

Area of Specialisation	Macro Themes	Development Theme	
AEROSPACE (AERONAUTICS)	AS1 Aeronautical platforms of the future	AS1.1 Development of innovative architecture and cutting-edge technologies for fixed wing aircraft, training systems and rotary wing aircraft linked to the increase in efficiency and a reduction in environmental impact	
		AS1.2 Development of innovative architecture and cutting-edge technologies for remote controlled machines with relative subsystems (control systems, navigation and communication; systems for measurement and observation) to increase the autonomy, range of action, application areas of these aircraft	
	AS2 Innovative systems and apparatus	AS2.1 Development of new generations of electro-avionic systems with special attention to innovative systems with capacity for self-diagnosis and dynamic reconfiguration and of systems to increase safety during mission stages (take-off and landing included)	
		AS2.2 Development of new mechanical and electro-mechanical apparatus to improve performance and compatibility with the operational environment	
	AEROSPACE (SPACE)	AS3 Applications and technologies from space for society	AS3.1 Development of innovative downstream applications through integration of aerospace technologies, with special attention to real-time monitoring of safety of the territory, infrastructures, prevention and reduction of natural and man-made risks, to risk and emergency management
			AS3.2 Transfer and application in other environments of innovative technologies, solutions and materials developed in the field of space
AS4 Development and innovation of technologies for space		AS4.1 Development of innovative materials and/or new electrical, electronic, optical, electro-mechanical, digital components and of advanced on-board and land subsystems	
		AS4.2 Development of innovative orbital robot systems and/or for exploration of the solar system	
		AS4.3 Development of innovative technologies for electric propulsion of satellites in terrestrial and/or interplanetary orbit to increase the launch capacity and operational life of satellites	
AS5 Safety in space and from space		AS5.1 Development of innovative technologies for monitoring, mapping and characterisation of debris and NEOs	
		AS5.2 Development of innovative systems to reduce the impact between debris and infrastructures in orbit	
		AS5.3 Development of innovative systems for the observation of weather in space	
AS6 New platforms between earth and space		AS6.1 Development of innovative systems for guiding, navigating and controlling stratospheric balloons and/or platforms	
		AS6.2 Development of innovative materials and/or structures for stratospheric balloons and/or platforms	
		AS6.3 Development of technologies and/or innovative components for sensor systems on board stratospheric platforms with special focus on territorial monitoring and support for emergency management	
		AS6.4 Development of innovative technologies and/or systems for secure data communication and transmission	
		AS6.5 Development of systems and/or innovative technologies to extend the operational period of stratospheric platforms, with special focus on the use of renewable energies	
AGROFOOD		AG1 Production systems for sustainability of organic resources	AG1.1 Development of highly efficient innovative production technologies and/or processes and/or effective control systems to avoid cross contamination (GMOs and non-GMOs)
	AG1.2 Selection and enhancement of biodiversity to increase the quantity/productivity and quality of animal and/or plant productions that best meet new market requests		
	AG1.3 Development of new integrated components and/or systems for innovative control, monitoring and traceability of processes and data in agrofood production		
	AG1.4 Development of innovative technologies and/or new feed systems for sustainable prevention of diseases in intensive farming, including aquaculture, and for diagnosis of product quality and freshness		
	AG1.5 Development of innovative systems and/or technologies to measure the water balance of cultivation methods for saving water and energy in the production cycles		
	AG2 Sustainable ingredients for a competitive food industry	AG2.1 Development of innovative technologies and/or processes for the production of ingredients of interest to the agrofood industry, in particular from obsolete or massive cultivations	
		AG2.2 Development of new, low-cost, portable devices/instruments for automation of sampling, extraction and analysis stages in checks right along the production chain	
		AG2.3 Development of innovative, flexible analytical platforms or checking product safety and quality with special focus on identification of allergens, GMOs and pathogens that concerning food and agriculture	
		AG 2.4 Development of innovative technologies and/or methods for the production of new ingredients from by-products in the agrofood production chain, useful for the formulation of innovative foodstuffs and/or improvement of the sensorial and/or nutritional properties in existing foodstuffs	
	AG3 Safe foodstuffs for sustainable consumption	AG3.1 Development of innovative process technologies to increase the shelf-life of food products, especially highly perishable ones	
		AG3.2 Development of sustainable, intelligent, innovative logistics for the distribution of fresh, perishable raw materials and/or foodstuffs	
		AG3.3 Development of innovative systems to defend the integrity of the production chain from abiotic and biotic contamination of agrofood products, from forgery, falsification and criminality regarding the finished products	
		AG3.4 Development of low-cost, non-invasive, innovative systems to check non-compliant products, especially to check for the presence of foreign bodies	

		AG3.5 Development of intelligent sustainable packaging technologies and/or systems with special focus on food-packaging conditioning systems	
		AG3.6 Development of innovative technologies and systems to guarantee quality and safety for foodstuffs during the different stages of storage and preparation of food in the home	
	AG4 Global dynamics and nutrition efficacy	AG4.1 New bioactive compounds from agrofood plant matrices, their extraction and stabilisation and checking of functional properties to meet new consumer needs	
		AG4.2 Development of innovative solutions to replace chemical additives in foodstuffs (for example, preservatives and antifungal alcohol) with natural new ingredients having high technological performance, with special focus on more sensitive consumers	
		AG4.3 Development of low-cost, functional new foodstuffs to prevent and reduce the pre-existing causes of dysmetabolism and to maintain consumer wellbeing with special focus on the elderly and/or consumers who suffer from food allergies and intolerances	
		AG4.4 Development of safe, technologically advanced new solutions or new ingredients to transmit sensations to the consumer, unprecedented in terms of taste, sight and the palate, with a view to encouraging correct diet, with special focus on young consumers	
ECO-INDUSTRY (ENVIRONMENT AND ENERGY)	AE1 Distributed generation and management of energy	AE1.1 Development of technologies and/or innovative solutions for smart grids	
		AE1.2 Development of intelligent systems for management, monitoring and safety of the network infrastructure	
		AE1.3 Development of new innovative systems and/or technologies to promote the integration of electrical, communication and thermal network infrastructures, in a smart city framework	
	AE2 Technological evolution of renewable sources	AE2.1 Development of new technologies and/or innovative systems or renewable source technologies (for example, third generation photovoltaic, new mini-hydro technologies for systems with low environmental impact)	
		AE2.2 Development of new applications for hydrogen-powered fuel cells, for example, in the civil and transport sectors	
	AE3 Energy accumulation systems	AE3.1 Development of technologies and/or innovative small accumulation systems, including non-conventional types	
		AE3.2 Development of innovative technologies and/or large accumulation systems for energy applications	
	AE4 Infrastructures for electric mobility	AE4.1 Development of innovative slow, fast and rapid (motorway) charging solutions for personal, collective and goods electric mobility	
	AE5 Intelligent illumination	AE5.1 Development of innovative technologies and new materials for efficient light production	
		AE5.2 Development of multipurpose integrated systems for intelligent management of public illumination	
	AE6 Technologies and materials for the building system	AE6.1 Development of innovative building materials and/or systems to increase the quality of life in civil and industrial buildings (for example, construction materials and/or techniques to give buildings with very high thermal-acoustic insulation and low environmental impact)	
		AE6.2 Development of low-cost innovative building technologies and techniques for reuse and recycling of materials used in construction	
		AE6.3 Development of innovative "Building-Plant" systems for effective and efficient integration for renewable sources in construction	
		AE6.4 Development of innovative building technologies and techniques for building redevelopment, including energy, to lower costs of management and maintenance of buildings with special focus on public, artistic and historic heritage	
		AE6.5 Development of innovative integrated systems to monitor energy consumption in industrial and civil buildings, with special focus on public ones and development of innovative tools and models for management and use of building information throughout its life cycle with a view to energy savings	
		AE6.6 Development of technologies, intelligent materials and/or innovative components for "non- structural" elements (for example, partitions, false ceilings, window and door frames, building systems, storage systems) for personal safety in the event of natural or man made incidents	
	AE7 Technologies for managing, monitoring and processing of water, air and waste	AE7.1 Development of innovative technological solutions for detection, anti-pollution and cleaning/purification of urban and industrial water and of the air	
		AE7.2 Development of ICT solutions and innovative systems for monitoring, controlling the use and optimisation of water consumption in urban and industrial areas	
		AE7.3 Development of innovative, integrated, intelligent technologies and/or systems for collection, managing and processing waste	
	ECO-INDUSTRY (GREEN CHEMISTRY)	CV1 Sustainable catalytic processes for industrial applications	CV1.1 Development and optimisation of (bio) catalysers within the Green Chemistry sector
			CV1.2 New biocomputer approaches and methods for industrial biotechnologies and for Green Chemistry
CV2 Creation of biorefineries to give products with added value		CV2.1 Development of processes based on the concept of biorefineries for the production of fine- and bulk-chemicals	
		CV2.2 Development of processes based on the concept of biorefineries for the production of biomaterials	
		CV2.3 Development of processes based on the concept of biorefineries for the production of bioenergies	
CV3 New catalysed and/or biocatalysed cascade chemical processes		CV3.1 Development of multi-enzymatic and chemo-enzymatic cascade processes	
	CV3.2 Metabolic engineering and synthetic biology		
	ICC1 Digitalisation, 3D detection and virtual reality	ICC1.1 Development of innovative integrated technologies and/or systems for information digitalisation (with special focus on 3D detection) and virtual reality for the preservation, restoration and use of the asset	

CREATIVE AND CULTURAL INDUSTRIES	ICC2 Preservation and maintenance of Cultural Heritage and artistic heritage	ICC2.1 Development of innovative technologies for diagnosis and/or development of innovative materials and/or technologies, including mechatronics for preserving, maintaining and monitoring Cultural Heritage
		ICC2.2 Development of innovative technologies and systems for archiving of Cultural Heritage
	ICC3 Instrumentation and sensors for diagnosis and safety of Cultural Heritage	ICC3.1 Development of innovative sensors and/or instruments for diagnosis and preservation of Cultural Heritage
		ICC3.2 Development of innovative sensors and/or systems for fighting fraud, traceability, monitoring and protecting Cultural Heritage from damage and theft
	ICC4 Fashion and Design	ICC4.1 Development of innovative food design models and technologies with special focus on local producers
ICC4.2 Development of innovative wearable technologies to meet new demands in the fashion, sport, fitness and personal protection sector		
ICC4.3 Development of innovative technological and service platforms to support and encourage connection and integration of, for example, competencies and creative, cultural, social and ICT capacities, belonging to a plurality of different parties to encourage the creative process		
ICC5 Attractive, proactive experiences of creative, cultural and media content	ICC5.1 Development of innovative technologies and/or ICT applications to support use of Cultural Heritage	
	ICC5.2 Development of innovative technologies and/or ICT applications to support immersive, interactive, proactive use in access to creative, cultural and media content	
	ICC5.3 Development of innovative technologies and/or ICT applications to support tourist use	
HEALTH INDUSTRY	IS1 Wellbeing	IS1.1 Development of innovative technological applications, including ICT, for the creation of new safer, more welcoming and accessible home and working environments, to improve people's wellbeing with special focus on the elderly and the disabled
		IS1.2 Development of immersive technology applications to improve people's wellbeing and quality of life with special focus on social inclusion
		IS1.3 Development of technologies and devices to make health self-management easier
		IS1.4 Development of innovative tools and systems to help families and care givers assisting severely disabled people
	IS2 Prevention	IS2.1 Development of wearable technologies and remote assistance systems for monitoring the condition of individuals at risk
		IS2.2 Development of new applications to reduce the risk of accidents in the home and workplace
		IS2.3 Development of new applications to reduce addiction (for example, to smoke, alcohol and gambling)
		IS2.4 Development of technologies and applications in the field of exposomics for risk measurement
		IS2.5 Development of innovative tools to check risk factors in the prevention of obesity and high blood pressure in infancy and childhood
		IS2.6 Development of innovative instruments for self diagnosis
	IS3 Active ageing	IS3.1 Development of cutting-edge devices and systems for 'independent life'
		IS3.2 Development of ICT applications to support enhancement and checking of treatment continuity
		IS3.3 Development of innovative systems to make work by elderly citizens easier
		IS3.4 Development of systems to protect the health and improve quality of life of elderly citizens
		IS3.6 Development of ICT systems to assess and/or stimulate cognitive capacity
		IS3.7 Development of innovative systems to assess and/or stimulate motor capacity
	IS4 Disability and rehabilitation	IS4.1 Development of innovative devices, systems, including ICT, and/or methods for neurocognitive and/or neuromotor rehabilitation
		IS4.2 Development of innovative models for monitoring, assessing and supporting rehabilitation of disabled patients for treatment continuity
		IS4.3 Development of communication, information and mobility systems for social, scholastic and work participation by the disabled
		IS4.4 Development of new instrumental and/or assessment methods for rehabilitation procedures
		IS4.5 Development of videogames and exergames that exercise cognitive and motor abilities
		IS4.6 Development of mechatronic technologies for rehabilitation
	IS5 Diagnostics	IS5.1 Development of innovative methods for the early diagnosis of diseases, including rare diseases and neurodegenerative diseases and possibly for the development of new drugs
IS5.2 Development of new technologies in biomedical imaging and dosing systems		
IS5.3 Development of innovative platforms and/or facilities of proteomics or metabolomics or lipidomics for medical diagnostics		
	IS6.1 Development of computational chemistry instruments to identify, stimulate and validate new molecular targets and new therapeutic targets	
	IS6.2 Development of gene and cell therapies for the treatment of orphan diseases, rare diseases in particular	
	IS6.3 Use of stem cells, including those genetically modified, to develop innovative methods for reparative transplant of cells and tissues and/or development of functional organoids	

	IS6 New therapeutic approaches	IS6.4 Development of immune-mediated therapies IS6.5 Development of new therapeutic approaches to multi-factor degenerative diseases with special reference to polyopathologies IS6.6 Development of advanced ICT applications for biobank management IS6.7 Development of new vaccines for the prevention of emerging and re-emerging pathogens IS6.8 Development of biodegradable functional substrates IS.6.9 Development of innovative High Throughput and High Content screening approaches for the study of new drugs
ADVANCED MANUFACTURING	MA1 Production with innovative processes	MA1.1 Development of technologies for advanced production processes of products with high added value
		MA1.2 Development of technologies and production processes of innovative materials with high mechanical and functional properties (for example, materials for extreme environments, multi-purpose textiles, high-performance renewable materials, advanced materials)
		MA1.3 Development of mechatronic technologies for innovative production processes
		MA1.4 Development of technologies and methods for modelling and simulation of innovative processes
	MA2 Evolving adaptable production systems	MA2.1 Development of innovative models and/or simulation technologies or evolved adaptable systems
		MA2.2 Mechatronic technologies and innovative methods of system engineering to support flexibility and reconfigurability of production system
		MA2.3 Development of innovative ICT solutions and/or technologies to support continual adaptation of production systems
		MA2.4 Development of innovative ICT solutions and/or technologies to support adaptation of human operators in real-time decision making at all levels (for example, solutions for memorising, presenting and interactive use of information and factory data)
		MA2.5 Development of innovative technologies for reconfiguring machines and systems, their reuse in new production layouts, their remanufacturing, reuse of components and end-of-life material recycling
	MA3 High-efficiency production systems	MA3.1 Development of technologies and processes for production systems to guarantee high levels of productivity, quality (zero defects) and efficiency
		MA3.2 Development of innovative technologies, models and simulation techniques and virtual reality systems to assess operator ability and performance
		MA3.3 Development of technologies for the production and use of innovative materials that increase production system performance
		MA3.4 Development of innovative ICT with low energy consumption to memorise large quantities of data from the field and the supply chain, to make hi-speed information available in a safe manner and to support collaboration at all levels in the factory networks and in dynamic supply chains
	MA4 Manufacturing for customised products	MA4.1 Development of technologies and/or ICT solutions to promote and increase involvement of the end user in design and production of customised solutions
		MA4.2 Development of innovative models and/or simulation technologies to increase the production performance of customised products
		MA4.3 Development of technologies and production processes of innovative materials (for example, multi-responsive intelligent and/or smart materials, bio-based and eco-friendly materials, new liquid and solid formable materials) for the production of customised products
		MA4.4 Development of innovative production technologies for customised products, such as manufacturing additives (for example, 3D and 4D-printing, stereolithography, laser sintering), production technologies for products that change shape over time, micro-technologies, hybrid processes for obtaining customised features
	MA5 Manufacturing systems for environmental sustainability	MA5.1 Development of innovative technologies to increase the sustainability (for example, energy savings and efficiency, waste heat energy recovery, reduced consumption of resources used and polluting emissions) of production processes, to make energy-autonomous factories, to implement end-of-life processes sustainable from an economic and environmental point of view (for example, disassembly, re-manufacturing, end-of-life and waste product recycling)
		MA5.2 Development of technologies for the production and use of innovative materials for environmental sustainability
		MA5.3 Development of innovative techniques for modelling and simulation for forecasting, over the entire product life cycle, the economic, environmental and social performances of products-services, processes and production systems
	MS1 New technologies for light vehicles in the future	MS1.1 Development of innovative systems, architectures and/or components with the use of light alloys and relative production technologies to make vehicles lighter
		MS1.2 Development of innovative systems, architectures and/or components of vehicles made with advanced and unconventional materials (for example, composites, hybrid structures, biomaterials) and relative production technologies to make vehicles lighter
	MS2 Energy efficiency and reduction in transport emissions	MS2.1 Development of innovative vehicle subsystems or components to reduce resistance to motion
		MS2.2 Development of innovative technologies, of new subsystems or components for vehicles to significantly reduce internal combustion engine emissions
		MS2.3 Development of innovative technologies, of new electrical components or power systems or vehicles and transport of people and goods
		MS2.4 Development of innovative technologies, of new components or subsystems for vehicles to reduce environmental impact and in particular to significantly reduce carbon footprint and/or other emissions such as fine particles

SUSTAINABLE MOBILITY		MS2.5 Development of innovative systems for energy recovery of vehicles
	MS3 Smart systems for transport and sustainable mobility	MS3.1 Development of innovative systems for V2V (vehicle-vehicle) communication, I2V (infrastructure-vehicle) and V2I (vehicle-infrastructure) to increase the safety and comfort of public or private systems to transport people and goods
		MS3.2 Development of innovative systems of smart transport for multimodal management of passenger traffic and goods transport
		MS3.3 Development of innovative technologies and smart transport systems for road safety and transport of goods with special focus on hazardous loads
	MS4 Safety in mobility of people and goods	MS4.1 Development of innovative technologies, components and/or systems/subsystems for the safety of vehicles, infrastructures and traffic
		MS4.2 Development of innovative technologies, of new components and/or subsystems for active or preventive safety, including the development of advanced driver assistance systems
		MS4.3 Development of on-board innovative technologies and solutions for the safety of goods transport
		MS4.4 Development of innovative technologies and solutions for the safety and comfort of passengers on board means of transport with special focus on fragile individuals