Sector: Materials, Construction & Industry

Areas of Intervention & Indicative Priorities 2021-2027

Areas of Intervention	Priorities
1. Processes, Equipment & Systems for the Transition to a Climate-neutral Industrial Production	1.1 Designing, modelling and/or developing industrial production or manufacturing processes with the aim of improving the carbon footprint, and/or using renewable energy sources and/or climate-neutral fuels, and/or reducing waste
	1.2 Innovative methods and systems for sustainable exploitation and/or management of natural resources for industrial uses
	1.3 Innovative raw material extraction and enrichment technologies with an emphasis in improving the overall environmental footprint
	1.4 Capture, storage and utilization of CO2 from industrial waste gases, including conversion into usable products
	1.5 Advanced and/or innovative composite materials for high-performance, low environmental impact industrial uses
	1.6 Pilot applications in real-scale industrial production or manufacturing plants to achieve synergies between the above priorities
1. Processes, Equipment & Systems for the transition to a digitalized industrial production	2.1 Developing innovative digital methods to improve industrial production or manufacturing processes, with an emphasis on improving energy efficiency, productivity and/or product quality
	2.2 Enhancing connectivity between production units and systems by upgrading industrial equipment and/or interconnecting resources (machinery, digital systems, human capital) using innovative digital technologies and methods
	2.3 Optimization of industrial equipment maintenance processes by applying advanced digital technologies and systems
	2.4 Development of “smart”, autonomous industrial production systems by applying advanced digital technologies and systems
	2.5 Incorporation of additive manufacturing or 3D printing technologies to increase production capacity, avoid failures, reduce waste during production and improve finished product quality attributes
	2.6 Pilot applications in real-scale industrial production or manufacturing plants to achieve synergies between the above priorities

3. Reconfigurable Manufacturing Systems & Added-Value Chains	3.1 Digital twin applications in industrial production and/or manufacturing processes
	3.2 Flexible and collaborative industrial production and/or manufacturing systems
	3.3 Novel high-productivity and reliability technologies for construction and/or manufacturing applications
4. Materials, Processes, Devices and Production Systems for Circular Economy & Industrial Symbiosis	4.1 Holistic product design aimed at minimizing negative effects on the environment across the full lifecycle of the product, environmental footprint tracking/monitoring/measuring systems and processes
	4.2 Development of safe and sustainable- by-design materials, products and processes, and risk assessment
	4.3 Development of integrated management technologies for mass-consumption products and materials based on the 5R (Reduce-Reprocess-Reuse-Recycle-Recover) principles. Novel methods for materials collection, separation and lifecycle monitoring
	4.4 Utilization of secondary materials, discarded materials and waste of industrial, mining, agricultural or urban origin, as alternative material or fuel sources
	4.5 Eco-innovative approaches to metal and critical raw materials recovery and reuse processes. Sustainable end-of-life dismantling and recycling technologies for metal and other structures
	4.6 Composite or multilayer organic material technologies and recycling
	4.7 Systems, techniques, materials and devices for improved water management, collection, recycling and reuse
	4.8 Materials and sensors for chemical and other processes destined for circular economy and industrial symbiosis applications
	4.9 Developing pilot real-scale industrial symbiosis solutions using, among others, flows of energy, materials, waste and water
	4.10 Clustering/Strengthening value chain clusters of materials, technologies and applications
5. Materials, Devices and Technologies for Health Applications	5.1 Microfluidic devices and labs-on-a-chip used in diagnostic, organ-on-a-chip, treatment, therapeutic diagnosis applications, etc.
	5.2 Biomaterials used in diagnosis and treatment
	5.3. Scaffolds and other tissue engineering and regeneration techniques, bioreactors, materials and methods for bioprinting and fabrication of the above
	5.4 Biosensors for detection, diagnosis and/or treatment
	5.5 Implantable materials, micro-/nanodevices and systems for measurement, diagnosis and treatment
	5.6 Biomimetic, bioactive biomaterials, patches, etc. and production processes for the above

	5.7 Novel environmentally-friendly sterilization and/or inactivation and/or log reduction technologies and materials for surfaces, objects, water, air, food, etc.
	5.8 Novel biomedical imaging and radio-labelling materials, devices and technologies
	5.9 Materials, devices, sensors, microsystems, technologies to be used for safety and hygiene purposes in work environments, hospitals, etc.
	5.10 Safety of novel bio-nano-materials, devices and technologies, techniques for their characterization and certification, legal arrangements for their approval, assessment of social ramifications from their use
6. Materials, processes and devices for energy generation, transmission and storage	6.1 Materials and devices for solar energy conversion and utilization
	6.2 Energy harvesting materials for energy autonomous interconnected devices/systems
	6.3 Intelligent energy conversion systems
	6.4 Materials for hydrogen production, transport, storage, including compression, and utilization
	6.5 Recycled and low environmental footprint materials and devices/systems for energy storage
	6.6 Materials for power-efficient devices
	6.7 Materials and devices designed to reduce energy requirements of constructions
7. Materials and Processes for Sustainability in Industrial and Other Buildings, Infrastructures and Cultural Heritage	7.1 Building materials, methods and/or systems for buildings and infrastructures with improved energy performance
	7.2 Building materials, methods and/or systems for buildings and infrastructures with improved operational performance and/or lifespan
	7.3 Building materials, methods and/or systems for buildings and infrastructures with improved environmental performance across the full lifespan
	7.4 Innovative building and infrastructure construction techniques, materials, processes and/or systems for their evaluation, highlighting efficiency, performance and sustainability
	7.5 Protection, repair and/or restoration of buildings, including analysis and diagnosis of architectural and cultural heritage monuments
	7.6 Advanced materials, methods and/or systems for specific-requirement constructions, including transport, energy, civil protection infrastructures
	7.7 Incorporating advanced digital methods and systems for the construction and/or the assessment of buildings and infrastructures currently in use

	7.8 Pilot applications in real-scale buildings and/or infrastructures to achieve synergies for incorporating materials, methods and/or systems referred to in the above priorities
8. Surface Treatment Materials, Coatings, Technologies	8.1 “Smart” coatings and/or micro-/nanostructured surfaces with one or more functional properties to control wetting and/or biodeposition and/or friction and/or optical properties, etc.
	8.2 “Smart”, functional coatings and/or micro-/nanostructured surfaces with response to changes in external factors
	8.3 Design and development of safe, eco-friendly and sustainable coatings and surfaces
	8.4 Surface chemical modification and/or surface micro-/nanostructuring technologies and applications
	8.5 Single- or multilayer wet and dry deposition processes, and/or selective deposition processes and applications
	8.6 Surface and coatings characterization and metrology
9. Raw Materials, Industrial Materials, Packaging, Mass Consumption products – Production Processes	9.1 Improvement and development of novel production, treating and forming processes for metal, non-metal and/or other products
	9.2 Novel alloy design, development and production processes to be used in transports, constructions, the energy sector, packaging or for specialized applications
	9.3 Development of materials and processes for highly demanding environments
	9.4 Development of materials, systems and processes for functional packaging
	9.5 Design, development and production processes for polymers, biopolymers, bioplastics, biodegradable, specialty polymers for industrial and consumer products, as well as for specialized applications
	9.6 Design, development and production processes for composite, nanocomposite materials and systems with improved properties
	9.7 Design, development and production processes for biomimetic materials and surfaces with advanced properties
	9.8 Development of materials and processes for fibrous, woven or non-woven products with improved properties and reduced environmental footprint to be applied in the construction, shipping, smart clothing, agriculture, security sectors, etc.
	9.9 Exploitation and sustainable management of domestic natural resources for applications in construction and industry as well as for other specialized applications and high added-value products – Innovative technologies for mapping, exploration and

	mining of mineral resources aimed at achieving sustainable exploitation
	9.10 Technologies for measurement and modelling of materials properties outside the laboratory environment. Computational simulation models, informatics tools for optimal and safe design of materials and processes
10. Materials and Devices for Transport, Space, Security & Telecommunications applications	10.1 Development of advanced materials and technologies for energy efficiency in land, air and sea transport
	10.2 Smart materials and materials for space applications
	10.3 Advanced materials for electromagnetic radiation protection and shielding
	10.4 Development of materials with high specific resistance in mechanical, electrical and thermal stresses
	10.5 Materials for unmanned airborne vehicles
	10.6 Materials, electronic devices and technologies for ground and satellite 5G-6G telecommunications and other communication networks
	10.7 Reliability of materials and devices
	10.8 Advanced sensors and technologies for transport applications and their monitoring
Nanotechnology, nanoelectronics, photonics	11.1 Materials and technologies for photonic and optoelectronic devices, photonic integrated circuits, and applications
	11.2 Materials and technologies for logic and memory devices (LMD), neuromorphic technologies
	11.3 Materials and technologies for power electronics, and applications
	11.4 Flexible printed electronic devices and wearable electronics, and applications
	11.5 Materials and devices for quantum technologies, magnetic and spintronic materials, phononic, photonic and meta-materials
	11.6 Monolayers, thin films, metasurfaces, nanostructured surfaces for photonics, electronics and sensor applications
	11.7 Materials and technologies for physical, chemical and biological sensors and micro-/nanosystems, and their applications, including environmental and IoT applications
	11.8 Materials and microfluidic devices or labs-on-a-chip to be used in environment, food safety, agriculture and energy applications, for circuit cooling in electronics applications, etc.
	11.9 Design of novel materials, devices, circuits. Material and device characterization or nanometrology techniques

	11.10 Nanomaterials for energy storage, and novel batteries or their components