

EN

Annex 3

Horizon Europe

Work Programme 2021-2022

3. Research Infrastructures

DISCLAIMER

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission. The information transmitted is intended only for the Member State or entity to which it is addressed for discussions and may contain confidential and/or privileged material.

Table of contents

Introduction	6
DESTINATION 1 – DEVELOPING, CONSOLIDATING AND OPTIMISING EUROPEAN RESEARCH INFRASTRUCTURES LANDSCAPE, MAINTAINING GLOBAL LEADERSHIP	9
Call - Developing, consolidating and optimising European Research Infrastructures to maintain global leadership (2021).....	11
Conditions for the Call	11
HORIZON-INFRA-2021-DEV-01-01: Support to the European Strategy Forum on Research Infrastructures	12
HORIZON-INFRA-2021-DEV-01-02: Strengthen the bilateral cooperation on research infrastructures with Africa: improving the knowledge base on climate change in Africa... 13	
HORIZON-INFRA-2021-DEV-01-03: Transition to digital/remote research infrastructure service provision: lessons learnt, needs and best practices	14
HORIZON-INFRA-2021-DEV-01-04: Support to National Contact Points (NCPs) for Research Infrastructures	15
HORIZON-INFRA-2021-DEV-01-05: Support to the e-Infrastructure Reflection Group (e-IRG).....	16
Call - Developing European Research Infrastructures to maintain global leadership (2021)	18
Conditions for the Call	18
HORIZON-INFRA-2021-DEV-02-01: Preparatory phase of new ESFRI Research Infrastructure projects	19
HORIZON-INFRA-2021-DEV-02-02: Consolidation of the research infrastructure landscape – Individual support for ESFRI projects	21
Call - Developing European Research Infrastructures to maintain global leadership (2022)	23
Conditions for the Call	23
HORIZON-INFRA-2022-DEV-01-01: Research infrastructure concept development.....	24
DESTINATION 2 – ENABLING AN OPERATIONAL, OPEN AND FAIR EOSC ECOSYSTEM.....	26
Call - Enabling an operational, open and FAIR EOSC ecosystem (2021)	28
Conditions for the Call	28
Open Science practices and a digitally-skilled workforce	29
HORIZON-INFRA-2021-EOSC-01-01: Supporting an EOSC-ready digitally skilled workforce	29

HORIZON-INFRA-2021-EOSC-01-02: Supporting the development and coordination of activities of the EOSC Partnership	31
Supporting EOSC-Core: Enabling access to the Web of FAIR data and services.....	34
HORIZON-INFRA-2021-EOSC-01-03: Deploying EOSC-Core components for FAIR....	34
HORIZON-INFRA-2021-EOSC-01-04: Innovative and customizable services for EOSC	36
Building with the scientific community a Web of FAIR data for open science	38
HORIZON-INFRA-2021-EOSC-01-05: Enabling discovery and interoperability of federated research objects across scientific communities	38
HORIZON-INFRA-2021-EOSC-01-06: FAIR and open data sharing in support of European preparedness for infectious diseases	41
HORIZON-INFRA-2021-EOSC-01-07: FAIR and open data sharing in support of cancer research.....	44
Call - Enabling an operational, open and FAIR EOSC ecosystem (2022)	46
Conditions for the Call	47
Open Science practices and a digitally-skilled workforce	48
HORIZON-INFRA-2022-EOSC-01-01: Services and tools to underpin a research assessment system that incentivises open science practices	48
HORIZON-INFRA-2022-EOSC-01-02: Improving and coordinating technical infrastructure for institutional open access publishing across Europe	50
Building with the scientific community a Web of FAIR data for open science	52
HORIZON-INFRA-2022-EOSC-01-03: FAIR and open data sharing in support of healthy oceans, seas, coastal and inland waters	52
HORIZON-INFRA-2022-EOSC-01-04: Support for initiatives helping to generate global standards, specifications and recommendations for open sharing of FAIR research data, publications and software.....	55
 DESTINATION 3 – RESEARCH INFRASTRUCTURE SERVICES TO SUPPORT HEALTH RESEARCH, ACCELERATE THE GREEN AND DIGITAL TRANSFORMATION, AND ADVANCE FRONTIER KNOWLEDGE.....	 57
Call - Research Infrastructure services to support health research, accelerate the green and digital transformation, and advance frontier knowledge (2021)	59
Conditions for the Call	59
A challenge-driven provision of Research Infrastructure services	60
HORIZON-INFRA-2021-SERV-01-01: Research Infrastructure services for rapid research responses to infectious disease epidemics.....	60
HORIZON-INFRA-2021-SERV-01-02: Research Infrastructures services to support research addressing cancer	64
HORIZON-INFRA-2021-SERV-01-03: Research Infrastructures services for a sustainable and resilient agriculture and agro-ecological transitions.....	68

HORIZON-INFRA-2021-SERV-01-04: Research Infrastructures services for responding to climate-related risks on the environment	72
HORIZON-INFRA-2021-SERV-01-05: Research Infrastructures services enabling the development of materials for a circular economy	75
HORIZON-INFRA-2021-SERV-01-06: Research Infrastructures services for sustainable and inclusive Global Value Chain and Europe recovery from socio-economic crises	79
Research Infrastructures services advancing frontier knowledge	82
HORIZON-INFRA-2021-SERV-01-07: Research Infrastructures services advancing frontier knowledge	82
Call - Research Infrastructure services to support health research and accelerate the green and digital transformation (2022)	86
Conditions for the Call	86
HORIZON-INFRA-2022-SERV-01-01: Enabling research infrastructure services for better use of imaging data to address challenges in thematic research areas	87
Call - Research Infrastructure services to support health research and accelerate the digital transformation (2022)	88
Conditions for the Call	88
HORIZON-INFRA-2022-SERV-02-01: Implementing digital services to empower neuroscience research for health and brain inspired technology via EBRAINS.....	89
DESTINATION 4 – NEXT GENERATION OF SCIENTIFIC INSTRUMENTATION, TOOLS AND METHODS AND ADVANCED DIGITAL SOLUTIONS	93
Call - Next generation of scientific instrumentation, tools and methods (2021).....	95
Conditions for the Call	95
HORIZON-INFRA-2021-TECH-01-01: Interdisciplinary digital twins for modelling and simulating complex phenomena at the service of research infrastructure communities.....	96
Call - Next generation of scientific instrumentation, tools and methods (2022).....	98
Conditions for the Call	98
HORIZON-INFRA-2022-TECH-01-01: R&D for the next generation of scientific instrumentation, tools and methods.....	99
DESTINATION 5 – NETWORK CONNECTIVITY IN RESEARCH AND EDUCATION - ENABLING COLLABORATION WITHOUT BOUNDARIES	101
Call - Network connectivity in Research and Education - Enabling collaboration without boundaries (2021)	102
Conditions for the Call	102

HORIZON-INFRA-2021-GEANT-01-01-FPA: Framework Partnership Agreement (FPA) for Research and Education Networks	103
Other Actions not subject to calls for proposals	107
Grants to identified beneficiaries.....	107
1. International Conference on Research Infrastructures – ICRI 2022	107
Specific Grant Agreements to the FPA for Research and Education Networks	108
1. a) SGA for networking and collaboration services and investments in long-term capacity for Research and Education Networks in Europe	108
2. b) SGA for investments on International connectivity and collaboration.....	111
Public procurement.....	112
1. Delivering the EOSC core infrastructure and services.....	112
2. Procurement for a research repository for FAIR Digital Objects under Horizon Europe	116
Expert contract actions	117
1. External expertise 2021	117
2. External expertise 2022	117
Budget.....	119
Specific Features for Research Infrastructure	121

Introduction

The overall objective of the Research Infrastructure Programme under Horizon Europe is to empower Europe through world-class and accessible Research and Technology Infrastructures.

Research Infrastructures (RIs), including the European Open Science Cloud, and Technology Infrastructures (TIs)¹ are crucial enablers of research and innovation and drivers of multidisciplinary and data-intensive science. Europe will benefit from an integrated, interoperable and effective ecosystem of RIs and TIs that helps covering the continuum of needs from fundamental knowledge creation to technology deployment and supports the implementation of Open Science policies as well as European technology leadership.

Previous European Framework Programmes have made a significant contribution towards a more efficient and effective use of national Research Infrastructures (RIs) and have developed, with the European Strategy Forum on Research Infrastructures (ESFRI), a coherent and strategy-led approach to policy making on pan-European research infrastructures. The work with ESFRI triggered, so far, the development of 55 European Research Infrastructures, of which 37 have already been implemented, across all fields of science, mobilising close to €20 billion in investments². Twenty-one of these research infrastructures have been established as European Research Infrastructure Consortia (ERIC) – a legal form enshrined in EU law and the only EU regulation in the ERA framework – that enables joint funding from Member States (MSs) and Associated Countries (ACs) and secures their commitment to continuing support. The EU invests in the research infrastructures also through the Cohesion Policy building research capacities at regional/national level with a view to deploy research results into markets.

Europe has a rich landscape of Research Infrastructures. For the future, smart investments will be required to drive the development of new research infrastructures towards filling knowledge gaps and supporting emerging needs, notably in the field of health and in the context of the green and digital transitions. At the same time, efforts to optimise and consolidate the existing capacities, avoiding fragmentation and unnecessary duplications, will provide ERA with a more effective and interlinked and well-functioning Research Infrastructure landscape. Such RIs landscape and its continuous evolution and upgrade will make the ERA attractive for researchers and talents from all over the world. It is therefore necessary to foster synergies between RI funding instruments to align R&I investments, ensure access to excellence and translate research results for the benefit of the society and the economy.

The recently published ESFRI White Paper also puts a new emphasis on the consolidation of a European research infrastructure ecosystem underpinning the ERA, on the role the existing facilities at European and national level can play to address EU's broad policy priorities and

¹

²

on the needs to integrate new Research Infrastructures in strategic areas to enhance R&I capacities in Europe. RIs, as highlighted in the ESFRI White Paper, have the potential to contribute to local and regional socio-economic development by triggering the creation and playing a central role in knowledge innovation hubs. In this context, closely interacting with local businesses and industry, they support regional research priorities and the implementation of the Smart Specialization Strategies (S3), thus contributing to the alignment of priorities at EU level.

In the RI landscape, the European Open Science Cloud (EOSC) offers a horizontal, pan-European, inter-operable, federated ecosystem of standards, technologies and services, along with rules of engagement, which will enable and enhance seamless access to and reliable re-use of research outputs, i.e. data, software and other digital objects, included those generated or collected by other research infrastructures, supporting the whole research data life-cycle from discovery and mining to analysis, storage and management. High-speed connectivity (GÉANT) underpins the development of EOSC and provides fast, trusted and reliable connectivity for researchers in Europe and beyond. Activities to deliver the EOSC as a trusted virtual environment supporting Open Science and data and service-driven research will be co-designed with MS/ACs and stakeholders in the framework of the proposed EOSC European partnership. This will allow Europe to seize data-intensive research and innovation opportunities and enable breakthroughs at the crossroads of different disciplines by a broad interdisciplinary user community. The deployment of an EOSC will be ensured through a platform based on a federated core, enabling access to a wider ecosystem of data and services, as well as use of integrated HPC, Cloud, data, networks and AI resources.

EU Framework Programmes have so far fostered the opening at EU level of RIs to transnational users, enabling all researchers in Europe and beyond to have access to the best RIs they need for their research. These efforts have radically transformed the availability of state-of-the-art facilities for researchers, reinforcing Europe's strong research performance and its ability to react rapidly, for example in providing reference materials worldwide for the coronavirus outbreak. Up to now, this approach has been mainly science driven.

As European RIs have the potential to enhance society's long term and consistent problem-solving capacity, new efforts are now needed to ensure the provision of customised, impact-oriented RI services and resources to accelerate the transition towards a socially inclusive green and digital future and to support an effective and responsive health system as well as evidence-based policy-making. In this regard, Research Infrastructures can substantially contribute to the objectives of Horizon Europe clusters, missions and partnerships in Pillar II as well as to support its innovation dimension.

The RI work programme under Horizon Europe will address the global environmental, social and economic challenges, in line with the renewed ERA, which requires an explicit contribution of research and technology infrastructures into Europe's wider policy objectives, thus maximizing the contribution of science and technology to the needs of the society and increasing Europe's competitiveness.

To cope with new challenges and ensure leadership of Europe in frontier research, RIs need to be maintained at the forefront of technological developments. To this extent, the RI work programme will support the development of off-the-shelves cutting-edge scientific instrumentation, software and methods. These developments, carried out in cooperation with industry, through co-creation, will advance the industrial technological level in Europe and lead to breakthrough technological and societal innovation.

Training for RI users, as well as strengthening the RI scientific and technical competencies of staff, will underpin all the activities implemented under the RI work programme, thus contributing to the education and employment opportunities of the next generation of researchers, technologists and high level science managers. A well-functioning RIs landscape and its continuous evolution and upgrade will make the ERA attractive for researchers and talents from all over the world.

The Research Infrastructure work programme is structured around the following four Destinations:

- **Destination #1: Developing, consolidating and optimising European RIs landscape, maintaining global leadership** to contribute to a strong, excellent and impactful European Research Area, by reinforcing RI capacities in Europe, their role at the global level and the policy-making in this field;
- **Destination #2: Enabling an operational, open and FAIR EOSC ecosystem**, aiming at delivering a “Web of FAIR Data and Services” for Science: a trusted virtual environment supporting Open Science, based on key horizontal core functions, with their corresponding e-infrastructures, and service layers accessible to researchers across disciplines throughout Europe;
- **Destination #3 RI services to support health research, accelerate the green and digital transformation, and advance frontier knowledge**, with a focus on the provision of RI services to enable R&I addressing major societal challenges, notably in health, in support of the green and digital transformation and ensuring resilience to crises as well as to support curiosity-driven research and advancement of frontier knowledge in large scientific domains;
- **Destination #4 Next generation of scientific instrumentation, tools and methods and advanced digital solutions**, to enable new discoveries and keep Europe’s RIs at the highest level of excellence, while paving the way to innovative solutions to societal challenges and new industrial applications, products and services;
- **Destination #5 Network connectivity in Research and Education – Enabling collaboration without boundaries**, providing high-bandwidth networks and network services to interconnect researchers, data and computing resources in a non-discriminatory way regardless of the location of the users and the resources to allow scientists to conduct excellent research.

DESTINATION 1 – DEVELOPING, CONSOLIDATING AND OPTIMISING EUROPEAN RESEARCH INFRASTRUCTURES LANDSCAPE, MAINTAINING GLOBAL LEADERSHIP

Over recent years, the European Commission, Member States (MS) and Associated Countries (AC) have been closely collaborating, in particular within the European Strategy Forum on Research Infrastructures (ESFRI), to develop an integrated and efficient ecosystem of research infrastructures (RIs) in Europe, which encompasses single-sited facilities, distributed facilities integrating resources across the European Research Area, as well as networks of national facilities and which serves researchers and engineers in all S&T fields, from basic to applied research. To facilitate integration and pooling of resources for the development of new capacities, a legal instrument has also been developed at European level, the European Research Infrastructure Consortium (ERIC) that provides favourable conditions for the establishment and operation of large European infrastructures among several MSs and ACs as well as third countries. While Member States remain central in the development and financing of public RIs, the Union and ESFRI play a catalysing and leveraging role in this field.

The challenges for the near future are to consolidate and optimise the European Research Infrastructure landscape and enhance its capacity to support frontier research and address the emerging and new scientific and societal objectives associated with the transition towards a sustainable and resilient Europe. In addition, there is the need to define an effective and sound RI strategy in Europe, in close cooperation with ESFRI, MSs and ACs, which is complemented by and interlocks with the long-term ambition of creating an integrated Technology Infrastructure (TI) landscape, the latter is supported in Pillar II of Horizon Europe Programme (HE). Such a strategy would also help in exploiting synergies between RI and TI financed from Horizon and massive investments in infrastructures from ERDF.

Destination 1 aims to create a world-leading coherent, agile and attractive RI landscape in Europe, by reducing its fragmentation at European, national and regional level, ensuring coordination of efforts and fostering alignment of priorities among MSs and ACs, connecting RIs to the European Open Science Cloud (EOSC), and which is able to support national and regional R&I ecosystems. The support to a European strategy for Research Infrastructures as well as activities to enhance the role of RIs for international cooperation and science diplomacy will also be covered under this Destination.

Expected impact

Proposals for topics under this Destination should set out a credible pathway to contributing to several of the following expected impact:

- Disruptive research and breakthrough science and innovation through cutting-edge, interconnected and sustainable Research Infrastructures;
- Strengthened scientific excellence and performance and efficiency of the European Research Area, increasing its attractiveness to researchers from all over the world;

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

- Coordinated research infrastructure capacity among countries and regions, also by exploiting possibilities given by the smart specialisation processes;
- Reinforced R&I capacities enabling systemic changes needed for a truly transformative societal and economic recovery and a strengthened resilience of critical sectors, as outlined in the Recovery Plan;
- Improved European response, in cooperation with international players, to emerging socio-economic and related scientific and technological challenges at global level.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2021	2022	
HORIZON-INFRA-2021-DEV-01	7.80		23 Sep 2021
HORIZON-INFRA-2021-DEV-02	42.50		13 Jan 2022
HORIZON-INFRA-2022-DEV-01		30.00	24 Mar 2022
Overall indicative budget	50.30	30.00	

Call - Developing, consolidating and optimising European Research Infrastructures to maintain global leadership (2021)

HORIZON-INFRA-2021-DEV-01

Conditions for the Call

Indicative budget(s)³

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁴	Number of projects expected to be funded
		2021		
Opening: 08 Jun 2021 Deadline(s): 23 Sep 2021				
HORIZON-INFRA-2021-DEV-01-01	CSA	2.50	1.50 to 2.50	1
HORIZON-INFRA-2021-DEV-01-02	CSA	1.50	0.80 to 1.50	1
HORIZON-INFRA-2021-DEV-01-03	CSA	1.50	0.80 to 1.50	1
HORIZON-INFRA-2021-DEV-01-04	CSA	2.00	1.50 to 2.00	1
HORIZON-INFRA-2021-DEV-01-05	CSA	0.30	Around 0.30	1
Overall indicative budget		7.80		

General conditions relating to this call

<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.

³ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁴ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex F.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-DEV-01-01: Support to the European Strategy Forum on Research Infrastructures

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 1.50 and 2.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- enhanced efficiency, impact and visibility of ESFRI strategy and actions;
- better structured and strengthened European research infrastructure ecosystem;
- reinforced global competitiveness of the European Research Area;
- coordination and alignment of EU and national priorities for RIs.

Scope: The European Strategy Forum on Research Infrastructures (ESFRI) brings together policy makers, funding bodies and the scientific community to identify investment priorities for pan-European research infrastructures as well as foster their implementation, sustainability and impact. A comprehensive and efficient support structure is essential for the effective execution of ESFRI tasks and activities.

In this respect, proposals should support ESFRI in carrying out the following activities:

- development and publishing of the ESFRI Roadmap;
- development and execution of the ESFRI communication and outreach strategy, including organisation of ESFRI-led conferences and outreach events;
- strengthen ESFRI analytical capacity, including through the use of external expertise in support of ESFRI policy and the ESFRI Roadmap processes;
- effective evaluation and monitoring of research infrastructures on the ESFRI Roadmap through appropriate ICT and analytical tools;
- fostering cooperation, exchange of experiences and good practices between the research infrastructures, their managers and stakeholders, as well as the funding bodies, including managing authorities of Cohesion policy programmes and policy makers;
- ensuring cooperation of ESFRI with the EOSC as well as with any other relevant bodies and stakeholders at European or international level.

HORIZON-INFRA-2021-DEV-01-02: Strengthen the bilateral cooperation on research infrastructures with Africa: improving the knowledge base on climate change in Africa

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 0.80 and 1.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 1.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: Legal entities established in non-associated third countries may exceptionally participate as members of the consortium in this Coordination and support action.

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- contribution to the new Commission strategy with Africa, notably to the following specific objectives: maximise the benefits of the green transition and minimise threats to the environment in full compliance with the Paris Agreement; rapidly enhance learning,

knowledge and skills, research and innovation capacities (with attention to female and young researchers);

- enhanced research capacities in Africa for climate change observation;
- enhanced Euro-African cooperation in R&I on measurements for climate change observation.

Scope: This topic aims at fostering EU-Africa cooperation to enhance climate (including Green House Gas and Short Lived Climate Forcers – GHG and SLCF) observation capacity across Africa. EU-Africa cooperation in the field of GHG observation will also include sharing of good practices and experiences to facilitate the development of a strategic approach for structuring R&I capacities at pan-African level. Particular attention should be given to tropical and sub-tropical Africa, which are currently the least covered regions in terms of climate observation. The participation of African partners is mandatory.

Proposals should address all following aspects:

- establish a concept for a Pan-African climate observation RI including the underlying data infrastructure and the related digital transformation. The potential contribution to the Global Earth Observation System of Systems (GEOSS) should be taken into account; attention should be paid to open and FAIR principles in data management policies.
- support the exchange of staff between several African countries and European Research Infrastructures to create expertise for the design, the governance and the operation of an integrated Pan-African RI for climate observation;

Proposals should build on existing cooperation activities between African and European countries and take into account the outcomes of previous and ongoing initiatives.

HORIZON-INFRA-2021-DEV-01-03: Transition to digital/remote research infrastructure service provision: lessons learnt, needs and best practices

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 0.80 and 1.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 1.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- increased resilience of research infrastructures during crisis;
- reduced ecological footprint of research infrastructure activities;
- wider access to research infrastructures and enlargement of their user base;

Scope: The provision of digital and remote research infrastructure services has proved its effectiveness during the COVID-19 emergency/lockdown. Such an approach would also contribute to a sustainable and effective ecosystem of research infrastructures, and, more in general, to a more sustainable society.

Building on the resilience strategies and approaches developed during the COVID-19 emergency by research infrastructures in Europe, proposals under this topic should adopt a broad approach, covering a wide range of different research infrastructures in many fields and address the following aspects:

- investigate good practices, strategies and lessons learned as well as needs, risks and threats and further technological developments necessary to support the transition to digital/remote research infrastructure service provision;
- identify solutions, technologies and software enabling secure remote control of instrumentation and measurement as well as strategies for providing support to remote users;
- develop guidelines to foster the transition to a digital/remote provision of research infrastructure services.

HORIZON-INFRA-2021-DEV-01-04: Support to National Contact Points (NCPs) for Research Infrastructures

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 1.50 and 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- improved professionalisation/skills of NCPs across Europe, helping to simplify access to Horizon Europe calls, lowering the entry barriers for newcomers, and raising the average quality of proposals submitted;
- harmonised and improved trans-national cooperation between NCPs;
- increased awareness across the research communities about the opportunities for access to research infrastructures offered by the Horizon Europe;
- strengthen the links between research infrastructures and smart specialisation strategies;
- seek complementarities between ESIF funded research infrastructures and research infrastructures funded under the Framework Programme.

Scope: Proposals should aim to facilitate trans-national co-operation between National Contact Points (NCPs) with a view to identifying and sharing good practices and raising the general standard of support to programme applicants.

Proposals should address issues specific to research infrastructures, such as the promotion of trans-national and virtual access opportunities, including specific activities targeting widening countries, and the awareness of the access provision rules. Cooperation with other policy and international cooperation oriented measures for research infrastructures (such as financed by ERDF) and synergies with other NCPs networks is encouraged. Proposals should build on the past experience and achievements gained in the Horizon 2020 grants.

The consortium should have a good representation of experienced and less experienced NCPs. Special attention should be given to enhancing the competence of NCPs, including helping less experienced NCPs rapidly acquire the know-how built up in other countries.

Proposals should cover the whole duration of Horizon Europe

HORIZON-INFRA-2021-DEV-01-05: Support to the e-Infrastructure Reflection Group (e-IRG)

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 0.30 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 0.30 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	The criteria are described in General Annex D. The following exceptions

	<p>apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following outcomes:

- cross-disciplinary and independent policy advice on digital matters related to EOSC and the digital transformation of the European Research Area;
- a more inclusive e-Infrastructure ecosystem, well coordinated with the ESFRI thematic clusters;
- improved coordination among National Open Science Clouds (NOSCs), National Research and Education Networks (NRENs), National HTC/Grid Infrastructures (NGIs) and all other national actors with national/pan-European links;

Scope: The e-Infrastructure Reflection Group (e-IRG) brings together representatives from policy makers, funding bodies and the scientific community from the Member States and Associated Countries to provide advice on policy-making towards inclusive, federated, user-driven and resilient e-Infrastructures and connected services.

Proposals should support e-IRG members in carrying out the following activities:

- strengthen e-IRG analytical capacity, including through the use of external expertise in support of e-IRG policy documents;
- developing and publishing policy papers, providing complementary advice and recommendations in the development of the e-Infrastructure area;

- developing and implementing the e-IRG communication and outreach strategy, and disseminating the results throughout the European Research Area;
- liaising with ESFRI to jointly underpin the interworking of e-Infrastructures with the ESFRI thematic clusters;

Following the setup of new constructs in the European landscape, notably the EOSC Association and the EOSC European Partnership, the e-IRG will conclude its work in the transitional period of 2021-2022 whereafter its expertise should assimilate to the relevant operational entities in Europe.

Call - Developing European Research Infrastructures to maintain global leadership (2021)

HORIZON-INFRA-2021-DEV-02

Conditions for the Call

Indicative budget(s)⁵

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁶	Number of projects expected to be funded
		2021		
Opening: 30 Sep 2021 Deadline(s): 13 Jan 2022				
HORIZON-INFRA-2021-DEV-02-01	CSA	35.00	1.50 to 3.00	12
HORIZON-INFRA-2021-DEV-02-02	CSA	7.50	1.00 to 1.50	5
Overall indicative budget		42.50		

General conditions relating to this call

<i>Documents</i>	The documents are described in General Annex E.
------------------	---

⁵ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁶ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex E.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-DEV-02-01: Preparatory phase of new ESFRI Research Infrastructure projects

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 1.50 and 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 35.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: Legal entities established in non-associated third countries may exceptionally participate as members of the consortium in this Coordination and support action.

Expected Outcome: Project results are expected to contribute to several of the following expected outcomes:

- structuring effect on ERA;
- the scientific excellence of the European landscape of sustainable RI enhances problem-solving capacities to address challenges in science, industry and society;

- solid ground for the decision making on new research infrastructures, is available to MS/ACs, their funding bodies and other relevant stakeholders (e.g.: international organisations, third countries; foundations; etc.);
- long-term perspective for RI investments;
- consistent and well-functioning European research infrastructures ecosystem through the development of synergies and complementarities between new and existing research infrastructures, including technology infrastructures and infrastructures financed by ERDF.

Scope: This topic supports the preparatory phase of new ESFRI Research Infrastructure Projects identified in the 2021 update of the ESFRI Roadmap. These ESFRI projects have been selected for the excellence of their scientific case and for their strategic importance for the European Research Area and the structuring of the European research infrastructure ecosystem.

Proposal consortia should involve all the stakeholders necessary to move the project forward, to take the decisions, and to make financial commitments, before construction can start (including, but not limited to, national/regional ministries/governments, research councils or funding agencies from the countries that have already declared their commitment in the application to ESFRI). Operators of research facilities, research centres, universities, and industry may also be involved whenever appropriate.

Proposals for research infrastructure preparatory phases will tackle all key questions concerning legal, financial and technical issues leading to the establishment of a new research infrastructure and ensuring commitment of Member States/Associated Countries to their long-term operation and use in all fields of science.

In this respect, proposals should address all following aspects:

- the development of legal and financial frameworks/plans relating to the setting-up, construction, operation and decommissioning of the research infrastructure as well as its Governance structure; the complementarities between national and EU instruments (such as the European Structural and Investment Funds or the European Investment Bank) and/or innovative financing solutions (e.g.: pre-commercial procurements; public-private partnerships);
- the preparation of legal and financial agreements, including site, governance, internal rules, financing of the new research infrastructures. These are deliverables that should be finalised before the end of the project (e.g.: through a Memorandum of Understanding; a 'signature-ready' document for the setting-up and the actual implementation of the research infrastructure);
- the establishment of plans for logistics and human resources management, in relation to the construction and future operation, including RI service provision as well as for an

efficient data curation and preservation and for the provision of access to data collected or produced by the future infrastructure, in line with the FAIR principles;

- the technical challenges concerning the development, transfer of knowledge and implementation of key RI technologies and the completion of the final technical design of the infrastructure;
- the development of plans for the provision of RI services to identified scientific user communities;
- the relevance of the RI for science and society, including its socio-economic impacts at local/regional level and links with the smart specialisation strategies at regional level.

Environmental (including climate-related) impacts as well as the optimisation of resource and energy use should be integrated in the Preparatory phase of new research infrastructures.

Proposals should explain any synergies and complementarities with previous or current EU grants.

HORIZON-INFRA-2021-DEV-02: Consolidation of the research infrastructure landscape – Individual support for ESFRI projects

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 1.00 and 1.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: Legal entities established in non-associated third countries may exceptionally participate as members of the consortium in this Coordination and support action.

Expected Outcome: Project results are expected to contribute to several of the following expected outcomes:

- enhanced ERA excellence and attractiveness;
- consistent and well-structured research infrastructures ecosystem in Europe;

- solid Member States/Associated Country engagement in fully-fledged pan-European research infrastructures;
- long-term perspective for investments in research infrastructures;
- synergies and complementarities between new and existing research infrastructures, including technology infrastructures and infrastructures financed by ERDF.

Scope: This topic targets the research infrastructure projects retained in the 2016 ESFRI Roadmap, for the excellence of their scientific case and for their strategic importance for the European Research Area and the structuring of the European research infrastructure ecosystem.

The recent ESFRI Monitoring exercise carried out for the update of the ESFRI Roadmap 2021 assessed the overall progress towards implementation of these 2016 ESFRI projects and highlighted a number of key aspects that could hamper their implementation and start of the operation phase.

Although these ESFRI projects have received EU funding for their preparatory phase and initial commitment from Member States/Associated Countries, the early stages of the research infrastructure life-cycle are particularly challenging, also considering additional difficulties linked to the COVID-19 pandemic. These ESFRI projects may suffer from the transition to the Horizon Europe new framework programme and the possible lack of opportunities for supporting their development as fully-fledged pan-European research infrastructures. Proposals are expected to specifically address the bottlenecks identified in the ESFRI Monitoring report and in the Report⁷ of the Commission High Level Group, and allow these ESFRI projects to enter into the implementation phase. The extent to which these critical issues are addressed will be considered in evaluating proposals.

Based on the recommendations stemming from these monitoring exercises, support can be provided for activities, such as enlargement of the membership; establishment of the governance structure; securing the funding; finalisation of the distributed architecture; development of ICT and data management solutions (including possible open access to data); development of access policies and users' strategies; consolidation of the international dimension; addressing staff and procurement related issues.

Proposal consortia should involve all stakeholders necessary to move the project forward and ensure financial commitments (including national/regional ministries/governments, research councils or funding agencies).

Proposals should explain any synergies and complementarities with previous or current EU grants. ESFRI projects currently benefitting from individual support under Horizon 2020 cannot apply to this topic.

7

Call - Developing European Research Infrastructures to maintain global leadership (2022)

HORIZON-INFRA-2022-DEV-01

Conditions for the Call

Indicative budget(s)⁸

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁹	Number of projects expected to be funded
		2022		
Opening: 10 Nov 2021 Deadline(s): 24 Mar 2022				
HORIZON-INFRA-2022-DEV-01-01	RIA	30.00	1.00 to 3.00	10
Overall indicative budget		30.00		

General conditions relating to this call	
<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and</i>	The criteria are described in General Annex

⁸ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>exclusion</i>	C.
<i>Procedure</i>	The procedure is described in General Annex F.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2022-DEV-01-01: Research infrastructure concept development

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 1.00 and 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 30.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%

Expected Outcome: Projects are expected to contribute to all the following expected outcomes:

- sound science cases for new research infrastructures, including expected scientific breakthrough, gap analysis and feasibility/design studies to support planning and decision making at the national level (e.g. funding bodies, governments) and at European level (e.g. ESFRI);
- a better alignment of the development of the research infrastructure landscape with the advancement of excellent science and frontier research;
- new services and access opportunities available to the research community, allowing to better tackle scientific and societal challenges.

Scope: This topic aims at supporting the development of new concepts for the next generation of research infrastructures of European interest¹⁰, single/multi sited, distributed or virtual, that none or few countries might individually be able to afford. All fields of research can be considered.

Major upgrades of existing infrastructures may also be considered if the end result is significantly transformative and equivalent to a new infrastructure concept.

Proposals for RI concept development will tackle all key questions concerning the technical and conceptual feasibility of new or upgraded fully fledged user facilities.

¹⁰

In this respect, proposals should address all following aspects:

- demonstrate relevance in relation to ERA, including to the existing landscape, and the advancement with respect to the state-of-art of the new infrastructure;
- highlight the research challenges the new research infrastructures will make possible to address, including at global level;
- indicate the gaps in the research infrastructure landscape the new infrastructure will cover and the synergies with existing infrastructures at European and global level, including those co-financed from other EU instruments (e.g.: Cohesion policy);
- indicate, when relevant, the potential impact of the new research infrastructure at regional level.

Proposals should also provide evidence that the project will effectively:

- identify technologies and develop research infrastructure architecture (e.g. single site or distributed, ...);
- identify scientific user communities (and their related needs) that will benefit from access to RI services, including scientific data and instrumentation, and develop the planning of research services to users;
- identify governance options and strategic approaches for institutional/stakeholders' commitment and engagement;
- develop initial financial plans for the RI construction (or major upgrades) and operation as well as preliminary ideas for long-term sustainability, including synergies with other funds and programmes (e.g.: ESIF);
- develop plans for an efficient data curation and preservation and for the provision of access to data collected or produced by the future infrastructure, in line with the FAIR principles.

Proposals considering just a new component of a research infrastructure are not in scope of this topic.

When relevant, environmental (including climate-related) impacts as well as the optimisation of resource and energy use should be integrated in the concept development of new research infrastructures.

DESTINATION 2 – ENABLING AN OPERATIONAL, OPEN AND FAIR EOSC ECOSYSTEM

The European Open Science Cloud (EOSC) is an ecosystem of research data and related services. It encompasses rules of engagement, standards, abstractions, technologies, and services, which will enable and enhance seamless access to and reliable re-use of FAIR¹¹ research outputs (i.e. data and other digital objects), including those generated or collected by other research infrastructures, and covering the whole research data life cycle from generation or discovery and mining to storage, processing, management, analysis, and re-use. The EOSC will contribute to the European Strategy for Data, including its thematic common interoperable data spaces, and the provision of secure and FAIR-enabling European cloud services.

EOSC development has been supported through a series of Horizon 2020 projects and an interim EOSC governance structure preparing the next stage of EOSC development for the period after 2020. These projects have contributed to the creation of a pan-European access mechanism; coordination of national activities for EOSC on-boarding; connection of European Research Infrastructures (e.g. ERIC and other world-class RIs) and existing e-infrastructures; initial development and operationalisation of the FAIR principles and a FAIR-compliant certification scheme for research data; the EOSC portal providing access to a range of services, guidelines and training; and the development and provision of a number of research-enabling value-added services, including distributed data processing and management (both public and commercial). From 2021, the EOSC partnership will help ensuring directionality (common vision and objectives) and additionality (complementary commitments and contributions) of the stakeholders involved.

Building on this progress, Destination 2 aims to continue to develop the European Open Science Cloud (EOSC) in a more cohesive and structured manner so that it becomes a fully operational enabling ecosystem for the whole research data lifecycle. This ecosystem includes FAIR research data commons (a.o. data, services, tools), based on key horizontal core functions, with corresponding e-infrastructures and service layers accessible to researchers across disciplines throughout Europe, leading to a “Web of FAIR Data and Services” for Science. The EOSC ecosystem will be the foundation for the setting up of a cross-cutting data space for Research and Innovation, as established in the European Strategy for Data.

Expected impact

Proposals for topics under this Destination should set out a credible pathway to contributing to several of the following expected impacts:

- Transforming the way researchers as well as the public and private sectors create, share and exploit research outputs (data, publications, protocols, methodologies, software,

11

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

code, etc.) within and across research disciplines, leading to better quality, validation, more innovation and higher productivity of research;

- Facilitating scientific multi-disciplinary cooperation, leading to discoveries in basic research and solutions in key application areas;
- Seamless access to and management of increasing volumes of research data following FAIR principles (that are open as possible) and other research outputs stimulating the development and uptake of a wide range of new innovative and value-added services from public and commercial providers
- Improving trust in science through increased FAIRness, openness and quality of scientific research in Europe, supported by more meaningful monitoring and better facilitators for reproducibility and validation of research results, and by improving pathways for the communication of science to the public.

All software developed under this destination should be open source, licensed under a CC0 or CC BY license or equivalent.

All projects that will be financed under this destination are expected to participate in concertation activities in the framework of the EOSC Partnership.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2021	2022	
HORIZON-INFRA-2021-EOSC-01	64.00		23 Sep 2021
HORIZON-INFRA-2022-EOSC-01		27.50	24 Mar 2022
Overall indicative budget	64.00	27.50	

Call - Enabling an operational, open and FAIR EOSC ecosystem (2021)

HORIZON-INFRA-2021-EOSC-01

Conditions for the Call

Indicative budget(s)¹²

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ¹³	Number of projects expected to be funded
		2021		
Opening: 08 Jun 2021 Deadline(s): 23 Sep 2021				
HORIZON-INFRA-2021-EOSC-01-01	CSA	7.00	Around 7.00	1
HORIZON-INFRA-2021-EOSC-01-02	CSA	4.00	Around 4.00	1
HORIZON-INFRA-2021-EOSC-01-03	RIA	10.00	Around 10.00	1
HORIZON-INFRA-2021-EOSC-01-04	RIA	18.00	3.00 to 5.00	4
HORIZON-INFRA-2021-EOSC-01-05	CSA	10.00	Around 10.00	1
HORIZON-INFRA-2021-EOSC-01-06	RIA	15.00	Around 7.00	1
HORIZON-INFRA-2021-EOSC-01-07	RIA		Around 8.00	1
Overall indicative budget		64.00		

General conditions relating to this call

<i>Documents</i>	The documents are described in General Annex E.
------------------	---

¹² The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

¹³ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex F.

Open Science practices and a digitally-skilled workforce

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-EOSC-01-01: Supporting an EOSC-ready digitally skilled workforce

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>

<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- availability of highly and appropriately skilled professionals enabling the practice of Open Science with adequate knowledge of standards, applications and tools and best practices for delivering, managing, re-using, sharing and analysing FAIR data, as well as other digital research objects;
- researchers are able to transform the way they carry out research and exploit research outputs, leading to better quality and more productivity of research;
- contribute to the Horizon Europe EOSC Partnership.

Scope: Development of new support material, curricula and learning pathways for researchers, data curators, and data stewards and new types of professionals. To ensure an efficient uptake and exploitation of data by Public Authorities (e.g. for evidence-based policy making), policy makers should also become skilled in data acquisition, management and analysis. Proposals should therefore cover the following activities:

- Engage with the relevant stakeholders at national and institutional level in order to co-create, promote, broker and ensure the recognition of digital career profiles specifically related to Open Science. This includes the development of quality assurance mechanisms for professional training and qualifications.
- Promote existing and develop new curricula (at undergraduate, PhD and professional level) that meet the demands of open and data-intensive science, and the establishment of advanced learning environments, in order to train the next generation of scientists, librarians and infrastructure professionals on topics such as the management and integration of diverse data flows and artificial intelligence for FAIR data management.
- Foster the development of a distributed pan-European user support network, supporting the collaboration of existing networks of competence and data curation centres, in order to provide expertise on storing, sharing and reusing digital outputs, as well as on the onboarding of EOSC services and the provision of open science resources.

- Support the development of a quality assurance and certification framework for learning material taking into account the life cycle of materials to ensure that training is up to date with technology and policy changes, as part of lifelong learning programmes.
- Promote the training of civil servants, policy makers and agencies, as well as their engagement with researchers, in order to foster the efficient uptake of relevant scientific data by public administration and encourage its use for evidence-based policy making, building on best practices where appropriate¹⁴.

Proposals should take into account and collaborate with the resulting project/s from the topic H2020-INFRAEOSC-03-2020¹⁵ and building on the results of the projects funded under the topic H2020-INFRAEOSC-05-2020¹⁶ on training, earmarking the necessary resources to do so. In addition, similar collaboration should be foreseen with the resulting grant/s from the topic HORIZON-INFRA-2021-EOSC-01-05. They should establish synergies with national and regional programmes on digital skills and training as well as with other parts of Horizon Europe (e.g. Marie Skłodowska-Curie) and other EU funding sources (e.g. DEP, Erasmus+), and policies (e.g. EHEA). They should be credible in that the necessary funds for hiring or continuing the employment of staff, such as “data curators and stewards” in universities and research performing institutions, have been ensured at institutional, regional or national level, as these funds are not to be provided by the Commission.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC.

HORIZON-INFRA-2021-EOSC-01-02: Supporting the development and coordination of activities of the EOSC Partnership

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	The criteria are described in General Annex D. The following exceptions apply:

¹⁴
¹⁵
¹⁶

	<p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- EOSC has a consolidated and engaged community across the European Research Area with an increasing number of users and service providers able to offer and consume resources based on the EOSC rules of participation;
- well-coordinated activities underpinned by a consistent monitoring framework contribute to the achievement of the EOSC Partnership objectives;
- effective business models are defined to guarantee future sustainability and development of EOSC as a key element of open science;
- facilitated access to information to and from all EOSC stakeholders across countries, institutions, networks and initiatives.

Scope: Support the development of an effective pan-European cooperation framework and a thriving EOSC ecosystem in which stakeholders from all parts of the European Research Area pull together in a strategic and coordinated manner to ensure the achievement of the EOSC Partnership objectives. Proposals should support the EOSC community at large by engaging and interacting with a large number of users and stakeholder communities, to monitor the uptake and (re)use of EOSC resources.

Proposals are expected to cover the following activities:

1. Further develop and update the Strategic Research and Innovation agenda (SRIA) for EOSC and corresponding detailed roadmaps in early consultation with the wider research community in Europe in full transparency and openness. The agenda should cover all aspects required for the development of the EOSC-Core, Minimum Viable EOSC and the future widening to the public and private sector as well as support the alignment of the contributions to EOSC at national, regional, institutional and scientific community level.
2. Facilitate an effective cooperation between and organise the concertation of EOSC-relevant projects, monitoring their results and ensuring that relevant outcomes are identified and serve as a baseline for future developments. Beyond EOSC-relevant projects, proposals should engage with the community through the organisation of a Stakeholders forum targeting research communities across disciplines and countries, including the ESFRI clusters, national and regional infrastructures and the long tail of science.
3. Based on the work already undertaken in the context of the EOSC Partnership and of the EOSC Landscape Working Group¹⁷, consolidate, continuously update and monitor EOSC key performance indicators (KPI's), investments and FAIR data production and management, in order to assess the success of EOSC and its implementation at the different levels (national, regional, institutional and scientific community). The monitoring activities should also consider the results of the European Research Data Landscape study launched by the European Commission¹⁸ in order to provide a living picture of the research data ecosystem in Europe.
4. Develop a cooperation framework to implement the EOSC rules of participation.
5. Effectively cooperate and establish links with other selected Horizon Europe Partnerships as well as with other relevant initiatives, including sectoral data spaces. Participate and represent EOSC Partnership stakeholders in international cooperation activities to foster global Open Science commons avoiding any overlap with existing efforts by the communities.
6. Develop and test cost models and future business models for a lasting long-term sustainability framework, building on the work performed by the EOSC Sustainability Working Group¹⁹ and the studies already conducted as well as on the findings in this area of EOSC related projects.

The selected project will be expected to align with the EOSC Partnership. Proposals should involve and be driven by one or more representatives of the relevant actors of the field, in particular those directly involved in the EOSC Partnership.

¹⁷ <https://www.eoscsecretariat.eu/working-groups/landscape-working-group>

¹⁸ Reference to be included.

¹⁹ <https://www.eoscsecretariat.eu/working-groups/sustainability-working-group>

Supporting EOSC-Core: Enabling access to the Web of FAIR data and services

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-EOSC-01-03: Deploying EOSC-Core components for FAIR

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- European researchers can find, access and re-use an increasing amount of research outputs across borders and disciplines through state-of-the-art technologies underpinning discoverability and interoperability of research outputs;
- contribute to the Horizon Europe EOSC Partnership.

Scope: Enable the enforcement and implementation of the EOSC PID policy²⁰ by developing tools, processes and additional infrastructure required to support use of Persistent Identifiers (PIDs) to a maximal extent, for both the management and analysis of data, and also the publication, curation and tracking of research outputs. This shall include a PID ‘meta resolver’ for EOSC or tools to support the alignment of PID infrastructure with the EOSC PID Policy. In addition, and building on community efforts on metadata and ontologies and on the work developed under topic HORIZON-INFRA-2021-EOSC-01-05, this topic aims at ensuring the adoption and use of coherent metadata frameworks and deploying a common dataset search to enhance discovery via EOSC. Proposals under this topic shall also cover other research outputs, such as software, developing services based on open standards and common practices adopted by the different disciplines.

Proposals should address all of the following activities:

- Contribute to the consolidation of an interoperable ecosystem of PID Infrastructures based on open specification and standards to support machine actionability and offer sufficient flexibility and capacity e.g. by developing a common PID ‘meta resolver’ and standardised interfaces and open protocols for exchanging information on PIDs to support the creation and use of a PID Graph²¹.
- Develop EOSC PID services to address a wide variety of applications appropriate to community needs.
- Develop schemas and APIs based on open specifications and metadata framework as well as related crosswalks for improved discovery and interoperability.
- Develop and deploy a flexible and scalable federated search service across the EOSC repositories, exploiting the aforementioned building blocks (PIDs resolution, APIs and metadata schemas). Such service should ensure customisability of querying (e.g. interfaces, APIs and scripts) and, when possible, ranking of queries results according to FAIRness of data and other prioritisations responding to the users’ needs.
- Develop services and tools to archive, reference, describe and cite research software, based on standards and common practices of the different disciplines.
- Develop services that build on metadata registries, starting from those that support communities in the uptake of metadata schemas and crosswalks and facilitate their

²⁰ Reference to be included

²¹ The details of this will be further defined as part of the outcomes of the EOSC Architecture Working Group and the recommendations of the RDA Working Groups on PID Information Types and PID Kernel Information.

maintenance; services to validate data sources against metadata schemes and to monitor data sharing, notably across communities and disciplines, are also expected.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC. In particular, projects will need to be flexible in order to take into account and coordinate the technical work with the ongoing grants under topic HORIZON-INFRA-2021-EOSC-01-05, earmarking the necessary resources to do so. They shall build on the EOSC PID policy from the PID Task force of the EB Architecture WG²² and FAIR WG²³ and should coordinate with the awarded grants under the topic H2020-INFRAEOSC-03-2020²⁴ and the future procurement activity under Other Actions²⁵.

HORIZON-INFRA-2021-EOSC-01-04: Innovative and customizable services for EOSC

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 3.00 and 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 18.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a</p>

²² <https://www.eoscsecretariat.eu/working-groups/architecture-working-group>

²³ <https://www.eoscsecretariat.eu/working-groups/fair-working-group>

²⁴ https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-infrastructures_en.pdf

²⁵ Reference to be included

	well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.
--	---

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- increased service offer and capabilities beyond the present landscape in addressing the current and anticipated needs of the research community at large;
- increased availability of (pre)operational services that can be customised and integrated in the existing workflows of researchers across different disciplines, facilitating the cross-disciplinary collaboration, reducing the time to results and increasing productivity.

Scope: The aim is to provide researchers with a set of highly innovative new services that would exploit, in a structural way, cloud-based EOSC technologies and European compute and data management capacities. The focus is on technologies that start with the baseline TRL 5-6, aiming to reach TRL7 or higher.

Proposals should cover the following activities:

- Development and improvement of existing pre-operational software, tools and open source services, aiming to be integrated to the service-based architecture offered through the EOSC;
- Iterative and inclusive development in close cooperation/co-design with the relevant user communities;
- Improving the TRL of the components and adding new features based on requirements from research communities, use of open source software and tools for wide availability and uptake;

The application range of these services for data intensive science is wide (e.g. automated extraction of information from scientific literature, experimentation, optimising experimental design, collection and analysis of heterogeneous and/or large-scale data, validation of data quality, repeatability and reproducibility in science, discovery and on-demand provisioning of open science resources and their reuse; storing, sharing and reusing research data, enabling secure data use and transactions, workflow management) making use of various enabling technologies, e.g. artificial intelligence and machine learning, natural language processing, automation, simulation, big data analytics or blockchain.

To be robust, customizable and scalable, all developments should be tested against 2-3 real life **use cases** from a variety of scientific domains. The projects should cooperate with other relevant and related projects and e-Infrastructures and large user communities. Joint use cases and testing across individual project boundaries are encouraged.

The services should be integrated in the EOSC core service platform²⁶ and proposals should include sufficient provisions to address the integration, including, appropriate IPR and licence agreements. The resources that the services will offer should be clearly identified in the proposals. The sustainability model for the long-term availability of services can rely on EOSC. Participation of industry players, including SMEs, is recommended for both the development and further exploitation of the project results.

Building with the scientific community a Web of FAIR data for open science

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-EOSC-01-05: Enabling discovery and interoperability of federated research objects across scientific communities

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>

²⁶

Reference to be included

	Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: The granting authority can fund a maximum of one project.

Expected Outcome:

Project results are expected to contribute to all the following expected outcomes:

- improved findability, accessibility, interoperability and re-usability (“FAIRness”) of data and other research outputs by coordinating the implementation of frameworks and the alignment of FAIR data practices on metadata, persistent identifiers, etc.;
- wide uptake of and compliance with FAIR data principles and practices by national and European research data and metadata providers and repositories, leading to the development of the Web of FAIR data and related services;
- contribute to the Horizon Europe EOSC Partnership.

Scope: Align and support the development and implementation of common EOSC methodologies, open standards and frameworks to ensure wide uptake and coherent implementation of the FAIR principles, to support the FAIRness of the research digital objects made accessible through EOSC.

Proposals should cover all of the following areas and activities:

a) Persistent identifiers:

- Support the creation of a coordination mechanism of EOSC PID Service Providers to respond to the needs of research and Open Science, in a way that ensures sustainability, continuity of services and innovation.
- Promote the alignment of PID infrastructures in line with the EOSC PID Policy.
- Support the continuous standardisation of resource types and promotion of new practices to expand the range of identifiable objects e.g. instruments, services, organisations and software.

b) Metadata and ontologies:

- Support the development of governance structures at discipline level for coordinating the work on metadata and ontologies and ensure overall coordination within EOSC.
- Develop EOSC guidelines for a minimum metadata description for data discovery and metadata exchange, based on existing or emerging metadata schemas and tools.

- Develop EOSC guidelines for common standards to archive, run, reference, describe and cite research software.
- Collect information about existing metadata schemas, ontologies, crosswalks, and tools for metadata management and disseminate best practices amongst EOSC-relevant repository operators.
- Support all research communities to develop and adopt disciplinary standards, to generate clear and precise definitions for the terms they use, and to consolidate common metadata and data schemata for use in the EOSC context. Provide support to make these definitions publicly available and referenceable by persistent identifiers for machine actionability.
- In carrying out the previous actions, proposals should take into account existing initiatives by established initiatives and organisations.

c) Metrics, certification and guidelines for FAIR:

- Support research communities to implement existing or emerging metrics and make use of the FAIR data maturity model²⁷ to develop assessment methods or to assess FAIR digital objects and iterate based on testing. Building on previous and current developments, for instance, by the ESFRI clusters, proposals should engage with new communities to accelerate the uptake of these best practices broadly.
- Translate FAIR guidelines and frameworks to make them applicable to other digital objects, such as software, code, data management plans, protocols, etc.

d) Interoperability:

- Agree and implement a common set of rules to ensure data and services within EOSC support interoperability.
- Promoting the use of already existing common technical specifications, standards or infrastructure, endorsed by the various scientific communities.
- Foster alignments with existing frameworks and standards from non-scientific large data sources of interest for research and, where appropriate, promote in such context the implementation of the FAIR principles as means to improve interoperability.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC. In particular, proposals should build on the work developed by the FAIRsFAIR project²⁸ and by the FAIR Working Group²⁹ of the EOSC Executive Board. In addition, they should map and incorporate all relevant outputs, services

²⁷ Reference

²⁸ <https://www.fairsfair.eu/>

²⁹ <https://www.eoscsecretariat.eu/working-groups/fair-working-group>

and results produced by the ESFRI Cluster projects, e-Infrastructures and the national initiatives in the above mentioned areas, as well as establish the necessary coordination and bidirectional feedback mechanism with the projects resulting from the Horizon Europe topics under this Work Programme HORIZON-INFRA-2021-EOSC-01-06, HORIZON-INFRA-2021-EOSC-01-07 and HORIZON-INFRA-2022-EOSC-01-03 that will incorporate FAIR to challenge driven use cases. In addition, this topic should aim to develop concrete proposals for the cross-linking of EOSC with the other envisioned European data spaces foreseen in the European strategy for data (COM/20202/66 final). Finally, projects will need to be flexible in order to take into account and coordinate the technical work with the ongoing grant/s under topic HORIZON-INFRA-2021-EOSC-01-03, earmarking the necessary resources to do so.

HORIZON-INFRA-2021-EOSC-01-06: FAIR and open data sharing in support of European preparedness for infectious diseases

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million. ³⁰
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex</p>

³⁰

This budget is shared with topic HORIZON-INFRA-2021-EOSC-01-07

	<p>I to the Grant Agreement.</p> <p>Beneficiaries must deposit the digital research data generated in the action in a trusted repository federated in the European Open Science Cloud (EOSC) in compliance with EOSC requirements.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- European researchers fighting the spread of infectious diseases, e.g. COVID-19 and emerging infectious diseases are able to store, share, access, analyse, process and cite research data and other research digital objects across disciplines and national borders and to collaborate with global partners;
- federation of viral and human infectious disease data from national centres enables pan-European and global sharing and combination of research and clinical data, thereby catalysing and accelerating research advances to combat the COVID-19 pandemic and prepare for future outbreaks;
- linking of FAIR data and metadata on SARS-CoV-2 and COVID-19, on other related viruses and diseases, and on socio-economic consequences, across research fields, from omics, clinical, and epidemiological research, to Social Sciences and Humanities accelerate infectious disease research, surveillance and outbreak investigation;
- contribute to the Horizon Europe EOSC Partnership.

Scope: This topic responds to the need to enable researchers, health care professionals and society at large to share, access, analyse, link and process research data and other research digital objects across disciplines and national borders in response to the COVID-19 pandemic. As seen with other infectious disease outbreaks, such as haemorrhagic fevers, COVID-19 will likely remain a societal challenge beyond the immediate outbreak, considering its destructive and disruptive impact on healthcare systems and the economy. Provision of comprehensive open data on infectious agents and diseases during outbreaks support evidence-based quality assessment - across scientific, medical, public health and policy domains and promotes reproducibility of research outcomes. European readiness for future pandemics is of utmost importance and should be addressed to ensure the preparedness of infrastructure building on already existing frameworks for broader use such as the EOSC.

Proposals should facilitate and accelerate the access to, and the linking of data and metadata on SARS-CoV-2 and COVID-19, including through the European COVID-19 Data Portal³¹, the Versatile Emerging infectious disease Observatory (VEO) and other relevant initiatives. It

³¹ <https://www.covid19dataportal.org>

should further expand to other relevant infectious diseases, epidemiological, clinical, and socio-economic data, spanning from molecular biology to other disciplines, including Social Sciences and Humanities. A One-Health approach building on the latest technological advances, covering epidemics and epizootics is encouraged. Particular importance should be given to the need of federating data between national centres to effectively manage data protection.

To ensure the interoperability of the data, community best practices and community-endorsed standards and community metadata schemas, as well as PIDs, should be used. Newly implemented domain specific research data solutions from the project should feed into the work of established international initiatives. Particular attention should be given to the harmonisation and management of meta-data and sample- identifiers to ensure interoperability of national and regional efforts into the EOSC and the long-term cataloguing of data resources within the EOSC.

A strong focus should be placed on exploiting and contributing to EOSC capabilities for data access and federation as well as relevant standards and policies for managing, sharing and reusing research data from different disciplines. As such, the proposals should demonstrate the value of sharing FAIR research data that is as open as possible through EOSC, help consolidating data-sharing and data management practices across the Member States, Associated Countries and beyond, and provide feedback to the EOSC Partnership for the future evolution of EOSC.

Proposals should build on the European COVID-19 Data Platform³² and support the creation of national and regional structures to coordinate and promote in-country actions, such as to build surveillance and rapid-response capabilities. Synergies with topic 'HORIZON-INFRA-2021-SERV-01-01: Research Infrastructure services for rapid research responses to infectious disease epidemics' should be sought from the outset to ensure that data generated from access to infectious disease services can be available for re-use through the EOSC. Proposals should consider already established national and European infrastructures and build on existing efforts, including ESIF projects. Proposals should seek to establish synergies with the European Health Data Space as well as relevant initiatives under Digital Europe.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC. In particular, in areas such as data interoperability, metadata and vocabularies or the use of persistent identifiers, proposals should coordinate the work and establish a feedback mechanism with the awarded proposal/s from the topic HORIZON-INFRA-2021-EOSC-01-05 in order to ensure alignment with EOSC policies and to identify common useful tools and resources as well as relevant data repositories that comply with EOSC guidelines. Proposals are also expected to engage and/or align where appropriate with projects funded under topic HORIZON-INFRA-2021-EOSC-01-07 for a synergetic development of the area of Health within EOSC.

³² <https://www.covid19dataportal.org>

Grants awarded under this topic should also cooperate with the actions awarded under topic HORIZON-INFRA-2021-SERV-01-01 to identify and better exploit related synergies, share results and to avoid overlaps. To this extent, proposals should foresee dedicated activities and earmark appropriate resources.

HORIZON-INFRA-2021-EOSC-01-07: FAIR and open data sharing in support of cancer research

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 8.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million. ³³
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p> <p>Beneficiaries must deposit the digital research data generated in the action in a trusted repository federated in the European Open Science Cloud (EOSC) in compliance with EOSC requirements.</p>
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply:

³³ This budget is shared with topic HORIZON-INFRA-2021-EOSC-01-06

	The granting authority can fund a maximum of one project.
--	---

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- researchers, healthcare professionals, cancer patients and survivors contributing to cancer research regularly interact with EOSC to store, share, access, analyse and process research data and other research digital objects from their own discipline, across disciplines and national borders;
- open and FAIR data are the new norm for research conducted under this mission area;
- EU-wide sharing of research data relevant to this area is shown to be a critical mechanism to facilitate cancer research across Member States and Associated Countries;
- contribute to guaranteeing safety of patients' data while at the same time contributing to research advancement. Engaging with patients/survivors in the sharing, access and use of data;
- EOSC grows into a trusted research and innovation data space and service platform in Europe that supports the interdisciplinary community involved in this mission area;
- contribute to the Horizon Europe EOSC Partnership and other relevant partnerships related to cancer research.

Scope: Reuse of research, clinical, epidemiological and socio-economic data within and across disciplines and borders require openness, infrastructure capacity, better handling, careful management, machine actionability and seamless access to services all along the data life cycle. The Horizon Europe mission areas recognise upfront that providing access to data, knowledge and digital services through federated infrastructures is a key enabling condition for success. In addition, *European Partnerships* tackling complex societal challenges through multi-disciplinary approaches are facing important challenges in the European R&I systems, including poor data interoperability. In recent years, different scientific communities have started developing '*thematic clouds*' or '*data spaces*' within their domain of research and innovation. The EOSC provides the enabling framework to share, connect and upscale best practices and services by the communities to implement FAIR principles for (open, when possible) data sharing and management. The development of this framework is advancing rapidly as EOSC enters its second phase of implementation. Access to an initial EOSC federation of research infrastructures and their services is being consolidated and concepts such as FAIR data management and FAIR-by-design digital research outputs (data, publications, software, code, protocols, etc.) become more prominent.

The overall objective of this topic is to accelerate research and innovation under this mission area through better access, management, interoperability and reuse of digital information, to be achieved by using and integrating EOSC resources ranging from EOSC federated infrastructures, services and data to guidelines, best practices, tools and metrics for the

management of FAIR and open data. This should be achieved through cross-domain, strategic use cases of direct relevance to the mission areas and the European Partnerships supporting this mission area on cancer.

The use cases should demonstrate the value of sharing FAIR and open research data, help to establish data sharing and management practices within the involved communities and across the Member States and Associated Countries, leveraging European research infrastructures and e-Infrastructures. The use cases should provide feedback to the EOSC Partnership on the desired future evolution of EOSC. Special attention shall be put on aspects of data harmonisation, integration of data collection, data quality assurance, data privacy and security, big-data analysis and machine learning methods, as well as on the socio-economic dimension of the use case. Proposals should also foster the creation of user environments that researchers in this field can then use in order to seamlessly interact with digital information in the framework of the EOSC ecosystem.

Proposals shall foresee activities to collaborate with relevant European Partnerships. Synergies with HE Cluster 1 activities and other relevant initiatives, including ESIF projects are welcome. The activities shall contribute to the consolidation of a European Health Data Space which is well articulated with the EOSC. They shall build on results of relevant Horizon 2020 projects, including those providing pilots/models for linking clinical data and samples to cancer research, on initiatives for cancer such as the European Network of Cancer Registries, the European Reference Networks, the iPAAC Joint Action and on the lessons learned from the ongoing European COVID-19 Data Platform and other initiatives in other disease areas. Proposers should consider already established ESFRI research infrastructures and efforts by relevant ESFRI cluster projects.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC. In particular, in areas such as data interoperability, metadata and vocabularies, the use of persistent identifiers or Authentication and Authorisation Infrastructure (AAI), proposals should coordinate and establish a feedback mechanism with the awarded proposal/s from the topic HORIZON-INFRA-2021-EOSC-01-05 in order to ensure alignment with EOSC policies and to identify common useful tools and resources as well as relevant data repositories that comply with EOSC guidelines. Proposals are also expected to engage and/or align where appropriate with projects funded under topic HORIZON-INFRA-2021-EOSC-01-06 for a synergetic development of the area of Health within EOSC.

Grants awarded under this topic should also cooperate with the actions awarded under topic HORIZON-INFRA-2021-SERV-01-02 to identify and better exploit related synergies, share results and to avoid overlaps. To this extent, proposals should foresee dedicated activities and earmark appropriate resources.

Call - Enabling an operational, open and FAIR EOSC ecosystem (2022)

HORIZON-INFRA-2022-EOSC-01

Conditions for the Call

Indicative budget(s)³⁴

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³⁵	Number of projects expected to be funded
		2022		
Opening: 10 Nov 2021 Deadline(s): 24 Mar 2022				
HORIZON-INFRA-2022-EOSC-01-01	RIA	6.00	2.00 to 3.00	3
HORIZON-INFRA-2022-EOSC-01-02	RIA	4.50	Around 4.50	1
HORIZON-INFRA-2022-EOSC-01-03	RIA	15.00	6.00 to 7.50	2
HORIZON-INFRA-2022-EOSC-01-04	CSA	2.00	Around 2.00	1
Overall indicative budget		27.50		

General conditions relating to this call	
<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and</i>	The criteria are described in General Annex

³⁴ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

³⁵ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>exclusion</i>	C.
<i>Procedure</i>	The procedure is described in General Annex F.

Open Science practices and a digitally-skilled workforce

Proposals are invited against the following topic(s):

HORIZON-INFRA-2022-EOSC-01-01: Services and tools to underpin a research assessment system that incentivises open science practices

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 2.00 and 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- enable a rewards and recognition system based on a new generation of (qualitative or quantitative) metrics and indicators³⁶, leading to a culture and system change that increases the quality and impact, the creativity and the transparency of and trust in science;
- establish a system of qualitative information based on community-led curation and annotations of research outcomes that feeds into a revamped rewards and recognition system;
- contribute to the Horizon Europe EOSC Partnership.

Scope: A coherent corpus of reports and recommendations³⁷ shows a broad consensus among researchers and policy makers that changes in the evaluation of research and researchers' performance are necessary in order to incentivise higher quality research, collaboration and open science practices.

This topic supports the development of EOSC-federated services and tools that allow the gathering and monitoring of information and data on the use and uptake of research outputs and of open science practices across borders and disciplines. Such tools and services are essential to collect the information to be used for next generation metrics³⁸, together with qualitative indicators, in an assessment system that valorises open science.

Services and tools should collect data on the different usages of research outputs such as data sets, models, software, etc., on the usage of EOSC services, research infrastructures, data platforms, etc., and on open science practices such as those identified in the context of the Open Science Policy Platform registry of pilots and implementations of responsible metrics³⁹ and the RDA Interest Group on Open Science Graphs for FAIR Data⁴⁰.

Proposals should also aim to promote the adoption of community-led curation and annotation systems to foster qualitative aspects of a new generation research assessment system. Related services should be developed, considering for example FAIRness evaluation and the use of machine learning algorithms and AI, to provide qualitative information that will enrich the meta-information of all research outputs.

The tools and services may support research-performing and/or research-funding organisations in measuring the usage, relevance, quality and impact of research outputs,

³⁶ Indicator frameworks for fostering open knowledge practices in science and scholarship: <https://op.europa.eu/en/publication-detail/-/publication/b69944d4-01f3-11ea-8c1f-01aa75ed71a1/language-en/format-PDF/source-108756824>

³⁷ For example, 2017 Commission report "*Evaluation of research careers fully acknowledging Open Science practices*" <https://doi.org/10.2777/75255>; 2018 "*Open Science Policy Platform recommendations*" <https://doi.org/10.2777/958647>; 2019 Commission report "*Indicator frameworks for fostering open knowledge practices in science and scholarship*" <https://doi.org/10.2777/445286>; 2018 LERU report "*Open Science and its role in Universities*" <https://www.leru.org/files/LERU-AP24-Open-Science-full-paper.pdf>; 2020 Final Report of the Open Science Policy Platform https://ec.europa.eu/research/openscience/pdf/ec_rtd_ospp-final-report.pdf.

³⁸ <https://ec.europa.eu/research/openscience/pdf/report.pdf>

³⁹ https://ec.europa.eu/research/openscience/pdf/ec_rtd_ospp-final-report.pdf

⁴⁰ <https://www.rd-alliance.org/groups/open-science-graphs-fair-data-ig>

research infrastructures and open science practices, thereby providing the necessary data and information for next-generation metrics and indicators for the implementation of a new research assessment system.

In developing the services and the tools, it is important to integrate a level of flexibility that allows research-performing and research-funding organisations to set their own recruitment and evaluation policies, respecting also the differences among scientific disciplines and allowing for diversity in practices.

Proposals should take into account existing services, tools and infrastructures in order not to duplicate efforts, e.g. on data collection, on discipline based metadata schemas, on AAI and on Persistent Identifiers developed by projects resulting from the topic HORIZON-INFRA-2021-EOSC-01-03. Proposals will also ensure that any results are open and in line with the FAIR principles.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC.

HORIZON-INFRA-2022-EOSC-01-02: Improving and coordinating technical infrastructure for institutional open access publishing across Europe

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.50 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up</i>	The rules are described in General Annex G. The following exceptions

<i>for grants</i>	<p>apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- a robust pan-European network of infrastructures, with all necessary relevant service-provision, that brings together already existing not-for-profit and no APC⁴¹-based ('diamond') open access publishing initiatives in order to become an integral part of EOSC – in particular through effective support to the FAIR principles and sharing common technical infrastructure standards;
- a comprehensive toolbox to implement common standards for technical infrastructure and service provision available in open source repositories and adopted within the network and beyond;
- interoperable data exchange and crosslinking among the network and with FAIR-compliant data repositories and other open access infrastructures already used by the research community in order to foster the concept of "single-point of access to services and content";
- contribute to the Horizon Europe EOSC Partnership.

Scope: This topic is addressed to not-for-profit institutions (such as universities, research centres, funders and other institutions supporting research and the dissemination of research outputs within national remits, e.g. national libraries) that run open access publishing initiatives for the public interest (non-commercial), in particular, publishing activities of journals and/or publishing platforms, and which do not levy article processing charges (APCs). Recent years have witnessed a sharp increase in open access publishing activities. Alongside commercial publishers who are in the business for publishing for profit, technology advances have enabled research-performing and other related organisations working for research to develop scholarly publishing infrastructures and services in the new digital environment, either continuing existing activities in print or in an entirely digitally-born environment. Such open access services operate in most European countries, in some cases with a national remit.

⁴¹ Article processing charges

This topic aims to improve efficiency, coordination and technological alignment among the network of institutional open access publishing infrastructures and to develop and provide the technical specifications to ensure interoperability, interconnection and improved quality of services to researchers. Proposals shall build on already existing and operational publishing services across Europe and embed the open access publishing network into the EOSC ecosystem.

The topic will support activities that:

1. Improve the understanding of technologies and services in such institutional not-for-profit services across Europe and provide recommendations for further alignment and interoperability;
2. Coordinate the development and adoption of common technical solutions for interoperability, cross-referencing, cross-linking, and sharing metadata across the European Research Area and beyond; and
3. support the implementation of technical specifications required to provide services through the EOSC, and the adoption of the essential solutions and standards (e.g. APIs, PIDs, metadata frameworks, ontologies, AAI etc.) to improve findability, accessibility, interoperability and re-usability of digital objects within the network of publishing infrastructures and in the EOSC federation.

Projects under this topic should liaise with other Horizon Europe funded initiatives in the ERA pillar, which address the non-technological aspects of institutional publishing.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC.

Building with the scientific community a Web of FAIR data for open science

Proposals are invited against the following topic(s):

HORIZON-INFRA-2022-EOSC-01-03: FAIR and open data sharing in support of healthy oceans, seas, coastal and inland waters

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 6.00 and 7.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million.
<i>Type of Action</i>	Research and Innovation Actions

<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries will be subject to the additional exploitation obligations: make all relevant outputs generated in the action available, through a well-defined mechanism, to the EOSC Partnership. Applicants must acknowledge and incorporate this obligation in the application and Annex I to the Grant Agreement.</p> <p>Beneficiaries must deposit the digital research data generated in the action in a trusted repository federated in the European Open Science Cloud (EOSC) in compliance with EOSC requirements.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- seamless interactions between EOSC, operational dataspace or environments (e.g. EMODnet and Copernicus Marine Service), researchers and other stakeholders contributing to restoring healthy oceans, seas, coastal and inland waters to store, share, access, analyse and process research data and other research digital objects from their own discipline, across research infrastructures, disciplines and national borders;
- open and FAIR data is the new norm for research contributing to restoring healthy oceans, seas, coastal and inland waters;
- EU-wide sharing of research data relevant to this area is shown to be a critical mechanism to facilitate ocean and water restoration across Member States and Associated Countries;
- EOSC grows into a trusted research and innovation data space and service platform in Europe that supports the interdisciplinary research community involved in this mission area;
- contribute to the Horizon Europe EOSC Partnership and other relevant partnerships related to restoring healthy oceans, seas, coastal and inland waters.

Scope: Reuse of research data within and across disciplines and borders require openness, infrastructure capacity, better handling, careful management, machine actionability and seamless access to services all along the data life cycle. The Horizon Europe mission areas recognise upfront that providing access to data, knowledge and digital services through federated infrastructures is a key enabling condition for success. In addition, *European Partnerships* tackling complex societal challenges through multi-disciplinary approaches are facing important challenges in the European R&I systems, including poor data interoperability. In recent years, different scientific communities have started developing ‘*thematic clouds*’ or ‘*data spaces*’ within their domain of research and innovation. The EOSC provides the enabling framework to share, connect and upscale best practices and services by the communities to implement FAIR principles for (open, where possible) data sharing and management. The development of this framework is advancing rapidly as EOSC enters its second phase of implementation. Access to an initial EOSC federation of research infrastructures and their services is being consolidated and concepts such as FAIR data management and FAIR-by-design digital research outputs (data, publications, software, code, protocols, etc.) become more prominent.

The overall objective of this topic is to accelerate research and innovation under this mission area through better access, management, interoperability, reuse and citation of digital information, to be achieved by using and integrating EOSC resources ranging from EOSC federated infrastructures, services and data to guidelines, best practices, tools and metrics for the management of FAIR and open data, and to extend these resources to the relevant marine and maritime domains that are less familiar with EOSC. This should be achieved through cross-domain, strategic use cases of direct relevance to the Digital Twin of the Ocean, the mission areas and the European Partnerships supporting this mission area on healthy oceans, seas, coastal and inland waters.

The use cases should demonstrate the value of sharing FAIR and open research data, help to establish data sharing and management practices within the involved communities and across the Member States and Associated Countries, leveraging European research infrastructures and e-Infrastructures. The use cases should provide feedback to the EOSC Partnership on the desired future evolution of EOSC. Special attention shall be put on aspects of data harmonisation, data quality assurance, integration of data collection, data privacy and security, big-data analysis and machine learning methods, data and model validation, as well as on the socio-economic dimension of the use. Proposals should also foster the creation of user environments that researchers in this field can then use in order to seamlessly interact with digital information in the framework of the EOSC ecosystem.

Proposals shall foresee activities to collaborate with relevant European Partnerships. Synergies with HE Cluster 6 activities and other relevant initiatives, including ESIF projects, are welcome. Research and innovation shall build on results of Horizon 2020 (e.g. the Blue Cloud project, the Odyssea project) and support the development of the Digital Twin of the Ocean. Proposers should consider already established ESFRI research infrastructures and efforts by relevant ESFRI cluster projects.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC. In particular, in areas such as data interoperability, metadata and vocabularies, the use of persistent identifiers or AAI, proposals should coordinate and establish a feedback mechanism with the awarded proposal/s from the topic HORIZON-INFRA-2021-EOSC-01-05 in order to ensure alignment with EOSC policies and to identify common useful tools and resources as well as relevant data repositories that comply with EOSC guidelines.

HORIZON-INFRA-2022-EOSC-01-04: Support for initiatives helping to generate global standards, specifications and recommendations for open sharing of FAIR research data, publications and software

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Funding rate</i>	100%
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p>Additional sub-criterion for Impact:</p> <p>The extent to which the proposed work incorporates the necessary coordination efforts and resources with other relevant projects and the EOSC governance structure in the context of the EOSC Partnership.</p>
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries may provide financial support to third parties. The maximum amount to be granted to each third party is EUR 60 000.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The granting authority can fund a maximum of one project.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- standards, recommendations and methodologies essential for putting FAIR principles into practice and supporting the development of the EOSC ecosystem are developed in alignment with international efforts and practices;
- contribute to the Horizon Europe EOSC Partnership.

Scope: Support community-driven processes that involve the research community and other stakeholders from across the world to foster the development, adoption and maintenance of generic and/or domain specific research data solutions suited to the EOSC context as well as to similar initiatives being built by other international partners. Proposals should facilitate and promote the participation of European stakeholders in such international processes.

To ensure complementarity of outcomes, proposals are expected to cooperate and align with activities of the EOSC Partnership and to coordinate with relevant initiatives and projects contributing to the development of EOSC. In particular, it should coordinate with the awarded grant/s under the topic HORIZON-INFRA-2021-EOSC-01-05 and the future procurement activity under Other Actions⁴²

⁴² Reference to be included

DESTINATION 3 – RESEARCH INFRASTRUCTURE SERVICES TO SUPPORT HEALTH RESEARCH, ACCELERATE THE GREEN AND DIGITAL TRANSFORMATION, AND ADVANCE FRONTIER KNOWLEDGE

Inclusive access to the services provided by research infrastructures in the European Research Area is essential both for the quality of the research produced and for the training of researchers. Easy access to high-quality resources, based on clear conditions and with appropriate funding, is an important and attractive feature of the EU research and innovation system, allowing researchers to move within or from outside Europe to perform their research. An open landscape of RIs in Europe contributes to the circulation of skills and attraction of talents and promotes European cohesion.

The support under past Framework Programmes of trans-national and virtual access to RIs has opened to research communities across Europe state-of-the-art services and resources for their scientific activities. RIs are key players in the generation of knowledge and drivers of scientific excellence in Europe. In conjunction with the European Open Science Cloud and Technology Infrastructures they are crucial enablers of research and innovation. The provision of services at EU level has been so far mainly organised per types of infrastructures or disciplines. The complexity and urgency of the socio-economic and environmental transition that Europe is facing requires interdisciplinary approaches and a new challenge-driven provision of customised services able to accelerate the pace of the research cycle and the delivery of solutions.

Actions under Destination 3 will provide efficient and customised research infrastructure services to drive and enable the transition toward a sustainable Europe and a prosperous economy. RI services (e.g. access to unique scientific tools and facilities, samples provision, processing and analysis, data and modelling services) will be directed to support an effective and responsive health system and to accelerate the transition towards a green and digital future. Specific alignments and synergies with priorities in Pillar 2 will be developed and research infrastructure support will duly contribute to the identified missions and partnerships under Horizon Europe. At the same time, Research Infrastructures, which are key players in the generation of fundamental knowledge and drivers of scientific excellence in Europe, will also continue enabling the advancement of frontier knowledge in areas complementary to those addressed through a challenge-driven approach.

Proposals for topics under this Destination should set out a credible pathway to contributing to the following expected impact:

- Reinforced research infrastructures capacity to provide at scale and across the EU services to support excellent research to address societal challenges, and HE missions and partnerships' objectives;

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

- Enhanced and increased society’s long-term and consistent problem-solving capacity and evidence-based policy making in areas linked to health, and the green and digital transition, including a better understanding of socio-economic implications, through the provision of innovative, customised and efficient RI services;
- New discoveries and knowledge breakthroughs enabled by access provision to the best and in some cases unique state-of-the-art RIs;
- A new generation of researchers trained to optimally exploit all the essential and advanced tools for their research;

Cross-fertilisation and a wider sharing of knowledge and technologies across disciplines and between academia and industry and businesses.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2021	2022	
HORIZON-INFRA-2021-SERV-01	115.00		23 Sep 2021
HORIZON-INFRA-2022-SERV-01		10.00	24 Mar 2022
HORIZON-INFRA-2022-SERV-02		35.00	21 Sep 2022
Overall indicative budget	115.00	45.00	

Call - Research Infrastructure services to support health research, accelerate the green and digital transformation, and advance frontier knowledge (2021)

HORIZON-INFRA-2021-SERV-01

Conditions for the Call

Indicative budget(s)⁴³

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁴⁴	Number of projects expected to be funded
		2021		
Opening: 08 Jun 2021 Deadline(s): 23 Sep 2021				
HORIZON-INFRA-2021-SERV-01-01	RIA	85.00	7.00 to 15.00	1
HORIZON-INFRA-2021-SERV-01-02	RIA		7.00 to 15.00	1
HORIZON-INFRA-2021-SERV-01-03	RIA		7.00 to 15.00	1
HORIZON-INFRA-2021-SERV-01-04	RIA		7.00 to 15.00	1
HORIZON-INFRA-2021-SERV-01-05	RIA		7.00 to 15.00	1
HORIZON-INFRA-2021-SERV-01-06	RIA		7.00 to 10.00	1
HORIZON-INFRA-2021-SERV-01-07	RIA	30.00	7.00 to 15.00	2
Overall indicative budget		115.00		

General conditions relating to this call

<i>Documents</i>	The documents are described in General Annex E.
------------------	---

⁴³ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁴⁴ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex E.

Topics under this call bring together several complementary and interdisciplinary research infrastructures to provide trans-national access (in-person, when the user visits the infrastructure to make use of it or remote access) and/or virtual access to integrated and customised research infrastructures services for challenge-driven research and innovation or advancing frontier knowledge. Access also includes ad hoc users' training and scientific and technical support. Harmonisation, customisation and virtualisation of research infrastructures services will also be supported.

A challenge-driven provision of Research Infrastructure services

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-SERV-01-01: Research Infrastructure services for rapid research responses to infectious disease epidemics

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 7.00 and 15.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 85.00 million. ⁴⁵
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%

⁴⁵ This budget is shared with topic HORIZON-INFRA-2021-SERV-01-02, HORIZON-INFRA-2021-SERV-01-03, HORIZON-INFRA-2021-SERV-01-04, HORIZON-INFRA-2021-SERV-01-05, HORIZON-INFRA-2021-SERV-01-06

<p><i>Admissibility conditions</i></p>	<p>The conditions are described in General Annex A. The following exceptions apply:</p> <p>Applicants are not required to submit a plan for the exploitation and dissemination of the results as the main objective of these actions is the service provision.</p> <p>As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.</p>
<p><i>Eligibility conditions</i></p>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<p><i>Award criteria</i></p>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the infrastructures provide and to further develop their on-line services.
<p><i>Legal and financial set-up for grants</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p>

	The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the applications attain all thresholds.

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- provision of innovative, customised and efficient RI services enhancing and increasing society's long-term and consistent problem-solving capacity and evidence-based policy making in the health areas, including a better understanding of socio-economic implications.
- comprehensive catalogue of research infrastructures services relevant to tackle infectious diseases epidemics is available, including for contributing social sciences research;
- higher levels of integration between research infrastructures to better tackle infectious diseases and face epidemics, including for use by epidemics risk assessment and risk management bodies (like ECDC and national epidemics management bodies);
- rapid response to epidemics outbreaks through research infrastructure services underpinning and supporting epidemics research ;
- development of novel/adapted epidemics intervention tools and measures
- availability of research data emerging from access provision activities for re-use on common data platforms and registries, according to FAIR principles and compliant to legal provisions under the GDPR.

Scope: Proposals under this topic, will integrate research infrastructure services to form a comprehensive and inclusive portfolio to support research in response to infectious diseases epidemics or underpinning respective forefront research in the field.

Proposals will support the provision of trans-national and/or virtual access to researchers as well as training for using the infrastructures, and activities to improve, customise and integrate the services the infrastructures provide, to facilitate and integrate the access procedures and to further develop remote or virtual provision of services.

Access to RI services will be provided to users for supporting their research projects targeting the development of new or adapted prevention and/or intervention tools and measures, such as new or adapted diagnostic procedures and therapies, drugs, vaccines, clinical disease management or disease vector control, or evidence-based public health, socio-behavioural and socio-economic measures. Following the One-Health concept, services supporting research on transmission of pathogens from animals to humans (or vice versa animals as host reservoir), including vector-borne transmission, should be covered. RIs dealing with social science should be involved to enable data acquisition in an epidemics setting and enlarge the portfolio of services. Flexibility in the provision of services should be properly demonstrated to ensure fast re-orientation and enlargement of the portfolio in response to unexpected epidemics situations. Effective operational links to epidemics risk assessment and management bodies like ECDC, WHO and national authorities are essential. Global standards, common data platforms and registries should be used to make user project results openly available and usable, thus enabling access to, and linking of, data and metadata on pathogens and disease manifestation, behavioural research and other epidemics related social science research.

Appropriate links with the European Open Science Cloud (EOSC) and the European COVID-19 Data Platform should be ensured. Data management (and related ethics issues) and interoperability should be addressed.

Grants awarded under this topic should cooperate with the actions awarded under topic HORIZON-INFRA-2021-EOSC-01-06 to identify and better exploit related synergies, share results and to avoid overlaps. To this extent, proposals should foresee dedicated activities and earmark appropriate resources.

Pandemics are global challenges and collaboration with relevant international partners should be foreseen.

Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#).

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for the scope. To this extent they should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of research infrastructures of European interest⁴⁶ which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Research infrastructures from third countries⁴⁷ can be involved when appropriate, in particular when they offer complementary or more advanced services, including data, than those available in Europe.

⁴⁶ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁴⁷ See the Eligibility and admissibility conditions for this call.

Services offered by the Joint Research Centre (JRC) of the European Commission, and in particular by its Nanobiotechnology infrastructure platform, could be considered for their inclusion in the service portfolio.

Proposals should include an outreach plan to actively advertise its services to targeted research communities and, if applicable, to relevant industries, including SMEs.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Proposals will include the list of services/installations⁴⁸ opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users.

Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section “Specific features for Research Infrastructures” of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

HORIZON-INFRA-2021-SERV-01-02: Research Infrastructures services to support research addressing cancer

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 7.00 and 15.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 85.00 million. ⁴⁹
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants are not required to submit a plan for the exploitation and dissemination of the results as the main objective of these actions is the service provision. As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.
<i>Eligibility</i>	The conditions are described in General Annex B. The following

⁴⁸ “Installation” means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

⁴⁹ This budget is shared with topic HORIZON-INFRA-2021-SERV-01-01, HORIZON-INFRA-2021-SERV-01-03, HORIZON-INFRA-2021-SERV-01-04, HORIZON-INFRA-2021-SERV-01-05, HORIZON-INFRA-2021-SERV-01-06

<p><i>conditions</i></p>	<p>exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<p><i>Award criteria</i></p>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the infrastructures provide and to further develop their on-line services.
<p><i>Legal and financial set-up for grants</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p> <p>The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.</p>
<p><i>Procedure</i></p>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio, grants will be awarded to applications not</p>

	only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the applications attain all thresholds.
--	--

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- provision of innovative, customised and efficient RI services enhancing and increasing society's long-term and consistent problem-solving capacity and evidence-based policy making in the health areas, including a better understanding of socio-economic implications;
- advancement of knowledge for personalised cancer prevention strategies and treatments;
- accelerated availability of solutions and products to patients in need;
- wider access to specialised R&I services to underpin the competitiveness of the European industry and of biotech SMEs developing new personalised cancer prevention strategies and treatments.

Scope: Proposals under this topic aim at integrating at EU level and providing access to a wide and inclusive portfolio of complementary research infrastructure services, including data services, and customised workflows supporting R&I projects along the development pipeline from discovery research to personalised treatment of cancer. Services should also support activities addressing the socio-economic dimension of cancer, the development of evidence-based public health measures and patient-centred approaches, as well as regulatory aspects of novel biomedical products or relevant biomarkers.

Proposals will support the provision of trans-national and/or virtual access to researchers as well as training for using the infrastructures, and activities to improve, customise and combine the services the infrastructures provide, to facilitate and integrate the access procedures and to further develop remote or virtual provision of services.

In order to facilitate user access, different interfaces could be developed, offering tailored resources and services for different types of cancer or different classes of users.

Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#).

Proposals could foster cross-fertilisation by offering technologies involved in cancer advanced therapies to research projects targeting other major chronic disease.

Data management (and related ethics issues), interoperability, as well as the connection of digital services (e.g. data services) to the European Open Science Cloud, should be duly addressed.

Appropriate links and complementarities will be ensured with the HE Mission on cancer (link). Other major European or international initiatives, including the EU Beating Cancer Plan and the new EU biomedical research agency recently announced by the European Commission, should be duly taken into account. Whenever appropriate, proposals should foster the use and deployment of (open) global standards.

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for the scope. To this extent they should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of research infrastructures of European interest⁵⁰ which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Proposals should also look to establish active collaboration with clinical centres to facilitate translation of research results into clinical practice.

Research infrastructures from third countries⁵¹ can be involved when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Proposals should consider the inclusion of infrastructures that can facilitate a rapid transition of research findings to innovations and therefore, to society.

Proposals should include an outreach and engagement plan to actively advertise its services to targeted research communities and, if applicable, to relevant industries, including SMEs.

Grants awarded under this topic should cooperate with the actions awarded under topic HORIZON-INFRA-2021-EOSC-01-07 to identify and better exploit related synergies, share results and to avoid overlaps. To this extent, proposals should foresee dedicated activities and earmark appropriate resources.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Proposals will include the list of services/installations⁵² opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users. Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section “Specific features for Research Infrastructures” of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

⁵⁰ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁵¹ See the Eligibility and admissibility conditions for this call.

⁵² “Installation” means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

HORIZON-INFRA-2021-SERV-01-03: Research Infrastructures services for a sustainable and resilient agriculture and agro-ecological transitions

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 7.00 and 15.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 85.00 million. ⁵³
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Admissibility conditions</i>	<p>The conditions are described in General Annex A. The following exceptions apply:</p> <p>Applicants are not required to submit a plan for the exploitation and dissemination of the results as the main objective of these actions is the service provision.</p> <p>As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.</p>
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the</p>

⁵³ This budget is shared with topic HORIZON-INFRA-2021-SERV-01-01, HORIZON-INFRA-2021-SERV-01-02, HORIZON-INFRA-2021-SERV-01-04, HORIZON-INFRA-2021-SERV-01-05, HORIZON-INFRA-2021-SERV-01-06

	<p>following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the infrastructures provide and to further develop their on-line services.
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p> <p>The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the applications attain all thresholds.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- provision of innovative, customised and efficient RI services enhancing and increasing society's long-term and consistent problem-solving capacity and evidence-based policy making for resilient and sustainable agriculture systems and its nexus with environment, health and food security, including a better understanding of socio-economic implications;
- wider understanding of the main threats (e.g.: emerging pests and diseases, antimicrobial resistance, climate change;) and socio-economic benefits (e.g.: high quality, safe, accessible and affordable food; improved human and animal wellbeing; resilience of local communities;) of a systemic approach to sustainable and resilient agriculture and agroecological transition;

- higher levels of integration between RIs services to better support the development of sustainable agroecological systems for a healthy planet as well as the protection and preservation of natural resources and biodiversity under changing climate conditions;
- wider catalogues of RI services and capacities enabling researchers to access, generate, share, analyse and interpret various and heterogeneous factors influencing agro-ecological systems and thus paving the way to ambitious and sustainable advancements in the field and foster trans-disciplinarity;
- strengthened climate-change resilience, sustainability and the development of smart innovation in agriculture for sustainable rural transformation;
- effective support to the Green Deal objectives, the One Planet Summit's commitments, the implementation of the Farm to fork strategy and enhanced contribution to related SDGs, notably poverty, hunger, ecosystems' sustainability.

Scope: This topic aims at integrating and providing trans-national and/or virtual access to a complementary and interdisciplinary research infrastructures services to support R&I in view of achieving a sustainable and resilient agriculture and support agro-ecological transitions, in line with the One-Health approach. This approach appears to be particularly relevant to provide evidence to restore biodiversity, increase efficiency in the use of resources and prevent future crises . RIs should integrate, customise and offer a wide range of services to support agricultural research also in relation with agroforestry, aquaculture, horticulture, husbandry and pastoralism, taking into account the value chain, social and behavioural aspects and possibly human and animal nutrition dimensions.

Appropriate links and complementarities will be ensured with HE Missions, in particular the one on Soil health and food⁵⁴ ,on Adaptation to climate change including societal transformation (link) and with the relevant HE partnerships identified in the HE strategic plan, in particular the ones on “accelerating farming systems transitions: agroecology living labs and research infrastructures”, “animal health and welfare” and “agriculture of data⁵⁵”. Other major European or international initiatives relevant for the scope should be taken into account. Whenever appropriate, proposals should foster the use and deployment of global standards.

Proposals will support access provision to researchers as well as training for using the infrastructures, and activities to improve, customise and integrate the services the infrastructures provide, to facilitate and integrate the access procedures and to further develop remote or virtual provision of services.

Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#).

⁵⁴ https://ec.europa.eu/info/horizon-europe/missions-horizon-europe/soil-health-and-food_en

⁵⁵ https://ec.europa.eu/info/research-and-innovation/research-area/agriculture-forestry-and-rural-areas/partnership-agroecology_en

RI services will include access to agricultural data and models relevant for human, plants and animal health and wellbeing; tools for rapid and precise analysis of agronomic practices' performance and main threats on agriculture (i.e. emerging pests and diseases, climate change, including drought, soil health, pollution and contaminants, etc.); methods to assess socio-economic impact of moving to more sustainable and resilient agriculture including agroecological transition (e.g. quality and safe food, health and wellbeing of people, animals and plants, farm and rural resilience). RI services will also support the development of mitigation and adaptation strategies and policy frameworks for a more resilient and sustainable agriculture.

Data management (and related ethics issues), interoperability, as well as the connection of digital services (e.g. data services) to the European Open Science Cloud, should be addressed where relevant. Appropriate links and complementarities will be ensured with the relevant data spaces.

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for the scope. To this extent they should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of research infrastructures of European interest⁵⁶ which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Research infrastructures from third countries⁵⁷ can be involved when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Proposals should include an outreach plan to actively advertise its services to targeted research communities and, if applicable, to relevant industries, including SMEs.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Proposals will include the list of services/installations⁵⁸ opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users. Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section "Specific features for Research Infrastructures" of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

⁵⁶ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁵⁷ See the Eligibility and admissibility conditions for this call.

⁵⁸ "Installation" means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

HORIZON-INFRA-2021-SERV-01-04: Research Infrastructures services for responding to climate-related risks on the environment

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 7.00 and 15.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 85.00 million. ⁵⁹
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Admissibility conditions</i>	<p>The conditions are described in General Annex A. The following exceptions apply:</p> <p>Applicants are not required to submit a plan for the exploitation and dissemination of the results as the main objective of these actions is the service provision.</p> <p>As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.</p>
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the</p>

⁵⁹ This budget is shared with topic HORIZON-INFRA-2021-SERV-01-01, HORIZON-INFRA-2021-SERV-01-02, HORIZON-INFRA-2021-SERV-01-03, HORIZON-INFRA-2021-SERV-01-05, HORIZON-INFRA-2021-SERV-01-06

	<p>following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the infrastructures provide and to further develop their on-line services.
<p><i>Legal and financial set-up for grants</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p> <p>The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.</p>
<p><i>Procedure</i></p>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the applications attain all thresholds.</p>

Expected Outcome: Project results are expected to contribute to all of the following expected outcomes:

- enhanced and increased society’s long-term and consistent problem-solving capacity and evidence-based policy making in areas of climate-related risks, disaster risk management, health and green transition, including a better understanding of socio-economic implications, through the provision of innovative, customised and efficient RI services;
- enhanced and integrated cross-disciplinary R&I capacities addressing climate related-risks in Europe and in particular support relevant R&I objectives of Horizon Europe clusters, missions or partnerships;
- harmonisation of data policies and management of IPRs and ethical issues; interoperability across disciplines and with risk management platforms;

- researchers in the environment and climate change able to optimally exploit the research infrastructure services relevant for their research.

Scope:

Climate change and land use are increasing the occurrence and severity of natural hazards notably floods, storm surges, landslides, droughts, desertification, cryosphere melting and fires in Europe and their negative impacts. Research to understand the interlinked processes and to develop new knowledge and tools necessary to better predict, mitigate and adapt to these risks requires an integrated and strongly cross-disciplinary approach and access to very diverse research infrastructures (such as observatories, experimental facilities, modelling capacities or data infrastructures). However, necessary research infrastructures, including those prioritised by ESFRI, are often targeting primarily one or few disciplines, scientific communities or risks and cannot, individually, sufficiently serve a truly integrated and cross-disciplinary approach.

Proposals will bring together key complementary and possibly heterogeneous national and European research infrastructures to provide effective access to an integrated wide range of RI services (e.g.: observations, models and experimental platforms) necessary for highly cross-disciplinary research and innovation addressing climate-related multi-hazards risks in Europe including their social dimension. Actions will in particular offer, when appropriate, fit-for-purpose access modalities facilitating the joint selection and or coherent scheduling of cross-disciplinary user project(s) by several research infrastructures, ad-hoc support and training of (new) users, customised RI data, data products, scientific services including joint services by complementary infrastructures. Actions will develop interoperability among the research infrastructures as well as with relevant initiatives and programmes and facilitate the use of external data and services, such as Copernicus services, to further develop their portfolio of multi- and cross-disciplinary scientific services.

Proposals aim at supporting the provision of trans-national and/or virtual access to researchers as well as training for using the infrastructures, and activities to improve, customise and integrate the services the infrastructures provide, to facilitate and integrate the access procedures and to further develop remote or virtual provision of services.

Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#).

Data management (and related ethics issues), interoperability, as well as the connection of digital services (e.g. data services) to the European Open Science Cloud, should be addressed where relevant.

Proposals should duly take into account major European or international initiatives relevant in the field/for the scope. Whenever appropriate, they should foster the use and deployment of global standards.

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for the scope. To this extent they

should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of research infrastructures of European interest⁶⁰ which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Research infrastructures from third countries⁶¹ can be involved when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Proposals should include an outreach plan to actively advertise its services to targeted research communities and, if applicable, to relevant industries, including SMEs.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Actions should design customised and/or new RI services taking into account the needs of ongoing research in the field and of existing disaster risk management knowledge platforms and networks (e.g. Disaster Risk Management Knowledge Centre). Due attention to the latest development of Horizon Europe priorities, its Missions and Partnerships will ensure appropriate links and complementarities. Actions should foresee a flexible approach to address ad-hoc R&I specific requests and to respond to long-term or recurrent needs.

Projects may consider the use of the molecular ecotoxicology and microbiology laboratories of the Joint Research Centre of the European Commission's Joint Research Centre (JRC) in their infrastructure portfolio.

Proposals will include the list of services/installations⁶² opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users. Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section “Specific features for Research Infrastructures” of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

HORIZON-INFRA-2021-SERV-01-05: Research Infrastructures services enabling the development of materials for a circular economy

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 7.00 and 15.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

⁶⁰ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁶¹ See the Eligibility and admissibility conditions for this call.

⁶² “Installation” means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

<i>Indicative budget</i>	The total indicative budget for the topic is EUR 85.00 million. ⁶³
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Admissibility conditions</i>	<p>The conditions are described in General Annex A. The following exceptions apply:</p> <p>Applicants are not required to submit a plan for the exploitation and dissemination of the results as the main objective of these actions is the service provision.</p> <p>As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.</p>
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the

⁶³ This budget is shared with topic HORIZON-INFRA-2021-SERV-01-01, HORIZON-INFRA-2021-SERV-01-02, HORIZON-INFRA-2021-SERV-01-03, HORIZON-INFRA-2021-SERV-01-04, HORIZON-INFRA-2021-SERV-01-06

	infrastructures provide and to further develop their on-line services.
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p> <p>The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the applications attain all thresholds.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- enhanced and increased society’s long-term and consistent problem-solving capacity and evidence-based policy making in areas of sustainable materials and green transition, including a better understanding of socio-economic implications, through the provision of innovative, customised and efficient RI services;
- development of a world-class European research and technology ecosystem underpinning the development of materials and materials processing and the related value chains;
- optimum exploitation of R&I services relevant for materials research for a circular economy;
- enhanced competitiveness of current and emerging industries through the availability of the most advanced research and technology infrastructures R&I services;
- breakthrough research and innovation in materials development and materials processing;
- materials enabling products with increased durability and/or reusability⁶⁴;

⁶⁴ In line with the Circular Economy Action Plan

- cross-fertilisation and a wider sharing of knowledge and technologies across the various disciplines that contribute to materials for a circular economy;
- enhanced socio-economic impact of investments in research infrastructures from EU countries and from the European Structural and Investment Funds.

Scope: This action brings together several complementary and interdisciplinary key research infrastructures relevant for materials research and innovation for a circular economy. The facilities will provide coordinated and integrated transnational and/or virtual access to technically advanced instrumentation and scientific methods in a user-friendly way. The facilities will also jointly develop and provide specific service workflows that are relevant for the R&I activities. The services should address different TRLs and they should be relevant for stakeholders along the whole value chain and in view of possible industrial applications. The facilities will provide training for their use including for services such as materials modelling, data mining, and experiment design.

Proposals aim at supporting the provision of trans-national and/or virtual access to researchers as well as training for using the infrastructures, and activities to improve, customise and integrate the services the infrastructures provide, to facilitate and integrate the access procedures and to further develop remote or virtual provision of services.

Access provision activities will also contribute to address the objectives of European initiatives, such as the Circular Economy Action Plan and the EU Strategy for Plastics in the Circular Economy, to tackle critical issues such as materials design, processing, recycling, and recovery in a cradle-to-cradle cycle.

Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#).

Proposals should clearly identify research communities and potential industrial users, which can benefit from this pan-European open access to research services and advanced instrumentations offered by internationally renowned facilities and strengthen the cooperation among academic and industrial researchers.

Proposals are expected to take into account relevant major European initiatives, such as the Open Innovation Test Beds, to exploit synergies or to build partnerships. Whenever appropriate, they should foster the use and deployment of global standards.

Data management (and related ethics issues), interoperability, as well as the connection of digital services (e.g. data services) to the European Open Science Cloud, should be addressed where relevant.

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for the scope. To this extent they should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of

research infrastructures of European interest⁶⁵ which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Research infrastructures from third countries⁶⁶ can be involved when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Proposals should include an outreach plan to actively advertise its services to targeted research communities and, if applicable, to relevant industries, including SMEs.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Proposals will include the list of services/installations⁶⁷ opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users. Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section “Specific features for Research Infrastructures” of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

HORIZON-INFRA-2021-SERV-01-06: Research Infrastructures services for sustainable and inclusive Global Value Chain and Europe recovery from socio-economic crises

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 7.00 and 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 85.00 million. ⁶⁸
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants are not required to submit a plan for the exploitation and

⁶⁵ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁶⁶ See the Eligibility and admissibility conditions for this call.

⁶⁷ “Installation” means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

⁶⁸ This budget is shared with topic HORIZON-INFRA-2021-SERV-01-01, HORIZON-INFRA-2021-SERV-01-02, HORIZON-INFRA-2021-SERV-01-03, HORIZON-INFRA-2021-SERV-01-04, HORIZON-INFRA-2021-SERV-01-05

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

	<p>dissemination of the results as the main objective of these actions is the service provision.</p> <p>As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.</p>
<p><i>Eligibility conditions</i></p>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<p><i>Award criteria</i></p>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the infrastructures provide and to further develop their on-line services.
<p><i>Legal and financial set-up for grants</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p> <p>The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the</p>

	internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the applications attain all thresholds.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- scientific evidence for developing the European Recovery Plan and the design of European policies for trade, production, employment and investments in relation to Global Value Chain;
- enhanced society's long-term and consistent problem-solving capacities to recover from socio-economic crises;
- strengthened EU position on the global market;
- contribution to the definition of standards in evolving markets;
- provision of evidence on labour market patterns and needed skills.

Scope: Global value chains (GVCs) nowadays account for almost half of all international trade. In this age of global value chains, and especially at a time when the world economy and supply chains are challenged by the COVID-19 crisis, GVCs and their role in international trade and economic growth across the world as well as their impact on employment and skill are more important than ever.

Proposals will bring together complementary and possibly heterogeneous national and European research infrastructures to provide effective access to an integrated wide range of RI services providing insights into the functioning, characteristics and impacts of Global Value Chains. Research infrastructures services will allow to assess to what extent the configuration of value chains helps to reinforce the resilience of production processes, investments and employment. They will also enable research in and analysis of the consequences of the international fragmentation of production.

Proposals will support the provision of trans-national and/or virtual access to researchers as well as training for using the infrastructures, and activities to improve, customise and integrate the services the infrastructures provide, to facilitate and integrate the access procedures, and to further develop remote or virtual provision of services. Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#)

Data management (and related ethics issues), interoperability, as well as the connection of digital services (e.g. data services) to the European Open Science Cloud, should be addressed where relevant.

Proposals should duly take into account major European or international initiatives relevant in the field/for the scope. Whenever appropriate, they should foster the use and deployment of global standards.

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for the scope. To this extent they should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of research infrastructures of European interest⁶⁹ which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Research infrastructures from third countries⁷⁰ can be involved when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Proposals should include an outreach plan to actively advertise its services to targeted research communities and, if applicable, to relevant industries, including SMEs.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Proposals will include the list of services/installations⁷¹ opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users. Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section “Specific features for Research Infrastructures” of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

Research Infrastructures services advancing frontier knowledge

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-SERV-01-07: Research Infrastructures services advancing frontier knowledge

Specific conditions	
<i>Expected EU contribution per</i>	The EU estimates that an EU contribution of between EUR 7.00 and 15.00 million would allow these outcomes to be addressed appropriately.

⁶⁹ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁷⁰ See the Eligibility and admissibility conditions for this call.

⁷¹ “Installation” means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

<i>project</i>	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 30.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Admissibility conditions</i>	<p>The conditions are described in General Annex A. The following exceptions apply:</p> <p>Applicants are not required to submit a plan for the exploitation and dissemination of the results as the main objective of these actions is the service provision.</p> <p>As proposals need to give information on the research infrastructures providing access, the page limit of the application is 100 pages.</p>
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: given the specific nature of this topic access provision activities shall be included in the proposal. Please read carefully the provisions under the section “Specific features for Research Infrastructures” before the preparation of your application.</p> <p>Legal entities established in Australia, Brazil, Canada, China, India, Japan, Mexico, New Zealand, Republic of Korea, Russia, United Kingdom and USA, which provide, under the grant, access to their research infrastructures to researchers from Members States and Associated countries, are eligible for funding from the Union.</p>
<i>Award criteria</i>	<p>The criteria are described in General Annex D. The following exceptions apply:</p> <p>The following application of the general award criteria including any weighting and thresholds applies:</p> <p><i>For the criterion Excellence</i>, in addition to its standard sub-criteria, the following aspects will also be taken into account;</p> <ul style="list-style-type: none"> • The extent to which the Access Activities (Trans-national Access and/or Virtual activities) will offer access to the state-of-the-art infrastructures of European interest in the field, high quality services, and will enable users to conduct excellent research. • The extent to which the project will contribute to facilitate and integrate the access procedures, to improve the services the

	infrastructures provide and to further develop their on-line services.
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs may take form of unit costs for trans-national and virtual access to research infrastructures as defined in the Decision authorising the use of unit costs for the actions involving trans-national and virtual access</p> <p>The following cost categories will be ineligible costs: the depreciation costs of equipment, infrastructure or other assets for providing trans-national and/or virtual access to research infrastructure as well as the internally invoiced goods and services for providing trans-national and/or virtual access to research infrastructure.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio covering different scientific domains, grants will be awarded to applications not only in order of ranking but at least also to those projects that are the highest ranked within each scientific domain, provided that the applications attain all thresholds.</p>

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- wider, simplified, and more efficient access to the best research infrastructures available to researchers to conduct curiosity-driven research, irrespective of location;
- breakthrough and leading-edge research enabled by advanced research infrastructure services made available to a wider user community;
- improved and harmonised RI services and broader use of RI resources across Europe deriving from the exploitation of synergies and complementarities;
- a new generation of researchers trained to optimally exploit all the essential tools for their research;
- cross-disciplinary fertilisations and a wider sharing of information, knowledge and technologies across scientific fields fostered by closer interactions between researchers active in and around research infrastructures;
- better management, including implementing FAIR data principle, of the continuous flow of data collected or produced by research infrastructures.

Scope: This topic aims at providing trans-national access (on-site or remote) and/or virtual access to integrated and customised RI services for curiosity-driven research in wide scientific domains, offered by a wide range of complementary and interdisciplinary top level research

infrastructures. Scientific domains are identified on the basis of a Multi-Annual Priority Setting (MAPS) exercise aiming at achieving a balanced coverage of scientific disciplines addressed under Destination 3 as well as complementarities with Horizon 2020 ongoing grants offering access provision. The MAPS follows the taxonomy used in the ESFRI Roadmap.

In 2021, the scientific domains called under this topic are:

- Geosphere, including geo-hazards and geo-resources;
- Particle and nuclear physics.

Training for using the infrastructures, and activities to improve, customise and harmonise the services the infrastructures provide, to facilitate and integrate the access procedures, and to further develop remote or virtual provision of services may also be supported.

Proposals should adopt the guidelines and principles of the [European Charter for Access to Research Infrastructures](#)

Data management (and related ethics issues), interoperability, as well as the connection of digital services (e.g. data services) to the European Open Science Cloud, should be addressed where relevant.

Proposals should duly take into account major European or international initiatives relevant in the domain. Whenever appropriate, they should foster the use and deployment of (open) global standards.

Proposals should make available to researchers the widest and most comprehensive portfolio of research infrastructures services which are relevant for frontier research in the domain. To this extent they should involve, as beneficiaries or as third parties, the necessary interdisciplinary set of research infrastructures of European interest⁷² which provide such services. The inclusiveness of the proposal will be taken into account in the Excellence score. Proposals including only few of the relevant research infrastructures services will be scored lower.

Research infrastructures from third countries⁷³ can be involved when appropriate, in particular when they offer complementary or more advanced services than those available in Europe.

Proposals are expected to exploit synergies and to ensure complementarity and coherence with other EU grants supporting access provision.

Proposals will include the list of services/installations⁷⁴ opened by research infrastructures for trans-national or virtual access and the amounts of units of access made available for users.

⁷² A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located. This includes ESFRI and ERIC infrastructures.

⁷³ See the Eligibility and admissibility conditions for this call.

Further conditions and requirements relating to access provisions that applicants should fulfil when drafting a proposal are given in the section “Specific features for Research Infrastructures” of this Work Programme. Compliance with these provisions will be taken into account during evaluation.

Call - Research Infrastructure services to support health research and accelerate the green and digital transformation (2022)

HORIZON-INFRA-2022-SERV-01

Conditions for the Call

Indicative budget(s)⁷⁵

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁷⁶	Number of projects expected to be funded
		2022		
Opening: 10 Nov 2021 Deadline(s): 24 Mar 2022				
HORIZON-INFRA-2022-SERV-01-01	RIA	10.00	3.00 to 5.00	3
Overall indicative budget		10.00		

General conditions relating to this call	
<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

⁷⁴ “Installation” means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

⁷⁵ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁷⁶ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex F.

Use of artificial intelligence as enabler for better exploitation of data sets for research queries will be an important contribution from research infrastructures to the Commission's AI strategy proposed in the Commission's White Paper On Artificial Intelligence - A European approach to excellence and trust (COM(2020) 65 final). The topic under this call brings together several complementary and interdisciplinary RIs to provide trans-national access (in-person, when the user visits the infrastructure to make use of it or remote access) and/or virtual access to integrated and customised RI services for challenge-driven research and innovation. Access also includes ad hoc users' training and scientific and technical support. Harmonisation, customisation and virtualisation of RI services will also be supported.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2022-SERV-01-01: Enabling research infrastructure services for better use of imaging data to address challenges in thematic research areas

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 3.00 and 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%

Expected Outcome:

Project results are expected to contribute to some of the following expected outcomes:

- improved acquisition, quality, interoperability and analysis of imaging data from different disciplines (e.g.: health & food, climate and environmental research, digital transformation);
- wider use of image analysis services based on AI in different scientific areas.

Scope: The availability of high-performance image analysis tools, including those based on AI, through the provision of RI services, has a great potential to improve the use of image data for research purposes. These services enable better use of imaging data by aligning data formats, ensuring better data quality and noise reduction, improving interoperability, applying advanced data analysis, interpretation and potentially visualisation, as well as by integrating imaging data with other data sets of different types.

Successful proposals will offer services, including AI-based services for improved analysis of imaging data in different thematic areas (e.g. environmental monitoring, life sciences, chemistry, physics,...). Appropriate links and complementarities must be ensured with the existing AI4EU platform and relevant activities under Pillar II of Horizon Europe. AI-based tools and services will make use of the EOSC commons as working environment where these tools, services and relevant data sets will be made findable and accessible for use, thus making EOSC operational for the delivery of research infrastructure data services for thematic research challenges.

Call - Research Infrastructure services to support health research and accelerate the digital transformation (2022)

HORIZON-INFRA-2022-SERV-02

Conditions for the Call

Indicative budget(s)⁷⁷

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁷⁸	Number of projects expected to be funded
		2022		
Opening: 01 Jun 2022 Deadline(s): 21 Sep 2022				
HORIZON-INFRA-2022-SERV-02-01	RIA	35.00	Around 35.00	1
Overall indicative budget		35.00		

⁷⁷ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁷⁸ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

General conditions relating to this call	
<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex F.

EBRAINS is an integrative, distributed digital research infrastructure (RI) of pan-European relevance, designed and prepared as part of the Human Brain Project (HBP) during H2020 to cross-fertilise progress in neuroscience, medicine and advanced computing including AI.

While EBRAINS is a candidate ESFRI RI, the topic below is to support the RI implementation and enrichment to ensure the delivery of a cloud-based wide-range of integrated facilities and distributed specialised competence centres, for comprehensively serving the European communities for neuroscience and research in brain medicine, including for dementia and other neurodegenerative conditions, and brain-inspired cognitive technologies.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2022-SERV-02-01: Implementing digital services to empower neuroscience research for health and brain inspired technology via EBRAINS

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 35.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 35.00 million.
<i>Type of Action</i>	Research and Innovation Actions

<i>Funding rate</i>	100%
<i>Legal and financial set-up for grants</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries may provide financial support to third parties.</p> <p>The support to third parties can only be provided in the form of grants.</p> <p>The maximum amount to be granted to each third party is EUR 60 000 except for the actual development of the new services where it can be up to EUR 200 000 for each third party.</p>

Expected Outcome: Project results are expected to contribute to all the following outcomes:

- integrated multi-disciplinary collaborative tools and services widely serving the European neuroscientific community, providing them with FAIR data indexing and archival, multilevel data mining and modelling/simulation of brain functions, and empowering workflows for reproducible research;
- a rich collection of multilevel human brain models, atlases and workflows, directly supporting the research and development for personalised brain medical treatments e.g. target binding drugs, precise neuro-stimulation positioning and guided surgery, regarding brain diseases such as epilepsy, Parkinson, consciousness disorders, or rare or multi-factor diseases;
- a comprehensive set of cognitive brain model scaffolds and associated modular / large-size neuromorphic and neurorobotic facilities for assisting the design and validation of applicative cognitive technologies benefitting from neurosciences latest knowledge, as enablers for autonomous and adaptive robotics approaches that use fast sensory processing and decision-making capabilities;
- supplementary population of EBRAINS facilities with multidisciplinary services/applications that answer well-identified new neuroscience related S&T needs, in correlation with national and European research priorities for neuroscience, brain medicine and cognitive-technologies;
- integration of EBRAINS with EOSC and linkage with common European data spaces in the life science and health sector;
- better-aligned national investments in neuroscience across Europe, building on the Member States' and Associated Countries' specialised competence centres, which in turn will help creating additional synergies and enabling further research activities around the EBRAINS services.

Scope: Building on the EBRAINS architecture and base facilities developed under Horizon 2020, the scope of this action is to:

1. To implement a user-friendly service infrastructure along the principles of Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) to widely serve the research communities in neurosciences, brain medicine and brain-inspired cognitive technologies. This includes the following dimensions:

- Enabling the EBRAINS Research Infrastructure digital facilities supporting neuroscience dedicated tools and services, with a high quality of service including robustness, security, scalability, flexibility, usability and user-centricity. This includes a sustainable system for allocation and management of data capacities and of simulation and computing service resources.
- Establishing in-depth collaboration with teams from other European research and testing infrastructures and of EOSC, in order to ensure efficiency and harmonisation, e.g. regarding Authorisation, Authentication and Identification (AAI), Persistent Identifiers (PID), discovery ontologies and API for both services and data.
- Directly interfacing with the European HPC capacities towards exascale, deployed in EuroHPC and capitalising on the FENIX developments for big-data integration and interactive use.
- Delivering an efficient Europe-wide service to researchers, based on promoting excellence and innovation, and supporting users' digital experiments with the assistance of high-level support teams and feedback mechanisms, and guiding communities in developing novel software solutions that build on the EBRAINS base offering.
- Deploying an open metrics framework to assess the EBRAINS performances reached, the efficiency of the facilities offered in particular regarding the human-based services, and the uptake especially regarding the enabled science excellence and related results and the medical and technological innovation empowerment.

2. To develop, integrate in EBRAINS, and operate:

- Constantly improving open science services/applications that respond to up-to-date and upcoming identified needs of the neuroscientific community, with a co-design approach and in-depth engagement with scientific, medical and industrial stakeholders and the establishment of an appropriate and transparent prioritisation mechanism. This includes ensuring openness to other research groups and new applications; reaching out to scientific and industrial communities, including with tailored training and skills development programmes.
- The deployment of complementary S&T services from regional or national competence nodes, supporting and enriching the cloud-based deliveries and facilitating the sharing of produced data and use of national resources.

In addition to the above, EBRAINS should open its approaches to other communities, going beyond neuroscience, for example by supporting compute-intensive simulation to identify

candidate drugs addressing new disease targets in other explicit medical domains where this approach is justified.

The financial support to third parties mechanism (see specific call conditions) can be used to design and develop new services (under item 2) and/or to facilitate the co-design approaches and/or the targeted involvement of broader stakeholders, user communities and competence nodes.

DRAFT

DESTINATION 4 – NEXT GENERATION OF SCIENTIFIC INSTRUMENTATION, TOOLS AND METHODS AND ADVANCED DIGITAL SOLUTIONS

Scientific communities cannot adequately respond to current research challenges without having access to state-of-the-art scientific instruments and tools. Their constant adaptation, upgrading and innovation, as the underlying technologies develop at a very rapid pace, is critical for providing the optimal conditions for scientific advancements and discoveries in Europe.

The aim of Destination 4 is the development of ground-breaking RI technologies, including scientific instruments, tools, methods, and advanced digital solutions, to enable new discoveries and keep Europe's RIs at the highest level of excellence in science, while paving the way to innovative solutions to societal challenges and new industrial applications, products and services. New instruments and tools (such as advanced sensors, imaging devices, light source detectors, high-tech developments for accelerators, robots/automated solutions) and advanced digital solutions (e.g. digital twins, data analytics and AI tools, etc.) for RI upgrade, will enable solutions to be found even for the most demanding scientific and societal challenges.

Proposals for topics under this Destination should set out a credible pathway to contributing to the several of the following expected impact:

- Enhanced global competitiveness and technological excellence of Europe in an extremely fast-moving environment through investments into the development, of forward-looking technical instruments and tools for European RIs.
- Enhanced competitiveness of European industry through co-development with industrial actors of advanced RI technologies and technology transfer;
- Opening up of new areas of research and development of new industrial applications/products;
- Development of skills of RI staff aligned with the advancements of the RI technologies;
- Transdisciplinarity, cross-fertilisation and a wider sharing of knowledge and technologies between academia and industry;
- Wider use of AI in research and enhanced data-based research across Europe.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2021	2022	

*Horizon Europe - Work Programme 2021-2022
Research Infrastructures*

HORIZON-INFRA-2021-TECH-01	30.00		23 Sep 2021
HORIZON-INFRA-2022-TECH-01		120.00	24 Mar 2022
Overall indicative budget	30.00	120.00	

DRAFT

Call - Next generation of scientific instrumentation, tools and methods (2021)

HORIZON-INFRA-2021-TECH-01

Conditions for the Call

Indicative budget(s)⁷⁹

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁸⁰	Number of projects expected to be funded
		2021		
Opening: 08 Jun 2021 Deadline(s): 23 Sep 2021				
HORIZON-INFRA-2021-TECH-01-01	RIA	30.00	10.00 to 15.00	3
Overall indicative budget		30.00		

General conditions relating to this call	
<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and</i>	The criteria are described in General Annex

⁷⁹ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁸⁰ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>exclusion</i>	C.
<i>Procedure</i>	The procedure is described in General Annex F.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-TECH-01-01: Interdisciplinary digital twins for modelling and simulating complex phenomena at the service of research infrastructure communities

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 10.00 and 15.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 30.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%

Expected Outcome: Research infrastructures are not only thematically very diverse but also in terms of size, ranging from the long tail of science, often characterised by individual laboratories or small groups of researchers, to large, “big science” collaborations. Scientists and researchers, including the long-tail of science, lack capabilities enabling complex simulations, combining simulations with observations and dealing with very large volumes of diverse data from various and distributed sources. The availability of high-quality Digital Twins⁸¹ across a wide range of thematic applications could fill this gap.

Project results are expected to contribute to all the following expected outcomes:

- availability of a pre-operational prototype of an interdisciplinary Digital Twin, using a combination of the latest digital technologies, relevant to addressing challenges where multi-disciplinarity is the defining element of complexity;
- availability of latest modelling and prediction technologies in a number of different areas widely serving research communities and supporting interoperability of data and software, integration and collaboration across different scientific domains, disciplines and across the different research infrastructures involved;
- a robust framework enabling Researchers to ensure the quality, reliability, verifiability of the data, information and outputs of such Digital Twins and to exploit to the maximum the existing and new data made available through the Common European Data Spaces and the European Open Science Cloud.

⁸¹ A Digital Twin is defined as a digital replica of a living or a non-living physical entity.

Scope: Actions should develop digital twins that provide advanced modelling, simulation and prediction capabilities to RIs and their research communities through a convergent use of advanced digital technologies such as high performance computing, software, AI methods and big data analytics.

With the advent of big data analytics and supercomputing, AI methods have the potential to allow exploiting the full potential of simulations and observations at significantly enhanced scales and to substantially increase the value, which can be extracted from investments into digital infrastructures and hardware. This fusion of models and real-time data is of crucial importance in many scientific areas, which – due to the complexity of the underlying phenomena – are heavily dependent on converging traditional modelling with the increasing amount of real-time data in order to arrive at more accurate present-state assessments and predictions (e.g. high energy physics, astrophysics, environmental research, security applications, materials research, resource efficiency, econometrics, population dynamics and related global changes).

Achieving this will require a co-design approach with user communities. Target should be the development of more integrated systems and a consistent set of standard methods and protocols in the areas of (a) model and data fusion for optimal synergy between observations and models, including provisions to include information from the entire digital continuum (from smart sensors, IoT, big data to citizen science type of information, high-performance computing; and (b) visualisation and artificial intelligence based knowledge generation from spatio-temporal information.

Given the emerging nature of the Digital Twin concept as applied to more complex phenomena, work should also cover the development of quality measures and trust, development of standard quality mapping and indicators for appropriately communicating differences in qualities of inputs and outputs from digital twins, addressing issues such as data and model pedigree, accuracy and lack of knowledge.

In addition to addressing pertinent priority areas in an interdisciplinary manner, proposals should also demonstrate the following:

- Deliver a breakthrough in terms of accuracy and realism
- Optimally fuse observations and models
- Integrate downstream sectors at the source of data production (adjacent science sectors)
- Include a rigorous handling of quality and confidence of information
- Develop capabilities of the new digital continuum enabling research communities to continuously learn and update themselves from data and information originating from different sources

Work under this topic should reach a sufficiently high TRL level to be considered for integration into operational activities of for example existing research infrastructures, the EOSC platform, and undertaken in related fields.

Work under this topic should link to relevant actions, when appropriate, under Digital Europe Programme (e.g. Destination Earth).

Call - Next generation of scientific instrumentation, tools and methods (2022)

HORIZON-INFRA-2022-TECH-01

Conditions for the Call

Indicative budget(s)⁸²

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁸³	Number of projects expected to be funded
		2022		
Opening: 10 Nov 2021 Deadline(s): 24 Mar 2022				
HORIZON-INFRA-2022-TECH-01-01	RIA	120.00	5.00 to 10.00	12
Overall indicative budget		120.00		

General conditions relating to this call	
<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

⁸² The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁸³ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Horizon Europe - Work Programme 2021-2022
Research Infrastructures

<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex F.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2022-TECH-01-01: R&D for the next generation of scientific instrumentation, tools and methods

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of between EUR 5.00 and 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 120.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: consortia must be built around a leading core of at least 3 world-class research infrastructures, being ESFRI infrastructures, European Research Infrastructures Consortia (ERICs) and/or other world-class Research Infrastructures of European interest (i.e. able to attract users from EU or associated countries other than the country where the infrastructure is located).
<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G. The following exceptions apply: PCP/PPI procurement costs are eligible.

Expected Outcome: Project results are expected to contribute to several of the following expected outcomes:

- enhanced scientific competitiveness of European Research Infrastructures

- development of innovative companies;
- increase of the technological level of industries through the co-development of advanced technologies for research infrastructures and creation of potential new markets;
- integration of research infrastructures into local, regional and global innovation systems.

Scope: The aim of this topic is to deliver innovative scientific instrumentation, tools and methods, which advance the state-of-art of European RIs, and show transformative potential in RIs operation. The related developments, which underpin the provision of improved and advanced services, should lead research infrastructures to support new areas of research and/or a wider community of users, including industrial users.

Cutting-edge technologies will also enhance the potential of RIs to contribute addressing EU policy objectives and socio-economic challenges.

Proposals should address all following aspects:

- Research and development of new scientific instrumentation, tools and methods for research infrastructures taking into due account resource efficiency (e.g. energy consumption) and environmental (including climate-related) impacts;
- their technology validation and prototyping;
- training of RI staff for the operation and use of these new solutions;
- the innovative potential for industrial exploitation of the solutions and/or for the benefits of the society.

Consortia must be built around a leading core of at least 3 world-class research infrastructures, being ESFRI infrastructures, European Research Infrastructures Consortia (ERICs) and/or other world-class Research Infrastructures of European interest⁸⁴ and can include a wider set of RIs. Other technological partners, including industry and SMEs, should also be involved, thus promoting innovation and knowledge sharing through co-development of new technical solutions for research infrastructures.

Proposals may include PCP subcontracting activities as described in part H of the General Annexes of the Work Programme.

⁸⁴ A research infrastructure is of European interest when is able to attract users from EU or associated countries other than the country where the infrastructure is located.

DESTINATION 5 – NETWORK CONNECTIVITY IN RESEARCH AND EDUCATION - ENABLING COLLABORATION WITHOUT BOUNDARIES

The way scientific research is conducted has dramatically changed over the last years. Network, storage and computing services provide the foundation to conduct modern scientific research. Today the data for research is generated from countless sources and large instruments across the globe (e.g. CERN/Copernicus/Galileo/ESO⁸⁵/SKA⁸⁶) and stored in data repositories. Allowing scientists to conduct excellent research requires high-bandwidth networks and network services to interconnect researchers, data and computing resources in a non-discriminatory way regardless of the location of the users and the resources.

The federation of National Research and Education Networks shape a fundamental building-block of Europe's e-infrastructure landscape, delivering a pan-European network for scientific excellence, research, education and innovation by providing an integrated catalogue of services for connectivity, collaboration, security and trust-and-identity that ensure Europe remains at the forefront of research.

This community has the potential to develop a new pan-European investment programme to reach Terabit capacity and meet the huge growth in network capacity and demand for advanced services for Research and Education. This programme will set the basis for a paradigm shift in the digital science and computational infrastructures planned for research and education over the next 10 years.

The activities will be covered by a Framework Partnership Agreement (FPA) setting out the framework conditions governing potential grants to partners on the basis of an action plan and jointly agreed general objectives. Once the FPA contract has been signed, the consortium will be invited to submit proposals for Specific Grant Agreements (SGA) to implement the objectives and action plan of the FPA.

The FPA itself has no budget. The budget and rules on funding are set out in each SGA and depend on the specific type of action.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)Deadline(s)
HORIZON-INFRA-2021-GEANT-01-FPA	15 Jun 2021
Overall indicative budget	

⁸⁵

⁸⁶

Call - Network connectivity in Research and Education - Enabling collaboration without boundaries (2021)

HORIZON-INFRA-2021-GEANT-01-FPA

Conditions for the Call

Indicative budget(s)⁸⁷

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁸⁸	Number of projects expected to be funded
Opening: 14 Apr 2021 Deadline(s): 15 Jun 2021				
HORIZON-INFRA-2021-GEANT-01-01-FPA	RIA	Around 0.0	1	
Overall indicative budget				

General conditions relating to this call

<i>Documents</i>	The documents are described in General Annex E.
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Award criteria</i>	The criteria are described in General Annex D.

⁸⁷ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

⁸⁸ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Legal and financial set-up for grants</i>	The rules are described in General Annex G.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Procedure</i>	The procedure is described in General Annex F.

Proposals are invited against the following topic(s):

HORIZON-INFRA-2021-GEANT-01-01-FPA: Framework Partnership Agreement (FPA) for Research and Education Networks

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR 0.0 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Funding rate</i>	100%

Expected Outcome: Project results are expected to contribute to all the following expected outcomes:

- very high-bandwidth, end-to-end connectivity among research and education users all over Europe, and cross-border collaboration services that are reliable and secure, enabling Europe to be at the forefront of global Research and Education, attracting data and talent;
- secure access to computing facilities and data repositories for European and International Research Infrastructures (RIs) and paving the way for widespread access to common European Data Spaces;
- an integrated portfolio of services for connectivity, collaboration, security, trust and identity;
- collaboration with international partners, to foster global RI connectivity in line with Europe's international cooperation policy objectives.

Scope: Building on the successful former partnership in this field and the achievements delivered under the Horizon 2020 framework programme, and considering the need for continuing the provision of critical services for the scientific and research community without disruption, the Commission calls for a new partnership with the National Research and

Education Networks that would cover the whole duration of Horizon Europe, with the following general objectives:

- Provide faster, resilient, agile and secure **connectivity services** for enabling scientists, researchers and students to access near real-time applications that support development of solutions and evidence-based decision-making for society and a world-wide effective collaboration of virtual research communities. The aim is to provide connectivity in the European Research Area (ERA) in multiples of 100 Gbps, paving the way for Terabit connectivity in certain areas where higher bandwidth is required for both disciplinary and interdisciplinary research collaboration amongst the researchers and scientists across Europe and beyond. Both the cross-European educational dimension and providing ERA scientists and researchers with optimal and secure access to Research Infrastructures (RI) and data resources worldwide are within the scope of the FPA.

The scope of the partnership activities should be to deliver an action plan on basis of jointly agreed objectives, covering the next 7 years of work. The action plan should cover the following areas of activity:

1. High quality connectivity and collaboration services for excellence in Research and Education

- Provide operational excellence by delivering and developing high quality, secure, trusted, interoperable and cost-effective services, connectivity and collaboration services for both Research and Education sectors and align service offering for supporting the policy agenda of ERA⁸⁹, EEA⁹⁰ and EHEA⁹¹: to enable borderless collaboration, and attract talent from anywhere in the world to cooperate and exchange data with their peers.
- Provide core services on security and identity federation, in coordination with other e-infrastructure and heterogeneous identity providers to enable service interoperability and a trusted and seamless user experience. National and European regulation in electronic identity (e.g., such e-IDAS) should be considered in particular for the development of Trust & Identity service in order to maximise societal impact beyond the research and scientific community.
- Innovation of the service portfolio, including possible activities at lower TRL levels, in order to support researchers working on new network and added-value services such as super high transfer speeds, quantum network testing, etc.
- Stimulating the development of consortium partners' human capital (including training, secondment and exchange schemes) will be an important pillar in fostering service innovation and assuring expertise in all Member States and Associated Countries.

⁸⁹ See COM(2020)628, "A new ERA for Research and Innovation

⁹⁰ European Economic Area

⁹¹ European Higher Education Area

2. State-of-the-art connectivity for the wider European Digital Infrastructure

- Push the boundaries of the state-of-the-art of the communication commons by constant development of both innovative multi-domain services and their use, and by translating this innovation into a competitive European ICT sector. This can include interconnection with key European data spaces and data repositories, including the Common European data spaces⁹² and with a wide spectrum of actors, e.g. industry and SMEs in collaboration with commercial operators.
- Adapt to the changing environment by the continuous development of the service portfolio of the European communications commons while maintaining the high level of accountability, security, measurability, transparency and sustainability. Actions should align with and contribute to the regulatory, standardisation and policy framework in order to enable full exploitation of the communications commons.
- Progressive upgrade from a Gigabit to a Terabit network as a critical part of the main public digital infrastructures in the EU.

3. International connectivity and collaboration

- Services and network architecture shall enable European driven researchers and scientists unconstrained access to data and resources worldwide while attracting data and talent. Activities in the international realm shall clearly foster international cooperation among researchers, contribute to the objectives of other relevant EU programmes and policies, (in particular under DG DEVCO, DG NEAR, DG RTD & EEAS) and leverage the existing resources to maximise impact. Capacity building activities will be a crosscutting element in international cooperation.

Wherever necessary in implementing the action plan, the partnership should make recourse to procurement as a fundamental tool for maximising the utility of available resources and broadening the offer of state-of-the-art digital services to scientific, research and education communities. The action plan should specify the main areas where procurement is expected to take place. Whenever the partnership makes recourse to procurement activities, it should explore broader scenarios and business models (including the participation in innovative procurement actions) for the benefit of the research and education community and potentially the wider user base.

The partnership should also develop close synergies with EU Policy and EU Programmes, wherever these are relevant for its activities, for instance with Marie Skłodowska-Curie Actions (MSCA) for activities related to human capital development, training, and international collaboration. It may also seek synergies with other programmes and funding lines of the EU that demonstrate greater impact potential and or better efficiency in the use of resources in the implementation of the action plan.

⁹² A European strategy for data, COM(2020)66 final

The long-term cooperation between the Commission and the selected partners will be formalised within a Framework Partnership Agreement (FPA) covering the entire duration of Horizon Europe. The extended duration of the partnership is justified by the need to provide a stable environment for the implementation of a European communications commons and uninterrupted provisioning of digital services.

Through the Framework Partnership Agreement (FPA), the Commission intends to award Specific Grants⁹³ (SGA) to implement the action plan agreed in the FPA, in accordance with the procedures laid down in the FPA (see also section on "Other actions").

DRAFT

⁹³ Awarding of specific grants will follow the rules and procedures established in the Financial Regulation

Other Actions not subject to calls for proposals

Grants to identified beneficiaries

1. International Conference on Research Infrastructures – ICRI 2022

Expected outcomes: Projects are expected to contribute to all the following outcomes:

- Contribution to address global challenges with a global dimension;
- Increased capacity of Europe to respond, in cooperation with international players, to emerging challenges at global level;
- Development of further cooperation with ongoing key international partners for research infrastructures;
- Enhanced role of the Union in international organisations and multilateral fora;
- Progress towards the development of global research infrastructures.

Scope:

The International Conference on Research Infrastructures (ICRI) is organised alternatively in Europe and in a Third Country, in cooperation with the European Commission. ICRI 2022 will contribute to the objectives of Destination 1.

The next ICRI Conference is planned in the Czech Republic, under the Czech Presidency, in the second semester 2022.

The objectives of the conference are (1) to provide an international forum for the discussion on the development of global research infrastructures, in particular, on issues of common interest such as the long-term sustainability of Research Infrastructures and their innovation potential; (2) to facilitate strategic international cooperation between European Research Infrastructures and their International counterparts; (3) to address the role of RIs to tackle global challenges and to contribute to the SDGs; (4) to analyse the resilience and adaptability of RIs in times of crisis.

Legal entities:

Ministerstvo školství, mládeže a tělovýchovy (Ministry of Education, Youth and Sports), Karmelitska 7, 11812 Prague, Czechia

Masarykova univerzita (MU), Zerotinovo namesti 9, 60177 Brno Stred, Czechia

Vysoké učení technické v Brně (Brno University of Technology), Antoninska 548/1, 60190 Brno Stred, Czechia

Form of Funding: Grants not subject to calls for proposals

Type of Action: Grant to identified beneficiary according to Financial Regulation Article 195
- Coordination and support action

Indicative timetable: Fourth quarter of 2021

Indicative budget: EUR 0.30 million from the 2021 budget

Specific Grant Agreements to the FPA for Research and Education Networks

The consortium of the selected Framework Partnership Agreement (FPA) for Research and Education Networks, is invited to submit proposals for two Specific Grant Agreements (SGA) for the first period of the partnership (2021-2023). The expected outcomes of the SGAs should be in line with the objectives defined in the Framework Partnership Agreement (FPA) action plan. The proposals will be evaluated according to the criteria established in the invitation from the Commission, complying with the Horizon Europe general requirements of evaluation and selection procedures.

Two separate proposals for SGAs should be submitted, one addressing the first and second areas of activity of the FPA (namely, “High quality connectivity and collaboration services for excellence in Research and Education” and “State-of-the-art connectivity for the wider European Digital Infrastructure”) and another one addressing the third area of activity of the FPA (“International connectivity and collaboration”).

1. a) SGA for networking and collaboration services and investments in long-term capacity for Research and Education Networks in Europe

(a1) This part of the action aims at implementing the first period of the FPA action plan, and in particular related to the action related to (1) high quality connectivity for excellence in Research and Education and (2) state-of-the-art connectivity for the wider European Digital Infrastructure⁹⁴.

The scope will be further defined once the FPA is in place. The possible actions, in line with the final action plan, may include:

- Maintenance, operation and upgrade of the production network infrastructure by pursuing a cost-effective approach in advance of demand growth and progressing quality requirements.
- Pan-European innovative procurement efforts to assure access for researchers and students to state-of-the-art commercial services.
- Operations of core network services (TRL8) and development of new ones (minimum TRL6) to cater for the new needs of institutions, research centres and end users

94

Subject to modifications following the final scope of the FPA action plan.

- Support the current (TRL8+) and development and prototyping (TRL6+) of added-value services (such as security services) and collaborative tools on top of core connectivity required by scientists, researchers and higher education students.
- Support researchers by developing new network and added-value services (including those based on lower TRLs) such as super high transfer speeds, quantum network testing, high precision time distribution, and other metrology services for example.
- Service level metrics, baseline and targets on quality of service for every service (connectivity and collaboration) in production stage.
- Expansion of the agreements with operators and service providers (public and private) that enable scientists and researchers access to a broader set of data sources (including European Data spaces) and digital tools, and facilitate collaboration with SME's and industry.
- Maintain and evolve the current core operations on identity federations and ensuring support of more complex services.
- Alignment of the AAI systems across various communities and RIs in Europe and assistance in deployment of community AAIs, including synergies with EU policies beyond the scientific and research domains, such as e-IDAS or ERASMUS+.
- Effective communication and dissemination activities across domains and target audiences across Europe
- Collaboration activities with other NRENs and RRNEs (National/Regional Research and Education Networks) outside the EU not covered in this or other programmes and that will contribute to the objectives of the action, including capacity development for researchers and scientists.

The aim is to provide faster, resilient, agile and secure **connectivity and collaboration services** for enabling scientists, researchers and students access to near real-time applications that support evidence-based decision-making in society and world-wide effective collaboration of virtual research communities.

The network infrastructure must offer state-of-the-art services for extracting the full potential and maximise value from the investments in data sources, research infrastructures and computing resources. The network services have to cater for virtual research teams from different domains and affiliations, providing trusted and secure access to heterogeneous digital resources and allowing collaboration with the private sector and SME's, when necessary. The provision should cover overall connectivity within the ERA, including HPC connectivity.

Expected Outcomes of the action:

- pan-European unconstrained and non-discriminatory secure and trusted access to data sources, storage and computing services, allowing scientists to conduct excellent research regardless of their location and the location of data and computing resources;
- evolved existing services and newly developed services to assure State-of-the art trusted and secure connectivity and collaboration services within Europe across the full spectrum of research and education networks in Europe;
- high quality, cost-effective, secure and resilient connectivity services providing unconstrained capacity ahead of demand in the backbone network and NREN⁹⁵ access in multiples of 100Gbps, paving the way for Terabit connectivity;
- exchange points for users beyond the traditional scientific and research communities within the remit of NRENs mandate, enabling data interoperability with for example SMEs and industry;
- networking and access facilities to the European open Data Spaces;
- authentication and authorisation Infrastructure (AAI) services and interoperability mechanisms with other well-accepted authentication systems and e-ID standards (in particular e-IDAS and its future evolution);
- access for researchers and students to commercial services required for Open Science under European data requirements and at a good value;
- support to training, dissemination for consolidating and expanding the cooperation and community building and for alignment with EU policy and participation with standardisation bodies.

(a2) The activities in this part of the SGA should follow the action plan developed under the FPA for Research and Education Networks.

They should cover upfront investments for long-term acquisitions of capacity and associated equipment (excluding operating costs) for covering connectivity within Europe for new research technologies that have requirements beyond existing networking. This action follows the successful models (e.g. BELLA-S1 & GN4-3N projects) with a dedicated action for covering full costs of equipment and acquisition of links (e.g. through IRU).

Activities within this action should be restricted to the procurement and launch into service of digital links. The selection of these should be fully aligned with the overall connectivity approach, which is developed and operated in the action SGA (a).

Expected Outcomes of the action:

- procurement of new long-term network capacity in the most suitable contractual form (e.g., IRU, Indefeasible Rights of Use, for spectrum, dark fibre, etc.). The duration of the

⁹⁵ National Research and Education Networks.

IRUs or participation/contract agreement shall minimise the TCO (Total Cost of Ownership) of links and provide for a minimum service of 7-10 years;

- procurement of necessary equipment to operate and exploit the capacity acquired under the action;
- a resilient topology that contributes in preserving European leadership in Research and education networking and aligns with EU principles on digital autonomy and sovereignty. The action will veil in particular avoiding systemic dependencies from non-associated countries.

Scope:

This action should cover full-cost of procurement of goods and services that are not covered already by the part (a1). The life span of goods and services procured under this action may extend after the duration of the action and beyond the FPA coverage. The consortium shall not claim further costs in the future to anyone for the capital investments covered in this action.

Form of Funding: Grants not subject to calls for proposals

Type of Action: Specific grant agreement awarded without call for proposals in relation to a Framework Partnership Agreement

Indicative timetable: Second quarter of 2022

Indicative budget: EUR 55.00 million from the 2022 budget

2. b) SGA for investments on International connectivity and collaboration

The activities under this SGA should follow the action plan developed under the FPA for Research and Education Networks.

The action should cover upfront investments for long-term acquisitions of capacity and associated equipment (excluding operating costs) for covering connectivity outside Europe. This action follows the successful models (e.g. BELLA-S1 & GN4-3N projects) with a dedicated action for covering full costs of equipment and acquisition of links (e.g. through IRU). It should be carried out in close partnership with key Regional European and International Partners and collaborations, such as the Advanced North Atlantic (ANA) and the AsiaPacific Europe Ring (AER).

Activities within this action should be restricted to the procurement and launch into service of digital links. The selection of these should be fully aligned with the overall connectivity approach, which is developed and operated in the action SGA (a) and SGA (b).

Expected Outcomes of the action:

- Maintenance, operation and upgrade of the existing production intercontinental network infrastructure by pursuing a cost-effective approach in advance of demand growth and progressing requirements from international research infrastructures (such as SKA etc.).
- Procurement of new long-term network capacity in the most suitable contractual form (e.g., IRU, Indefeasible Rights of Use, for spectrum, dark fibre, etc.). The duration of the IRUs or participation/contract agreement shall minimise the TCO (Total Cost of Ownership) of links and provide for a minimum service of 7 years.
- Procurement of necessary equipment to operate and exploit the capacity acquired under the action.
- A resilient topology that contributes in preserving European digital autonomy and sovereignty, in particular avoiding systemic dependencies from non-associated countries, based on reciprocity and the international cooperation rules of Horizon Europe.

Scope:

This action should cover full-cost of procurement of goods and services that are not covered already by the SGA (a). The life span of goods and services procured under this action may extend after the duration of the action and beyond the FPA coverage. The consortium should not claim further costs in the future to anyone for the capital investments covered in this action.

Form of Funding: Grants not subject to calls for proposals

Type of Action: Specific grant agreement awarded without call for proposals in relation to a Framework Partnership Agreement

Indicative timetable: Fourth quarter of 2021

Indicative budget: EUR 15.00 million from the 2021 budget

Public procurement

1. Delivering the EOSC core infrastructure and services

Expected Results:

- A fully operational, secure cloud-based EOSC infrastructure, including a federated core platform and the EOSC Exchange⁹⁶, offering high quality professional services and providing for a superior user experience, usability and ease of use for a very large number of users, with the functionalities available 24/7.

⁹⁶ “EOSC-Exchange” builds on the EOSC-Core and comprises Common (horizontal) and Thematic services that enable researchers to exploit FAIR data. Service providers that participate in EOSC-Exchange are required to conform to predefined Rules of Participation.

- Population of EOSC with a rich set of innovative, modular, customisable and composable services for a wide variety of users from the research communities and beyond.
- A large number of data and service communities aligned in terms of standards and consolidated at subdomain, domain and interdisciplinary levels.
- Established links with common European data spaces in crucial sectors, such as green deal or health, and synergies with the work on the European cloud federation as described in the Member States' joint declaration on building the next generation of cloud in Europe⁹⁷.
- Increased discovery and reuse of European research output as a result of FAIR data and services provided through EOSC, and cross-fertilisation and a wider sharing of knowledge and technologies.

Scope:

This action should build and deploy a fully operational enabling infrastructure for EOSC, providing access to a rich portfolio of FAIR data and professional quality FAIR services in all relevant domains from data handling to computing, processing, analysis and storing.

The infrastructure should be robust, secure, scalable, flexible and user-centric. It is constantly improved and upgraded following user feedback and the state-of-the-art of the underlying core technologies. It offers high quality of service management compliant with industrial standards, providing for a superior user experience, usability and ease of use for a very large number of users (i.e. hundreds of parallel user sessions per day), with the functionalities available 24/7. It offers seamless access to data, software and services through customised user interfaces, allowing users to navigate with built-in guidance tools and analytics for (re)use and service composition. It builds on the key concept of **federation**, standards and processes for Open Science, such as the EOSC Interoperability Framework and FAIR-by-design data and services.

The objective:

The infrastructure should build closely on the outcome of the H2020-INRAEOSC-03-2020 call and will cover at least⁹⁸ the following elements:

a) Deployment and operationalisation of the EOSC infrastructure for access to and exploitation of FAIR data and services

The EOSC infrastructure should be based on a cloud-based core platform that will serve as a point of access to the EOSC resources, enabling the federation of existing and planned research data infrastructures and allowing cross-border and cross-sectoral discovery of

⁹⁷ <https://ec.europa.eu/digital-single-market/en/news/towards-next-generation-cloud-europe>

⁹⁸ The final scope of the call for tender will be defined in 2022 taking into account the level of progress achieved through the selected project of the H2020-INRAEOSC-03-2020 call.

resources in the EOSC ecosystem. The platform should interface with a large number of data and service communities, including with thematic portals created by the ESFRI and national clusters, to allow users to benefit from EOSC in a customised manner.

To ensure scalability and effective federation of e-Infrastructures, data and services and use of the resources, the core platform should utilise an Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) approach.

The main features and functions of the core platform will include at least the following:

- Authorisation, Authentication and Identification (AAI) standards and services, ensuring security and privacy;
- Persistent Identifier services, compatible with the EOSC PID policy, and mechanisms for resolution of different PID types;
- Advanced discoverability, service catalogue management and orchestration services for all types of resources, metadata services and ontologies for discovery of and access to data and services across the federated EOSC ecosystem;
- Efficient workflow management, mechanisms allowing data inter-linking and application of data sharing policies;
- Standardised Application Programming Interfaces (APIs), including the development of new ones if needed, for machine-actionable and interoperable data, for interfacing with a large number of data and service communities, at subdomain, domain and interdisciplinary levels;
- User-friendly, responsive and easy to use visualisation services, data analytics and downloading tools designed for improved user experience;
- Thorough testing and reporting procedures;
- Auditing and reporting processes and services;
- Service quality management, monitoring and accounting, performance management;
- Helpdesk for data/service providers and users, including advice on data ownership, licensing and privacy issues;
- Services to ensure scalability and availability, allowing simultaneous use by hundreds of individual concurrent user sections per day with a standard response time;
- Services, processes and policies for availability and capacity management to ensure business continuity and disaster recovery;
- Application of firm cybersecurity policies and measures for systems' hardening and regular assessments regarding potential threats and the infrastructure's vulnerabilities

and overall attack surface, and well defined procedures for incident reporting and notification;

- Support for an open metrics framework to assess the EOSC uptake (usage, performance, value for money, user satisfaction, etc.) through the platform;
- Feedback mechanism to allow users to comment on the EOSC-core and EOSC-Exchange functionalities.

b) Provision of innovative, modular, customisable and composable services to serve a wide variety of users

The service provision of the EOSC infrastructure should be provided through two main service modalities (to be identified according to the specific needs, users and service areas):

Platform as a Service (PaaS)

The EOSC platform should provide secure, cloud-based access to the required resources (computing power, data, storage, programming tools and libraries, operating systems etc.) for the various user groups to exploit these resources, develop their own services, tools and applications of added value, and make them available to the wider EOSC community, across disciplines and countries.

Software as a Service (SaaS)

Under this service provisioning model, the users will be able to use, directly and on-demand, the whole range of available services provided by the EOSC Exchange. This service layer should make an extensive use of appropriate interfaces and the service workflow and catalogue management components of the core platform.

To ensure a rich set of services, applications and tools, covering both generic and thematic research needs, the EOSC Infrastructure should include at least the following functions:

- Assistance to data and service providers to comply with the EOSC Rules of Participation, align with its interoperability and FAIR standards, and prepare high quality datasets and services for reuse through EOSC;
- Validation and certification schemes for FAIR data;
- Onboarding and management services for the EOSC Exchange;
- Mechanism to link EOSC with the EuroHPC Joint Undertaking for high performance computing services;
- Mechanism to link EOSC with the European cloud federation;
- Procurement mechanism for e-infrastructures services, like computing, storage, and processing;

- Tools and services to allow researchers to find, access, reuse and combine their data with non-research data and resources, like the European Common Data Spaces.

The contractor can be either a single entity or a consortium, working in close collaboration with the selected consortium of the H2020-INRAEOSC-03-2020 call, to ensure continuity and professionalization of the services and to experiment and improve services through a close cooperation approach with the users.

The contractor(s) will also work closely with the EOSC Association, the EOSC community under the EOSC co-programmed Partnership, including eInfrastructures, and the representatives of the Member States in the governance of EOSC, to ensure engagement of the community, involvement of the users and alignment with national initiatives. The European Commission will oversee the operations of the infrastructure. Specific security conditions for eligible partner participation will apply, in line with the current EU legislation.

The use of common Free and Open Source Software (FOSS) is required, in line with both the open source strategy of the European Commission and the recommendation of the European Interoperability Framework.

Following the service contract, the final EOSC-core infrastructure and service platform will be property of the European Union and its Member States.

The duration of the performance of the contract should not exceed 36 months (including 2 months for approval of deliverables and payment).

Form of Funding: Procurements

Type of Action: Grant to identified beneficiary according to Financial Regulation Article 195 - Research and innovation action

Indicative timetable: Third quarter of 2022

Indicative budget: EUR 35.00 million from the 2022 budget

2. Procurement for a research repository for FAIR Digital Objects under Horizon Europe

Form of Funding: Procurements

Type of Action: Grant to identified beneficiary according to Financial Regulation Article 195 - Research and innovation action

Indicative timetable: xxxx quarter of yyyy

Expert contract actions

1. External expertise 2021

This action will support:

1. The use of appointed independent experts for the monitoring of actions (grant agreement, grant decision, public procurement actions, financial instruments) and where appropriate include ethics checks.
2. The use of individual experts to advise on, or support, the design and implementation of EU research policy, including the preparation of future programmes. The activities carried out by the experts will be essential to the development and monitoring of the Union policy on Research, Technological development and demonstration. The experts will be highly qualified, specialised, independent experts selected on the basis of their competence and knowledge of the field. A special allowance of EUR 450/day will be paid to the experts appointed in their personal capacity who act independently and in the public interest. This amount is considered to be proportionate to the specific tasks to be assigned to the experts, including the number of meetings to be attended and possible preparatory work.
3. The use of individual experts for the assessment of ERIC applications, as required under the ERIC Regulation⁹⁹. The experts will be highly qualified independent experts selected on the basis of their specific competence. The experts will provide a report for each of the assessed ERIC application. A special allowance of EUR 450/day will be paid to the experts appointed in their personal capacity who act independently and in the public interest. This amount is considered to be proportionate to the specific tasks to be assigned to the experts.

Form of Funding: Other budget implementation instruments

Type of Action: Expert contract action

Indicative budget: EUR 0.40 million from the 2021 budget

2. External expertise 2022

This action will support:

1. The use of appointed independent experts for the monitoring of actions (grant agreement, grant decision, public procurement actions, financial instruments) and where appropriate include ethics checks.
2. The use of individual experts to advise on, or support, the design and implementation of EU research policy, including the preparation of future programmes. The activities

⁹⁹ Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community Legal Framework for a European Research Infrastructure Consortium.

carried out by the experts will be essential to the development and monitoring of the Union policy on Research, Technological development and demonstration. The experts will be highly qualified, specialised, independent experts selected on the basis of their competence and knowledge of the field. A special allowance of EUR 450/day will be paid to the experts appointed in their personal capacity who act independently and in the public interest. This amount is considered to be proportionate to the specific tasks to be assigned to the experts, including the number of meetings to be attended and possible preparatory work.

3. The use of individual experts for the assessment of ERIC applications, as required under the ERIC Regulation¹⁰⁰. The experts will be highly qualified independent experts selected on the basis of their specific competence. The experts will provide a report for each of the assessed ERIC application. A special allowance of EUR 450/day will be paid to the experts appointed in their personal capacity who act independently and in the public interest. This amount is considered to be proportionate to the specific tasks to be assigned to the experts.

Form of Funding: Other budget implementation instruments

Type of Action: Expert contract action

Indicative budget: EUR 0.40 million from the 2022 budget

¹⁰⁰ Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community Legal Framework for a European Research Infrastructure Consortium.

Horizon Europe - Work Programme 2021-2022
Research Infrastructures

Budget¹⁰¹

	Budget line(s)	2021 Budget (EUR million)	2022 Budget (EUR million)
Calls			
HORIZON-INFRA-2021-DEV-01		7.80	
	<i>from</i> 01.020103	7.80	
HORIZON-INFRA-2021-DEV-02		42.50	
	<i>from</i> 01.020103	42.50	
HORIZON-INFRA-2022-DEV-01			30.00
	<i>from</i> 01.020103		30.00
HORIZON-INFRA-2021-EOSC-01		64.00	
	<i>from</i> 01.020103	64.00	
HORIZON-INFRA-2022-EOSC-01			27.50
	<i>from</i> 01.020103		27.50
HORIZON-INFRA-2021-SERV-01		115.00	
	<i>from</i> 01.020103	115.00	
HORIZON-INFRA-2022-SERV-01			10.00
	<i>from</i> 01.020103		10.00
HORIZON-INFRA-2022-SERV-02			35.00
	<i>from</i>		35.00

¹⁰¹ The budget figures given in this table are rounded to two decimal places.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2021 and 2022.

**Horizon Europe - Work Programme 2021-2022
Research Infrastructures**

	<i>01.020103</i>		
HORIZON-INFRA-2021-TECH-01		30.00	
	<i>from 01.020103</i>	<i>30.00</i>	
HORIZON-INFRA-2022-TECH-01			120.00
	<i>from 01.020103</i>		<i>120.00</i>
HORIZON-INFRA-2021-GEANT-01-FPA			
Other actions			
Grant to identified beneficiary according to Financial Regulation Article 195		0.30	
	<i>from 01.020103</i>	<i>0.30</i>	
Specific grant agreement		15.00	55.00
	<i>from 01.020103</i>	<i>15.00</i>	<i>55.00</i>
Public procurement			35.00
	<i>from 01.020103</i>		<i>35.00</i>
Expert contract action		0.40	0.40
	<i>from 01.020103</i>	<i>0.40</i>	<i>0.40</i>
Estimated total budget		275.00	312.90

Specific Features for Research Infrastructure

This section provides, for different topics under the Destination 3 of the Research Infrastructures Work Programme, further conditions and requirements on access provision that applicants should fulfil when drafting a proposal. The compliance to these provisions will be taken into account during evaluation.

Trans-national and/or virtual access¹⁰² activities.

Trans-national access activities

To provide 'free of charge' trans-national access to selected researchers or research teams (user-groups) including from industry, to infrastructure services offered under the grant. Access activities should be implemented in a coordinated way such as to improve the overall service provision to the research community. Access may be made available to external users, either **in person** ('hands-on'), when the user visits the infrastructure to make use of it, or through the provision to the user of **remote** scientific services, such as the provision of reference materials or samples, the performance of sample analysis or sample deposition.

The research infrastructures shall publicise widely the access offered under the grant agreement to ensure that researchers who might wish to have access to the infrastructures are made aware of the possibilities open to them. They shall open specific calls to invite researchers to apply for access. The research infrastructures shall promote equal opportunities in advertising the access and take into account the gender issues when defining the support provided to visitors. They shall maintain appropriate documentation to support and justify the amount of access reported. This documentation shall include records of the names, nationalities, and home institutions of the users within the research teams, as well as the nature and quantity of access provided to them. To this extent a unit of access to each infrastructure service/installation¹⁰³ will be identified and precisely defined in the proposal.

The selection of researchers or research teams shall be carried out through an independent peer-review evaluation of the research projects they wish to carry out at the infrastructure. The research team, or its majority, must work in countries other than the country(ies) where the infrastructure is located (when the infrastructure is composed of several research facilities, operated by different legal entities, this condition shall apply to each facility) except when access is provided by an International organisation, the Joint Research Centre (JRC), an ERIC or similar legal entities with international membership. User teams where all or the majority of users works in third countries can be supported as far as the cumulative access provided to them is below 20% of the total amount of units of access provided under the grant. In exceptional and well justified cases a higher percentage of access to third-country user teams can be foreseen in the proposal.

¹⁰² As defined in Article 18 of Annex 5 of Horizon Europe Model Grant Agreement

¹⁰³ "Installation" means a part or a service of a research infrastructure that can be used independently from the rest. A research infrastructure consists of one or more installations.

Only user groups that are allowed to disseminate the results they have generated under the action may benefit from the access (unless the users are working for SMEs).

The duration of stay at a research infrastructure shall normally be limited to three months, unless otherwise foreseen in the proposal.

EU financial support to trans-national access will cover the *access costs*¹⁰⁴ incurred by the access provider for the provision of access to the selected researchers as well as the travel and subsistence incurred to support the visits to the infrastructure of these researchers.

The *access costs* charged to the grant will not include capital investments, unless otherwise specified in the Work Programme, while they may cover the running costs of the infrastructure as well as the cost for the logistical, technological and scientific support to users' access, including costs for ad-hoc training needed by users to use the infrastructure and for preparatory and closing activities that may be necessary to carry out users' work on the infrastructure.

Virtual access activities

To provide virtual access to research infrastructure through communication networks to users complying with the access policy of the RI, without selecting them. Examples of virtual access activities are provision of access to databases available via Internet, or data deposition services.

The research infrastructures shall publicise widely the access offered under the grant agreement to ensure that researchers who might wish to have access to the infrastructures are made aware of the possibilities open to them.

The EU financial support to virtual access will cover the *access costs*¹⁰⁵ incurred by the infrastructure for the provision of access under the project, including the technological and scientific support needed by researchers to effectively use the services. Capital investments will not be eligible costs unless otherwise specified in the Work Programme, in which case only the portion used to provide virtual access under the project can be eligible. A unit of access to each research infrastructure service will be identified and precisely defined in the

¹⁰⁴ Access costs will be supported through the reimbursement of the eligible costs specifically incurred by a research infrastructure for providing access to the research teams selected for support under the project, or on the basis of unit costs calculated according to the methodology indicated in the Decision authorising the use of unit costs for the costs of providing trans-national and virtual access in Research Infrastructures actions under the Horizon Europe Programme. In the latter case the access costs will be calculated multiplying the unit cost by the quantity of access provided under the grant. The cost of the unit of access to the infrastructure, i.e. the unit cost, shall then be indicated in the proposal. A combination of the two methods mentioned above will also be possible.

¹⁰⁵ Access costs will be supported through the reimbursement of the eligible actual costs specifically incurred by a research infrastructure for providing virtual access to identified users under the project, or on the basis of unit costs calculated according to the methodology indicated in the [Decision authorising the use of unit costs for the actions involving trans-national and virtual access](#) under the Research Infrastructures Part of the Horizon Europe Framework Programme. In the latter case, the access costs will be calculated multiplying the unit cost by the quantity of access provided under the grant. The cost of the unit of access to the research infrastructure, i.e. the unit cost, shall then be indicated in the proposal. A combination of the two methods mentioned above will also be possible.

proposal. The provision of virtual access during the project lifetime will be measured through the units of access defined in the Grant Agreement and shall be periodically assessed by an external board. Eligibility criteria (e.g. affiliation to a research or academic institution) for the users to whom access will be provided can be defined in the proposal, to take into account the access policies of the different RIs.

DRAFT