and technological sovereignty.

**The projects:** Spectrum management and regulation; Technology assessment of next-generation vehicular communications; 5G network assessment in terms of safety, security and performance; and Electromagnetic exposure in 5G networks for health and safety.

**Policy DGs:** CNECT, MOVE

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

**- Impact area(s):** High-quality digital services for all.

#### ***2.1.2 Artificial intelligence and digital transformation***

The portfolio provides scientific evidence to underpin the Commission's policy actions under the: 'A Europe fit for the digital age' priority. It supports European AI and robotics policies, building the evidence base for upcoming regulations and advancing research in areas of future regulations (e.g. fairness, accountability and transparency of AI algorithms). It also includes a scientific foresight dimension (e.g. envisaging the impact on human behaviour) and contributes to the JRC's work on technological sovereignty. It interacts closely with the portfolios on the data and platform economy and cybersecurity, as well as the portfolios addressing the digitisation of health, finance, education, mobility and other sectors.

**The portfolio:**

- (1) monitors the development, uptake and impact of artificial intelligence in Europe;
- (2) analyses the impacts of digital transformation on the economy and society, including on innovation and SMEs;
- (3) conducts a research of the impacts of digital transformation on new forms of governance, public sector innovation, and innovative public services; and
- (4) advances state-of-the-art research in trustworthy, ethical AI and human-AI interactions.

**The projects:** Artificial intelligence knowledge service; Impact of digital transformation on the economy and society; Innovation of public services and digital transformation of governance; Human behaviour and machine intelligence: understanding the impact of artificial intelligence on human behaviour.

**Policy DGs:** CNECT, JUST, DIGIT

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Secure and cybersecure digital technology.

### ***2.1.3 Data and platform economy***

The portfolio provides solid scientific evidence to support several actions and policy areas under the 'A Europe fit for the digital age' priority, in particular the data strategy and regulatory interventions in the area of platforms and digital services. It addresses these aspects from a multidisciplinary perspective. It contributes to the legislative framework for the governance of common European data spaces, the Data Act and the Open Data Directive's Implementing Act on high-value data sets. It will also contribute to the revision of the e-Commerce Directive, to the analysis of the market power of big platforms and to ongoing reflections on which type of regulation would ensure fair access to markets and would more efficiently address the fight against illegal content online.

**The portfolio:**

- (1) provides scientific evidence for the regulatory interventions necessary to develop a fair data economy and to maximise the benefits of digital platforms, while minimising the associated risks; and
- (2) supports the development of European data spaces and of interoperability solutions and standards for data sharing and reuse.

**The projects:** Data economy and regulation; Data ecosystems and enablers; and Platform economy and regulation.

**Policy DGs:** CNECT, DIGIT

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** A competitive and secure data economy.

#### ***2.1.4 Smart cities, complexity, and analysis platforms for engineering systems***

This portfolio tackles a number of specific aspects that affect technical and capacity-building measures to sustain EU policy, legislation and R&D promotion of smart city platforms. It supports EU policy drivers with hands-on technical validation combined with technology foresight and horizon-scanning activities.

**The portfolio:**

- (1) supports and develops the next generation of SMART cities;
- (2) carries out modelling of urban dynamics using sensors; and
- (3) prepares simulations for technology-based urban strategies that provide support for critical events (e.g. pandemics).

**The projects:** Smart city digital platforms; Monitoring and modelling dynamic complexity in the urban environment; and Forecasting European construction and urban network technologies.

**Policy DGs:** GROW

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** High-quality digital services for all.

#### ***2.1.5 Learning and skills in the digital age***

This portfolio will support the implementation of actions planned under the new digital education action plan. On top of its contribution to the ‘A Europe fit for the digital age’ priority, it also supports the ‘Promoting our European way of life’ priority by collecting evidence on policies that foster better use of digital technologies in lifelong learning.

**The portfolio:**

- (1) develops digital competence frameworks and tools (SELFIE & DigCompEdu) for schools and educators' digital competence and
- (2) provides evidence and analysis on digital transformation of education and training from a lifelong learning perspective.

**The projects:** Learning for life in the digital age (3 and 4); Digital age learning and skills; Self-reflection tool for teachers in compulsory education; and Self-reflection on effective learning by fostering the use of innovative educational technologies (SELFIE) work-based learning.

**Policy DGs:** EAC, EMPL

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** Inclusive growth and new job opportunities.

### **2.1.6 Cyber security, privacy and digital identities**

This portfolio addresses the elements required to strengthen cybersecurity in the EU. It is structured around three clusters of activities: two clusters grouping work requiring a more cross-sectoral approach and one cluster grouping all activities with a near-to-the-market vertical domain of application.

#### **The portfolio:**

- (1) provides evidence and foresight capabilities to anticipate emergent threats and supports policy needs concerning cybersecurity and privacy of new technologies;
- (2) supports the implementation of the European cybersecurity strategy and in particular the take-off of the new European cybersecurity research and competence centre and the European cybersecurity atlas;
- (3) supports the development of a strategic autonomy strategy concerning cybersecurity with the development of a European cybersecurity market observatory;
- (4) supports the streamlining of cybersecurity and privacy into sectorial policy packages;
- (5) supports with the definition of new policies concerning the dematerialisation of identity cards and travel documents and visa; and
- (6) supports the smart-border package operating the European root certification authority and the European Passport Conformity test Laboratory.

**The projects:** Horizontal cybersecurity research and policy support; Cybersecurity research on AI and data protection; Digital identity; Cybersecurity and digital technologies in the energy sector; Cybersecurity and distributed ledgers; and Cybersecurity education, awareness and societal aspects.

**Policy DGs:** CNECT, HOME, ENER

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Secure and cybersecure digital technology.

### ***2.1.7 Security and privacy in the transport sector***

This portfolio addresses cybersecurity challenges and issues related to cooperative intelligent transport systems for cooperative, connected and automated mobility. It also provides cybersecurity expertise to support policymaking and operations in DG MOVE. It aims to strengthen the citizen's security and privacy in this sector and to safeguard the objectives of increased road safety (reduction of accidents and fatalities) and transport efficiency (under the EGD). These objectives cannot be achieved if cybersecurity in new mobility services fails.

#### **The portfolio:**

- (1) strengthens JRC expertise on cybersecurity in the transport sector, contributing to the safe, secure and interoperable deployment of cooperative, connected and automated mobility services in the EU; and
- (2) supports the Commission services in activities aiming to define, implement and operate the cybersecurity systems and tools required by EU road transport legislation as regards social rules and the functioning of the internal market.

**The projects:** The EU C-ITS security credential management system; Vehicle cybersecurity; and Cybersecurity related to EU road transport legislation on social rules and the internal market.

**Policy DGs:** MOVE

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A - Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Secure and cybersecure digital technology.

### **Policy area 2.2 – Single market**

The European single market is a cornerstone of the EU. It allows for free movement of goods, services, capital and labour. It brings numerous benefits, including stimulation of trade and exploitation of economies of scale. It also facilitates lower production costs and lower prices due to increased competitiveness. Finally, it allows for transfer of skills and labour mobility. Standardisation and enforcement of internal market legislation are indispensable to making the single market function well. The general objective of the new single market programme is: "to improve the functioning of the internal market, and especially to protect and empower citizens, consumers and businesses, in particular micro, small and medium-sized enterprises (SMEs), by enforcement of Union law, facilitation of market access, standard setting, and by promoting human, animal and plant health and animal welfare".

#### **Portfolios:**

##### ***2.2.1 Motor vehicle market surveillance***

The JRC carries out market surveillance for vehicles placed on the European market, and the in-service conformity testing. Market surveillance covers the assessment and laboratory testing of vehicles' environmental and safety performance.

#### **The portfolio:**

- (1) supports the Commission responsibilities regarding the compliance of motor vehicles placed on the EU market according to Regulation (EU) 2018/858.

**The projects:** Market surveillance: emissions; and Market surveillance: safety.

**Policy DGs:** GROW

**JRC HE intervention area:** Global challenges: digital, industry and space

### ***2.2.2 Single market enforcement action plan***

The portfolio focuses on a number of actions included in the ‘Long-term action plan for better implementation and enforcement of single market rules’ (COM(2020) 94 final). It includes a reference laboratory for chemical analysis of tobacco products, which generates data on the elemental and volatile composition of genuine and seized tobacco products. The portfolio also supports EU and national authorities in the fight against tax evasion, helping to identify contraband tobacco smuggled into the European market. As regards actions related to the e-enforcement lab and EU Product Compliance Network, the portfolio provides support on market surveillance and compliance of non-food products.

#### **The portfolio:**

- (1) provides support to set up and run the EU Product Compliance Network;
- (2) helps the Commission services address new challenges arising from the spreading of e-commerce and contributes to lifting some barriers to the Single Market;
- (3) operates a dedicated tobacco laboratory, supporting enforcement activities in the EU Member States and those carried out by OLAF investigators;
- (4) supports Commission services in the implementation of EU legislation in the field of (novel) tobacco products; and
- (5) supports the EU institutions and Member States to set up and implement methodologies to detect, identify and monitor illicit drugs, drug precursors and other hazardous products appearing on the market.

**The projects:** Tobacco and drug control; and Product compliance.

**Policy DGs:** GROW, OLAF, TAXUD, HOME

**JRC HE intervention area:** Innovation, economic development, and competitiveness

### **Policy area 2.3 – Innovation - Industry, entrepreneurship and SMEs**

Industry is the backbone of the EU economy and it provides approximately 35 million jobs. Its competitiveness is at the heart of the Commission’s agenda, especially since the Commission is committed to supporting the digital and green transformation of EU industry. At the same time, support for the EU’s SMEs is also crucial, since they represent some 99% of businesses. Such support includes reducing administrative burdens, making access to funding easier and supporting access to global markets. In 2020, the Commission adopted its strategies on both industry and SMEs: an SME strategy for a sustainable and digital Europe (COM(2020)103 final) and a new industrial strategy for Europe (COM(2020)102 final). The Commission will support this area with additional legislative and non-legislative action.

#### **Portfolios:**

##### ***2.3.1 Strategic autonomy***

The portfolio aims to strengthen the EU's capacity to assess risks and monitors critical dependencies in strategic domains. It will bring together comprehensive scientific evidence and analysis from the JRC and external sources, including other EU institutions and think tanks. The portfolio addresses economic, technological, security and defence aspects.

**The portfolio:**

- (1) provides an overview of relevant existing JRC work, focusing on the strategic sovereignty angle of the different work strands;
- (2) provides overview of high level methodologies for critical dependence analysis and risk assessments, identifying commonalities and synergies;
- (3) identifies EU strengths and weaknesses including critical dependencies, as needed for key sectors and technologies;
- (4) builds and maintains data, information and indicator infrastructure; and
- (5) fosters communication and uptake by policy makers.

**The projects:** CHINA 2.0; Monitoring of cross-border investments and contribution to the FDI screening; Identification and analysis of multinational enterprises; EU technological sovereignty - digital supply chains; Strategic autonomy in digital Europe; Vulnerabilities in EGNSS industrial supply chains; Post-covid-19 EU strategic sovereignty for critical inputs, services and industries.

**Policy DGs:** GROW, TRADE, DEFIS, CNECT

**JRC HE intervention area:** Global challenges: digital, industry and space

**HE key strategic orientation:** KSO A: Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Industrial leadership in key and emerging technologies that work for people.

### ***2.3.2 Productivity, SMEs and scale-up***

The JRC takes part in the European Semester process for economic policy coordination amongst Member States by providing evidence to support country-specific policy recommendations. It contributes by providing detailed analyses of: (i) drivers and trends in productivity, (ii) access to finance, including venture capital for European SMEs and small- and mid- caps, and (ii) national framework conditions for the emergence and development of high-growth companies and SMEs. This portfolio will support the objectives of the European Semester, particularly regarding the policy response to the socio-economic impacts of the COVID-19 crisis.

**The portfolio:**

- (1) annually analyses trends and key drivers in productivity in the EU and individual Member States;
- (2) annually assesses access to finance, notably venture capital, for European SMEs and small- and mid-caps; and
- (3) annually analyses national framework conditions and the role of eco-innovation in the emergence and competitiveness of high-growth companies in Europe.

**The projects:** Productivity; Company financing, SMEs, venture capital; and High-growth enterprises.

**Policy DGs:** GROW, ECFIN

**JRC HE intervention area:** Innovation, economic development and competitiveness

### ***2.3.3 Places and actors of the digital and green transitions***

The digital and green transitions are at the heart of the European industrial strategy and innovation policies. This portfolio combines actions that aim to achieve the ‘an industry that becomes greener and more digital while remaining competitive on the global stage’ objective with recognising the important role of regions and other actors involved in industrial ecosystems, and the need to take a value-chain approach. Giving places and actors a central role in the digital and green transformations requires tailored governance models that allow variable geometry coalitions across Europe, in order to support the implementation of European value chains across EU territories.

**This portfolio:**

- (1) analyses the role of less developed territories in understanding and managing transitions, and their further extension to other territories;
- (2) provides support to the Just Transition Mechanism;
- (3) analyses the role of skills and human capital in transitions, building on work on higher education and vocational training in regional economic and industrial development; and
- (4) enhances understanding of the roles that actors, places and innovation eco-systems can play in contributing to existing and new EU and global value chains.

**The projects:** Education and skills for regional innovation and transformation; Analysis of transition towards resilient industrial ecosystems; Targeted support for transitions and reforms; Geography of innovation – strategic intelligence in place-based innovation supporting the ecological and digital transitions of the EU; and European place-based innovation ecosystems.

**Policy DGs:** RTD, REGIO, EAC, EMPL

**JRC HE intervention area:** Innovation, economic development, and competitiveness; Territorial development and support for Member States and regions.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

**- Impact area(s):** Inclusive growth and new job opportunities.

### **Policy area 2.4 – Earth observation and space**

EU space policy aims to tackle some of the most pressing of today's challenges, such as fighting climate change, helping to stimulate technological innovation, and providing socio-economic benefits, including security. Space technology, data and services have become indispensable in lives of the EU citizens. The EU currently has three flagship space programmes: Copernicus - a leading provider of Earth observation data; Galileo - Europe's



global satellite navigation system, and; EGNOS (the European Geostationary Navigation Overlay Service), which offers ‘safety of life’ navigation services to aviation, maritime and land-based users across Europe. The new Space Programme Regulation covers Copernicus, European Global Navigation Satellite System (EU GNSS), and two new initiatives Space Situational Awareness (SSA), and the European Union Governmental Satellite Communications (GOVSATCOM).

### **Portfolios:**

#### ***2.4.1 Science, technology and innovation for EU GNSS***

GALILEO and EGNOS, the EU's GNSS programmes, have become an essential pillar of Europe's strategy to improve industrial competitiveness, generate growth, create highly skilled jobs, boost innovation, reinforce the EU's strategic autonomy, and help make the EU a stronger global actor. The main focus of this portfolio it is to support the implementation of the EGNSS programmes. It also aims to establish synergies across EU policy areas and promote the uptake of EU GNSS programmes within them, which will increase the policies' economic and societal impact and strengthen the EU's strategic autonomy.

#### **The portfolio:**

- (1) strengthens the role of the JRC as a source of independent, in-house expertise and testing laboratories to support the Commission in its role as the EU GNSS Programme Manager;
- (2) establishes the JRC's GNSS laboratories and the 'living labs' ecosystem as the main reference site for testing and demonstration activities carried out as part of R&D actions under the EU's GNSS programmes, GALILEO and EGNOS;
- (3) organises and runs training activities jointly with major stakeholders in the EU's GNSS programmes and continues to support the ESA-JRC International GNSS Summer School;
- (4) underpins the innovation and competitiveness of products and services that make it possible to use GALILEO by supporting the establishment, implementation and adoption of EU standards and regulatory frameworks;
- (5) identifies potential synergies across the four components of the EU space programme; and
- (6) supports the implementation of the EU Regulation on the Space Programme etc.

**The projects:** A testing and demonstration hub for EU GNSS; Scientific and technical support for EU GNSS; and EMSL (European Microwave Signature Laboratory) third-party work.

**Policy DGs:** DEFIS

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO A: Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Industrial leadership in key and emerging technologies that work for people.

### ***2.4.2 Copernicus Emergency Management Service***

This portfolio provides information to support an emergency response to different types of disaster, including meteorological hazards, geophysical hazards, deliberate and accidental manmade disasters and other humanitarian disasters, as well as prevention, preparedness, response and recovery activities. The work carried out under this portfolio has strong links with other activities, such as adaptation to climate change and the work of the Disaster Risk Management Knowledge Centre.

#### **The portfolio:**

- (1) manages the Copernicus Emergency Management Service;
- (2) contributes to other projects and activities related to disaster risk management, such as adaptation to climate change and the work of the Disaster Risk Management Knowledge Centre; and
- (3) carries out research and innovation activities to support the evolution of the Copernicus Emergency Management Service.

**The projects:** Supporting resilience to floods at local, national, European and global level; Addressing risks due to droughts and extreme temperatures in Europe and globally; Early warning, assessment and monitoring of wildfire impacts in Europe and globally; Copernicus EMS – Mapping.

**Policy DGs:** DEFIS, ECHO, DEVCO

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO A: Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Industrial leadership in key and emerging technologies that work for people

### **Policy area 2.5 – Aerospace and Defence industry**

In the 2016 European defence action plan (COM(2016) 950 final), the Commission proposed a list of specific measures/areas to support the development of defence capabilities needed in the future. This includes the launch of a European Defence Fund (COM(2017) 295 final) that supports collaborative research projects and the joint development of defence capabilities with funding from the EU budget. The fund also provides opportunities to SMEs and helps them engage in cross-border partnerships.

#### **Portfolios:**

### ***2.5.1 Research, technologies and synergies in defence, aerospace and security***

This portfolio responds to the need for EU-level scientific support in the realm of dual-use and defence research and development and synergies civil-space-defence. In addition to supporting the EU defence industry, a number of wider defence and dual-use aspects are included in the portfolio, such as those related to military mobility and hybrid threats. The portfolio will also cover strategic thinking on current and future EU-level defence needs, which will also support the European External Action Service.

#### **The portfolio:**

- (1) provides annual structured and consolidated information to the Commission services to support the formation of opinions and decisions on European defence, aerospace, dual-use research and technology (R&T) and industry;
- (2) provides annual assessments of possible future evolutions relevant for defence, aerospace and dual-use R&T;
- (3) produces a biannual report on critical technologies, dependencies, value chains and testing infrastructure for the defence, space and related civil industries;
- (4) provides a meaningful support to EU defence R&D efforts by developing innovative experimental/numerical tools for dual-use materials and scenarios;
- (5) is a reference for strategic Commission's decisions on the EU funding of R&D for quantum applications for space, security and defence;
- (6) by end of 2022, prepares a research and innovation roadmap and coordination plan for GOVSATCOM;
- (7) brings together the defence and dual-use work in JRC and supports the JRC contribution to the Inter-service group on defence and security technologies; and
- (8) co-leads the EU Observatory on critical technologies.

**The projects:** Foresight for defence industry and space; Dual-use material testing and simulation; Quantum technology for defence and security; Dual-use and defence landscape studies; EU dual-use and defence R&D priorities; Entrusted GOVSATCOM; and the EU observatory on critical technologies in civil, defence and space.

**Policy DGs:** DEFIS, CNECT, GROW, SG

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A resilient EU prepared for emerging threats.

## **PRIORITY 3 – ECONOMY THAT WORKS FOR PEOPLE**

### **Policy area 3.1 – Economic and Monetary Union**

The 2015 Five Presidents' Report on Completing Europe's Economic and Monetary Union (EMU), together with the 2017 reflection paper on the deepening of the economic and monetary union (EMU) (COM(2017) 291 final), set out specific measures to move towards a stronger union that contributes to jobs, growth and prosperity. Public finances have been considerably stretched in recent years, with the crisis entailing a sharp increase in public sector debt. As the economy starts growing again, the EMU needs to address the social and economic differences that emerged from the crisis, and keep protecting itself against shocks.

In December 2017, the Commission presented its Communication on further steps towards Europe's Economic and Monetary Union (COM(2017) 821 final). The communication presents the Commission's initiatives and proposals that support the deepening of the EMU, including proposals to set up a European Monetary Fund and to strengthen the Structural

Reform Support Programme. It also presented a roadmap for deepening Europe's Economic and Monetary Union.

### **Portfolios:**

#### ***3.1.1 Anchoring and asserting the role of evidence in the European Semester and Recovery and Resilience Facility***

The JRC is actively engaged in the European Semester cycle of economic policy coordination to underpin policy recommendations with robust evidence. The portfolio will strengthen the JRC's role in the European Semester (including discussions on the recovery and resilience plans) in various areas, including: modelling the redistributive and fiscal effects of tax-benefit reforms in Member States with the Euromod model; (eco)innovation and smart specialisation; the global multi-country (GM) model for short/medium term forecasting and assessing the main drivers of key macroeconomic variables; GAP estimates to assess the cyclical position of economies (output gap) and their productive capacity; nowcasting models to evaluate the instantaneous evolution of core macro variables; and resilience dashboards.

#### **The portfolio:**

- (1) supports the European Semester and recovery and transition policies with model-based forecasts/nowcasts and assessments of macroeconomic drivers;
- (2) supports the preparation of the JRC's country-specific contributions; and
- (3) maintains and/or launches initiatives on the key topics identified with policy DGs as priorities for the subsequent European Semester cycle.

**The projects:** Aligning the European Semester and the Sustainable Development Goals; Macroeconomic and fiscal surveillance, Resilience analyses and dashboards; Modelling SDGs in the European Semester; and Coordination of the European Semester and the Recovery and Resilience Facility.

**Policy DGs:** SG, ECFIN, EMPL, TAXUD, REFORM

**JRC HE intervention area:** Innovation, economic development, and competitiveness

#### ***3.1.2 Towards a stronger and fairer Economic and Monetary Union***

The portfolio aims to strengthen the Commission's capacity to effectively analyse/monitor the main trends in and obstacles to an effective Capital Markets Union and the completion of the Banking Union. It is related to the Commission priority on 'an economy that works for people', and in particular to the aim of completing both the Banking Union and the Capital Markets Union.

#### **The portfolio:**

- (1) builds and maintains data, models and indicator infrastructure to provide policy makers with targeted evaluations to help them monitor the challenges posed by financial markets and achievements in the Banking Union and the Capital Markets Union;
- (2) analyses factors that could be the source of substantial risks for the long-run sustainability of economic and financial integration and that may hamper the companies' competitiveness;

- (3) provides support in the field of financial stability through various legislative and non-legislative initiatives, to help the Commission gain a more complete understanding of risks in the financial system and the impact of financial regulation.

**The projects:** Completing the Banking Union; Capital markets monitoring and company financing; and Microeconomic data for international macroeconomics.

**Policy DGs:** FISMA, ECFIN

**JRC HE intervention area:** Innovation, economic development, and competitiveness.

### ***3.1.3 Impact of policies on growth and innovation***

This portfolio provides the knowledge base to support EU policies under priority 2. It aims to support the transition towards the sustainable, inclusive and competitive territorial development of Europe. By means of territorial data and the RHOMOLO modelling framework, the portfolio provides horizontal support for the impact assessment of different policies under a coherent and consistent evaluation framework. Beyond scientific developments, it also contributes to *ex-ante* economic evaluation in various policy areas.

#### **The portfolio:**

- (1) supports the *ex-ante* impact assessment of major funding programmes (e.g. funds under Union Cohesion Policy, the Investment Plan for Europe, Horizon Europe);
- (2) develops and maintains the RHOMOLO modelling framework; and
- (3) carries out territorial/sectoral value-chain analysis using the RHOMOLO-IO model.

**The projects:** Macroeconomic modelling on heterogeneous firms; Economic modelling for territorial and sector analysis: Territorial analysis - RHOMOLO VII; Economic modelling of EU Investment Plan and European Investment Bank etc.

**Policy DGs:** REGIO, GROW, EMPL, ECFIN

**JRC HE intervention area:** Innovation, economic development, competitiveness and value chain.

**HE key strategic orientation:** KSO A: Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.

- **Impact area(s):** Industrial leadership in key and emerging technologies that work for people.

### **Policy area 3.2 – Fair and effective tax and benefit systems**

The Commission's tax policy strategy is outlined in its 2001 Communication on tax policy in the European Union - Priorities for the years ahead (COM(2001)260 final). In this Communication, the Commission stated that there is no need for an across the board harmonisation of Member States' tax systems. National governments are responsible for raising taxes and setting tax rates that they consider most appropriate and according to their preferences. However, the EU coordinates some national tax rules and tax rates where differences might discourage people from buying and selling in other EU countries. It also promotes cooperation between its member countries on tackling tax avoidance and tax evasion, eliminating discrimination cases and reducing compliance burdens. Tax fraud, tax

avoidance and aggressive tax planning are currently major problems for the EU. Companies exploit the lack of coordination on national measures to evade taxation. This leads to significant revenue losses for Member States, a heavier tax burden for individuals and competitive distortions for businesses that pay their share. The Commission initiatives on corporate taxation and VAT, along with the Communication on fair taxation of the digital economy, aim to tackle these issues.

### **Portfolios:**

#### ***3.2.1 Modelling the redistributive and fiscal impact of tax and social benefit reforms***

The portfolio provides support to policy DGs and the Member States in the area of tax and social benefit reforms. It will address the reforms undertaken in the context and aftermath of the COVID-19 crisis, both through the analysis of country-specific measures and by supporting the Commission's proposals aiming, among others, to improve the EU's shock absorption mechanisms. Both actual and hypothetical reforms will be simulated, mainly using the Euromod model. The portfolio also manages the maintenance and updating of the Euromod model. This portfolio supports Member States in the design and implementation of national policies through JRC's cooperation with national administrations in EU Member States. The collaboration may include transfer of administrative data between the parties and further processing of such data for scientific research purposes, including the provision of scientific and technical support to EU policies.

#### **The portfolio:**

- (1) provides support to the Commission services for the analysis of Member States' tax and social policy measures in the aftermath of the COVID-19 crisis, including redistributive effects;
- (2) supports Member States in the formulation of policy recommendations in the context of the European Semester;
- (3) analyses the fiscal impact of migration trends, using the Euromod model;
- (4) analyses the fiscal and distributional impact of green tax policies; and
- (5) provides technical support to the Member States on tax and social policy modelling etc.

**The projects:** Maintenance and update of Euromod; Support to fiscal policy analyses; Analysis of pension taxation; Technical support to tax and social benefit reforms; Fairness of tax and social benefit systems; and Development and extension of tax and social benefit modelling.

**Policy DGs:** ECFIN, EMPL, REFORM, TAXUD

**JRC HE intervention area:** Innovation, economic development, and competitiveness.

### **Policy area 3.3 – Customs**

Under the EU's legal framework, the customs authority is the lead authority for controlling goods at the EU's external borders and has the coordinating role in this area. Member States' customs authorities are responsible for the supervision and control of all goods entering, passing through or leaving the EU. EU customs authorities raise substantial revenue for the EU and Member State budgets. They also play an important role in ensuring the security and integrity of the supply chain for international goods, ensuring the security and safety of the

EU and its citizens, facilitating and accelerating legitimate trade movements and promoting EU competitiveness.

### **Portfolios:**

As part of the JRC Competence Centre for Data Analysis and Robust Statistics working under the 'Competences for better policymaking and regulation' portfolio, the JRC will continue to provide support for EU customs initiatives. This includes the development of tools and techniques to support the Commission and Member State authorities in customs risk assessment, and methodological support for the 'joint analytical capacity' initiative.

**Policy DGs:** TAXUD

**JRC HE intervention area:** Innovation, economic development, and competitiveness.

### **Policy area 3.4 – Social Europe and the future of work**

Social justice is the foundation of the European social market economy and at the heart of the EU. It underpins the idea that social fairness and prosperity are the cornerstones of building a resilient society with the highest wellbeing standards in the world. In January 2020, the Commission adopted a Communication on a strong social Europe for just transitions (COM(2020) 14 final). The document builds on the European Pillar of Social Rights and asks the Member States, regions and partners to present their views on the way forward, as well as their plans to deliver on the Pillar's objectives. This also forms part of the renewed European skills agenda for sustainable competitiveness, social fairness and resilience (COM(2020) 274 final) and the Action plan to implement the European Pillar of Social Rights (June 2020). In the upcoming years, the Commission also intends to prepare and adopt various initiatives, including a proposal on minimum basic income.

### **Portfolios:**

#### ***3.4.1 The future of social Europe***

This portfolio strengthens the JRC's impact in the areas of social policy and welfare state reforms, social economy, social innovation and impact investing. It aims to open up and steer the debate on where the evolutionary paths of welfare systems could lead European societies, in light of the impact of the digital transformation, and the required rethinking of their functioning and role. This is part of the Commission's obligation to support and complement Member States' policies in this area. Projects in the portfolio also aim to support the implementation of the European Pillar of Social Rights, particularly principle 12, and the mapping of progress towards more universal social protection systems.

#### **The portfolio:**

- (1) carries out a foresight exercise considering possible scenarios for the future of the welfare state and focusing on role and meaning of universality in the future of welfare, as well as on role and potential for social innovation in light of the universality principle and the future of welfare;
- (2) provides a comprehensive narrative on main trends in the field of social economy, how its role could be framed in light of these trends and the envisioned future of welfare; and
- (3) provides a consolidated analysis of the entire portfolio findings and results, including the identification of future policy relevant research directions, testable hypotheses and a set of validation and dissemination activities.

**The projects:** The future of the welfare state in Europe; and The future of social economy in Europe.

**Policy DGs:** EMPL, GROW

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** Inclusive growth and new job opportunities.

### ***3.4.2 The future of work***

The portfolio assesses various aspects of the changing nature of work and implications at global level, including in cooperation with the International Labour Organisation. It contributes to the Commission's reflections on the future of work and supports the implementation of the European Pillar of Social Rights and the Recovery Plan for Europe. The portfolio also strengthens and deepens the existing evidence on the disruption of labour markets in the EU in the digital age and as a result of the COVID-19 crisis. Research carried out under this portfolio will develop new knowledge on various aspects of the future of work that are relevant for the EU and other key countries and that are high on the political and policy agenda, requiring further analysis and understanding.

#### **The portfolio:**

- (1) strengthens cooperation and carries out joint research with the ILO, Eurofound, Cedefop, EU-OSHA and other bodies to gather evidence on various aspects of the future of work, focusing on those of relevance to the EU and selected non-EU regions; and
- (2) produces research results that enable a better analytical understanding of the future of work in the EU and globally; these include new forms of work, platform work, the impact of automation on employment, labour market transitions and shifts in job structures at global level.

**The projects:** Jobs in the future; The future of work at the global level; Skills intelligence in cooperation with Cedefop; and Employment and skills: contribution to transversal projects.

**Policy DGs:** EMPL, FPI, ECFIN, HOME

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** Inclusive growth and new job opportunities.

### ***3.4.3 Looking at the future of the middle class***

The portfolio looks at income dynamics and individual coping capacities in the EU, with a special focus on the threats, challenges and prospects related to the EU's middle class. It combines analyses of the middle and bottom of income distribution (middle class and



poverty), and the dynamic ability of people and households to deal with challenges, such as sudden income or wealth losses. It pays special attention to vulnerable groups, in particular those at risk of poverty. In this way, it serves the objectives of moving towards a fairer EU society, strengthening its resilience, and the fight against poverty.

**The portfolio:**

- (1) contributes to the new emerging foresight portfolio, by understanding the drivers of middle class dynamics, the capacity of the EU to cope with foreseen and unforeseen future challenges, and to mobilise resources to manage the green, fair and digital transitions; and
- (2) provides specific tools (e.g. absolute measurement of poverty or new definitions of the middle class) and general analyses (e.g. household coping capacities or vulnerable groups) to feed data into policy discussions, the policy agenda and eventually implementation.

**The projects:** Trends and challenges for the middle class in the EU; Income inequality and absolute poverty; and Determinants of societal resilience in the EU.

**Policy DGs:** EMPL

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** Inclusive growth and new job opportunities.

**Policy area 3.5 – Territorial policy and cohesion**

Cohesion policy is the EU's main investment policy. Since 1986, the objective of cohesion policy has been to strengthen economic and social cohesion. The Lisbon Treaty and the Europe 2020 strategy (COM(2010) 2020 final) introduce territorial cohesion. Cohesion policy investments in Member States, regions and cities are increasingly important for achieving the objectives of the Europe 2020 strategy and the priorities of the Investment Plan for Europe and its successor, the InvestEU Programme (2021-2027). The policy is an integral part of EU economic governance and contributes to the European Semester process. Cohesion policy aims at economic, social and territorial cohesion and is funded through the European structural and investment funds. Similarly, the Commission's European Urban Initiative tries to offer a coherent support to cities by bringing together different urban initiatives and support tools and enhancing the link with the mainstream cohesion policy activities.

**Portfolios:**

***3.5.1 Urban observatory on the future of cities and urban strategies***

The portfolio aims to assess and model trends towards 'the city of the future' at European and global scale (the latter, with a focus on Africa and Southern and Eastern Partnerships) hence covering the internal and external dimensions of EU investments. Work under this portfolio analyses how the energy, mobility and data nexus will transform cities to be more sustainable. It also assesses effects on housing, prices, urban morphology, sustainable urban transport and the urban-rural divide. Projects will study how demand for new solutions can connect to supply in living labs or system demonstrators. Furthermore, the portfolio will set up an urban

observatory and advise policy makers in cities and rural areas on how to design and implement innovation-led transformative urban strategies for climate neutrality. In this context, it will support the Horizon Europe mission on Cities by providing monitoring and continuous learning of transformative innovation policy in cities.

**The portfolio:**

- (1) identifies broader trends related to cities (such as urbanisation), as well as targeted considerations (mobility, ageing, governance, etc.);
- (2) contributes to the revision of world population prospects;
- (3) defines recovery paths in cities, harmonising sustainable development and economic growth with socially fair principles; and
- (4) characterises strategic corridors in Africa, based on set of wide range of criteria including territorial connectivity and urban development.

**The projects:** Supporting knowledge management of EU measures for integrated urban and territorial development (phase 2); Urban data platform plus; Housing stock, affordability and ownership; The future of cities and urban foresight; Cities and innovation; The future of corridors and urban systems in Africa; and Community of practice - CITIES.

**Policy DGs:** REGIO, INTPA, RTD, NEAR

**JRC HE intervention area:** Territorial development and support for Member States and regions.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A secure, open and democratic EU society

***3.5.2 Places of the EU: territorial data, analysis and modelling - fostering cohesion and fairness***

The portfolio provides the knowledge base to support EU policies under the 'an economy that works for people' priority, in line with the aims of cohesion policies and the Commission's equality goal (equality for all and equality in all of its senses). It aims to support the transition towards the sustainable and competitive territorial development of European regions, cities and areas with specificities, taking as reference both people and places.

**The portfolio:**

- (1) supports the definition of new priorities and the re-orientation of multiannual financial framework;
- (2) contributes to the long term vision for rural areas with territorial modelling and analysis; and
- (3) evaluates exit strategy patterns (post-COVID-19).

**The projects:** Knowledge Centre for Territorial Policies; Application of the LUISA modelling platform to cohesion and investment policies; Low density development and territorial strategies.

**Policy DGs:** REGIO, ECFIN, AGRI, EMPL

**JRC HE intervention area:** Territorial development and support for Member States and regions.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A secure, open and democratic EU society.

### ***3.5.3 Global human settlement layer***

This portfolio continues the successful work of the global human settlement layer that delivers spatial information about the presence of built-up areas and people. This entails the processing of socio-economic and environmental Big Earth Data using open, transparent, repeatable and internationally agreed mathematical techniques that facilitate collective understanding and public discussion of complex multiple-causal processes. The development and testing of new human-centric AI methods able to support international decision-making and policy frameworks are at the core of the portfolio.

**The portfolio:**

- (1) develops and tests new human-centric AI methods able to support international decision-making and policy frameworks; and
- (2) improves and updates the global human settlement layer with more refined information and new information layers to support the monitoring of international frameworks an regional and urban policies.

**The projects:** Global human settlement layer data evolution; and Human-centric AI that supports the global human settlement layer.

**Policy DGs:** REGIO

**JRC HE intervention area:** Global challenges: digital, industry and space.

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A secure, open and democratic EU society.

### ***3.5.4 Tourism***

The portfolio addresses the urgent and extensive challenges faced by the tourism sector due to the COVID-19 outbreak and subsequent lockdowns and responds to the need to design and implement relevant policy action at European, national and local level. It builds on previous work carried out in the field of tourism, in the context of territorial modelling activities, the Knowledge Centre for Territorial Policies and various smart specialisation projects. The portfolio also intends to consolidate the EU's policy impact and scientific reputation as regards the collection and analysis of data related to tourism, with a specific focus on localised impacts, trends, scenarios and strategies, and with a special interest in the transition towards sustainable tourism.

**The portfolio:**

- (1) supports the full recovery of the tourism sector; and
- (2) develops a new paradigm for innovative, sustainable and resilient tourism.

**The projects:** Tourism and places: from shock to recovery; and the 'Reopen EU' project.

**Policy DGs:** GROW, REGIO, SG, ECFIN

**JRC HE intervention area:** Territorial development and support for Member States and regions

**HE key strategic orientation:** KSO D: Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** Inclusive growth and new job opportunities.

## **PRIORITY 4 - A STRONGER EUROPE IN THE WORLD**

### **Policy area 4.1 – Globalisation of the world economy**

EU trade policy makes sure that European trade adapts to the fast-changing world. Trade outside the EU is an exclusive responsibility of the EU, rather than the national governments of Member States. The EU also manages trade and investment relations with non-EU countries through its trade and investment policy. The EU's responsibilities cover: 1) trade in goods and services, 2) the commercial aspects of intellectual property, such as patents, 3) public procurement and 4) foreign direct investment. In 2015, the Commission adopted a Communication on 'Trade for all: Towards a more responsible trade and investment policy' (COM(2015) 497 final), setting out the EU's trade policy priorities and proposing ways to increase effectiveness, transparency and ethics in trade policymaking. In 2017, it adopted a Communication on 'A balanced and progressive trade policy to harness globalisation' (COM(2017) 492 final), which aimed to ensure a sustainable and transparent trade policy based on values that help harness globalisation and ensure a balanced approach to open and fair trade agreements. The Commission also aims to guarantee that foreign investment remains a major source of growth in the EU while protecting the EU's essential interests.

### **Portfolios:**

#### ***4.1.1 Free fair trade agreements***

This portfolio deals with socio-economic and environmental analyses, modelling and support to the EU's bilateral and multilateral free trade agreements (FTAs), including those specific to EU agri-food international trade and abiotic (mineral) raw materials.

#### **The portfolio:**

- (1) prepares modelling and impact assessments of bilateral FTAs;
- (2) prepares modelling, impact assessments and support to EU's bilateral and multilateral agreements with specific focus on trade and sustainable development provisions, the EU agri-food and raw materials sectors;
- (3) analyses environmental impacts of trade policies and of potential trade measures to secure a level-playing field of the EU with its trade partners (i.e. border carbon tax);
- (4) analyses and quantifies non-tariff measures and sanitary and phytosanitary standards, including on EU agri-food trade;

- (5) analyses environmental impacts of trade policies;
- (6) analyses impacts of trade barriers on specific raw materials markets; and
- (7) prepares dedicated country profiles on trade with raw materials in support of EU's trade policies; includes both biotic and abiotic raw materials.

**The projects:** Agriculture, trade and the global economy; and Trade along raw materials supply chain.

**Policy DGs:** AGRI, TRADE

**JRC HE intervention area:** Innovation, economic development, and competitiveness.

#### *4.1.2 Assessing global corporate tax avoidance*

This portfolio aims to support the Commission in assessing the extent of tax revenue lost due to global tax avoidance by multinationals, which is relevant for the 'a stronger Europe in the world' priority. Global corporation investment and tax avoidance behaviour are key challenges to the world economy and the EU in particular. The JRC has developed tools to measure the extent of corporate tax base erosion and profit shifting. On this basis, it has received further demand for the analysis of the impact of global tax competition and profit shifting on small and medium businesses.

##### **The portfolio:**

- (1) develops a corporate microsimulation model for the EU;
- (2) maintains and extends the CORTAX model to address digital taxation and efficiency issues;
- (3) supports the Commission services in assessing the extent of corporate tax avoidance;
- (4) analyses the impact of multinationals' profit shifting on SMEs; and
- (5) supports the impact assessments of Commission proposals on fighting corporate tax avoidance.

**The projects:** Tax avoidance and profit shifting; and Modelling the resilience and fairness of tax systems by fighting tax fraud and tax avoidance.

**Policy DGs:** TAXUD

**JRC HE intervention area:** Innovation, economic development and competitiveness.

#### **Policy area 4.2 – External action**

Peace keeping, diplomacy, trade and development aid are among the priorities of the EU's external action. The EU carries out civilian and military missions worldwide under the common security and defence policy (CSDP). Through political, logistic and economic support, it has played a crucial role in building peace in locations around the world. With the New Pact on Migration and Asylum, the EU has also developed a new approach to better manage all aspects of migration and forced displacement. This aims to ensure that migration takes place in a safe and regular manner, avoid loss of life, and provide international protection to those who need it. To do so, the external dimension of the Pact foresees comprehensive, tailor-made and mutually beneficial migration partnerships with key third countries. To improve management of migration and mobility, and respond to security challenges, the EU needs to work with countries outside the EU.

## **Portfolios:**

### ***4.2.1 External dimension of migration***

This portfolio contributes to making the EU a stronger presence in the world. It focuses on the external dimension of migration, specifically looking at contexts outside the EU. It aims to provide policy-relevant knowledge on global and regional migration drivers and flows, as well as on the relationship between international migration and other processes including international development and climate change. It does so through a combination of knowledge management, new analysis, tools and knowledge exchange networks. The portfolio also contributes to the Promoting our European way of life priority, with a specific focus on the incorporation of the external dimension of migration under the topic of Migration and asylum and into the New Pact on Migration. Alongside these issues it will also focus on elements relevant for other Commission priorities, such as the European consensus on development and the 2030 Agenda for sustainable development.

#### **The portfolio:**

- (1) supports the implementation of the migration agenda and the Joint Commission and HR/VP Communication ‘Towards a Comprehensive Strategy with Africa’ through knowledge management and communicating scientific knowledge on migration and demography related topics to relevant policy partners;
- (2) enhances the Commission’s knowledge on youth migration between Africa and Europe through new analyses and synthesis of existing scientific knowledge;
- (3) intends to understand the benefits of the green transition and threats of climate change in Africa through the creation of new knowledge on the relationship between extreme climate events and migration and forced displacement; and
- (4) supports a comprehensive and tailored-made partnership with Africa on approaches to migration and mobility through knowledge exchange with African researchers and policymakers.

**The projects:** Climate-induced migration; Migration, youth and development; Partnerships for knowledge on migration in Africa; and Atlas of Demography.

**Policy DGs:** INTPA, NEAR, HOME

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

**- Impact area(s):** A secure, open and democratic EU society.

### **Policy area 4.3 - International cooperation and development**

Through its international cooperation and development policy, the EU is committed to eradicating poverty and driving global sustainable development, as defined in the 2030 agenda for a fairer, sustainable, resilient and more stable world (A/RES/70/1) and in the 2017 European consensus on development (2017/C 210/01). The 2030 agenda is based on a global partnership involving all stakeholders and requires the mobilisation of all means of implementation and a strong follow-up and review mechanism to ensure progress and accountability. The consensus is a cornerstone of EU relations with the rest of the world,

alongside foreign, security and trade policy (and international aspects of other policies, such as environment, agriculture and fisheries). In its international cooperation and development policy, the EU focuses on certain sectors of intervention, depending on the needs of partner countries, and promotes policy coherence for development.

### **Portfolios:**

#### ***4.3.1 Green transition in ACP regions***

This portfolio brings together activities on the management of natural resources and climate change adaptation in ACP (African, Caribbean and Pacific) countries. It contributes to the evidence base and to networks of science partners with information based on which we can collectively 'take urgent action to combat climate change' (SDG 13). By focusing on the achievement of SDG 13, it will also have a significant impact on many other goals, not least SDG 2 on zero hunger, SDG 3 on good health and wellbeing, SDG 6 on clean water and SDG 15 on life on land. Specific activities under this portfolio investigate sectoral interdependence in a cross-border context to allow for better management of natural resources, by integrating water, energy, agricultural and environmental modelling across various JRC directorates actively working in Africa, as well as the broader intra-ACP region. The projects contributing to this portfolio also have a strong technological dimension, and benefit innovation and observational and modelling data integration, which provides decision makers with better information to use in the decision-making process.

#### **The portfolio:**

- (1) ensures effective coordination of the JRC's activities on natural resource management and climate in Africa and the ACP countries;
- (2) strengthens direct JRC-Africa scientific and technical cooperation through regional bodies in Africa, the Caribbean and Pacific focusing on Earth observation science, and natural resource management and climate applications; and
- (3) aims to develop a science-policy interface in the areas of natural resources management and climate change adaptation.

**The projects:** WEFE Nexus perspectives in developing countries; and Support for intra-ACP action on climate services.

**Policy DGs:** INTPA, ENV

**JRC HE intervention area:** Territorial development and support for Member States and regions.

#### ***4.3.2 Food and nutrition security and sustainable food systems***

This portfolio supports a global just transition to food security for all, ending all forms of malnutrition, and the impact analysis of relevant policies. It consists of a mix of products, networks and African partnerships, and contributes to the EU's comprehensive strategy on Africa. It provides key links between the EGD and the international component of the Farm to Fork Strategy, as well as reinforcing aspirations to give Europe a stronger presence in the world. More specifically, it supports the rules-based global order through its work for the Global network against food crises. It also develops nutrition indicators and contributes to the development of an agri-food systems sustainability framework.

#### **The portfolio:**

- (1) supports the rules-based global order on food and nutrition security through its work for the Global Network Against Food Crises and by providing scientific support to the EU's food and nutrition security policy, which is based on a sustainable food systems approach;
- (2) develops nutrition indicators;
- (3) supports the operation and expansion of the Pan-African Network for Economic Analysis of Policies;
- (4) develops the Knowledge Centre for Global Food and Nutrition Security by providing access to documentation and EU-wide food and nutrition security knowledge; and
- (5) provides global early warning information on food production hotspots and country dashboards to serve country-level decisions and support food assistance projects.

**The projects:** Knowledge Centre for Global Food and Nutrition Security; Food security and food systems; Technical and scientific support to food and nutrition security and food systems; and Analysing agriculture for developing countries.

**Policy DGs:** INTPA

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment.

### ***4.3.3 Africa Platform***

The portfolio's goal is to strengthen its unique brand of responsible global leadership, in particular through the promotion and implementation of ambitious environment, climate and energy policies as set out in the European Green Deal and supporting the EU's own ecological transition. It provides the necessary coordination to bring together the various activities involved in a coherent way, in particular the knowledge they generate, to better support the needs of the JRC, the Commission, the EU's African partners and civil society and the scientific community on both continents.

#### **The portfolio:**

- (1) ensures coordination of the JRC's knowledge management activities concerning Africa;
- (2) delivers information and knowledge products from across the JRC;
- (3) strengthens and extends JRC-Africa science-policy partnerships and networks;
- (4) improves direct JRC-Africa scientific and technical cooperation;
- (5) anticipates key issues and challenges of common interest and relevance to the AU-EU partnership; and
- (6) supports the assessment of medium- to long-term consequences of the COVID-19 outbreak in Africa.

**The projects:** European Union global socio-economic data and indicators; and the Africa Knowledge platform.

**Policy DGs:** INTPA, ECHO, EEAS, HOME

**JRC HE intervention area:** Territorial development and support for Member States and regions.



#### ***4.3.4 Strengthening the EU's presence in the Arctic***

This portfolio continues and consolidates the multi-faceted work that has been undertaken on the Arctic to date and positions the JRC as an important Commission instrument for implementing EU Arctic policy. At the same time, it further improves knowledge in the key areas for the Arctic identified by the Council, such as space, as well as assessing the societal impacts of a changing Arctic and examining how these environmental changes feed through to society and the Arctic economy.

##### **The portfolio:**

- (1) continues and expands the JRC's 'science for diplomacy' engagement with the Arctic Council, its subsidiary bodies and other international bodies;
- (2) contributes to revising EU Arctic policy and to the international policy framework;
- (3) contributes to the development of roadmaps to improve the EU's capacity for space observation in the Arctic and international initiatives to build integrated pan-Arctic observation systems; and
- (4) contributes to assessments of the societal impact of a changing Arctic and how these influence socio-ecological resilience.

**The projects:** Environmental, climate and societal impacts of a changing Arctic.

**Policy DGs:** EEAS

**JRC HE intervention area:** Global challenges: food, bioeconomy, natural resources, agriculture and environment.

#### ***4.3.5 Localising Sustainable Development Goals***

The portfolio addresses the policy request to fully integrate the 2030 Agenda and its SDGs in the EU policy framework. It focuses on the territorial dimension (regional and urban) of the 2030 Agenda and its SDGs and supports the agenda's implementation at subnational scale (localisation of the SDGs). It contributes to the Commission's 'a stronger Europe in the world' priority, and in particular to the 'international partnerships' policy area, in line with the new European consensus on development, contributing to the implementation and monitoring of SDGs. The portfolio also contributes to achieving the objectives of the EGD, in particular those on cleaner transport, building efficiency and improvement of global environmental standards.

##### **The portfolio:**

- (1) supports the local implementation of the 2030 agenda and strengthens the leading role of European cities and regions in this field;
- (2) consolidates the JRC's position in the global arena as a key organisation working on localising SDGs; and
- (3) consolidates the role and uptake of smart specialisation as a methodology for the localisation of SDGs and their achievement at local level.

**The projects:** Localising the SDGs through Voluntary Local Reviews; and Smart specialisation for SDGs: pathways for green recovery.

**Policy DGs:** REGIO, INTPA

**JRC HE intervention area:** Territorial development and support for Member States and regions

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** A secure, open and democratic EU society.

#### **Policy area 4.4 - European neighbourhood and enlargement policies**

At the heart of the EU's neighbourhood and enlargement policies is regional stabilisation in political, socio-economic and security-related terms. Through the European neighbourhood policy (ENP), the EU offers partner countries the possibility to build a special relationship based on a mutual commitment to common values. This policy governs the EU's relations with 16 of its closest Eastern and Southern neighbours. It was launched in the early 2000s with the objective of avoiding the emergence of new dividing lines between the enlarged EU and its neighbours and instead strengthening the prosperity, stability and security of all and manage migration closely. It is based on the values of democracy, the rule of law and respect for human rights. One of its key elements is strengthening and promoting the role of civil society actors in reforms and democratic changes taking place in neighbourhood countries. The 2015 ENP Review focused on the stabilisation of the Neighbourhood through state and societal resilience as described in the EU Global Strategy, a differentiated approach to partner countries, and enhanced ownership of the policy by all stakeholders (EU Member States, partner countries, civil society).

#### **Portfolios:**

##### ***4.4.1 A European future for the EU enlargement and neighbourhood region, including more global outreach***

The Western Balkans are one of the Commission's key political priorities and a key element of its global role and ambition. The Western Balkans Agenda on Innovation, Research, Education, Culture, Youth and Sport will contribute to the economic development and regional cooperation in the Western Balkans building on the overall EU support for a rapid restart of the region's economy and the on-going accession process. The Eastern partnership countries have recently increased their efforts to reach EU standards and are an important geopolitical factor in consolidating ties across the EU's Eastern border. The portfolio supports these countries' transition towards stronger ties with the EU and already provides a significant range of supporting tools and analyses. It contributes to the Commission 'a stronger Europe in the world' priority by building capacity and providing targeted guidance on applying EU policies in the EU neighbourhood and enlargement region. It also contributes to the EGD by focusing on sustainability and the green agenda for the Western Balkans.

#### **The portfolio:**

- (1) develops institutional capacity for evidence-informed policymaking in the EU's enlargement and neighbourhood region;
- (2) consolidates the JRC's position as a key science-for-policy enabler for a robust and realistic integration of EU enlargement and neighbourhood region;
- (3) develops targeted expertise and support in the areas of innovation policy, energy, EGD; and

- (4) develops new methods and approaches to support an effective global uptake of smart specialisation.

**The projects:** S3 Enlargement: Smart Specialisation in EU Enlargement Region; Supporting the EGD in the Western Balkans; Smart specialisation in the EU neighbourhood countries; S3 Africa: Smart Specialisation in Africa; and S3 World: Smart Specialisation in Latin America and Worldwide.

**Policy DGs:** NEAR, HOME, INTPA, REGIO

**JRC HE intervention area:** Territorial development and support for Member States and regions

#### **Policy area 4.5 – Security and crisis management**

A globalised world marked by complexity, uncertainty and opportunity requires effective responses to safety and security threats. It also requires an EU that can improve the coherence of its external actions, from EU foreign and security policies and risk management strategies, to international cooperation, development, and humanitarian assistance. With the Global strategy on EU foreign and security policy, the EU committed to focusing on human security, addressing conflict prevention and security issues, as well as sustainable development, disaster resilience and humanitarian crises.

#### **Portfolios:**

##### ***4.5.1 Disaster Risk Management Knowledge Centre***

The Disaster Risk Management Knowledge Centre (DRMKC) provides a key platform for developing a coherent and evidence-based approach to reducing disaster risk. It aims to integrate and consolidate existing scientific multidisciplinary knowledge to develop innovative solutions that address existing needs. Its activities are developed in the context of sustainable development, making the transformation under the EGD and supporting the development of more resilient cities able to adapt to climate change challenges. At a global level, the DRMKC is aligned with the objectives of the Sendai Framework for Disaster Risk Reduction, the Paris Agreement, the Sustainable Development Goals and Habitat III. Furthermore, the DRMKC actively supports the various humanitarian and development actions around the world and addresses conflict risk, including the Global Conflict Risk Index.

#### **The portfolio:**

- (1) establishes the Disaster Risk Management Knowledge Centre as the founding element for the Union civil protection mechanism's knowledge network;
- (2) promotes a common understanding of risk management for natural and man-made hazards, climate change and conflict;
- (3) takes advantage of existing knowledge to ensure a more resilient Europe;
- (4) identifies opportunities for future sustainable development; and
- (5) brings the Commission closer to EU Member States.

**The projects:** Global conflict risk index; the Science4Peace project; DRMKC - communication and outreach; DRMKC - multihazard data and tools; and DRMKC - multihazard risk assessment.

**Policy DGs:** ECHO, RTD, HOME, CLIMA, EEAS

**JRC HE intervention area:** Global Challenges: civil security for society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A resilient EU prepared for emerging threats.

#### **4.5.2 Crisis management**

The portfolio addresses the scientific needs of the Commission's crisis response systems. It provides the Commission with a core scientific and technical capacity for emergency management. Combining rapid development of automated monitoring solutions with scientific expertise on the major disaster types, the portfolio offers a reliable scientific counterpart to the Emergency Response Coordination Centre (ERCC) to ensure optimal situational awareness. It aims to integrate the latest developments of the Copernicus EMS, the DRMKC and EU-wide tools into a suite of systems that the ERCC can use. The portfolio also maintains specific expertise in cyclones, tsunamis and earthquakes.

##### **The portfolio:**

- (1) revamps the European Crisis Management Laboratory;
- (2) develops a global crisis alert and response system for the Commission services; and
- (3) builds integrated systems to support the global disaster alert and coordination system, Copernicus EMS services, the DRMKC and other services.

**The projects:** Post conflict damage assessment for urban recovery frameworks; Scientific and crisis monitoring facility; and the CRITECH project.

**Policy DGs:** ECHO, SANTE, HOME

**JRC HE intervention area:** Global Challenges: civil security for society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A resilient EU prepared for emerging threats.

#### **Policy area 4.6 – Global dimension of nuclear research**

To play an important role in global sustainable development, nuclear applications must excel at reducing the risk deriving from accidental or intentional events involving nuclear or other radioactive material that could pose a threat to society. To increase nuclear safety in its Member States and beyond, the EU has set up a strong nuclear safety regulatory framework rooted in the EURATOM Treaty. Through the European Instrument for International Nuclear Safety Cooperation and its promotion of the Vienna declaration on nuclear safety, this framework helps to improve nuclear safety worldwide. The JRC promotes the EU's internal policy at international technical fora, cooperates in the implementation of these policies and manages a network of European nuclear safety authorities. The EURATOM Treaty (chapter 7) sets up a strict system of safeguards throughout the EU and the JRC provides R&D as well as technical support to the EURATOM safeguards inspectorate in its implementation.

Through the Commission support programme to IAEA, JRC and the EURATOM safeguards inspectorate contribute to ensuring an effective nuclear non-proliferation regime and a global nuclear safeguards system. The EU plays a key role in developing global nuclear security architecture and the JRC helps address the challenge of improving nuclear security. The JRC supports the implementation of the Council Regulation No 428/2009 on export control of dual use items, which is taken as a reference worldwide. It also helps address the threats associated with nuclear or other radioactive materials out of regulatory control which includes measures related to prevention, detection and response.

### **Portfolios:**

#### ***4.6.1 Strengthening global partnership in nuclear expertise***

The portfolio includes all JRC activities that support Euratom and international safeguards. The international component of the JRC's work on safety and security is also in this portfolio, including activities on standardisation and export control. To address the challenges associated with the peaceful use of nuclear energy on a global scale (ensuring nuclear safety, preventing proliferation of nuclear weapons of mass destruction, combating illicit trafficking of radioactive and nuclear materials and assuring adequate international safety levels), the EU runs multiple initiatives, relying on treaty-based verifications and several multilateral approaches.

#### **The portfolio:**

- (1) provides expertise, R&D, tools, technologies and approaches to increase the effectiveness and efficiency of the implementation of the EURATOM Treaty based safeguards obligations in the EU;
- (2) provides the Commission with scientific-technical support and analytical services in the implementation of measures under the EURATOM Treaty;
- (3) provides and develop training courses on nuclear safeguards and nuclear security at the European Nuclear Security Training Centre for professionals from EU Member States and third countries;
- (4) contributes to improved strategic trade control activities to support the EU response to the challenges presented by the proliferation of weapons of mass destruction, protecting the EU's society security and its competitiveness;
- (5) supports the Commission in its project management activities under various instruments (European Instrument for International Nuclear Safety Cooperation, Instrument contributing to Stability and Peace);
- (6) provides technical and scientific expertise to the IAEA under the Commission Support Programme to IAEA on nuclear safeguards;
- (7) contributes to the IAEA's work in the areas of nuclear safety and security through consulting, capacity building measures and training activities; etc.

**The projects:** Promoting nuclear safety; Nuclear material measurements for safeguards; Metrological tools for safeguards; Standards for nuclear signatures; Training and Member States support in nuclear security; Contributing to global nuclear security capacity building; Containment and surveillance of nuclear materials; Non-destructive assay techniques for safeguards, security and waste management; Data analytics for nuclear safeguards and non-proliferation applications; Strategic dual-use trade control for non-proliferation and global issues; Methodologies and knowledge management for nuclear non-proliferation, safeguards

and security; Safeguards training and capacity building; Shared ledger technology for safeguards.

**Policy DGs:** INTPA, ENER, TRADE, HOME, TAXUD

**The specific objective of the Euratom programme:** A. Safe and secure use of nuclear energy and non-power applications of ionizing radiation, D. Support the policy of the Union and Member States on continuous improvement of nuclear safety, safeguards and security.

## **PRIORITY 5 - PROMOTING OUR EUROPEAN WAY OF LIFE**

### **Policy area 5.1 – Migration and asylum**

Migration has been a constant feature of human history with a profound impact on European society, its economy and its culture. With a well-managed system, migration can contribute to growth, innovation and social dynamism. On 23 September 2020, the Commission proposed a New Pact on Migration and Asylum (COM(2020) 609 final) with the aim of building a system that manages and normalises migration for the long term. It provides a comprehensive approach, bringing together policy in the areas of migration, asylum, integration and border management. It creates faster, seamless migration processes and stronger governance of migration and borders policies, supported by modern IT systems and more effective agencies. It aims to reduce unsafe and irregular routes and promote sustainable and safe legal pathways for those in need of protection. It reflects the reality that most migrants come to the EU through legal channels, which should be better matched to EU labour market needs. And it will foster trust in EU policies by closing the existing implementation gap.

The new Pact on Migration and Asylum covers all of the different elements needed for a comprehensive European approach to migration. To better manage migration and mobility, the EU needs to work in partnership with countries outside the EU. This common response needs to include the EU's relationships with third countries, as the internal and external dimensions of migration are inextricably linked.

### **Portfolios:**

#### ***5.1.1. Data and knowledge for migration and demography***

The portfolio responds to the identified need to provide relevant scientific evidence and knowledge to inform policy in areas related to migration, integration and demography. The ultimate aim is to strengthen the Commission's overall response to the opportunities and challenges related to migration and demography.

#### **The portfolio:**

- (1) provides scientific evidence on migration and demography for EU policy;
- (2) develops migration and demography knowledge management, with continuous development, upgrading and maintenance of KCMD data and information tools;
- (3) extends and consolidates knowledge management activities to include demography;
- (4) consolidates the role of the KCMD as a training hub for migration and demography scientists, experts and policymakers in using evidence, also outside the Commission;
- (5) provides reference data and knowledge to other activities, including the external dimension of migration, future of youth, integration of migrants, impacts of

demographic changes at the local and regional levels, attitudes to and perception of migration and discrimination of vulnerable groups; and

- (6) investigates data improvement in the fields of migration and mobility using data innovation and data science to provide timely response to policymakers in areas requiring enhanced situational awareness, including for early-warning and forecasting in the context of the migration preparedness and crisis response or the COVID-19 pandemic.

**The projects:** Evidence for the New Pact on Migration and Asylum; Dynamic Data Hub; Data innovation and demographic tool – Platform; Atlas of Migration; and Mobility data innovation to help fight COVID-19.

**Policy DGs:** HOME, EEAS

**JRC HE intervention area:** Global Challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A secure, open and democratic EU society.

### **Policy area 5.2 – Internal security**

The EU's home affairs policies are based on its core values and principles: freedom, democracy, the rule of law, equality, tolerance and respect of human rights. Terrorism, organised crime (smuggling of migrants and trafficking in human beings), and cybercrime are complex and evolving security challenges that cross European borders. The terror attacks on public spaces that occurred in recent years have confronted Europe with challenges that defy the capacity of individual countries to act alone and require a coordinated and collaborative approach. Strengthening Europe's fight against terrorism and organised crime, including cybercrime, the resources to support them and our defences and resilience are essential to building an effective and genuine security union.

#### **Portfolios:**

##### ***5.2.1 Hybrid threats***

The portfolio addresses the challenges of Europe's and the world's new security reality, which affects people's wellbeing, perception of security and economic prosperity. It also takes into account the geopolitical implications of the COVID-19 crisis and the role of international organisations and multilateralism in this new environment.

#### **The portfolio:**

- (1) supports a holistic approach to hybrid threats, taking stock of the work on resilience, digital transformation and sectoral security-related activities;
- (2) supports the development of national hybrid threats strategies;
- (3) supports the development of future EU policies strongly linked with hybrid threats as well as those with a more sectoral dimension;
- (4) deepens knowledge about specific domains and how they can be impacted by hybrid tools;
- (5) identifies and proposes resilience tools for hybrid activities;

- (6) supports the Commission and the Member States in the activities related to the hybrid risk surveys aimed to identify national vulnerabilities in relation to hybrid threats;
- (7) supports the development of a tool to monitor EU-level response throughout various policy fields contributing to countering hybrid threats; and
- (8) supports the Commission in the identification of additional relevant activities at EU level, in particular aimed to reinforce situational awareness and to step up resilience against hybrid threats.

**The projects:** Managing technological and hybrid risks due to natural hazards; Chemical disasters risk management addressing safety and security needs and hybrid threats; A conceptual framework of hybrid threats; Hybrid threat detection and technology; A European Reference Network for critical infrastructure protection; and Proactive measures to counter terrorism.

**Policy DGs:** HOME, DEFIS, ENV

**JRC HE intervention area:** Global challenges: civil security for society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A resilient EU prepared for emerging threats.

### **5.2.2 Border security solutions**

The portfolio supports actions that make it possible to return to a fully functioning Schengen area of free movement, which is a key driver of the EU's prosperity and security and supports its freedoms. Border management entails many measures, systems and people working together to ensure a smooth border crossing for legitimate people and goods as well as the highest possible rate of detection of illegal attempts to cross the Schengen borders. This portfolio plays an important role here by supporting standardisation, interoperability and improvement of border security systems. It also seeks synergies with the activities aimed at enabling a reliable control of goods, yet their smooth flow and customs to contribute to secure the EU external borders.

#### **The portfolio:**

- (1) provides scientific and technical support to the Commission and Frontex in the field of border security, including standardisation, analysis of funded research achievements, cross border movements;
- (2) contributes to the analysis of the past and ongoing research projects in the field of border security to assess the support provided by European funding to the development of technologies throughout the different funded projects, including also ethical and societal issues;
- (3) provides adequate methodologies and tools for the monitoring and analysis of cross border mobility; and
- (4) contributes to the operationalisation of the common information sharing environment (CISE) for maritime surveillance and its integration with existing national and European systems such as EUROSUR and SafeSeaNet.



**The projects:** CISE roll out; Border security for people and goods; Mobility analytics for borders; and Technologies for border security.

**Policy DGs:** HOME, MARE, TAXUD

**JRC HE intervention area:** Global challenges: civil security for society

### ***5.2.3 Threat detection and security standards***

The portfolio addresses specific challenges related to threat detection and security standards. It will develop the materials needed to support testing and market surveillance. It also addresses the security challenges of specialised and targeted applications of artificial intelligence. It contributes to the EU's work on improving the security of public spaces and helps EU public authorities and private operators procure effective security detection equipment and promote European standardisation.

#### **The portfolio:**

- (1) supports security practitioners working with explosives and chemical detection equipment with harmonised test materials, training and scientific advice, with a focus on aviation security but also including law enforcement, customs and public spaces;
- (2) supports the implementation of Regulation 98/2013 on explosive precursors, by providing science-based advice and experimental studies to the standing committee for precursors; and
- (3) develops and promotes artificial intelligence for the automatic detection of security threats, to showcase the potential and to accelerate the uptake of the technology.

**The projects:** Producing test materials to verify explosives detection equipment; Setting out harmonised requirements for detection equipment for public spaces; and AI for EU security.

**Policy DGs:** HOME, MOVE

**JRC HE intervention area:** Global challenges: civil security for society.

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

**- Impact area(s):** A resilient EU prepared for emerging threats.

### ***5.2.4 Protection of public spaces***

The portfolio addresses the security issues related to the protection of public spaces and buildings in general. As terrorism today targets urban centres, public buildings and civilians, ensuring the structural integrity and functioning of key infrastructure and crowded places in our cities is of fundamental importance for the community and for the wellbeing of the EU citizens. Protection in urban city centres is highly visible and therefore requires appropriate design and appropriate communication with the citizens since the highest impact of terrorism on society is the fear that it provokes.

#### **The portfolio:**

- (1) fosters and promotes guidelines and standardisation activities for the protection of public spaces and buildings;

- (2) develops simulation tools, databases and experimental validation tests for assessing the risks and consequences of terrorist attacks on public spaces and infrastructure, including new technological threats such as the misuse of drones; and
- (3) provides support to the policy needs of EU institutions.

**The projects:** Terrorism risk assessment for public spaces; Terrorism data for policy; Protection of public spaces using innovative solutions; A service-level agreement on fusion energy; and Drones and counter-drone security.

**Policy DGs:** HOME, ENER

**JRC HE intervention area:** Global challenges: civil security for society.

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A resilient EU prepared for emerging threats.

#### ***5.2.5. CBRN threats and risk mitigation***

The portfolio holistically addresses the CBRN (chemical, biological, radiological and nuclear) security threats, gaps and challenges of the legislation. It will act as a liaison to develop cross-cutting initiatives which comprehensively address threats and the internal dissymmetry in Europe as far as the implementation of CBRN risk mitigation is concerned. It supports the synergies with other actions in training and capacity building for CBRN detection in EU MS and partner countries. It also extends the scope of the EU Chemicals framework 2030 to the domain of security.

**The portfolio:**

- (1) supports the steering, development and long-term evolution of CBRN threat risk mitigation and related policies;
- (2) assists in implementing and coordinating all needed CBRN threat risk mitigation actions; and
- (3) consolidates and expands networking and strategic partnerships beyond the Commission, other EU institutions and Member States.

**The projects:** Chemical, biological, radiological and nuclear centres of excellence; and Chemical threats and risk management.

**Policy DGs:** HOME, INTPA, TAXUD, MOVE, FPI

**JRC HE intervention area:** Global challenges: civil security for society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** A resilient EU prepared for emerging threats.

#### ***5.2.6 Digital forensic investigation techniques for law enforcement***

Fighting crime and terrorism is essential for the EU's security. This portfolio addresses all key elements (i.e. identification, localisation and crime characterisation) required to strengthen the efficiency of criminal investigations and prosecutions in the digital era, as well to improve crime prevention and protect the victims. It continues work on developing new digital forensic techniques and in this way directly contributes to Commission priorities.

**The portfolio:**

- (1) supports the processing of large amounts of multimedia data to identify and localise perpetrators and victims of child sexual abuse online and perpetrators of terrorism actions using multimedia devices;
- (2) fosters the accuracy of EU biometrics in large-scale IT systems;
- (3) addresses the growing challenges related to digital evidence being gathered from smart environments such as vehicles and homes with innovative approaches allowing their agile forensic extraction and processing;
- (4) tackles the challenge of encryption in criminal investigations by developing a context-based decryption prototype application.

**The projects:** Forensic research on cyber-, automotive- and smart-home technologies; Biometric research applied to security in the Schengen area; Identification of perpetrators and victims of child sexual abuse online; and Disrupting organised crime with innovative digital technologies.

**Policy DGs:** HOME

**JRC HE intervention area:** Global challenges: civil security for society.

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** A resilient EU prepared for emerging threats.

**Policy area 5.3 – Skills, education and youth**

Because of the changing nature of the EU economy, the demand for relevant knowledge and skills changes over time. To deal with these changes, people need to be equipped with a set of key competences such as literacy, numeracy and digital competences. Additionally, critical thinking, creativity and the ability to work as part of a team are equally important to build sustainable careers and become active citizens. Education and training play a crucial role in enabling young people, in particular, to develop these competences and, thereby, provide the conditions for the best possible start in life. In order to better identify and manage the acquisition of required knowledge, skills, and attitudes, and prevent the emergence of skills gaps and mismatches, effective communication of the needs of the EU economy to the education and training sector is essential. The Commission supports this area with various legislative and non-legislative initiatives.

**Portfolios:**

***5.3.1 Lifelong learning***

This portfolio covers work related to new skills and competences, and contributes to the Commission's priorities on: 'a European way of life', 'a Europe fit for the digital age' and 'an

economy that works for people'. It includes work on making the European Education Area a reality by 2025, as well as the Digital Education Action Plan.

**The portfolio:**

- (1) supports the further implementation of the DigComp, EntreComp, LifeComp and GreenComp competence frameworks, as well as supports the development of a Competence Framework for Scientists; and
- (2) explores the relevance of other transversal skills and competences labelled as non-cognitive skills (e.g. creativity).

**The projects:** Implementation of the LifeComp competence framework; Key competences validation (CompVal); Key competences for lifelong learning – INST; Development of a European framework for education for environmental sustainability.

**Policy DGs:** EAC, EMPL

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** Inclusive growth and new job opportunities.

**Policy area 5.4 – Health**

The promotion of health and prevention of disease safeguards not only the personal wellbeing and quality of life of people in the EU but also the sustainability of our healthcare systems and the competitiveness of our economy. The health sector offers great potential to promote growth, create new jobs, ensure fairness and trigger productivity gains. The unprecedented challenge of the COVID-19 pandemic has shown that the EU is willing and able to coordinate a common response to the outbreak. The Commission is preparing various legislative and non-legislative initiatives in the field of health for which the JRC is providing the necessary scientific support.

**Portfolios:**

***5.4.1 Combatting cancer and other diseases***

The COVID-19 pandemic has painfully exposed the need to address health holistically, with worst-case prognoses and outcomes affecting people who are obese and/or suffering from hypertension, cancer or diabetes. The worlds of non-communicable and communicable diseases are intrinsically linked and this portfolio embraces this holistic approach; bringing together projects that tackle different diseases and take diverse approaches to improve prevention, diagnosis and care. This will lead to an evidence-based strategy to inform the progress of biomedical research and drug development that considers innovative human-relevant models and non-animal methods. The new Knowledge Centre for Cancer will take a united EU approach to tackling cancer. While a major focus of this portfolio is cancer, its scope is not limited to this infirmity. The portfolio also tries to gather, manage and disseminate COVID-19 knowledge to deliver a curated overview of relevant scientific findings in the area. The portfolio responds to the needs of the Europe's beating cancer plan and Horizon Europe's mission on cancer.

**The portfolio:**

- (1) fosters one Commission coordinated approach to tackling cancer, provides up-to-date integrated JRC and Commission systems and databases that address cancer prevention, cancer health care quality (namely for breast and colorectal cancer) as well as cancer burden indicators and facilitates their use to cancer-related and health promotion policymaking;
- (2) provides evidence-based analyses on health technologies to support safer and better medical devices and in vitro diagnostic devices with safe by design concepts and AI-based tools including enhanced socio-economic assessments for equal access to modern healthcare, supports smart tools for better HTA and contributes to urgent healthcare-related priorities on coronavirus or other future pandemics by contributing to European Coordination Centre on Epidemiological Testing; and
- (3) analyses of scientific, economic and societal impact of selected areas of EU-funded research including the development of indicators as a basis for further progress, review and promotion of the use of human-relevant approaches based on non-animal methods for basic and applied biomedical research stimulating cross-disciplinarily and introduction of non-animal science into education and training programmes.

**The projects:** the Knowledge Centre on Cancer; Emerging and converging health technologies; The impact of health-related research; Nanomedicine for combatting microbial infections; Modelling the pathogenesis of COVID-19 using the adverse outcome pathway framework; Coronavirus decontamination; Future response strategies against coronaviruses; and Sensitive peptides for anomalous epidemic levels.

**Policy DGs:** SANTE, ENV, RTD

**JRC HE intervention area:** Global challenges: health

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

**- Impact area(s):** Good health and high-quality accessible healthcare.

#### **5.4.2 European strategy on health-related data**

This portfolio supports the 2018 Communication on digital transformation of health and care in the digital single market and the creation of the European health data space. It runs the European platform on rare disease registration (EU RD platform), a central point of access to information on rare disease registries in Europe. It also coordinates the functioning of the central registries of the EUROCAT (the European network of population-based registries for the epidemiological surveillance of congenital anomalies) and SCPE (the surveillance of cerebral palsy in Europe) surveillance networks. For rare disease activity, the JRC processes individual case data from registries in accordance with Regulation (EU) 2018/1725. The portfolio also addresses issues related to emerging health threats such as respiratory and vector-borne infectious diseases, including prevention, preparedness and control.

**The portfolio:**

- (1) develops the EU RD platform to be the central access point for information about rare disease registries in Europe by the end of 2022;
- (2) supports the 24 European reference networks for rare and complex diseases in developing harmonised, interoperable registries;

- (3) monitors congenital anomalies and cerebral palsy through the European surveillance networks and their population-based registries;
- (4) supports the Commission with scientific and technical aspects related to the 1M+ genomes initiative and ensures that societal values, citizens and patients interests are protected in Omics and AI practices, and defines harmonised and standardised criteria for accessing and adding information to any health and care digital data, especially in case of Omics and phenotypic information;
- (5) covers aspects of respiratory and vector-borne infectious diseases among the health threats with the goal to provide assessments of current approaches and concepts for the development of new tools for prevention, preparedness and response and to identify gaps and at the proposal of solutions informing policymaking in the area of health threats risk management.

**The projects:** The EU rare disease platform; Digital transformation of health and care; OMICs and regulations; Health threats: prevention, preparedness and response; and Knowledge Management and Foresight Coordination.

**Policy DGs:** SANTE, CNECT

**JRC HE intervention area:** Global challenges: health

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** Good health and high-quality accessible healthcare.

### **Policy area 5.5 – Nuclear R&I for protecting citizens**

The JRC provides independent, customer-driven scientific and technological support for formulating, developing, implementing, and monitoring EU policies on nuclear safety and nuclear safeguards. Accurate nuclear reference data are required for the safe use of ionising radiation, either for energy production or for any other application; JRC provides such data to the OECD-NEA and IAEA contributing to the most important nuclear data libraries. The JRC is also responsible for providing technical and scientific support for implementing articles 35 and 36 of the Euratom Treaty, related to the Member States obligation to monitor natural and man-made radioactivity in a harmonised way, throughout Europe and beyond. The policy area has close links to other policy areas in the nuclear field whose goal is to improve the nuclear safety, nuclear safeguards and nuclear security in the EU and globally.

#### **Portfolios:**

##### ***5.5.1 Nuclear R&I for protecting citizens***

The portfolio contributes to the development and implementation of techniques, measurement methods, nuclear standards and regulations to protect health, and the environment, and to improve the safety and security on the use of nuclear and radioactive materials. It supports the implementation of the Basic Safety Standards Directive. It studies roots to produce radionuclides for medical applications aiming to ensure a secure supply and supports the reduction of nuclear waste. It includes standards to harmonise and optimise the use of radiopharmaceuticals. It supports the Member States by facilitating the harmonisation of environmental radioactivity monitoring and disseminating the monitored data. It also helps Member States organisations and authorities to implement state-of-the art methods and

techniques for nuclear forensic examinations and free-release measurements. In cooperation with the new Knowledge Centre for Cancer, this portfolio will contribute to the implementation of the strategic agenda for medical ionising radiation applications.

**The portfolio:**

- (1) develops new techniques to produce radionuclides for diagnostics and treatment in medicine and improve targeted alpha therapy through the development of radiopharmaceuticals and optimised clinical practices;
- (2) contributes to protecting citizens from effects of natural and man-made ionising radiation, providing scientific and technological support to the EU emergency information exchange systems and to Commission's response to the radiological emergencies;
- (3) develops models to estimate dispersion of radionuclides in the environment;
- (4) continually develops and improve nuclear forensic techniques and materials databases for help combatting illicit trafficking of nuclear materials and addressing areas of concern related to accidentally released nuclear materials;
- (5) improves documentary standards by validating methods, promoting the use of reference materials and by providing technical comments during the standards development;
- (6) supports and assists Member States in the implementation of the Basic Safety Standards Directive;
- (7) support Member States and third countries through the implementation of various training activities; and
- (8) supports relevant studies, surveys and other activities on the security of supply and access to medical radioisotopes in Europe.

**The projects:** Radioactivity environmental monitoring and nuclear emergency preparedness and response; Nuclear standards for Europe; Radionuclides for medicine; Targeted alpha therapy; Nuclear forensic investigations; and Irradiation of nanoparticles to produce radionuclides.

**Policy DGs:** SANTE, GROW, HOME, ENER, RTD

**Specific objective of the Euratom programme:** A. Safe and secure use of nuclear energy and non-power applications of ionizing radiation, B. Maintain and further develop expertise and competence in the Union.

## **PRIORITY 6 - A NEW PUSH FOR EUROPEAN DEMOCRACY**

### **Policy area 6.1 – Protecting and supporting EU democracy**

The EU is built on a strong commitment to promoting and protecting human rights, democracy and the rule of law worldwide. In her Agenda for Europe, Commission President von der Leyen said that Europe should strive for more in terms of nurturing, protecting and strengthening our democracy. In order to protect our democracy from external interference, a joint approach is necessary to tackle issues such as disinformation and online hate messages. The Commission is preparing various legislative and non-legislative initiatives that will tackle the issues linked to protecting and supporting EU democracy, including the fight against disinformation and external interference in free elections, stability of systems and EU democracy. In March 2020, the EU's High Representative for foreign affairs and security

policy submitted to the European Parliament and the Council a joint communication on an EU action plan on human rights and democracy for 2020-2024 (JOIN(2020) 5 final).

### **Portfolios:**

#### ***6.1.1 Demography and democracy***

The portfolio incorporates expertise and analytical capabilities, including demographic modelling at macro and micro levels and multidimensional projections, to support Europe through the demographic transition. It addresses the challenges and opportunities of this transition with detailed quantitative analyses of demographic changes in different sections of the population, and areas and regions that are disproportionately affected, with the goal of moving towards a more inclusive society.

#### **The portfolio:**

- (1) improves understanding of the processes of Europe's ageing population, and the long-term impacts on key sectors of the economy;
- (2) develops a better understanding of how demographic composition shapes economic and social structures;
- (3) analyses demographic changes and migration in rural areas with a long-term vision;
- (4) develops demographic modelling, including micro- and macro- modelling, multidimensional projections and spatial demography; and
- (5) improves understanding of the impact of demographic change on Euroscepticism and voting in EU regions etc.

**The projects:** Modelling for demography and migration; Demography migration and inclusion; Attitudes, discrimination and vulnerable groups; and Education, skills and the labour market.

**Policy DGs:** HOME, REGIO

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society.

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

**- Impact area(s):** A secure, open and democratic EU society.

#### ***6.1.2 Evidence, policy and democracy***

The portfolio provides interdisciplinary scientific evidence to feed into the political decision-making process. There is a need to better understand and explain the drivers that influence policy decisions and political discourse and to optimise the way that evidence is used in policymaking. In a healthy democracy, changes in this area cannot be carried out by the technocratic elite, as this could potentially alienate citizens further from their governing institutions.

#### **The portfolio:**

- (1) establishes the extent to which values and identities influence the political decision-making process;
- (2) determines the extent to which online technologies influence political behaviour;



- (3) establishes meaningful and ethical communication strategies based upon state-of-the-art science and
- (4) supports the build-up of an evidence-informed policymaking capacity within the Commission, the European External Action Service and in the Member States, creating an evidence-informed policymaking community.

**The projects:** Technology and democracy; Science of values and identities; Evidence and policy external capacity building; and Fighting disinformation in defence of the EU democracy.

**Policy DGs:** COMM, REFORM, SG, CNECT, JUST, EEAS

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** A resilient EU prepared for emerging threats and a secure, open and democratic EU society.

### Policy area 6.2 – Citizen and stakeholder engagement

In her Agenda for Europe, Commission President von der Leyen said that the Commission will strive to give Europeans a greater say in setting EU priorities and deciding their level of ambition. She also expressed her intention to give people the possibility to have their say at a Conference on the Future of Europe, which should bring together private individuals, civil society and European institutions as equal partners. The importance of citizen engagement has been recognised and strengthened in the Lisbon Treaty with the inclusion of the European citizens' initiative and in a number of other documents and political declarations, such as the Commission's contribution to the Sibiu Declaration (COM(2019)218 final). At the same time, although consulting stakeholders is an established practice in the Commission, new approaches are needed, including comprehensive and innovative ways to communicate with the public, especially young people.

#### Portfolios:

##### **6.2.1 Citizen engagement**

This portfolio covers all of the JRC's citizen engagement activities, in support of the Commission.

#### **The portfolio:**

- (1) mainstreams citizen engagement, co-creation and deliberative practices across the policy cycle's various phases;
- (2) provides the necessary citizen engagement and deliberative democracy rationales, guidance (including evaluation framings), knowhow repository, and supports capacity building and infrastructure of the Commission;
- (3) supports the European democracy action plan and active participation beyond elections with steering a working group about strategies to implement this action;
- (4) pilots and where required implements citizen engagement activities at different scales by means of a variety of methodologies and media;

- (5) maintains a close connection to, and where appropriate with, relevant citizen engagement practices and practitioners through the community of practice on citizen engagement and deliberative democracy;
- (6) develops automatic analytical capabilities to analyse inputs from citizens through on-line engagement means etc.

**The projects:** Theory and Practice of Citizen Engagement and Deliberative Democracy; and Support for the Conference on the future of Europe.

**Policy DGs:** COMM, SG, RTD, EEAS

**JRC HE intervention area:** Global challenges: culture, creativity and inclusive society

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

- **Impact area(s):** A secure, open and democratic EU society.

### ***6.2.2 Integrated developments for science communication***

This portfolio aims to shape scientific and integrated science communication approaches for various audiences, from stakeholders to citizens to positively influence trust in science and provide evidence for policymaking. Special emphasis is placed on young generations, through a dedicated schools programme, while additional support is also provided to the Education for Climate Coalition.

#### **The portfolio:**

- (1) co-develops a revamped communication strategy exploring methodological aspects;
- (2) develops co-creative channels, innovative developments of contents and design or formats, and collaborations to match the policy agenda and give the JRC targeted visibility;
- (3) develops new forms of visual communication and data visualisation based on both cognitive science and graphics design, to maximise the appeal and impact of JRC products;
- (4) develops tailored content to respond to young people's educational needs, as identified by the Commission;
- (5) develops new formats and platforms for digital, hybrid and in-person events, and curates and coordinates the 'network 4 events' community of practitioners;
- (6) develops a digital communications strategy and social media campaigns for two-way science communication on priority areas, aiming to gather citizens' views on the JRC's knowledge products that are aligned with the Commission's political priorities; and
- (7) deploys advanced interactive digital communication technologies, such as virtual reality, to leverage storytelling.

**The projects:** JRC youth programmes; Innovations in communication and storytelling; Visual communication; Events and exhibitions; Digital communications strategy and social media campaigns; and Mixed reality for innovation in next gen interactive technology, training and science communication.

**Policy DGs:** COMM, EAC, CNECT

**JRC HE intervention area:** Strengthening the knowledge base for policy making

**HE key strategic orientation:** KSO D - Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions

- **Impact area(s):** A secure, open and democratic EU society; Inclusive growth and new job opportunities.

## **PRIORITY 7 – A HIGH PERFORMING MODERN COMMISSION**

### **Area 7.1 – Knowledge and data management**

The effective management and uptake of data, information and knowledge is a critical challenge for the Commission: not only does the Commission's ability to design and implement result-oriented policies rely on the quality of this process, but so do its authority and credibility within the EU and as a global player. Although a corporate strategy on data, information and knowledge management was set out in the 2016 Communication on data, information and knowledge management at the European Commission (C(2016) 6626 final) and is now being implemented throughout the Commission, existing knowledge largely remains scattered across different DGs and services. The generation of new knowledge requires better coordination on policy needs, but also upgraded methods and skills for informing policy, in light of the increasing complexity of both science and policymaking, and of the post-fact climate.

#### **Portfolios:**

##### ***7.1.1 Knowledge management and cooperation***

Through the projects under this portfolio, the JRC contributes to implementing the Communication on data, information and knowledge management and to the relevant work programme priorities of the Information Management Steering Board. Furthermore, this portfolio offers knowledge management and science-to-policy methodologies and services for the whole JRC, to support all Commission priorities.

#### **The portfolio:**

- (1) operates the Commission one-stop-shop for cooperation;
- (2) develops and operates processes and platforms for cross-Commission use of country knowledge;
- (3) develops and operates the JRC's corporate web platforms for digital knowledge dissemination and external communities;
- (4) develops and operates the Connected internal knowledge sharing platform and provides guidance for communities of practice; and
- (5) supports the strategic development of JRC knowledge management for better EU policies.

**The projects:** A one-stop-shop for collaboration; Enhancing country knowledge; Knowledge management for policy professionalization; Web-based knowledge platforms; Knowledge communities and collaboration solutions; and Knowledge management development.

**Policy DGs:** JUST, BUDG, ECHO, INTPA, FPI, RTD, ENV, CNECT, DGT, EAC, ECFIN, ENER, OLAF, REA, SCIC, SG, REFORM, HOME

**JRC HE intervention area:** Strengthening the knowledge base for policy making.

### ***7.1.2 Open science and FAIR data management***

The Commission's Corporate Data Strategy calls on Commission services to digitally transform their business processes by developing new innovative digital solutions or evolving existing ones in line with the strategy's principles and taking a corporate approach to information management, allowing the sharing and reuse of data. Alongside, the Horizon Europe Regulation and rules it sets clear requirements and incentives regarding Open Science. The JRC will contribute to the implementation and further development of the Commission Open Science policy and practices in the framework of Horizon Europe and the European Research Area, including early availability of research results; open and transparent knowledge bases of methods (e.g. reference, metrology) and results; robust evidence in strategic areas; FAIR data; reproducibility of research results and trustworthiness and integrity of EU research in general.

#### **The portfolio:**

- (1) ensures a coordinated approach to the JRC contribution to the implementation of the Commission Digital Strategy;
- (2) assists in the full implementation of the Commission open science policy in support of the European Research Area;
- (3) assists in the full implementation of open science provisions of Horizon Europe and
- (4) implements new policies regarding open science in alignment to the relevant policies of Horizon Europe.

**The projects:** Big Data Analytics Platform; Data for policy; Open science and knowledge repositories; and Impact assessment of pandemics through big data analytics research.

**Policy DGs:** DEFIS, SANTE, CNECT, DIGIT

**JRC HE intervention area:** Strengthening the knowledge base for policy making.

### **Area 7.2 – Competences for better policymaking and regulation**

Better regulation is linked to designing EU policies and laws that achieve their objectives at minimum cost. It ensures that policy is prepared, implemented and reviewed in an open, transparent way, that it is informed by the best available evidence and backed up by input from stakeholders.

#### **Portfolios:**

### ***7.2.1 Competences for better policymaking and regulation***

This portfolio brings together all the services provided by the JRC Competence Centres, the EU Policy Lab and the Central Intellectual Property Service, which develop, provide and apply analytical tools, methods and integrated solutions to better support all Commission services. They also help benchmark and validate analysis and knowledge across the Commission to improve the quality, coherence and robustness of EU policies. By integrating these competences, the JRC is in a unique position to offer transversal products and services that bring true innovation to policymaking.

**The portfolio:**

- (1) provides strategic and future-oriented input into policymaking, contributing to the development of a stronger anticipatory culture in the Commission; and
- (2) supports better regulation policy.

**The projects:** Design for policy; Competence Centre on Foresight; Competence Centre on Composite Indicators and Scoreboards; Competence Centre on Microeconomic Evaluation; Competence Centre on Modelling; Competence Centre on Behavioural Insights; Competence Centre on Text Mining and Analysis; Competence Centre in Data Analysis and Robust Statistics; Competence Centre on Technology Transfer; Central Intellectual Property Service; Countering the negative effects of misinformation during global crises through targeted behavioural interventions.

**Policy DGs:** SANTE, GROW, BUDG, EMPL, JUST, NEAR, RTD, TAXUD, HOME

**JRC HE intervention area:** Strengthening the knowledge base for policy making.

**Area 7.3 – Capacity building**

The JRC pursues excellence in research and extensive cooperation with top level researchers worldwide. It will carry out research in the emerging fields of science and technology. Research teams of JRC and external scientists will study new, multidisciplinary scientific fields related to policy.

**Portfolios:*****7.3.1 Exploring, building capacity innovate***

To deliver the best policy advice to the Commission and Member States, the JRC needs a certain degree of out-of-the box thinking, exploratory research, and development and testing of proofs of concepts. The projects under this portfolio are driven by scientific curiosity and the motivation to bridge gaps from an initial idea to implementation. They can be characterised as incubator projects and cut across different thematic areas and disciplines.

**The portfolio:**

- (1) connects the JRC to the cutting edge of the research community, and directly contributes to its scientific vitality and excellence;
- (2) facilitates the building of multidisciplinary communities of PhD students, young and expert researchers and engineers from different units; and
- (3) fosters technological development and innovation within the JRC, in cooperation with industry, by transferring and testing proofs of concepts;
- (4) widens the epistemological (and, by consequence cultural) horizon of researchers by introducing art and artists in their day-to-day practice; and
- (5) contributes to the building of expert networks in thematic areas novel to JRC, builds links to strategic industries and academia, stimulates exchange, mobility, and brings new concepts to Member States and the enlargement countries.

**The projects:** Exploratory research project and activity tier; Science and art for policy and society; CAS - Towards a technological platform for nanoplastics; CAS- Computational social science for policy; CAS - Social classes in the digital age; Place holder: CAS 9 resources to thematic research related to pandemics or other possible unexpected events with a potential for long-term global impact; Place holder: CAS 10 resources to thematic research

related to pandemics or other possible unexpected events with a potential for long-term global impact; CAS-Paradigm shift in communication; Collaborative Doctoral Partnerships; and CAS – BigNomics.

**Policy DGs:** HOME, SANTE, ENV, ECFIN

**JRC HE intervention area:** Scientific excellence