EOSC

All you need to know about the European Open Science Cloud (EOSC)

The purpose of this presentation is to provide the EOSC stakeholders with a standard set of slides that they can use to communicate about EOSC. As EOSC is evolving, the presentation will be updated when necessary and the new version will be made available on the eosc.eu website. This presentation has been produced with the support of the EOSC Focus funded project.

May 2023 by EOSC-A, v0.1

Focus

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1. EOSC vision in a nutshell

Why – what –how. The EOSC federation concept

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EOSC vision in a nutshell

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

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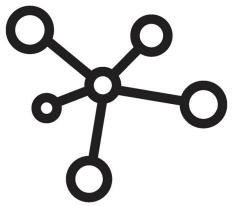
From vision to implementation: “the EOSC federation”

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)
- **EOSC rules of participation and access policies** will be developed for the users and providers of the federation

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2. Who is EOSC for?

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

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Who is EOSC for?

EOSC aims to support all European researchers

How?

- **Enhancing scientific research** by providing access to a weath 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 benefits from EOSC through their existing channels (e.g. universities, research institutes, research infrastructures, associations, science clusters, etc.) that will act as intermediaries.

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.

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3. EOSC is not...

The most common mistakes about EOSC

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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 e-infrastructure. EOSC is building i. the components to enable the federation of existing data, research and e- infrastructures 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 o e-infrastructures
EOSC will enable the federation of existing data, research and e-infrastructures 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 AAI 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, e-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.

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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

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4. Who´s who

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

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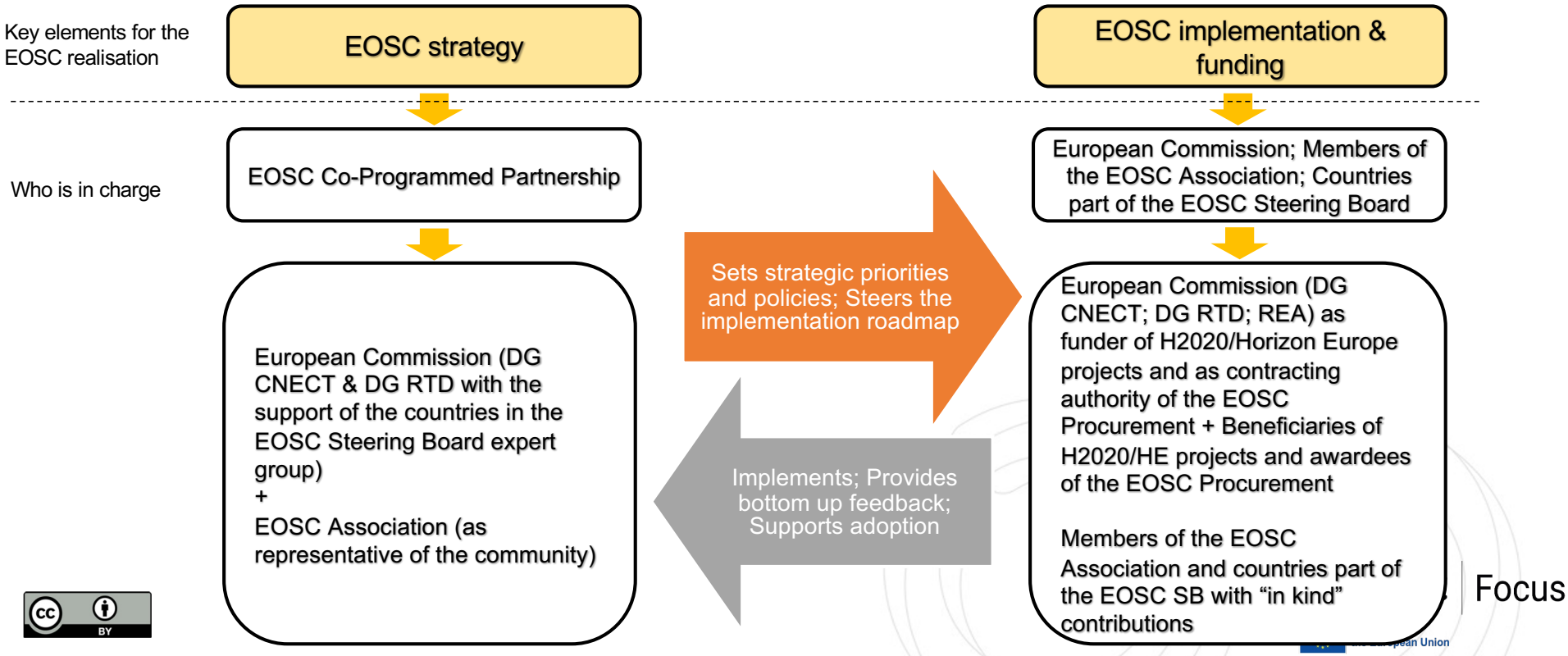
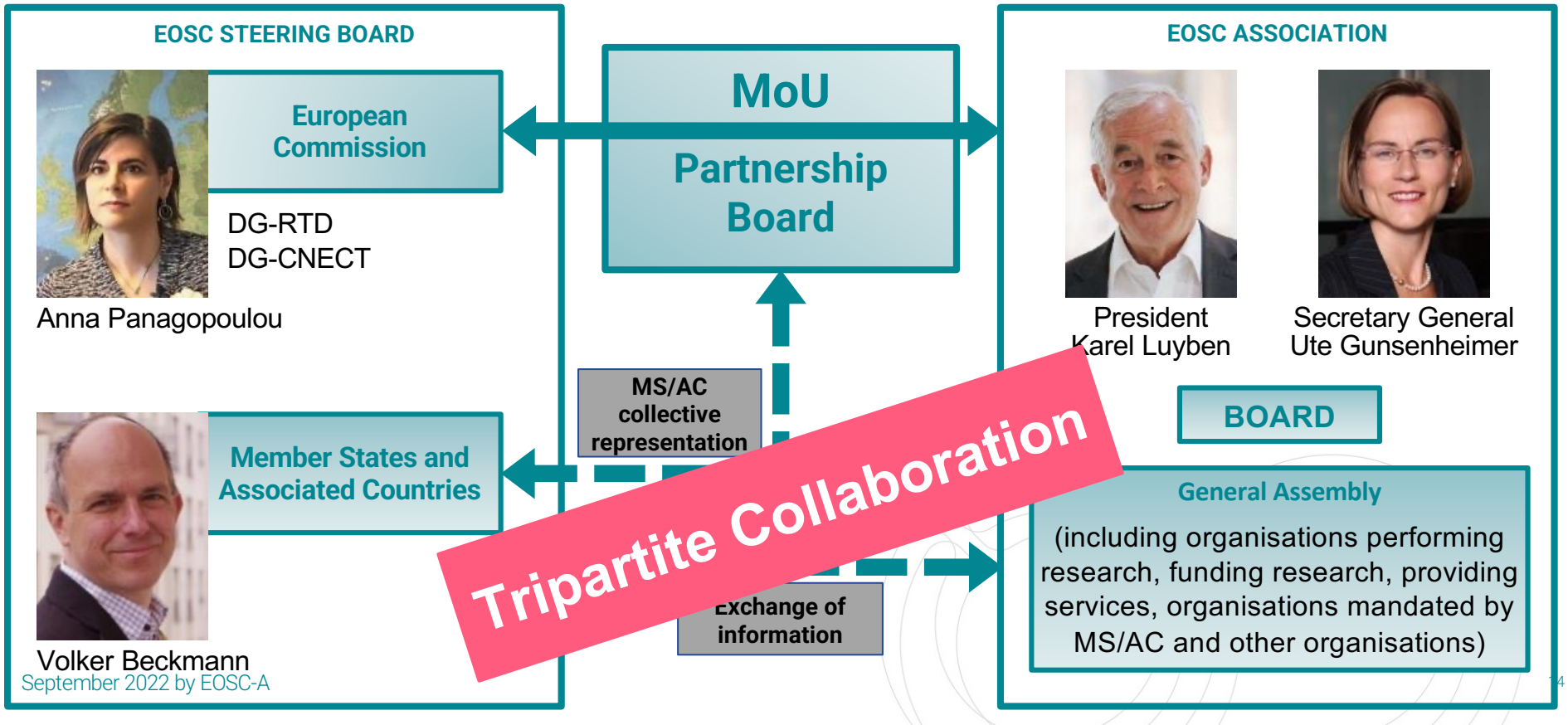
Who´s who

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 Partnership

Tripartite Collaboration



5. EOSC Financing

Who pays for EOSC and how much?

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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**
Funding instruments: **H2020 calls/grants approach**	**Funding instruments:** **HE INFRAEOSC calls / grants approach** **EOSC Procurement** **In kind contributions from the EOSC Association members**	**Funding instruments:** Under discussion
Funders: **European Commission (DG CNECT; DG RTD)**	**Funders:** **European Commission (DG CNECT; DG RTD)** **Members of the EOSC A, countries part of the EOSC SB & other in kind contributions**	**Funders:** Under discussion
Total funding: **350 M€**	**Total funding:** **1 billion € (500M€ from the EC + 500M€ as in kind contributions from the EOSC Association members) + other in kind contributions**	**Total funding:** Under discussion
Main purpose: To support the implementation strategy defined in the **EOSC roadmap** 2018-2020 by the European Commission	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)**	Main purpose: To support the **EOSC strategy and governance post 2027**

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6. EOSC in the policy context

What are the policies EOSC is contributing to and how?

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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

ERA 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)"

- 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.

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EOSC relevant policies and regulations

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

7. EOSC Implementation and Operation

How is EOSC implemented and operated?
Main implementation areas. What is the MVE?
MVE vs EOSC EU node

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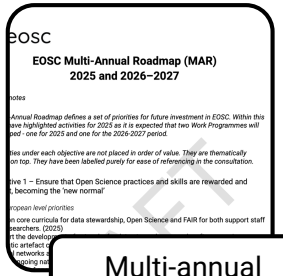
How EOSC is implemented

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)

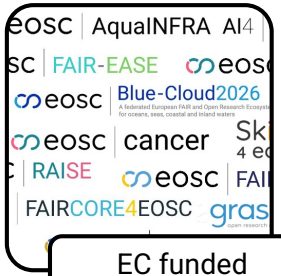
SRIA
eosc.eu/sria-mar



Multi-annual Roadmap
eosc.eu/sria-mar

Horizon Europe Workprogramme

Implementation



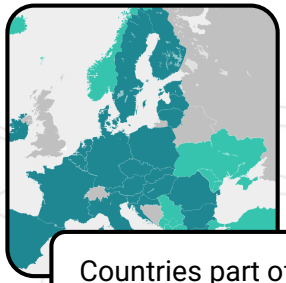
EC funded projects & EOSC Procurement

Identification of strategic implementation priorities

European Commission (DG CNECT & DG RTD) + EOSC A (via EOSC A Task Forces) + EOSC SB

Implementation in-kind contributions

EOSC Association members



Countries part of the EOSC Steering Board

Others

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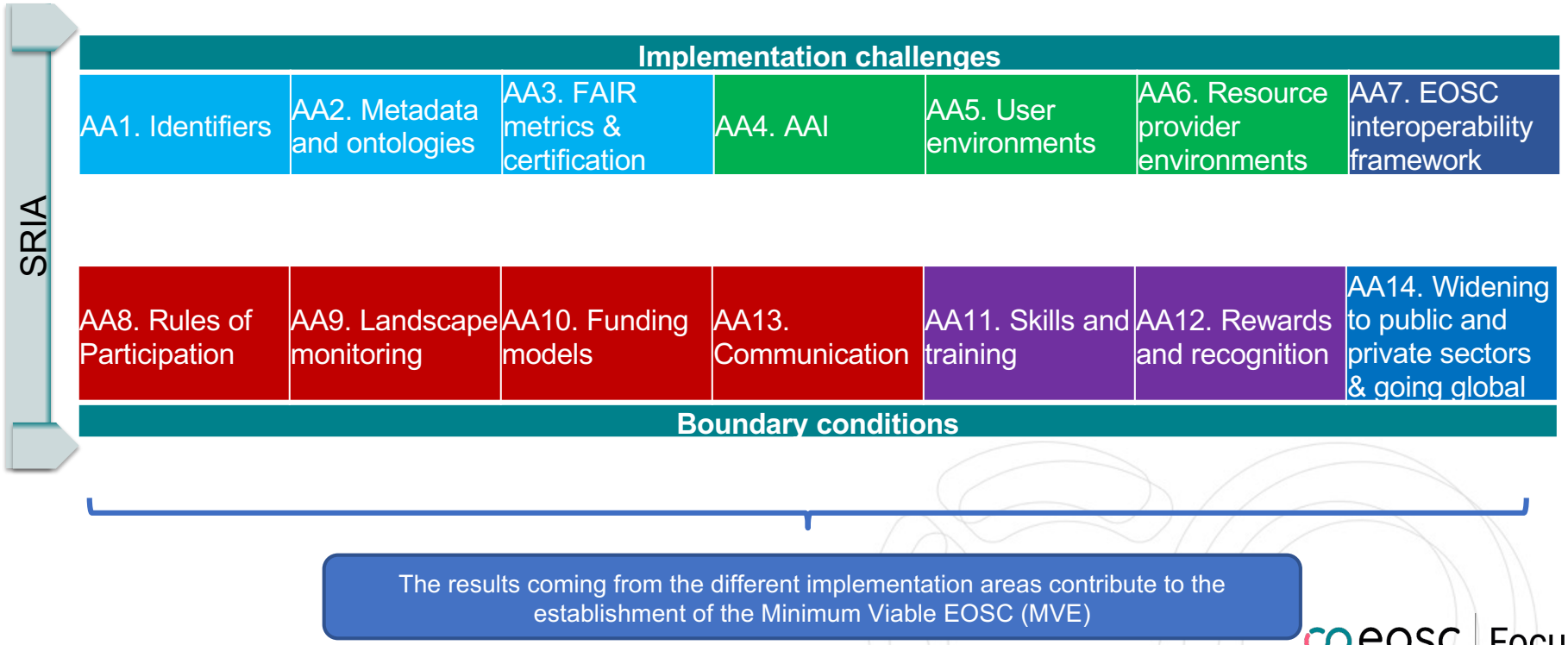
Main implementation areas

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)

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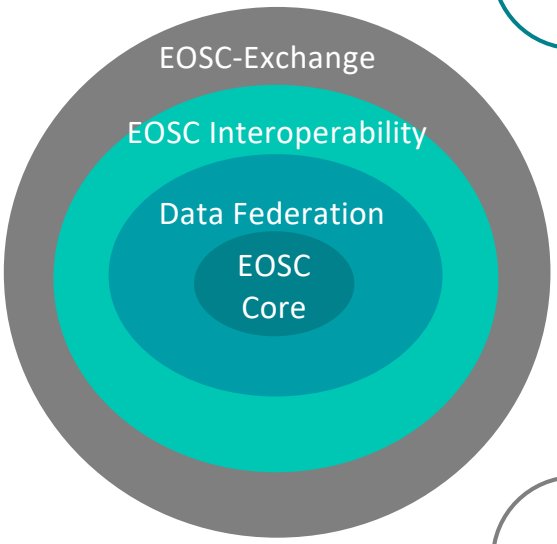
The MVE

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



EOSC-Core

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

EOSC-Exchange

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 prototypying phase will be moved to operation via the "Managed Services for the EOSC Platform" Procurement

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MVE vs EOSC EU node

The EOSC EU node is the federating element of the MVE

- The "Managed Services for the EOSC Platform" Procurement refers to an "EOSC European node"
- The "EOSC European node or EOSC EU node" can be considered **the European centrally financed instance of the MVE**
- The **EOSC EU node will enable the federation of existing data, research and e-infrastructures nodes** operating at institutional, national, regional, pan-European and thematic level
- The **EOSC EU node will be operational by the end of 2023** and **will include the minimum set of MVE components necessary to enable the EOSC federation**
- In the future, R&D projects will be conducted to develop and prototype new elements supporting the evolution of the tools enabling the federation

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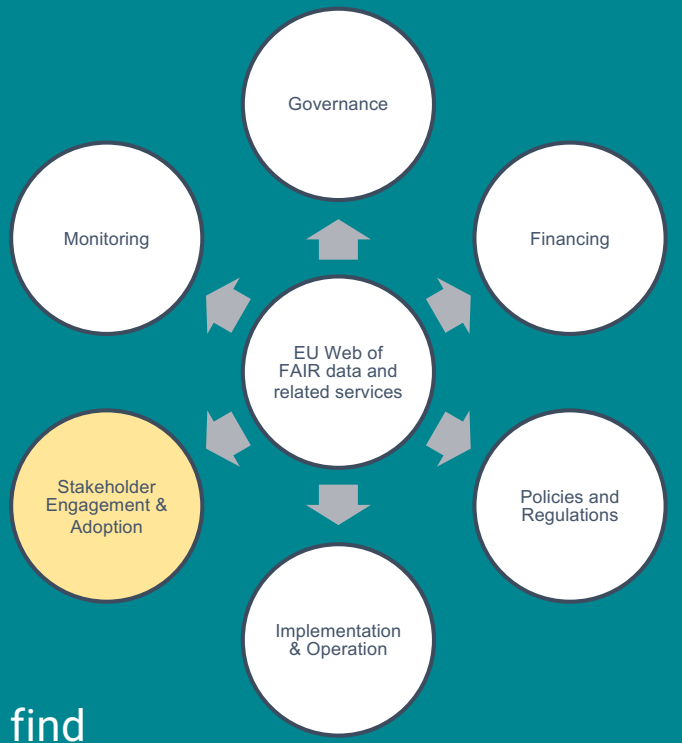
8. Stakeholder engagement & adoption

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



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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**

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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.

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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
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;	**Researcher perspective:** Access the resources made available via the EOSC federation	**Researcher perspective:** Ensure that the user perspective is taken into account
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	**Provider perspective:** Provide services / resources; Operate an EOSC node; Increase the offering for the customers; promote services in EOSC	**Provider perspective:** Ensure the provider perspective is taken in into account

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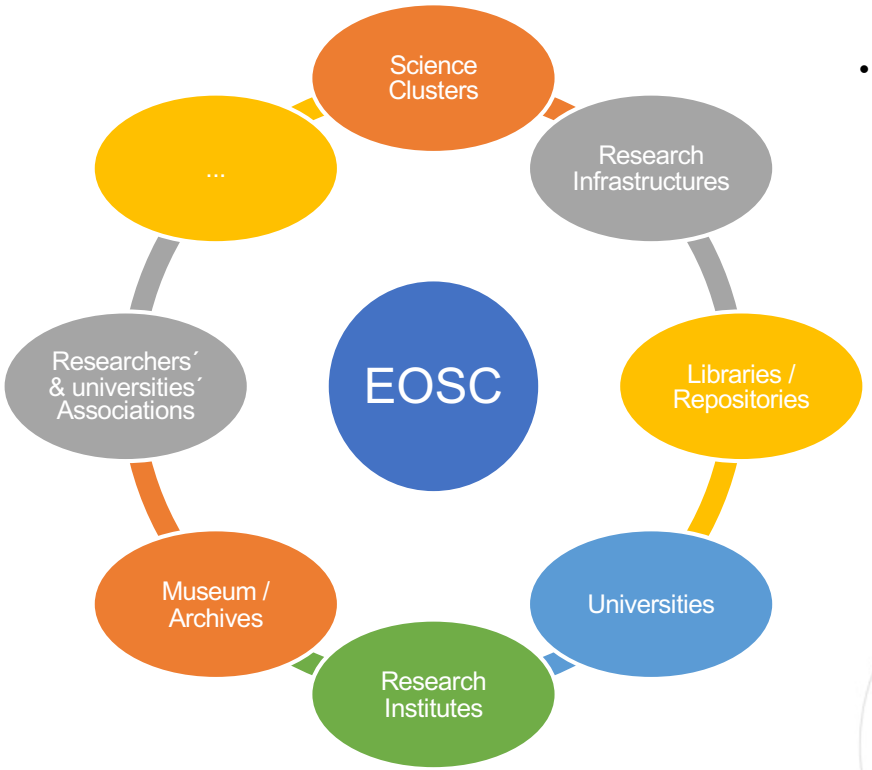
Intermediaries as channels towards the users

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

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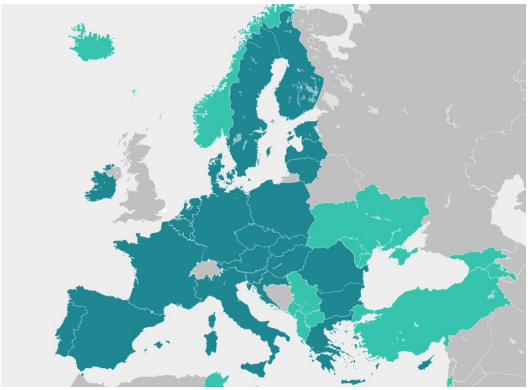
EOSC in the countries

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

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



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

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

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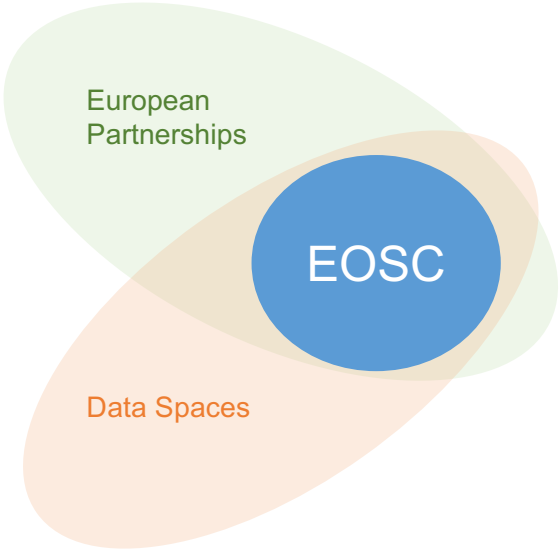
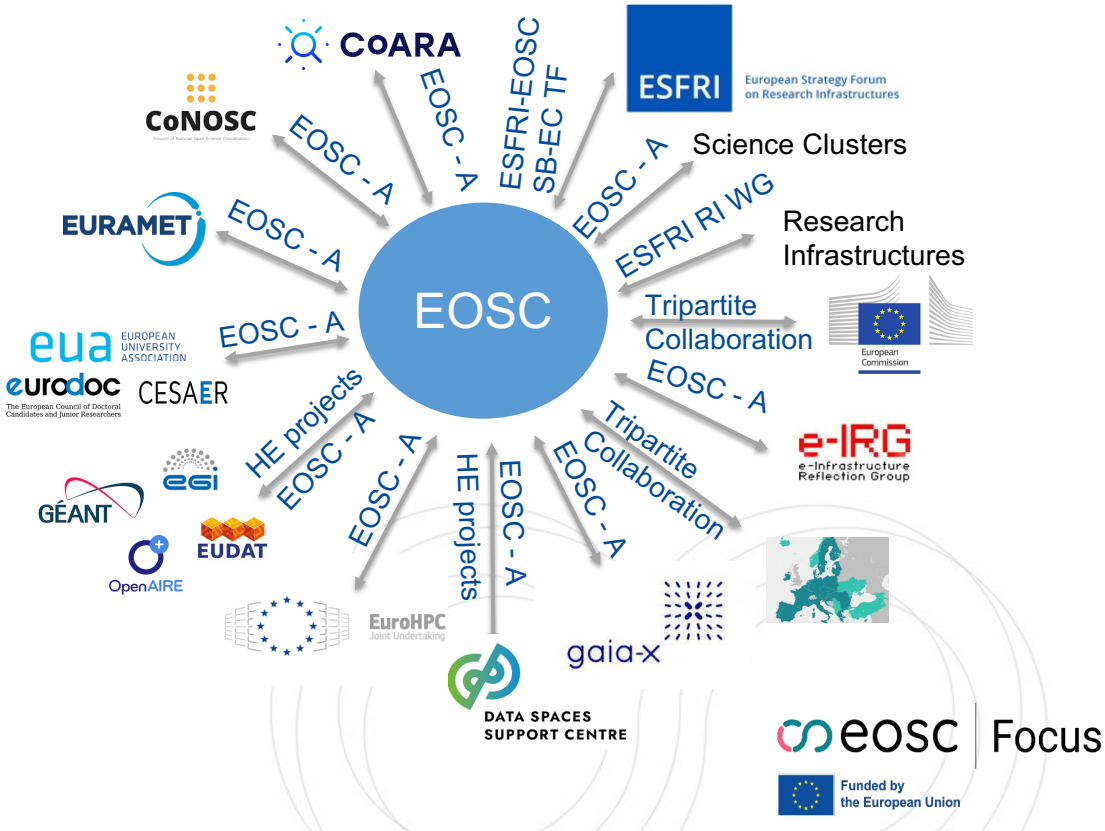
EOSC in the broader context

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



- EOSC in the European Data Strategy landscape



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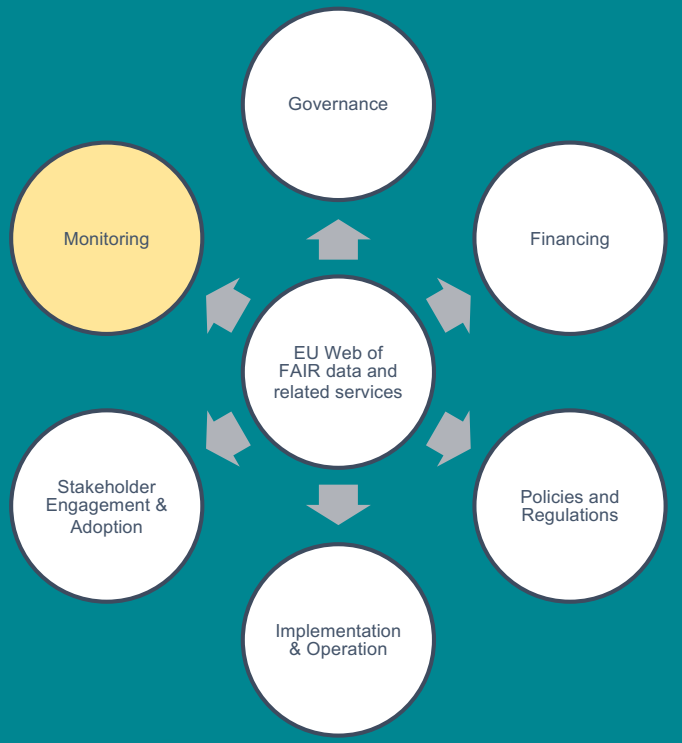
9. EOSC Monitoring

Why an EOSC monitoring and what it is



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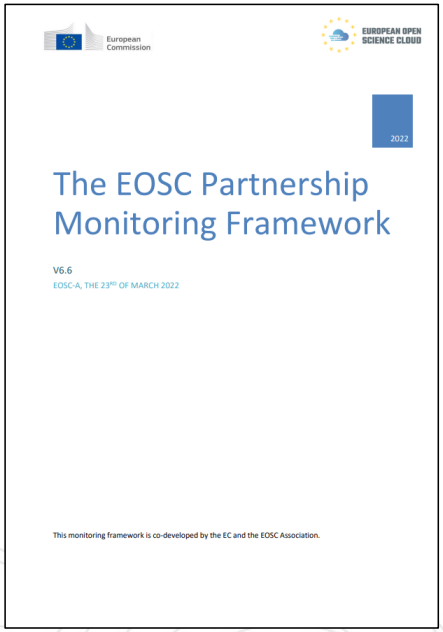
EOSC Monitoring

The tool to ensure progress towards the objectives of the EOSC Partnership

- All Horizon Europe Partnerships must formulate a reference monitoring framework, based on the general, specific, and operational objectives of their strategic agendas, allowing the progress to be tracked, towards achieving the specific Partnership goals.
- The EOSC Partnership monitoring framework reports on:

What is monitored	By whom
EOSC readiness of countries	EOSC Steering Board
Implementation progress of the Partnership (KPI Monitoring)	EOSC Association
Financial and in-kind contribution of EOSC Association members (Additional Activities Plan)	EOSC Association
Policies relevant for the EOSC Ecosystem	-



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10. What´s next?

Upcoming EOSC milestones

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Upcoming EOSC milestones

- Funding
  - INFRAEOSC calls 2024 (deadline March 2024)
  - INFRAEOSC calls 2025
  - INFRAEOSC calls 2026-2027
- Technical implementation
  - Implementation priorities 2025 --> MAR 2025 (June 2023)
  - INFRAEOSC 07 results --> June 2023
  - EOSC Future results / EOSC Procurement operational –> September 2023
  - Implementation priorities 2026 – 2027 --> MAR 2026-2027 (TBD)
  - Results of INFRAEOSC 2021-2022-2023 – continuous
  - SRIA V2.0 (December 2024)
- Governance
  - Identification of EOSC governance model post 2027 --> December 2023
  - Set up of governance post 2027 --> January 2024 – December 2027
- Events
  - EOSC symposium 2023, 20-22 September 2023 (symposium23.eoscfuture.eu/)
  - National tripartite events & other events (eosc.eu/events)

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