

Action 1: Enable the open sharing of knowledge and the re-use of research outputs, including through the development of the European Open Science Cloud (EOSC)	
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1. Description	<p>The amount of data generated or used in public-funded research and innovation (R&I) activities is growing exponentially. However, a significant part of the data never makes it to a trusted and sustainable repository, is poorly annotated or not formatted in a standardised way that supports machine readability. As a consequence, many experiments conducted on the basis of those data are considered not reproducible. Scientific data and other research digital output, such as codes and software, need to be more open, better managed, machine actionable and extensively re-used.</p> <p>The EOSC action should enable a step change across scientific communities and research infrastructures in Europe towards open sharing, seamless access and reliable re-use of data and all other digital objects produced along the research life cycle, e.g. methods, software and publications. The ambition is to provide European researchers, innovators, companies and citizens with an accessible, trusted and open distributed environment where they can publish, find and re-use each other's data and tools for research, innovation and educational purposes, as well as access relevant services.</p> <p>EOSC is transitioning to a stakeholder-driven approach with a shared vision, common objectives and complementary contributions at European, national and institutional levels. An EOSC Strategic Research and Innovation Agenda (SRIA) has been co-developed to set the general, specific and operational objectives and the related action areas of the EOSC European co-programmed partnership until 2030. It includes the development and deployment of EOSC foundations and federating services as well as EOSC value-added services for scientists. As part of this action, there is a commitment from the Member States, the European Commission (EC) and the EOSC association to establish a joint monitoring mechanism to collect data and benchmark contributions related to EOSC.</p> <p>Outcomes:</p> <ol style="list-style-type: none"> 1) Deploy the core components and services of EOSC and federate existing data infrastructures in Europe, working towards the interoperability of research data; 2) Establish a monitoring mechanism to collect data and benchmark investments, policies, digital research outputs, open science skills and infrastructure capacities related to EOSC; 3) Deploy Open Science principles and identify Open Science best practices. <p>EOSC will also help to gather and monitor data on the usage, quality and impact of research outputs, infrastructures, and on open science practices data to support new types of research assessment. It will investigate financial models for cross-RI service provision through the</p>

	EOSC and help to accelerate open science practices, FAIR Data management, and uptake of EOSC resources and frameworks by the research communities involved in the HE missions.
2. Actors	<p>A tripartite EOSC governance has been set up in 2021 to develop wider synergies between the multiple EOSC stakeholders at European, national, community and institutional levels:</p> <ul style="list-style-type: none"> • The European Commission representing the EU; • The EOSC Steering Board¹ representing the voice of the participating countries: the Member States and the countries associated to Horizon Europe (informal EC expert group), renewable in function of the future ERA governance); • The new EOSC association² (AISBL) representing the research community and its service providers.
3. Timing and milestones	<p>As far as a calendar can be established already at this stage.</p> <ol style="list-style-type: none"> 1. Deployment of the foundations for the EOSC federation (EOSC core) in 2022 and expansion of the EOSC Value-added Services for scientists (EOSC Exchange) in 2023-2024. Both with the support of topics and procurements under the Horizon Europe Work Programmes for Research Infrastructures); 2. Deployment of the EOSC Observatory to support MS/AC and EOSC stakeholders in tracking the EOSC readiness and maturity of MS/AC and monitoring key EOSC policy developments: dashboard development in Q1 2022, testing in Q2 2022 and initial roll-out in Q1 2023. 3. Continuous deployment of open science principles and identification of open science best practices by the MS and AC through annual surveys of the EOSC Steering Board and annual plans for additional activities by the EOSC Association and its members.
4. Funding	<ul style="list-style-type: none"> • A co-investment (in kind and in cash) by the EU and non-EU partners of at least €1 Billion is currently foreseen for the next seven years. The EU contribution will essentially come from the Horizon Europe Work Programmes for Research Infrastructures. • Ongoing EOSC-FUTURE H2020 grant (EU investment of EUR 40+ Mio in the period 2021-2023).
5. Expected impact	<p>The following objectives should be achieved by 2030:</p> <ul style="list-style-type: none"> • Ensure that Open Science practices and skills are rewarded and taught, becoming the 'new normal'; • Standards, tools and services allow researchers to find, access, reuse and combine results;

¹ 25 Member States are already represented in the EOSC Steering Board, plus several countries associated to Horizon Europe.

² As of 10 December 2021: 238 participating entities including 161 members and 73 observers.

	<ul style="list-style-type: none"> • A federated infrastructure enabling open sharing of scientific results is deployed and sustained. • Europe in the driving seat towards a web of FAIR data.
6. Monitoring	<p>Typical indicators of performance include:</p> <ol style="list-style-type: none"> 1. EOSC deployment in the period 2022-2024: <ul style="list-style-type: none"> • A first generation of pan-European federation of infrastructures for preservation, management and sharing of research software is available; • Number of core functions of Minimum Viable EOSC that are developed to make the EOSC ecosystem accessible to researchers across disciplines and countries; • Percentage of the repositories in EOSC that will implement a certification mechanism; • Percentage of research disciplines that have documented standards and protocols for data sharing and reuse; • Percentage of the metadata related to publicly funded research datasets which are defined as Open Data that are discoverable through EOSC federated infrastructure. 2. EOSC observatory deployment in 2022-2024: <ul style="list-style-type: none"> • <i>Aspects such as service level, availability, reliability, capacity and quality of service parameters against user requirements.</i> 3) Continuous deployment of open science principles <ul style="list-style-type: none"> • Number of research organisations located in the Member States and Associated countries joining the EOSC partnership; • Number of national education systems that recognise European curricula for data stewardship; • Percentage of EOSC Partnership members that recognise Open Science activities in research career assessments; • Percentage of publications from EOSC Partnership members that become immediate open access; • Percentage of research data from EOSC Partnership members which is deposited in repositories that is made as open as possible. • Percentage of EOSC Partnership members that have policies which require FAIR to be implemented in project design via Data Management Plans; • Percentage of EOSC Partnership members that have data stewards to support their research.
7. Communication	<ul style="list-style-type: none"> • Communication by the Commission on the occasion of the first procurement in 2022 on “Delivering the EOSC core infrastructure and services”. • Communication by the Commission, the EOSC Association and the EOSC-FUTURE consortia in 2023 on the occasion of the roll-out of the EOSC observatory.

TEMPLATE FOR EXPLANATORY DOCUMENTS ON ERA ACTIONS FROM THE ERA POLICY AGENDA

This document is a working document and should not be considered as representative of the European Commission's official position.

	<ul style="list-style-type: none">• Communication by the Commission, national public authorities and the EOSC Association on the occasion of the EOSC tripartite events and EOSC Symposia.
8. Additional information	<ul style="list-style-type: none">• EOSC Strategic research and innovation agenda: https://www.eosc.eu/strategic-agenda• EOSC FUTURE Open Days: https://eoscfuture.eu/eventsfuture/eosc-future-open-days/