

The CNRS logo is a white circle containing the lowercase letters 'cnrs' in a bold, black, sans-serif font. It is positioned in the upper right quadrant of the slide, overlapping the yellow and blue background areas.

cnrs

Dimension scientifique

Vision et objectifs d'EOSC et EOSC dans son écosystème

Suzanne Dumouchel – CNRS DDOR

→ Journée EOSC au CNRS – Mardi 6 février 2024

Science is in transition

Open Science: sharing knowledge and tools as early as possible, between researchers and disciplines and also with society at large.



Image by Nick Younason CC BY-

Open Science Commons

The Commons are community-governed and driven by a core set of values

EOSC

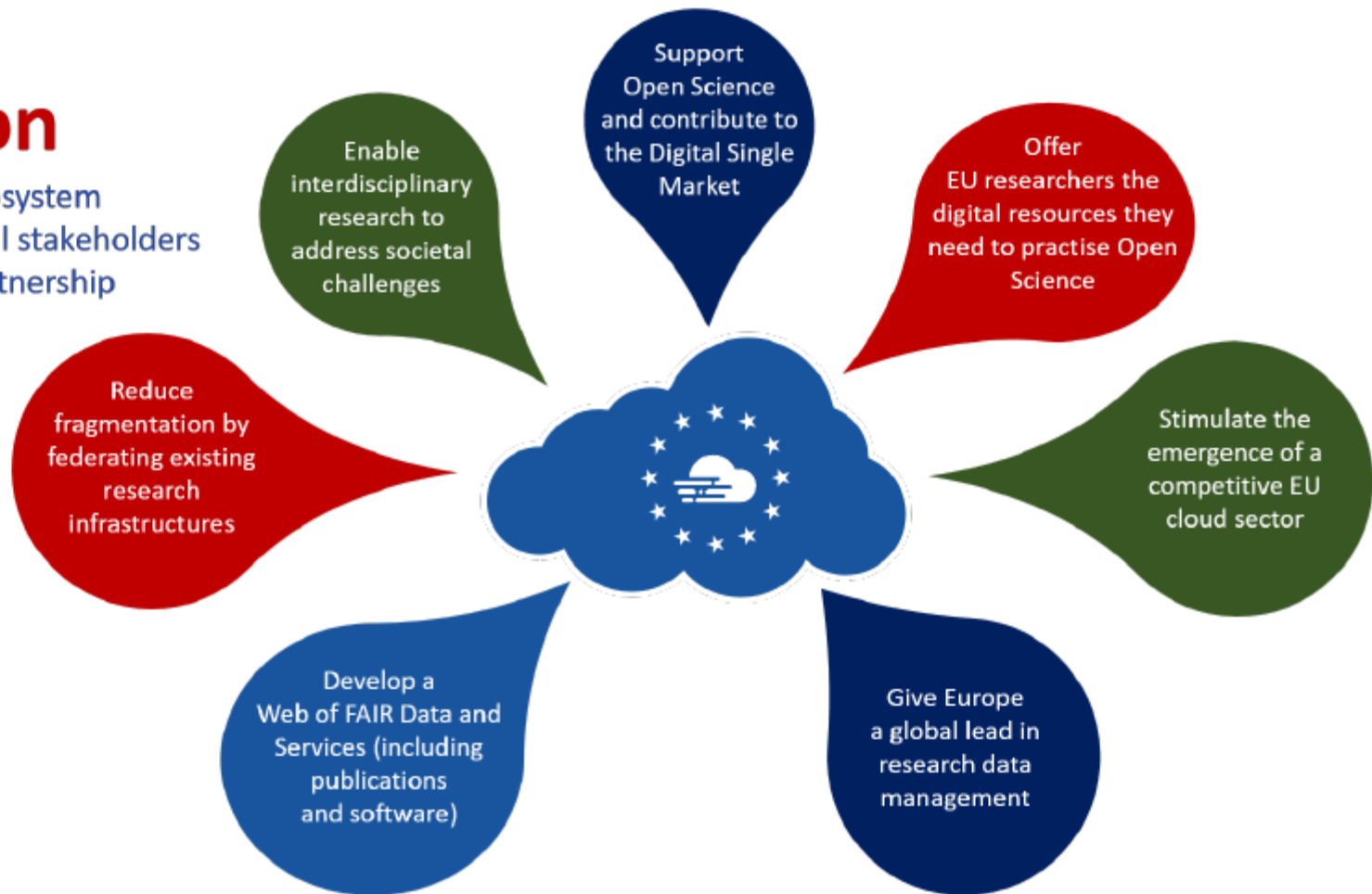
European Open Science Cloud
will

Enable Open Science Commons

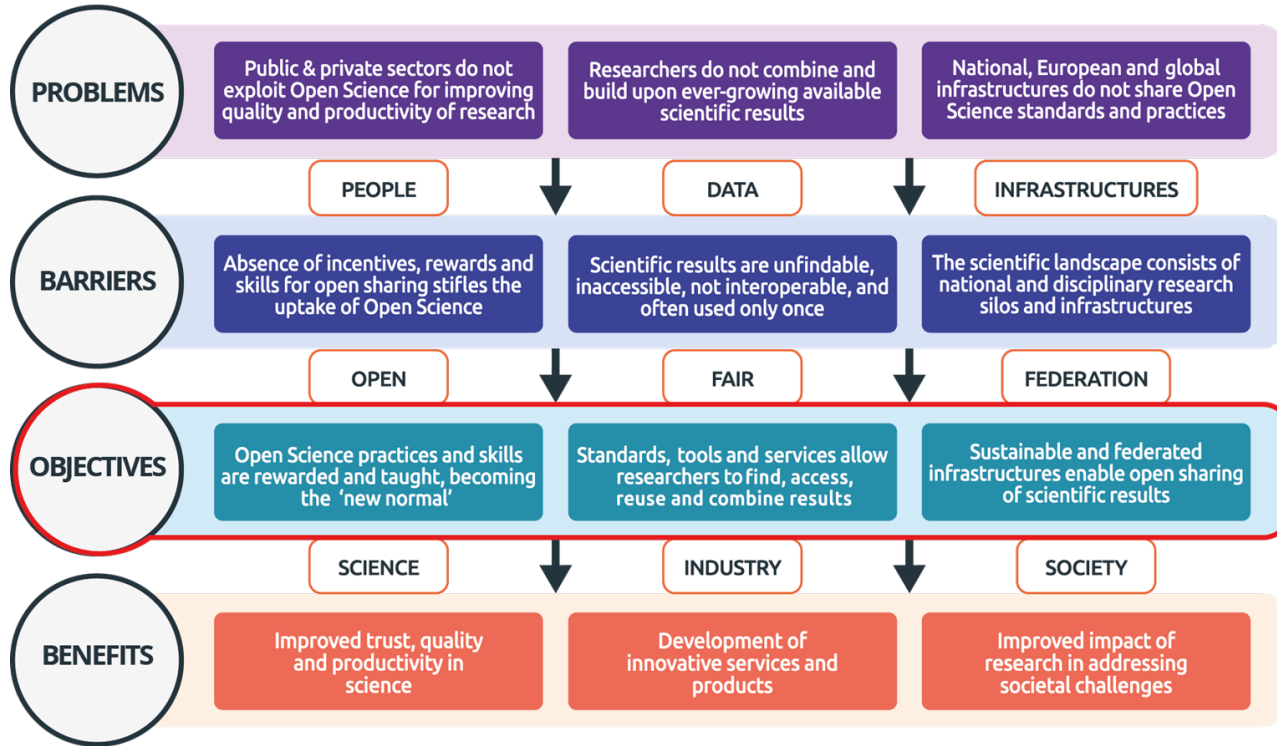


The Vision

Building the EOSC ecosystem collaboratively with all stakeholders through the EOSC Partnership



European Open Science Cloud Objectives Tree



(EOSC Strategic Research Implementation Agenda v1.0)

What

EOSC is the European web of FAIR data and related services for research

Research data that is easy to find, access, interoperate and reuse (FAIR)

Trusted and sustainable research outputs are available within and across scientific disciplines

Why

Unlock the full potential of research data to accelerate discoveries and innovation

How

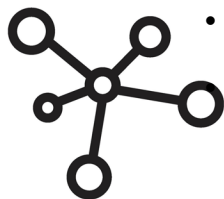
- Ensure that Open Science practices and skills are rewarded and taught, becoming the 'new normal'
- Enable the definition of standards, and the development of tools and services, to allow researchers to find, access, reuse and combine results
- Establish a sustainable and federated infrastructure enabling open sharing of scientific results



Strategic
Research and
Innovation
agenda (SRIA)
eosc.eu/sria-mar

eosc From vision to implementation: “the EOSC federation”

The EOSC vision is to set up a ‘Web of FAIR Data and Services’ for science in Europe. Central to this ambition is the deployment of a trusted, virtual, federation of existing infrastructures in Europe to store, share and reuse FAIR research outputs across borders and scientific disciplines also called the “EOSC Federation”.



- EOSC is **NOT** a new digital infrastructure

The EOSC ambition is to **federate existing data, research and e - infrastructures** nodes to make them all **available to European researchers across borders and across disciplines** (distributed EOSC ‘system of systems’)

- In doing so, **the federation will be augmented with new additional services and tools** that will enable the EU web of FAIR data and related services (EOSC can be seen as a thin federation layer based on FAIR principles)
- The federation will provide **coordinated entry points primarily for researchers in Europe (the so called “nodes”)** to find and access FAIR data and interoperable services that address elements of the whole research cycle (from discovery and mining to storage, management, analysis, publication, and re-use)
- **The entry points for EU researchers will be via their traditional channels** (e.g. via the national, regional, pan-European or thematic infrastructure nodes they are currently using) **or via the EU EOSC node central instance** (for the researchers that do not have existing access channels in place)



1. Who is EOSC for?

EOSC is for European research and thus the European researchers will be the main beneficiaries of EOSC

eosc Who is EOSC for?

EOSC aims to support all European researchers

How?

- **Enhancing scientific research** by providing access to a wealth of data and research outputs from various fields and institutions
- **Fostering innovation** by making it easier for researchers to share, collaborate and build on each other's work
- **Improving transparency and reproducibility** of research by making data and methods more open and accessible
- **Reducing data silos and duplication of efforts** by promoting data sharing and reuse
- **Facilitating interdisciplinarity research and cross - sectoral collaboration** by making data and resources from different domains more easily available



Individual researchers will benefit from EOSC through their existing channels (e.g. universities, research institutes, research infrastructures, associations, science clusters, etc.) that will act as intermediaries.

eosc EOSC can mean a lot for EU researchers

- **EOSC as Open Science (OS) & FAIR culture booster** Working with policy makers and European initiatives (such as the CoARA coalition), EOSC will support the cultural change towards OS and FAIR principles in the EU countries and institutions.
 - All EU researchers will indirectly benefit from the cultural change brought by EOSC. The EOSC vision aims to have Open Science and FAIR practices fully encouraged, supported and recognised at institutional and national level.
- **EOSC as point of reference for building the new OS / FAIR related skills and career paths:** Working closely with universities and research institutes, EOSC will support the creation of the workforce of the future and of the necessary competence support centers.
 - All EU researchers will benefit from the training material, guidelines and support provided by EOSC.
- **EOSC as web of FAIR data and related services:** The EOSC federation will make available the resources of existing data, research and e -infrastructures across borders and disciplines
 - All the EU researchers will be able to access an extended offer in terms of FAIR data and related services.



2. EOSC is not...

The most common mistakes about EOSC

eosc EOSC is not ...

1. ...a cloud infrastructure

Despite the word “cloud” part of its name, EOSC is not a new cloud computing platform

2. ... a new research data repository or research data management system

The federation of existing infrastructures, i.e. EOSC, is a new infrastructure which does not exist today

3. ... a new pan-European e-infrastructure

EOSC is not building a new infrastructure. EOSC is building i. the components to enable the federation of existing data, research and e-infrastructure nodes and ii. the additional services needed to enable the Web of FAIR data and related services.

4. ... synonymous of Open Science

EOSC is the enabler that will support the deployment of Open Science in Europe. EOSC does not substitute any existing Open Science networks.

5. ... the EOSC Association

The EOSC Association as representative of the various stakeholders in Europe is the legal entity established to work together with the European Commission to support the realisation of the EOSC strategy.

6. ... substituting any existing national, regional, pan-European, agnostic nor thematic Research Infrastructures or e-infrastructure

EOSC will enable the federation of existing data, research and infrastructure nodes. The new developments are focused on components enabling the federation and on the additional services needed to enable the Web of FAIR data and related services

7. ... the EOSC Portal

The EOSC Portal is one of the results of the EOSC Future EC funded project (2019-2023). The EOSC Portal is piloting the EOSC AA and the idea of a European marketplace for services supporting researchers.

8. ... owning any data or services

EOSC is an enabler. The ownership of the federated elements (data, services, research infrastructures, infrastructures, etc.) will remain with the providers.

9. ... engaging directly individual researchers.

Individual researchers will benefit from EOSC through their existing channels (e.g. universities, research institutes, research infrastructures, associations, etc.) that will act as intermediaries.



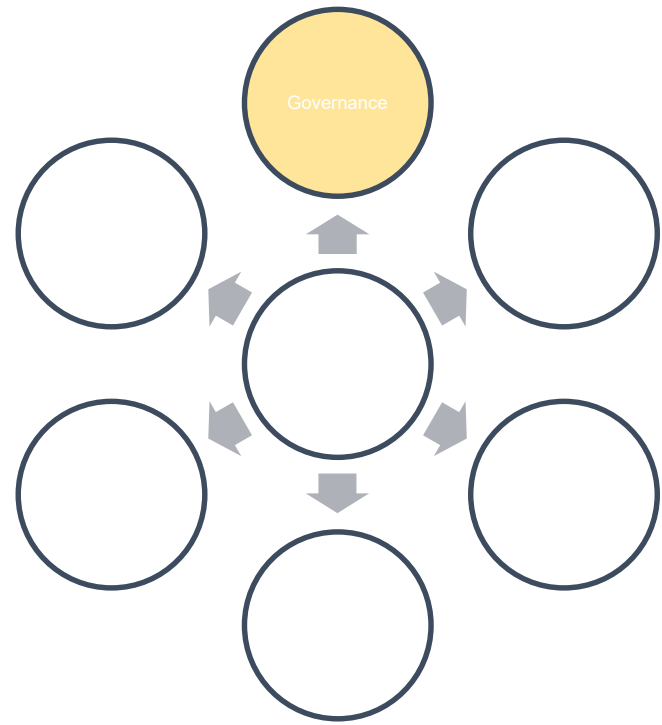
EOSC is not just about technical implementation



- The establishment of EOSC is not only a technical implementation issue
- There are at least six other crucial areas for its success
 - Governance
 - Financing
 - Policies and Regulations
 - Stakeholder Engagement & Adoption
 - Monitoring

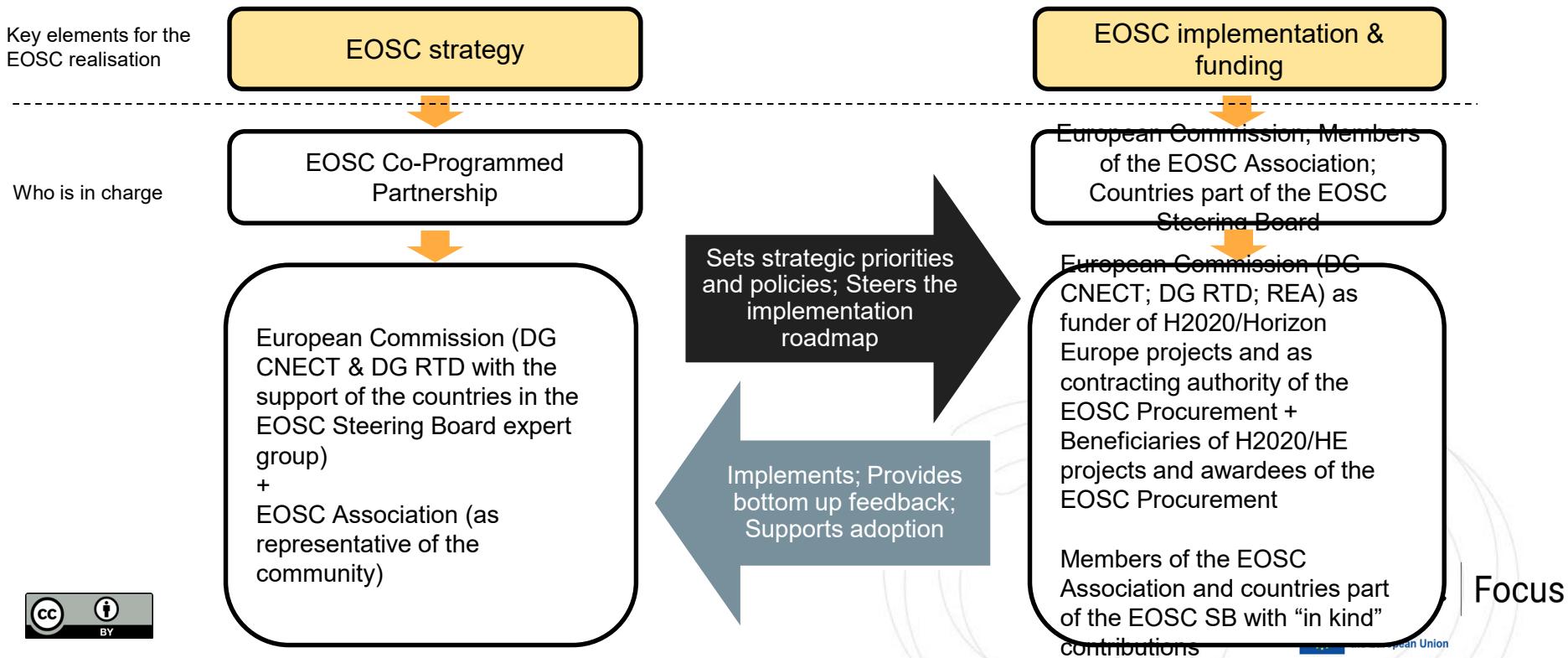
3. Who's who

Who owns EOSC? What are the actors part of its governance and with what role?



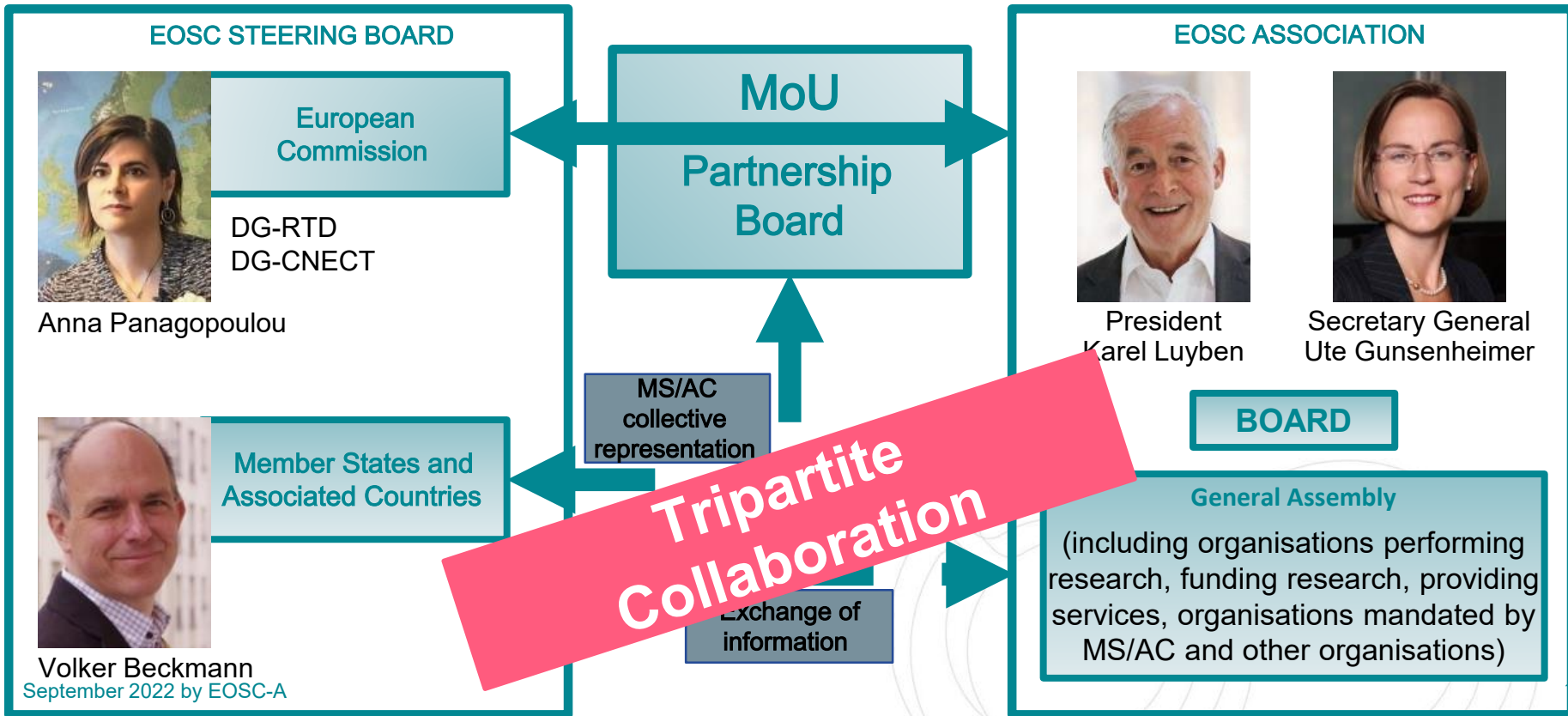
eosc Who's who

EOSC is a publicly funded initiative launched by the European Commission, the executive branch of the European Union (EU). Therefore, **EOSC is not owned by any single organisation or individual**, but rather is a collaborative effort involving a wide range of stakeholders across the scientific community. Its development is driven by the **EOSC Co-Programmed Partnership** governance.



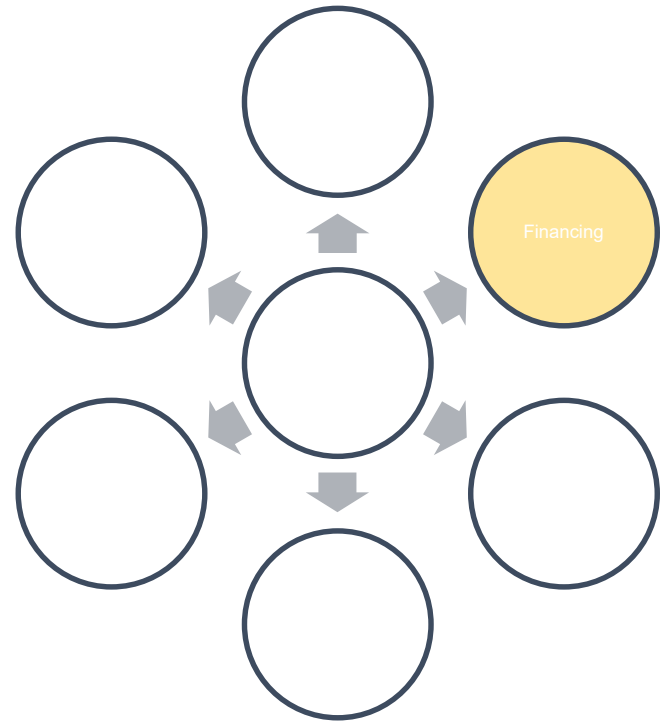
eosc EOSC Partnership

Tripartite Collaboration



4. EOSC Financing

Who pays for EOSC and how much?

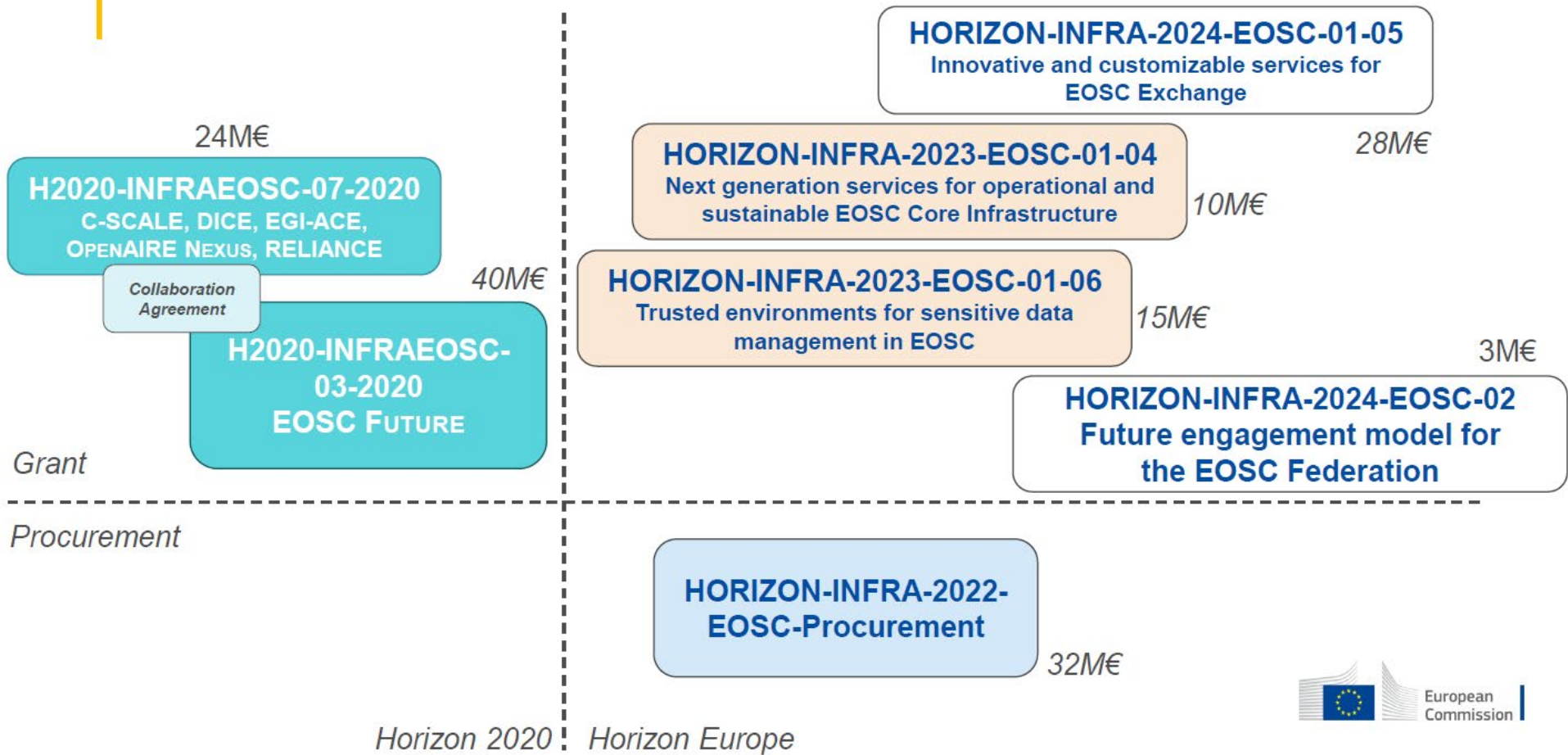


eosc Core funding for the EOSC development (2018&2027)

EOSC phase 1: preparatory 2018 - 2020	EOSC phase 2: convergence 2021 - 2027	EOSC phase 3: operation Post-2027
<p>Funding instruments: H2020 calls/grants approach</p>	<p>Funding instruments: HE INFRAEOSC calls / grants approach EOSC Procurement In kind contributions from the EOSC Association members</p>	<p>Funding instruments: Under discussion</p>
<p>Funders: European Commission (DG CNECT; DG RTD)</p>	<p>Funders: European Commission (DG CNECT; DG RTD) Members of the EOSC A, countries part of the EOSC SB & other in kind contributions</p>	<p>Funders: Under discussion</p>
<p>Total funding: 350 M€</p>	<p>Total funding: 1 billion € (500M€ from the EC + 500M€ as in kind contributions from the EOSC Association members) + other in kind contributions</p>	<p>Total funding: Under discussion</p>
<p>Main purpose: To support the implementation strategy defined in the EOSC roadmap 2018-2020 by the European Commission</p>	<p>Main purpose: To support the implementation of the strategic priorities identified in the Multi Annual Roadmap 2021-2022; 2023-2024; 2025; 2026-2027 of the Strategic Research and Innovation Agenda (SRIA)</p>	<p>Main purpose: To support the EOSC strategy and governance post 2027</p>



EU investments in direct support to the **EOSC Infrastructure**



Other EU investments through the INFRAEOSC Destination

Enabling Open Science

Supporting an EOSC-ready digitally skilled workforce

HORIZON-INFRA-2021-EOSC-01-01
SKILLS4EOSC (7Mio€)

Services that underpin a research assessment system that incentivises Open Science

HORIZON-INFRA-2022-EOSC-01-01
GRASPOS (8 Mio€)

Supporting institutional open access publishing across Europe

HORIZON-INFRA-2022-EOSC-01-02
CRAFTOA (5 Mio€)

Long term access and preservation infrastructures and data quality

HORIZON-INFRA-2024-EOSC-01-04 (8 Mio€)

FAIR implementation

Deploying EOSC-Core components for FAIR

HORIZON-INFRA-2021-EOSC-01-03
FAIRCORE4EOSC (10 Mio€)

Enabling discovery and interoperability of research objects across communities

HORIZON-INFRA-2021-EOSC-01-05
FAIR-IMPACT (10 Mio€)

Support to international standards and specifications for open sharing of FAIR research digital objects

HORIZON-INFRA-2022-EOSC-01-04
RDA TIGER (3 Mio€)

Planning, tracking and assessing scientific knowledge production

HORIZON-INFRA-2023-EOSC-01-03 (8 Mio€)

Improving the quality of scientific software and codes

HORIZON-INFRA-2023-EOSC-01-02 (8 Mio€)

Enabling a network of EOSC federated and trustworthy repositories

HORIZON-INFRA-2024-EOSC-01-03 (5 Mio€)

Uptake – Use cases

FAIR and open data sharing in support of the Cancer Mission

HORIZON-INFRA-2021-EOSC-01-06
EOSC4CANCER (8Mio€)

FAIR and open data sharing in support of the Mission on oceans & waters

HORIZON-INFRA-2022-EOSC-01-03
BLUE CLOUD 2026 AND AQUAINFRA (16 Mio€)

Build on the science cluster approach to ensure EOSC uptake

HORIZON-INFRA-2023-EOSC-01-01
(25 Mio€)

FAIR and open data sharing in support of the Mission climate adaptation

HORIZON-INFRA-2024-EOSC-01-01
(16 Mio€)

EOSC partnership

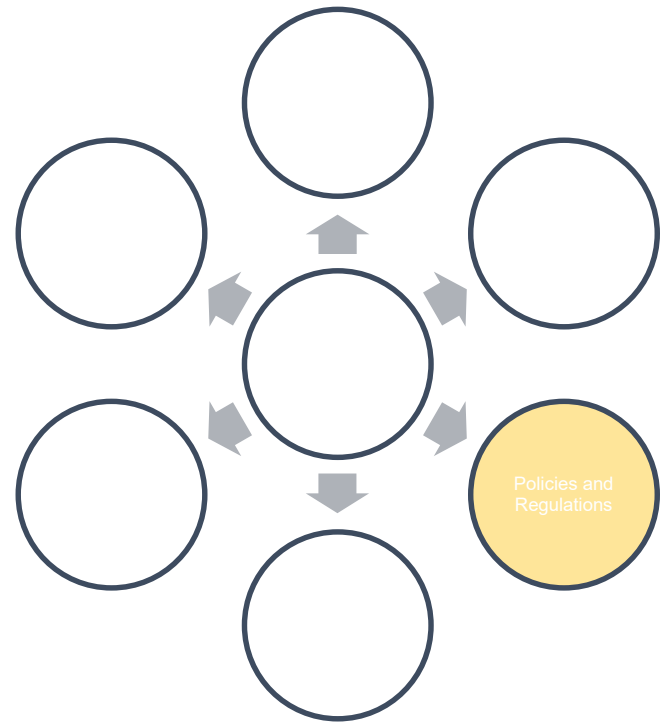
Supporting activities of the European EOSC Partnership

HORIZON-INFRA-2021-EOSC-01-02
EOSC-FOCUS
(4Mio€)

Supporting activities of the European EOSC Partnership
HORIZON-INFRA-2024-EOSC-01-02
(4 Mio€)

5. EOSC in the policy context

What are the policies EOSC is contributing to and how?





EOSC as a policy action

The EOSC initiative is a **policy priority of the European Union** since 2016 driven by DG RTD and DG CNECT.

“The EOSC is recognised by the Council of the European Union among the 20 actions of the [policy agenda 2022-2024 of the European Research Area \(ERA\)](#) with the specific objective to deepen open science practices in Europe. It is also recognised as the "science, research and innovation data space" which will be fully articulated with the other sectoral data spaces defined in the [European strategy for data](#)“

European Commission website

research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en

Enable the open sharing of knowledge and the re-use of research outputs, including through the development of the European Open Science Cloud (EOSC)”

- The Competitiveness Council of November 2021 placed the development of Open Science and EOSC as part of the European Research Area Policy Agenda for 2022-2024 to ‘enable the open sharing of knowledge and reuse of research outputs’.
- ERA Action 1 has a strategic focus on transforming current practices by the scientific, research and innovation communities and research infrastructures in Europe towards open sharing, seamless access to and reliable re-use of data and all other digital objects produced along the research life cycle e.g., methods, protocols, software, and publications. **The development of the EOSC is a key enabler for this to happen** as the infrastructure sustaining the transition to open science and the digital transformation of research.
- **25 Member States (MS), 3 associated countries (AC) and 9 stakeholders (SH)** have committed to actively participate in the implementation of Action 1.
- The action targets the following key deliverables:
 - Deploy Open Science principles and identify Open Science best practices;
 - Deploy the core components and services of EOSC and existing data infrastructures in Europe;
 - Establish a monitoring mechanism to collect data and benchmark investments, policies, digital research outputs, open science skills and infrastructure capacities related to EOSC.

European Data Strategy

- Commission Staff Working Document on Common European Data Spaces (SWD(2022)45).
- European Data Governance Act

Open Science Policies

- 2016: [Council Conclusions on the 'Transition Towards an Open Science System'](#)
- 2018: [EC Recommendation on 'Access to and Preservation of Scientific Information'](#)
- 2020: [EC Communication on the 'New ERA'](#)
- 2021: [Council Recommendation on a 'Pact for R&I in Europe'](#)
- 2021: [Council Conclusions on the 'Future Governance of the ERA' including the 'ERA Policy Agenda'](#)
- 2022: [Council Conclusions on 'Research Assessment and Implementation of Open Science'](#)

Other ERA Policy Agenda priority actions (2022 – 2024)

- Data legislative framework for research
- Reform of Research Assessment
- Research Infrastructures
- International cooperation
- Green/digital transition
- etc.

EU Missions in Horizon Europe

- [Adaptation to Climate Change: support at least 150 European regions and communities to become climate resilient by 2030](#)
- [Cancer: working with Europe's Beating Cancer Plan to improve the lives of more than 3 million people by 2030 through prevention, cure and solutions to live longer and better](#)
- [Restore our Ocean and Waters by 2030](#)

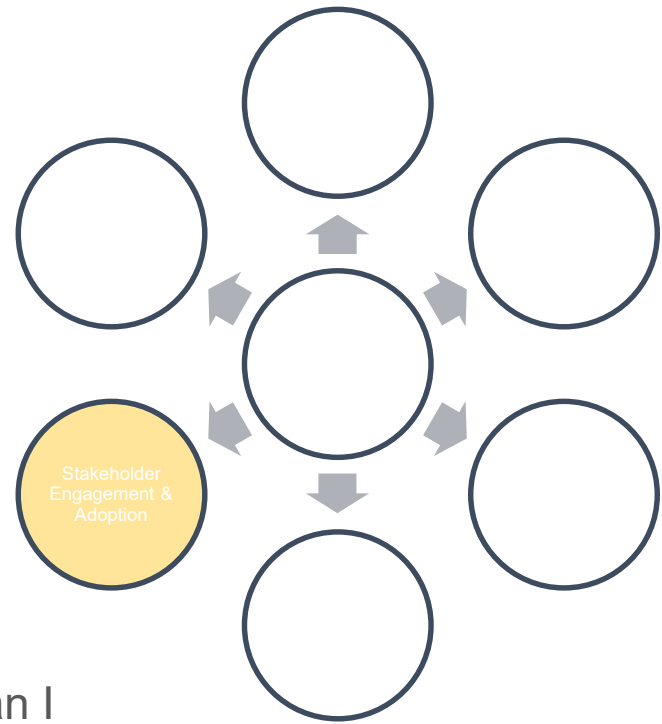
Des questions?

Etat des lieux du développement d'EOSC

Suzanne Dumouchel
06.02.2024

6. Stakeholder engagement & adoption

What EOSC brings to different stakeholders? Can I find EOSC in my country? What are the strategic initiatives for EOSC?



Why do we need EOSC?

Five reasons to support EOSC

1. EOSC will **facilitate collaboration and support cultural change in the entire research ecosystem** , reducing the disparities in the Open Science readiness in different countries
2. EOSC will provide a secure, safe and transparently trusted virtual environment where scientific outputs can be deposited and found according to the FAIR principles, **improving quality and productivity of science**
3. EOSC will facilitate integration not only within scientific domains but also across domains **supporting the cross -disciplinary research needed to address societal and global challenges**
4. EOSC will provide researchers with the means to access complete datasets and analysis platforms and provide services that **support reproducibility** , as well as ensuring long-term preservation and long-term availability of these research data and tools
5. The EOSC Web of FAIR Data and Services will provide the **ideal ground for building a wide range of new innovative and added value services thus stimulating innovation in Europe and keeping Europe competitive in the global market**



Multiple stakeholders, multiple roles

There is no “one-size-fits-all” formula for engagement in EOSC. It depends on your starting point (e.g. your type of work, your type of organisation, your mission and priorities, your level of maturity in terms of FAIR and OS implementation) and on what you want to achieve. Several options are possible

	User	Intermediary to engage the users	Co-developer	Data / Service Provider	Federation enabler	Policy maker	Funder	Supporter*
Researchers	x		x	x				x
RPOs (e.g. Universities, Research Institutes, HEIs, Libraries)	x	x	x	x	x			x
National, Regional, EU RFOs (e.g. EC, Ministries for Research, etc)	x	x	x	x		x	x	x
National, Regional, EU Research Infrastructures	x	x	x	x	x			x
National, Regional, EU e-Infrastructures	x	x	x	x	x			x
National, Regional, EU Data Infrastructures	x	x	x	x	x			x
Commercial entities	x		x	x	x			x
H2020 / HE projects	x		x	x	x			x
....								

* Trainers, Experts, Research Support Staff, Dissemination and Outreach managers, etc.

eosc Different reasons to be engaged

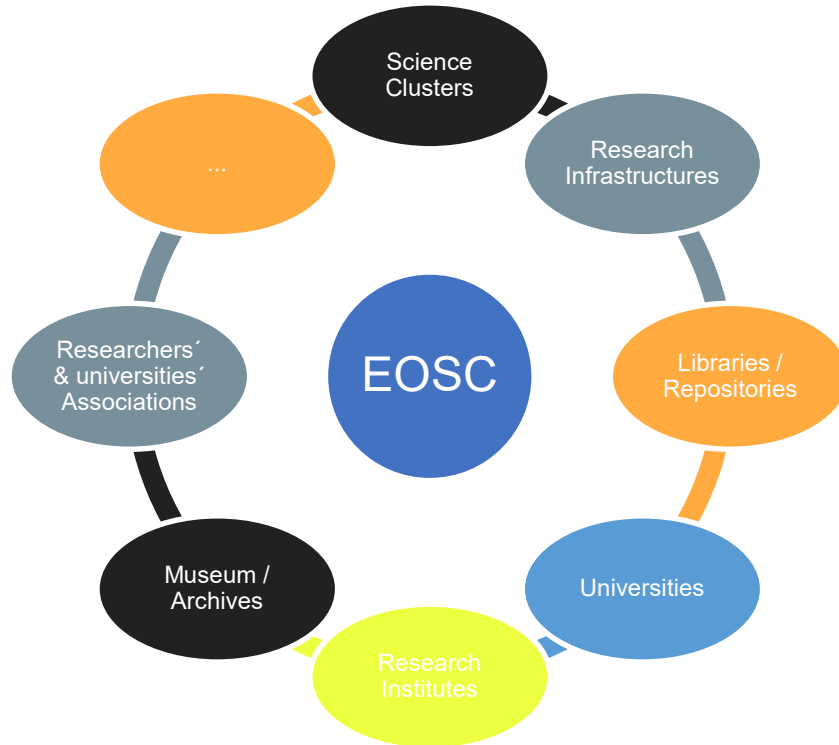
Depending on what is your main interest (EOSC development, operation, governance) the reasons and the way to be engaged in EOSC can change significantly

- Some concrete examples of why to engage in EOSC

EOSC development	EOSC operation	EOSC governance
<p>Researcher perspective: Test the MVE; provide feedback and requirements; co-develop solutions that will enrich EOSC in the future; influence the direction of some developments;</p>	<p>Researcher perspective: Access the resources made available via the EOSC federation</p>	<p>Researcher perspective: Ensure that the user perspective is taken into account</p>
<p>Provider perspective: Test the MVE; provide feedback and requirements; contribute to and test the federation; expose data/services; influence the direction of some developments; co-develop solutions that will enrich EOSC in the future</p>	<p>Provider perspective: Provide services / resources; Operate an EOSC node; Increase the offering for the customers; promote services in EOSC</p>	<p>Provider perspective: Ensure the provider perspective is taken into account</p>

Intermediaries as channels towards the users

Research intermediaries will be essential for the success of EOSC

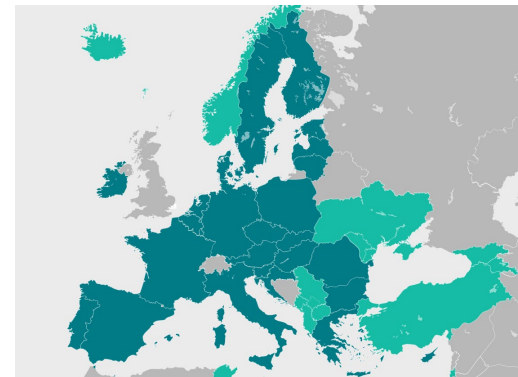


- Intermediaries will be fundamental to:
 - reach out to researchers
 - drive the cultural change stimulated by EOSC
 - promote the adoption of the Web of FAIR data and related services
 - educate and support researchers in the transition to EOSC
 - communicate about the EOSC benefits

eosc EOOSC in the countries

Different EOOSC engagement channels are present in many of the European countries

- EOOSC Steering Board members, the expert group of the EC composed by representatives of the EU Member States and Associated Countries ([Full list here](#));
- EOOSC Mandated Organisations, the organisations appointed by the governments to represent the country in the EOOSC Association ([Full list here](#))
- Other members and observers of the EOOSC Association ([Full list here](#))
- Beneficiaries from H2020 and HE projects
- Data, RIs, infrastructure nodes active in EOOSC



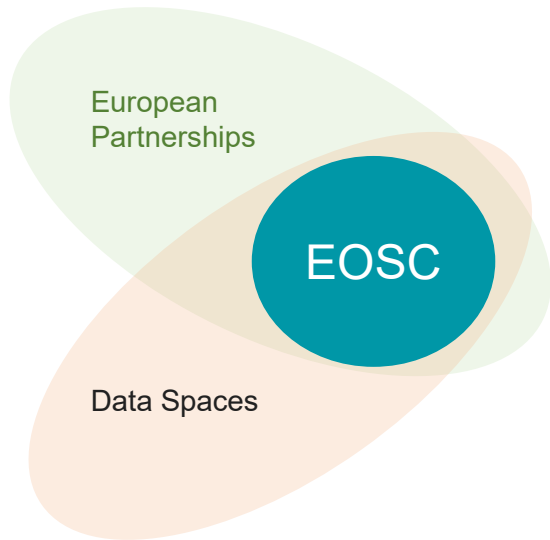
Consult the country pages at eosc.eu/tripartite-collaboration

If you don't know how to connect to EOOSC in your country you can contact the EOOSC Association at info@eosc.eu

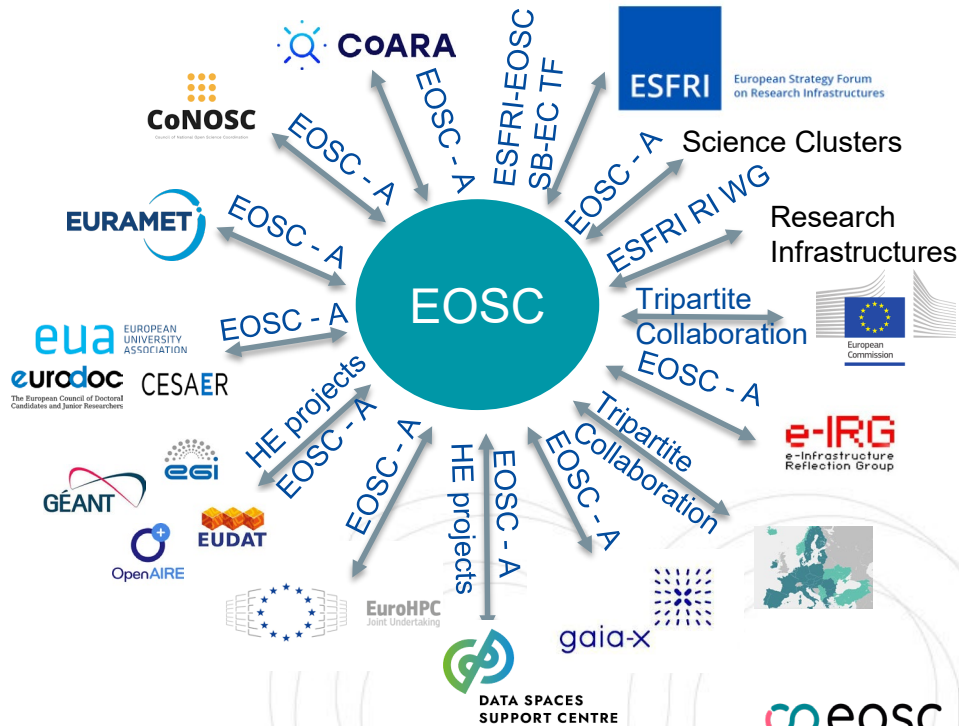


eosc EOSC in the broader context

- EOSC is one of the Horizon Europe Partnerships;
- EOSC is one of the emerging Data Spaces

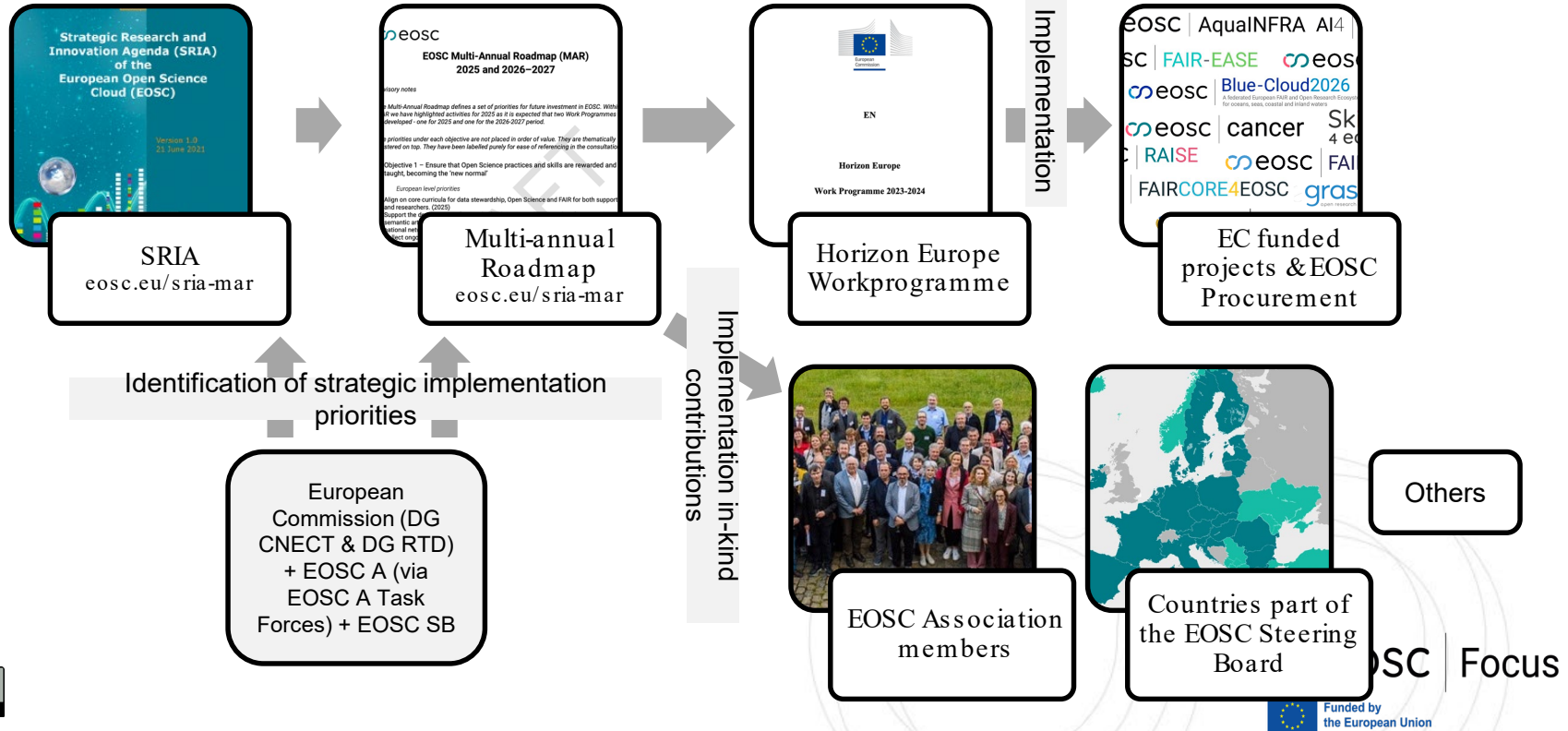


- EOSC in the European Data Strategy landscape



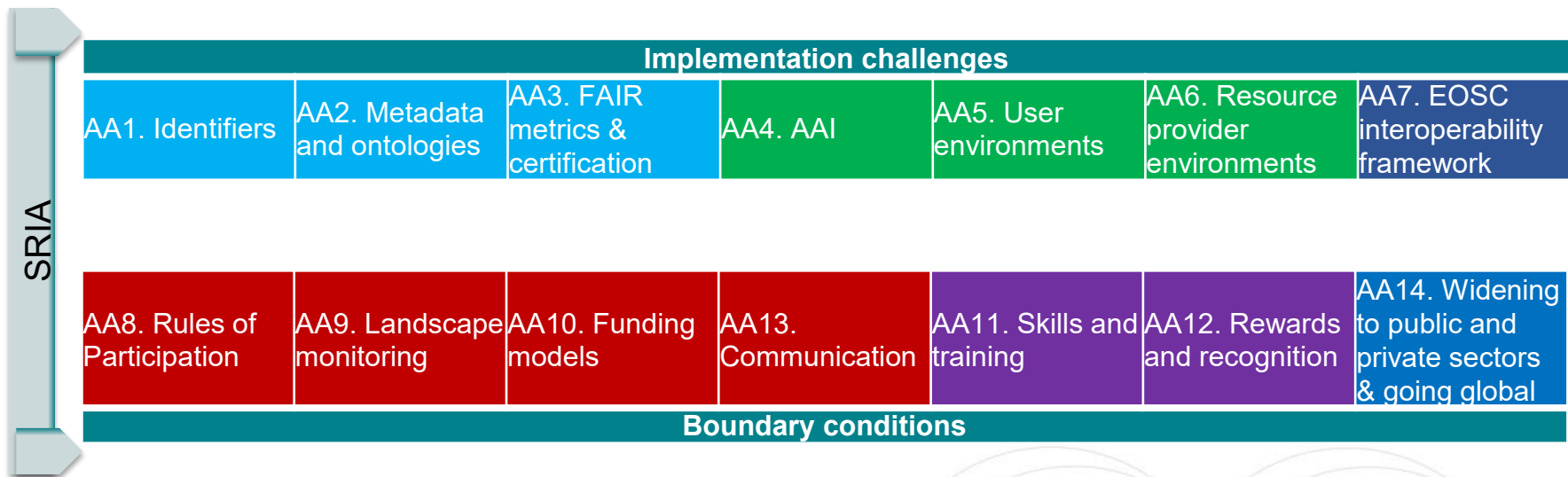
How EOSC is implemented

At least until 2028, the EOSC implementation will happen via EC funded projects, the EOSC procurements and in-kind contributions (from the members of the EOSC Association, the countries part of the EOSC Steering Board and others)



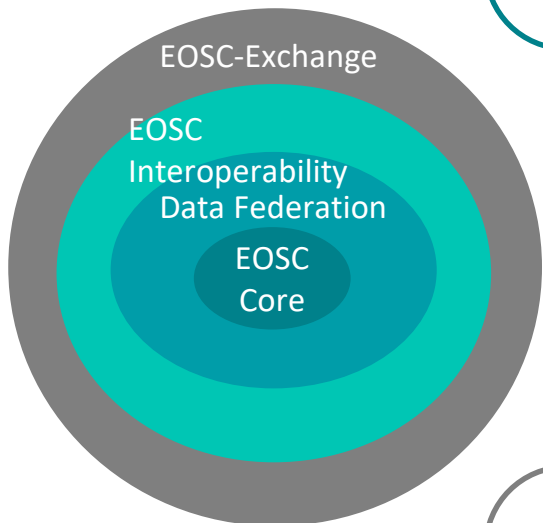
eosc Main implementation areas

The SRIA identifies 14 action areas considered key to deploy the EOSC ecosystem



The results coming from the different implementation areas contribute to the establishment of the Minimum Viable EOSC (MVE)

The MVE shall deliver on the core SRIA objectives and provide functional support for Open Science in Europe. The MVE is composed by four components:



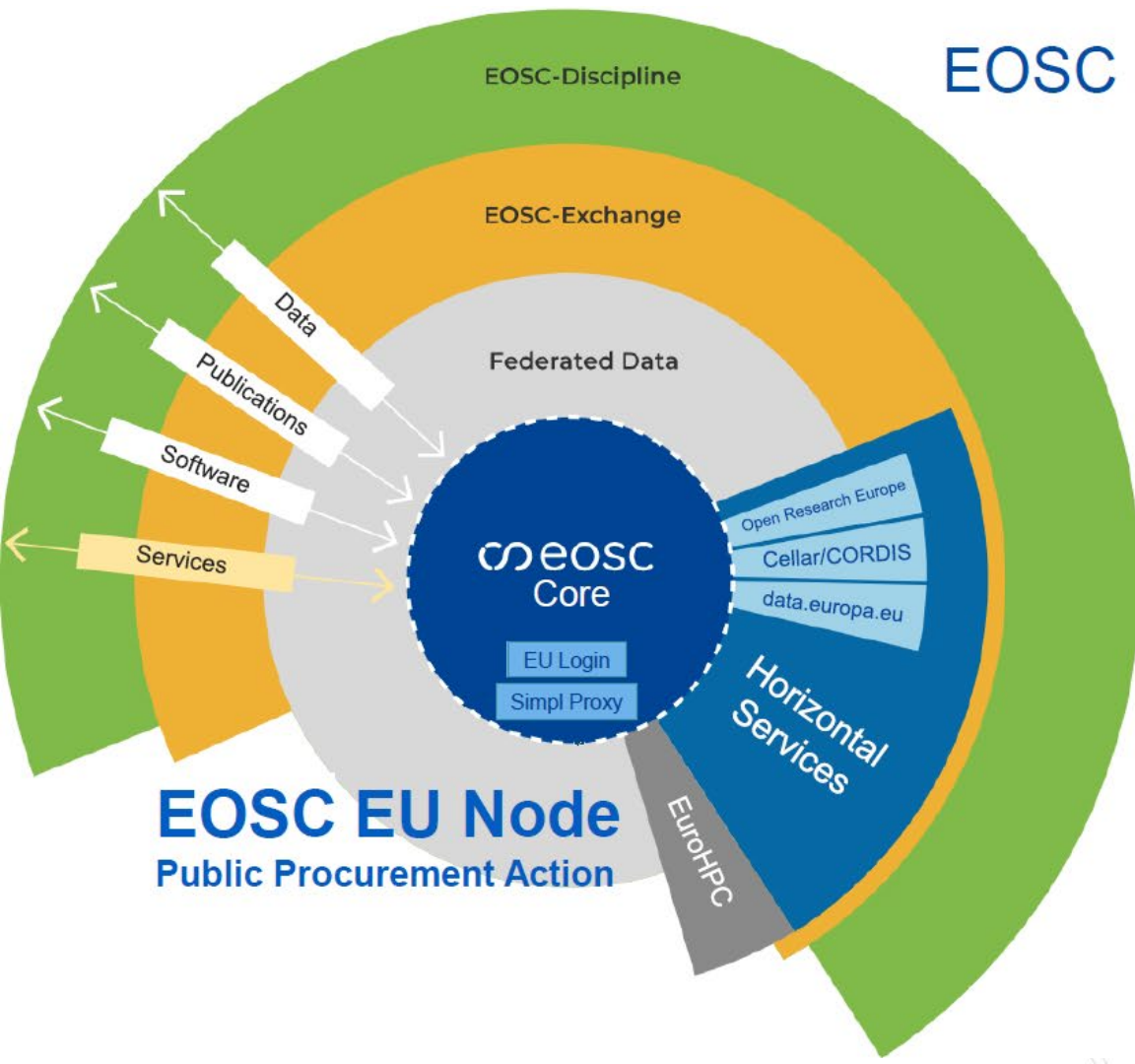
- EOSGCore**
The prerequisite **service component enabling** the large-scale brokering of research data and services between the participants in the **EOSC Federation**
- Data Federation**
FAIR Data need to be federated in such a way that **metadata on research outputs is harvested into a cross -search to enable** greater **discovery and reuse** of data residing in multiple institutional, domain-specific and national repositories across Europe
- EOSC Interoperability Framework**
Set of standards and guidelines to support interoperability and composability of resources across borders and disciplines while respecting privacy and security
- EOSGExchange**
The Exchange is the **pan-European marketplace for the EOSC federated resources**. It enables the **brokering of community services between federation participants and gives access to procurement contracts**.

The building elements of the MVE are progressively delivered through the EC funded projects. From September 2023, the MVE prototyping phase will be moved to operation via the “Managed Services for the EOSC Platform” Procurement

The EOSC EU node is the federating element of the MVE

- L'appel d'offres "Services gérés pour la plateforme EOSC" fait référence à un "nœud européen de l'EOSC"
- Le "nœud européen de EOSC" peut être considéré comme l'instance européenne du MVE financée de manière centralisée.
- Le nœud européen de l'EOSC permettra de fédérer les nœuds existants de données, de recherche et d'infrastructures électroniques fonctionnant au niveau institutionnel, national, régional, paneuropéen et thématique.
- Le nœud EOSC EU sera opérationnel d'ici la fin de 2023 et comprendra l'ensemble minimum de composants MVE nécessaires pour permettre la fédération de l'EOSC.
- À l'avenir, des projets de R&D seront menés pour développer et prototyper de nouveaux éléments soutenant l'évolution des outils permettant la fédération.

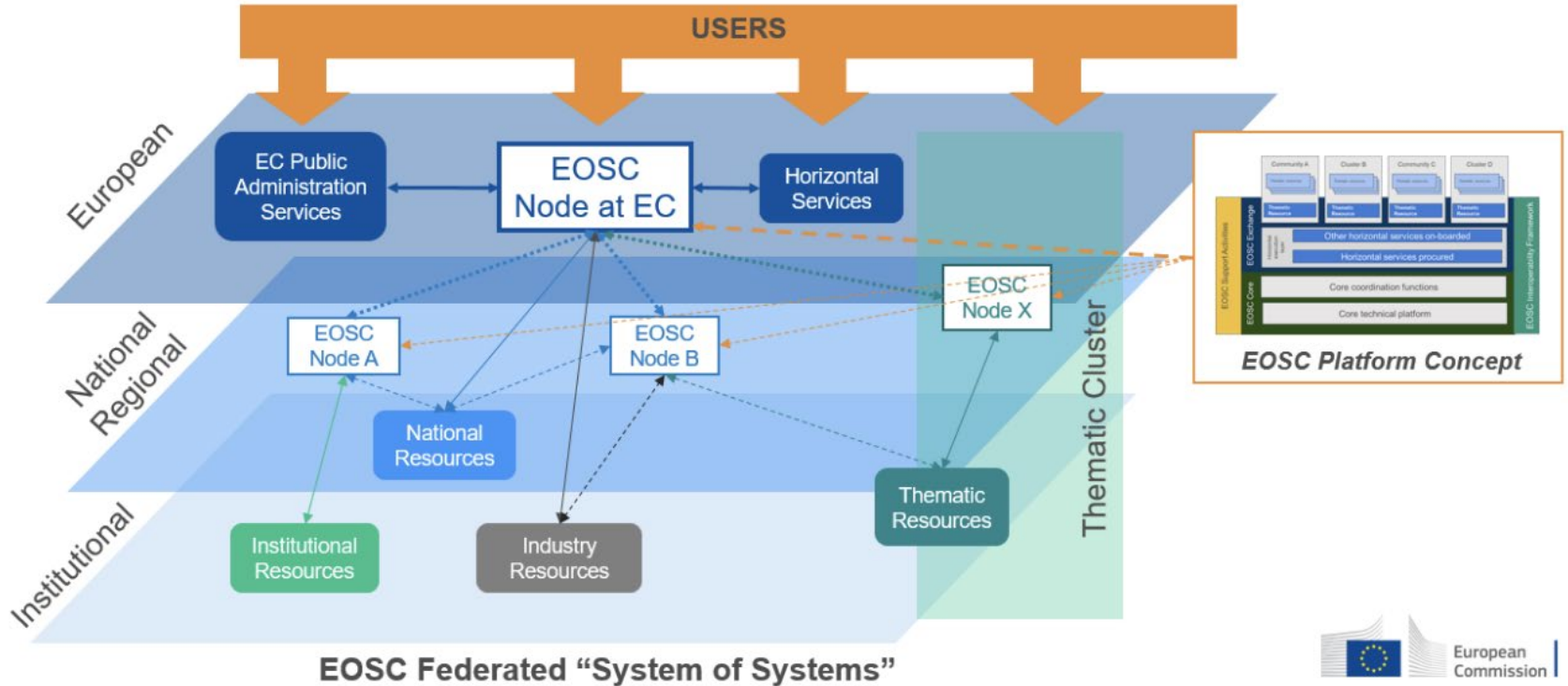
EOSC EU Node Value Proposition



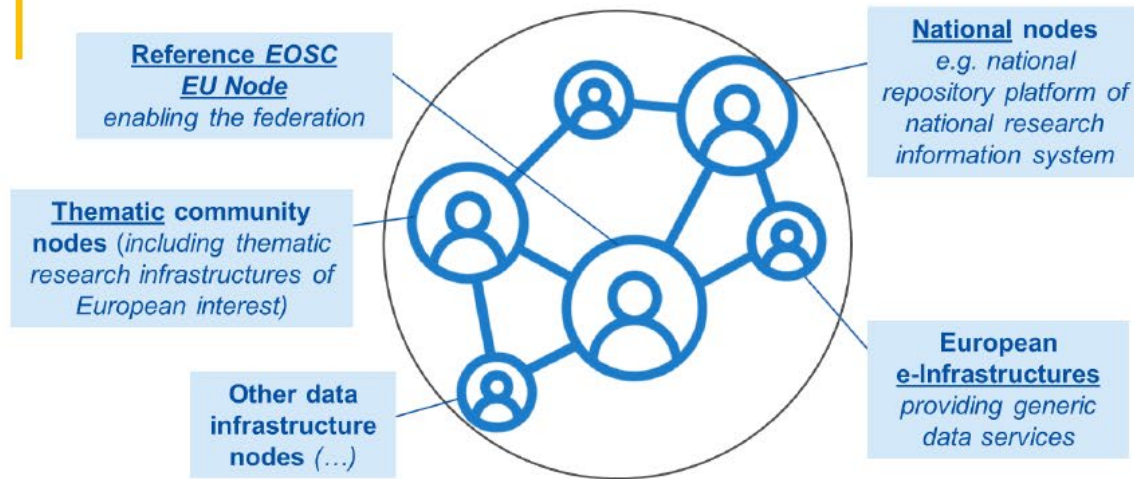
- **Facilitate** the creation of the “*Web of FAIR data and interoperable services*” (aka. EOSC Federation) under the Open Science Policy
- **Put** a “*seed in the ground*” by operationalizing the first recognised EOSC Node at the European level for the initial 3 years
- **Offer** “*core services*” for scientific research infrastructures to federate (single-sign-on, catalogues, knowledge graph, application workflow, monitoring, accounting, helpdesk) and common “*horizontal services*” for end-users to benefit from (compute, containers, data transfer, notebooks, file sharing, open research data)
- **Define** the *pathway and blueprint* (EOSC Interoperability Framework) for other potential EOSC Node operators to join the federation

The EOSC platform and nodes

Extract from the EOSC EC procurement document



About the EOSC Federation and EOSC Nodes



EOSC policies and standards:**

A baseline should be defined to ensure that each node can have a minimum working set of features and supports a minimum set of policies. It is important to mandate compliance with protocols and standards, but to give freedom to each node on how to support them.

EOSC Federation*: Open and trusted federation of collaborative, autonomous infrastructures applying agreed, consensus-based EOSC policies and rules of participation, combined into a system of systems to enable European researchers to store, share, process, analyse, and reuse research digital objects (e.g. data, publications and software)

EOSC Node*: Data infrastructure system of variable nature (national, regional, institutional or thematic) with consensus-based policies, transparent ownership and clear responsibility, connected to the EOSC Federation to share information and resources within the EOSC community and to leverage common services

* Source: "EOSC operations and evolution post-2027" supporting document by the EOSC-SB Policy subgroup (November 2023)

** Source: GEANT and NREN's position on EOSC Nodes (October 2023)

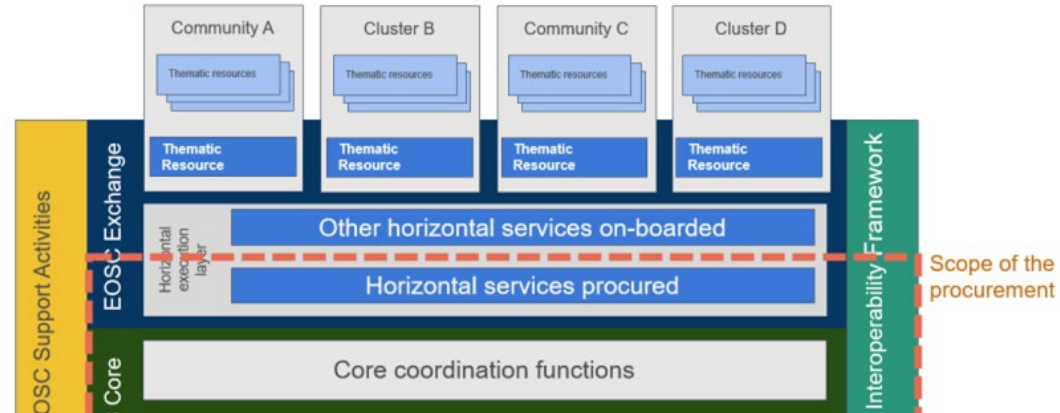
eosc The EOSC EC procurement

On-going procurement by DG CNECT to procure the EOSC EC-node (35M€)

- Lot 1: Managed EOSC core services
- Lot 2: Managed Container Platform and Virtual machine Service for EOSC Exchange
- Lot 3: Managed Collaborative data Platform, Interactive Data Analytics Platform and Virtualization Services for EOSC Exchange

3 years of operation starting by Q1 2024

Public Procurement Action 2022



The EOSC Node is a particular implementation of the EOSC Platform concept. The EOSC procurement action is to build and deploy a fully operational EOSC Node at the European level.

This EOSC Node may act as the master node for the federation and may serve as a deployment blueprint and operations guideline for future, national, regional and/or institutional (even thematic) implementations of the EOSC nodes, not covered in this procurement

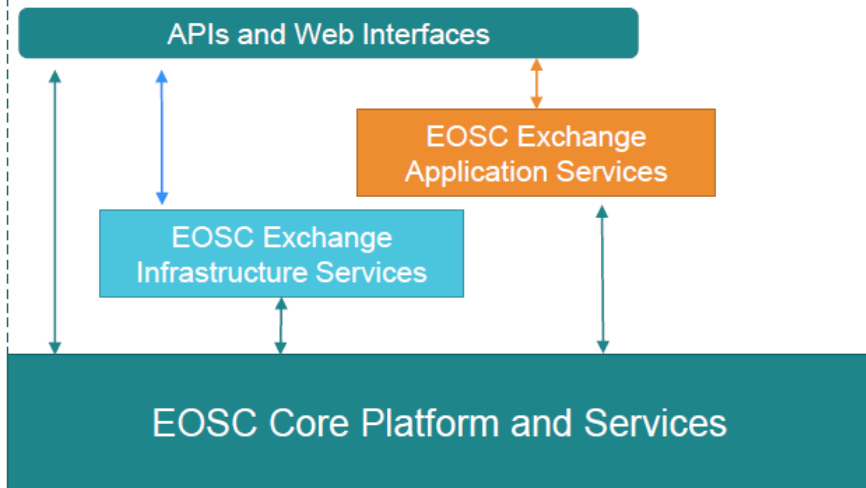
High level EOSC EU Node architecture

EOSC Exchange Thematic/Regional Services



EOSC Exchange Horizontal Services

EOSC Support Activities



EOSC Interoperability Framework

Procurement Lot Structure

Lot 3

Managed Collaborative Data Platform, Interactive Data Analytics Platform and Visualization Services for the EOSC Exchange (Application Services)

Lot 2

Managed Container Platform and Virtual Machine Services for the EOSC Exchange (Infrastructure Services)

Lot 1

Managed Services for the Development, Integration, Deployment and Operations of the Federated EOSC Core



Des questions?