



TECHNISCHE UNIVERSITÄT
BERGAKADEMIE FREIBERG

Die Ressourcenuniversität. Seit 1765.

EU-Forschungsrahmenprogramm 2021-2027 HORIZON EUROPE Cluster 4 – Digital, Industry and Space



Freiberg, 02.07.2021

Cluster 4 – Digital, Industry and Space

Politische Zielsetzung - Expected Impacts (Teil 1):

- Global leadership in clean and climate-neutral industrial value chains, circular economy and climate-neutral digital systems and infrastructures (networks, data centres), through innovative production and manufacturing processes and their digitisation, new business models, sustainable-by-design advanced materials and technologies enabling the switch to decarbonisation in all major emitting industrial sectors, including green digital technologies.
- Industrial leadership and increased autonomy in key strategic value chains with security of supply in raw materials, achieved through breakthrough technologies in areas of industrial alliances, dynamic industrial innovation ecosystems and advanced solutions for substitution, resource and energy efficiency, effective reuse and recycling and clean primary production of raw materials, including critical raw materials and leadership in circular economy.
- Sovereignty in digital technologies and in future emerging enabling technologies by strengthening European capacities in key parts of digital and future supply chains, allowing agile responses to urgent needs, and by investing in early discovery and industrial uptake of new technologies.

Cluster 4 – Digital, Industry and Space

Politische Zielsetzung - Expected Impacts (Teil 2):

- Globally attractive, secure and dynamic data-agile economy by developing and enabling the uptake of the next-generation computing and data technologies and infrastructures (including space infrastructure and data), enabling the European single market for data with the corresponding data spaces and a trustworthy artificial intelligence ecosystem.
- Open strategic autonomy in conceiving, developing, deploying and using global space-based infrastructures, services, applications and data, including by reinforcing the EU's independent capacity to access space, securing the autonomy of supply for critical technologies and equipment, and fostering the EU's space sector competitiveness.
- A human-centred and ethical development of digital and industrial technologies, through a two-way engagement in the development of technologies, empowering end-users and workers, and supporting social innovation.



Cluster 4 – Digital, Industry and Space

Programmbereiche - Destinations

- CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION
- INCREASED AUTONOMY IN KEY STRATEGIC VALUE CHAINS FOR RESILIENT INDUSTRY
- WORLD LEADING DATA AND COMPUTING TECHNOLOGIES
- DIGITAL AND EMERGING TECHNOLOGIES FOR COMPETITIVENESS AND FIT FOR THE GREEN DEAL
- OPEN STRATEGIC AUTONOMY IN DEVELOPING, DEPLOYING AND USING GLOBAL SPACE-BASED INFRASTRUCTURES, SERVICES, APPLICATIONS AND DATA
- A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL TECHNOLOGIES

Destination: Climate Neutral, Circular and Digitised Production

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/ Projekt [Mio.€]	Anzahl Projekte
Green, flexible and advanced manufacturing					
HORIZON-CL4-2021-TWIN-TRANSITION-01-01	AI enhanced robotics systems for smart manufacturing	IA	28	8-10	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-02	Zero-defect manufacturing towards zero-waste	IA	27	8-10	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-03	Laser-based technologies for green manufacturing	RIA	26	5-7	4
HORIZON-CL4-2021-TWIN-TRANSITION-01-05	Manufacturing technologies for bio-based materials	RIA	20	4-6	4
HORIZON-CL4-2022-TWIN-TRANSITION-01-01	Rapid reconfigurable production process chains	IA	27,5	8-10	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-02	Products with complex functional surfaces	RIA	21,5	4-6	4
HORIZON-CL4-2022-TWIN-TRANSITION-01-03	Excellence in distributed control and modular manufacturing	RIA	21,5	4-6	4
HORIZON-CL4-2022-TWIN-TRANSITION-01-04	Intelligent work piece handling in a full production line	RIA	21,5	4-6	4

Destination: Climate Neutral, Circular and Digitised Production

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/ Projekt [Mio.€]	Anzahl Projekte
Advanced digital technologies for manufacturing					
HORIZON-CL4-2021-TWIN-TRANSITION-01-07	Artificial Intelligence for sustainable, agile manufacturing	IA	18	4-6	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-08	Data-driven Distributed Industrial Environments	IA	24	4-8	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-06	ICT Innovation for Manufacturing Sustainability in SMEs	IA	30	4-8	4
HORIZON-CL4-2022-TWIN-TRANSITION-01-07	Digital tools to support the engineering of a Circular Economy	RIA	22	3-6	3
A new way to build, accelerating disruptive change in construction					
HORIZON-CL4-2021-TWIN-TRANSITION-01-10	Digital permits and compliance checks for buildings and infrastructure	IA	15	5	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-11	Automated tools for the valorisation of construction waste	RIA	21	6-10	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-12	Breakthrough technologies supporting technological sovereignty in construction	RIA	24	8-10	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-09	Demonstrate the use of Digital Logbook for buildings	IA	9	4,5	2

Destination: Climate Neutral, Circular and Digitised Production

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/ Projekt [Mio.€]	Anzahl Projekte
Hubs for circularity, a stepping stone towards climate neutrality and circularity in industry					
HORIZON-CL4-2021-TWIN-TRANSITION-01-14	Deploying industrial-urban symbiosis solutions for the utilization of energy, water, industrial waste and by-products at regional scale	RIA	28	8-12	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-16	Hubs for Circularity European Community of Practice (ECOP) platform	CSA	2	2	1
HORIZON-CL4-2022-TWIN-TRANSITION-01-10	Circular flows for solid waste in urban environment	IA	42,5	12-18	3
Enabling circularity of resources in the process industries, including waste and CO₂/CO					
HORIZON-CL4-2021-TWIN-TRANSITION-01-17	Plastic waste as a circular carbon feedstock for industry	IA	39	12-18	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-18	Carbon Direct Avoidance in steel: Electricity and hydrogen-based metallurgy	IA	28	6-8	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-19	Improvement of the yield of the iron and steel making	IA	14	4-5	4
HORIZON-CL4-2021-TWIN-TRANSITION-01-20	Reducing environmental footprint, improving circularity in extractive and processing value chains	IA	36	12	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-11	Valorisation of CO/CO ₂ streams into added-value products of market interest	IA	42,5	12-18	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-13	Raw material preparation for clean steel production	IA	14	4-5	3

Destination: Climate Neutral, Circular and Digitised Production

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/ Projekt [Mio.€]	Anzahl Projekte
Integration of Renewables and Electrification in process industry					
HORIZON-CL4-2021-TWIN-TRANSITION-01-21	Design and optimisation of energy flexible industrial processes	IA	39	12-18	3
HORIZON-CL4-2021-TWIN-TRANSITION-01-22	Adjustment of Steel process production to prepare for the transition towards climate neutrality	IA	14	4-5	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-15	New electrochemical conversion routes for the production of chemicals and materials in process industries	RIA	30	8-12	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-16	Modular and hybrid heating technologies in steel production	IA	10	3	3
HORIZON-CL4-2022-TWIN-TRANSITION-01-17	Integration of hydrogen for replacing fossil fuels in industrial applications	IA	42,5	12-18	3

Destination: Increased Autonomy in Key Strategic Value Chains for Resilient Industry

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Novel paradigms to establish resilient and circular value chains					
HORIZON-CL4-2021-RESILIENCE-01-01	Ensuring circularity of composite materials	RIA	24,7	8-9	3
HORIZON-CL4-2022-RESILIENCE-01-01	Circular and low emission value chains through digitalisation	RIA	25,3	6-8	4
Raw materials for EU open strategic autonomy and successful transition to a climate-neutral and circular economy					
HORIZON-CL4-2021-RESILIENCE-01-03	Identifying future availability of secondary raw materials	RIA	13,5	13,5	1
HORIZON-CL4-2021-RESILIENCE-01-04	Developing climate-neutral and circular raw materials	IA	36	12	3
HORIZON-CL4-2021-RESILIENCE-01-05	Building EU-Africa partnerships on sustainable raw materials value chains	CSA	8	8	1
HORIZON-CL4-2021-RESILIENCE-01-06	Innovation for responsible EU sourcing of primary raw materials, the foundation of the Green Deal	RIA	30	7,5	4
HORIZON-CL4-2021-RESILIENCE-01-07	Building innovative value chains from raw materials to sustainable products	IA	36	12	3

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Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Raw materials for EU open strategic autonomy and successful transition to a climate-neutral and circular economy					
HORIZON-CL4-2022-RESILIENCE-01-02	Monitoring and supervising system for exploration and future exploitation activities in the deep sea	RIA	14	14	1
HORIZON-CL4-2022-RESILIENCE-01-03	Streamlining cross-sectoral policy framework throughout the extractive life-cycle in environmentally protected areas	CSA	2,4	2,4	1
HORIZON-CL4-2022-RESILIENCE-01-04	Developing digital platforms for the small scale extractive industry	IA	15	5	3
HORIZON-CL4-2022-RESILIENCE-01-05	Technological solutions for tracking raw material flows in complex supply chains	RIA	13,5	13,5	1
HORIZON-CL4-2022-RESILIENCE-01-06	Sustainable and innovative mine of the future	IA	36	12	3
HORIZON-CL4-2022-RESILIENCE-01-07	Innovative solutions for efficient use and enhanced recovery of mineral and metal by-products from processing of raw materials	IA	36	12	3
HORIZON-CL4-2022-RESILIENCE-01-08	Earth observation technologies for the mining life cycle in support of EU autonomy and transition to a climate-neutral economy	RIA	13,5	4,5	3

Destination: Increased Autonomy in Key Strategic Value Chains for Resilient Industry

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Green and Sustainable Materials					
HORIZON-CL4-2021-RESILIENCE-01-08	Establishing EU led international community on safe- and sustainable-by-design materials to support embedding sustainability criteria over the life cycle of products and processes	CSA	4	3-4	1
HORIZON-CL4-2021-RESILIENCE-01-09	Promote Europe's availability, affordability, sustainability and security of supply of essential chemicals and materials	IA	28	7-10	3
HORIZON-CL4-2021-RESILIENCE-01-10	Paving the way to an increased share of recycled plastics in added value products	RIA	23	5-7	3
HORIZON-CL4-2021-RESILIENCE-01-11	Safe- and sustainable-by-design polymeric materials	RIA	19	4-5	5
HORIZON-CL4-2021-RESILIENCE-01-12	Safe- and sustainable-by-design metallic coatings and engineered surfaces	RIA	19	4-5	4
HORIZON-CL4-2022-RESILIENCE-01-10	Innovative materials for advanced (nano)electronic components and systems	RIA	20	3-5	4
HORIZON-CL4-2022-RESILIENCE-01-11	Advanced lightweight materials for energy efficient structures	RIA	20	3-5	5
HORIZON-CL4-2022-RESILIENCE-01-12	Functional multi-material components and structures	RIA	20	4-6	4
HORIZON-CL4-2022-RESILIENCE-01-23	Safe- and sustainable-by-design organic and hybrid coatings	RIA	20	3-5	3

Destination: Increased Autonomy in Key Strategic Value Chains for Resilient Industry

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Materials for the benefit of society and the environment and materials for climate-neutral Industry					
HORIZON-CL4-2021-RESILIENCE-01-14	Development of more energy efficient electrically heated catalytic reactors	IA	33	7-10	8
HORIZON-CL4-2021-RESILIENCE-01-16	Creation of an innovation community for solar fuels and chemicals	CSA	4	3-4	1
HORIZON-CL4-2021-RESILIENCE-01-17	Advanced materials for hydrogen storage	RIA	21	4-6	4
HORIZON-CL4-2021-RESILIENCE-01-20	Antimicrobial, Antiviral, and Antifungal Nanocoatings	RIA	23	4-6	4
HORIZON-CL4-2022-RESILIENCE-01-13	Smart and multifunctional biomaterials for health innovations	RIA	21	6-8	6
HORIZON-CL4-2022-RESILIENCE-01-14	Membranes for gas separations - membrane distillation	IA	21	5-7	3
HORIZON-CL4-2022-RESILIENCE-01-16	Building and renovating by exploiting advanced materials for energy and resources efficient management	IA	18	4-6	3
HORIZON-CL4-2022-RESILIENCE-01-24	Novel materials for supercapacitor energy storage	RIA	34	10-12	3

Destination: Increased Autonomy in Key Strategic Value Chains for Resilient Industry

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Materials and data cross-cutting actions					
HORIZON-CL4-2021-RESILIENCE-01-25	Biomaterials database for Health Applications	CSA	6	2-4	2
HORIZON-CL4-2021-RESILIENCE-01-26	Sustainable Industry Commons	RIA	6	2-4	2
HORIZON-CL4-2022-RESILIENCE-01-19	Advanced materials modelling and characterisation	RIA	4,5	4,5	1
HORIZON-CL4-2022-RESILIENCE-01-20	Climate Neutral and Circular Innovative Materials Technologies Open Innovation Test Beds	IA	20	3-5	4
HORIZON-CL4-2022-RESILIENCE-01-25	Optimised Industrial Systems and Lines through digitalisation	IA	23	4-6	4

Destination: Increased Autonomy in Key Strategic Value Chains for Resilient Industry

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Improving the resilience and preparedness of EU businesses, especially SMEs and Startups					
HORIZON-CL4-2021-RESILIENCE-01-27	Innovation Radar, Tech Due Diligence and Venture Building for strategic digital technologies	CSA	4	2,5-4	1
HORIZON-CL4-2021-RESILIENCE-01-28	Re-opening industrial sites preparatory action – Promoting a sustainable strategy for Europe's industrial future	CSA	2	1	1
HORIZON-CL4-2021-RESILIENCE-01-29	'Innovate to transform' support for SME's sustainability transition	CSA	10	5	2
HORIZON-CL4-2021-RESILIENCE-01-31	European Technological and Social Innovation Factory	RIA	5	3-5	1
HORIZON-CL4-2021-RESILIENCE-02-32	Social and affordable housing district demonstrator	IA	10	2,5	4
HORIZON-CL4-2022-RESILIENCE-01-21	Leveraging standardisation in Digital Technologies	CSA	15	4-5	1
HORIZON-CL4-2022-RESILIENCE-01-26	'Innovate to transform' support for SME's sustainability transition	CSA	10	5	2
HORIZON-CL4-2022-RESILIENCE-02-01-PCP	Boosting green economic recovery and open strategic autonomy in Strategic Digital Technologies through pre-commercial procurement	PCP	9	9	1

Destination: World Leading Data and Computing Technologies

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/ Projekt [Mio.€]	Anzahl Projekte
Data sharing in the common European data spaces					
HORIZON-CL4-2021-DATA-01-01	Technologies and solutions for compliance, privacy preservation, green and responsible data operations	RIA	52	8-11	5
HORIZON-CL4-2021-DATA-01-03	Technologies for data management	IA	30	5	6
HORIZON-CL4-2022-DATA-01-04	Technologies and solutions for data trading, monetizing, exchange and interoperability	IA	52	10-13	4
Strengthening Europe's data analytics capacity					
HORIZON-CL4-2022-DATA-01-01	Methods for exploiting data and knowledge for extremely precise outcomes	RIA	33	8-12	3
HORIZON-CL4-2022-DATA-01-05	Extreme data mining, aggregation and analytics technologies and solutions	RIA	30	5	6

Destination: World Leading Data and Computing Technologies

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/ Projekt [Mio.€]	Anzahl Projekte
From Cloud to Edge to IoT for European Data					
HORIZON-CL4-2021-DATA-01-05	Future European platforms for the Edge: Meta Operating Systems	RIA	54	8-12	5
HORIZON-CL4-2021-DATA-01-07	Coordination and Support of the 'Cloud-Edge-IoT' domain	CSA	3	1,5	2
HORIZON-CL4-2021-DATA-01-08	Roadmap for next generation computing and systems technologies	CSA	2	2	1
HORIZON-CL4-2022-DATA-01-02	Cognitive Cloud: AI-enabled computing continuum from Cloud to Edge	RIA	50	4-6	10
HORIZON-CL4-2022-DATA-01-03	Programming tools for decentralised intelligence and swarms	RIA	40	4-8	5

Destination: Digital and Emerging Technologies for Competitiveness and Fit for the Green Deal

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Ultra-low power processors					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-01	Ultra-low-power, secure processors for edge computing	RIA	26	8-10	3
HORIZON-CL4-2021-DIGITAL-EMERGING-01-05	Open Source Hardware for ultra-low-power, secure processors	CSA	2	2	1
HORIZON-CL4-2022-DIGITAL-EMERGING-01-26	Open source for cloud-based services	RIA	22	4-6	4
European Innovation Leadership in Electronics					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-31	Functional electronics for green and circular economy	RIA	35	3-5	9
HORIZON-CL4-2022-DIGITAL-EMERGING-01-38	International cooperation in semiconductors	CSA	3	3	1

Destination: Digital and Emerging Technologies for Competitiveness and Fit for the Green Deal

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
European Innovation Leadership in Photonics					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-06	Advanced optical communication components	IA	26	4-6	6
HORIZON-CL4-2021-DIGITAL-EMERGING-01-07	Advanced Photonic Integrated Circuits	RIA	39	3-5	8
HORIZON-CL4-2022-DIGITAL-EMERGING-01-03	Advanced multi-sensing systems	RIA	48	3-5	10
6G and foundational connectivity technologies					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-26	Coordination of European Smart Network actions	CSA	3	3	1
HORIZON-CL4-2022-DIGITAL-EMERGING-01-30	European Enabling technologies for Beyond 5G/6G RAN disaggregated architectures	RIA	13	13	1
HORIZON-CL4-2022-DIGITAL-EMERGING-01-39	Ultra low energy and secure networks	RIA	13	13	1

Destination: Digital and Emerging Technologies for Competitiveness and Fit for the Green Deal

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Innovation in AI, Data and Robotics					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-09	AI, Data and Robotics for the Green Deal	IA	27	3-5	7
HORIZON-CL4-2021-DIGITAL-EMERGING-01-10	AI, Data and Robotics at work	IA	22	3-5	6
HORIZON-CL4-2022-DIGITAL-EMERGING-01-05	AI, Data and Robotics for Industry optimisation (including production and services)	IA	19	3-5	5
Tomorrow's deployable Robots: efficient, robust, safe, adaptive and trusted					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-11	Pushing the limit of robotics cognition	RIA	44,5	5	9
HORIZON-CL4-2021-DIGITAL-EMERGING-01-12	European Network of Excellence Centres in Robotics	RIA	11,5	11,5	1
HORIZON-CL4-2022-DIGITAL-EMERGING-01-06	Pushing the limit of physical intelligence and performance	RIA	28,5	4	7
HORIZON-CL4-2022-DIGITAL-EMERGING-01-07	Increased robotics capabilities demonstrated in key sectors	IA	36	6	6

Destination: Digital and Emerging Technologies for Competitiveness and Fit for the Green Deal

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
European leadership in Emerging Enabling Technologies					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-13	Academia-Industry Forum on Emerging Enabling Technologies	CSA	2,5	2,5	1
HORIZON-CL4-2021-DIGITAL-EMERGING-01-14	Advanced spintronics: Unleashing spin in the next generation ICs	RIA	17	2-3	6
HORIZON-CL4-2021-DIGITAL-EMERGING-01-27	Development of technologies/devices for bio-intelligent manufacturing	RIA	22,5	5-7	4
HORIZON-CL4-2022-DIGITAL-EMERGING-01-35	Advanced characterisation methodologies to assess and predict the health and environmental risks of nanomaterials	RIA	17,5	2-3	5
Graphene: Europe in the lead					
HORIZON-CL4-2022-DIGITAL-EMERGING-02-17	New generation of advanced electronic and photonic 2D materials-based devices, systems and sensors	RIA	16,5	16,5	1
HORIZON-CL4-2022-DIGITAL-EMERGING-02-18	2D materials-based devices and systems for energy storage and/or harvesting	RIA	9	9	1
HORIZON-CL4-2022-DIGITAL-EMERGING-02-19	2D materials-based devices and systems for biomedical applications	RIA	6	6	1
HORIZON-CL4-2022-DIGITAL-EMERGING-02-20	2D-material-based composites, coatings and foams	IA	9	9	1
HORIZON-CL4-2022-DIGITAL-EMERGING-02-22	Supporting the coordination of the Graphene Flagship projects	CSA	3	3	1

Destination: Digital and Emerging Technologies for Competitiveness and Fit for the Green Deal

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Flagship on Quantum Technologies: a Paradigm Shift					
HORIZON-CL4-2021-DIGITAL-EMERGING-01-21	Next generation quantum sensing technologies	RIA	13,5	6,75	2
HORIZON-CL4-2021-DIGITAL-EMERGING-01-23	International cooperation with Canada	RIA	4	1,33	4
HORIZON-CL4-2021-DIGITAL-EMERGING-01-30	Investing in new emerging quantum computing technologies	RIA	10	5	2
HORIZON-CL4-2021-DIGITAL-EMERGING-01-32	Support and coordination of the Quantum Technologies Flagship Initiative	CSA	6,4	6,4	1
HORIZON-CL4-2021-DIGITAL-EMERGING-02-15	Framework Partnership Agreement for developing the first large-scale quantum computers	FPA			
HORIZON-CL4-2021-DIGITAL-EMERGING-02-16	Basic Science for Quantum Technologies	RIA	16	2-3	5
HORIZON-CL4-2021-DIGITAL-EMERGING-02-17	Framework Partnership Agreement for developing large scale quantum simulation platform technologies	FPA			
HORIZON-CL4-2021-DIGITAL-EMERGING-02-19	Framework Partnership Agreements in Quantum Communications	FPA			
HORIZON-CL4-2021-DIGITAL-EMERGING-02-20	Quantum sensing technologies for market uptake	IA	23	7-10	3
HORIZON-CL4-2021-DIGITAL-EMERGING-02-22	Framework Partnership Agreements for open testing and experimentation and for pilot production capabilities for quantum technologies	FPA			
HORIZON-CL4-2021-DIGITAL-EMERGING-02-10	Strengthening the quantum software ecosystem for quantum computing platforms	RIA	12	5-7	2

Destination: Open Strategic Autonomy in Developing, Deploying and Using Global Space-based Infrastructures, Services, Applications and Data

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Foster competitiveness of space systems					
HORIZON-CL4-2021-SPACE-01-11	End-to-end satellite communication systems and associated services	RIA	12	4-6	2
HORIZON-CL4-2021-SPACE-01-12	Future space ecosystems: on-orbit operations, new system concepts	RIA	6	1-2	3
HORIZON-CL4-2022-SPACE-01-11	Future space ecosystems: on-orbit operations, preparation of orbital demonstration mission	RIA	26	20-26	1
HORIZON-CL4-2022-SPACE-01-12	Technologies and generic building blocks for Electrical Propulsion	IA	5,1	1-2	3
HORIZON-CL4-2022-SPACE-01-13	End-to-end Earth observation systems and associated services	IA	8,1	2-3	3
Reinforce EU capacity to access and use space					
HORIZON-CL4-2021-SPACE-01-21	Reusability for European strategic space launchers - technologies and operation maturation including flight test demonstration	RIA	39	30-39	1
HORIZON-CL4-2021-SPACE-01-22	Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground tests	RIA	19,8	15-19	1
HORIZON-CL4-2021-SPACE-01-23	New space transportation solutions and services	RIA	3	1-1,5	2
HORIZON-CL4-2022-SPACE-01-21	Multi sites flexible industrial platform and standardised technology for improving interoperability of European access to space ground facilities	RIA	2	1-2	1

Destination: Open Strategic Autonomy in Developing, Deploying and Using Global Space-based Infrastructures, Services, Applications and Data

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Evolution of Copernicus services					
HORIZON-CL4-2021-SPACE-01-41	Copernicus Climate Change Service evolution	RIA	11	10-11	1
HORIZON-CL4-2021-SPACE-01-42	Copernicus Atmosphere Monitoring Service evolution	RIA	7,5	6-7,5	1
HORIZON-CL4-2021-SPACE-01-43	Copernicus Security and Emergency Services evolution	RIA	5	4-5	1
HORIZON-CL4-2021-SPACE-01-44	Copernicus evolution for cross-services thematic domains	RIA	5,6	3	2
Evolution of services of the EU space programme components: Copernicus					
HORIZON-CL4-2022-SPACE-01-41	Copernicus Marine Environment Monitoring Service evolution	RIA	10	8-10	1
HORIZON-CL4-2022-SPACE-01-42	Copernicus Anthropogenic CO ₂ Emissions Monitoring & Verification Support (MVS) capacity	RIA	6	5-6	1
HORIZON-CL4-2022-SPACE-01-43	Copernicus Land Monitoring Service evolution	RIA	5	4-5	1

Destination: Open Strategic Autonomy in Developing, Deploying and Using Global Space-based Infrastructures, Services, Applications and Data

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Innovative space capabilities: SSA, GOVSATCOM, Quantum					
HORIZON-CL4-2021-SPACE-01-62	Quantum technologies for space gravimetry	RIA	17	15-17	1
HORIZON-CL4-2022-SPACE-01-62	Space Weather	RIA	2	0,5-1	2
Targeted and strategic actions supporting the EU space sector					
HORIZON-CL4-2021-SPACE-01-81	Space technologies for European non-dependence and competitiveness	RIA	10,32	2-3	4
HORIZON-CL4-2022-SPACE-01-81	Space technologies for European non-dependence and competitiveness	RIA	10,5	2-3	4
HORIZON-CL4-2022-SPACE-01-82	Space science and exploration technologies	RIA	8	1-1,5	6
Space entrepreneurship ecosystems (including "New Space" and start-ups) and skills					
HORIZON-CL4-2022-SPACE-01-72	Education and skills for the EU space sector	CSA	3	2-3	1

Destination: A Human-centred and Ethical Development of Digital and Industrial Technologies

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
Leadership in AI based on trust					
HORIZON-CL4-2021-HUMAN-01-01	Verifiable robustness, energy efficiency and transparency for Trustworthy AI: Scientific excellence boosting industrial competitiveness	RIA	36	4	9
HORIZON-CL4-2021-HUMAN-01-02	European coordination, awareness, standardisation & adoption of trustworthy European AI, Data and Robotics	CSA	13	4-9	2
HORIZON-CL4-2021-HUMAN-01-03	European Network of AI Excellence Centres: Pillars of the European AI lighthouse	RIA	9	9	1
HORIZON-CL4-2021-HUMAN-01-24	Tackling gender, race and other biases in AI	RIA	10	3-3,5	3
HORIZON-CL4-2021-HUMAN-01-27	AI to fight disinformation	RIA	13	6,52	2
HORIZON-CL4-2022-HUMAN-01-01	AI for human empowerment	RIA	16	4	4
HORIZON-CL4-2022-HUMAN-01-02	European Network of AI Excellence Centres: Expanding the European AI lighthouse	RIA	34,5	11,5	3
HORIZON-CL4-2022-HUMAN-01-03	Internet architecture and decentralised technologies	RIA	22	11	2
HORIZON-CL4-2022-HUMAN-01-05	Next Generation Safer Internet: Technologies to identify digital Child Sexual Abuse Material (CSAM)	RIA	2	2	1
HORIZON-CL4-2022-HUMAN-01-07	NGI International Collaboration - USA and Canada	RIA	6	6	1

Destination: A Human-centred and Ethical Development of Digital and Industrial Technologies

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
An Internet of Trust					
HORIZON-CL4-2021-HUMAN-01-04	Trust & data sovereignty on the Internet	RIA	12	12	1
HORIZON-CL4-2021-HUMAN-01-05	Trustworthy open search and discovery	RIA	17	8,5	2
HORIZON-CL4-2021-HUMAN-01-07	Next Generation Internet community-building and outreach	CSA	2	2	1
HORIZON-CL4-2021-HUMAN-01-08	NGI International Collaboration - Transatlantic fellowship programme	CSA	2	2	1
HORIZON-CL4-2021-HUMAN-01-09	NGI Tech Review	CSA	1,5	1,5	1
eXtended Reality (XR)					
HORIZON-CL4-2021-HUMAN-01-13	eXtended Reality Modelling	RIA	14,5	4,8	3
HORIZON-CL4-2021-HUMAN-01-14	eXtended Reality for All – Haptics	RIA	6	6	1
HORIZON-CL4-2021-HUMAN-01-25	eXtended Collaborative Telepresence	IA	14	5-8	2
HORIZON-CL4-2021-HUMAN-01-06	Innovation for Media, including eXtended Reality	IA	26	8-9	3
HORIZON-CL4-2021-HUMAN-01-28	eXtended Reality Ethics, Interoperability and Impact	CSA	2,5	2,5	1

Destination: A Human-centred and Ethical Development of Digital and Industrial Technologies

Topic-Nr.	Topic-Bezeichnung	Art	Budget [Mio. €]	Budget/Projekt [Mio.€]	Anzahl Projekte
eXtended Reality (XR)					
HORIZON-CL4-2022-HUMAN-01-14	eXtended Reality Technologies	RIA	19	5-8	3
HORIZON-CL4-2022-HUMAN-01-19	eXtended Reality Learning - Engage and Interact	IA	21,5	5-8	3
Systemic approaches to make the most of the technologies within society and industry					
HORIZON-CL4-2021-HUMAN-01-17	Awareness raising on Intellectual property (IP) management for European R&I	CSA	1	1	1
HORIZON-CL4-2021-HUMAN-01-18	Fostering standardisation to boost European industry's competitiveness	CSA	1	1	1
HORIZON-CL4-2021-HUMAN-01-19	Testing innovative solutions on local communities' demand	CSA	5	5	1
HORIZON-CL4-2021-HUMAN-01-20	Piloting a new industry-academia knowledge exchange focussing on companies' needs	CSA	2	2	1
HORIZON-CL4-2021-HUMAN-01-21	Art-driven use experiments and design	CSA	8,5	2,8	3
HORIZON-CL4-2021-HUMAN-01-29	Support for transnational activities of National Contact Points in the thematic area of Digital	CSA	2,5	2,5	1
HORIZON-CL4-2021-HUMAN-01-30	Support for transnational activities of National Contact Points in the thematic area of Industry	CSA	1,5	1,5	1
HORIZON-CL4-2021-HUMAN-01-31	Support for transnational activities of National Contact Points in the thematic area of Space	CSA	1	1	1
HORIZON-CL4-2021-HUMAN-01-26	Workforce skills for industry 5.0	RIA	5	5	1