

# National Initiatives for Open Science in Europe

## European Open Science Cloud - EOSC

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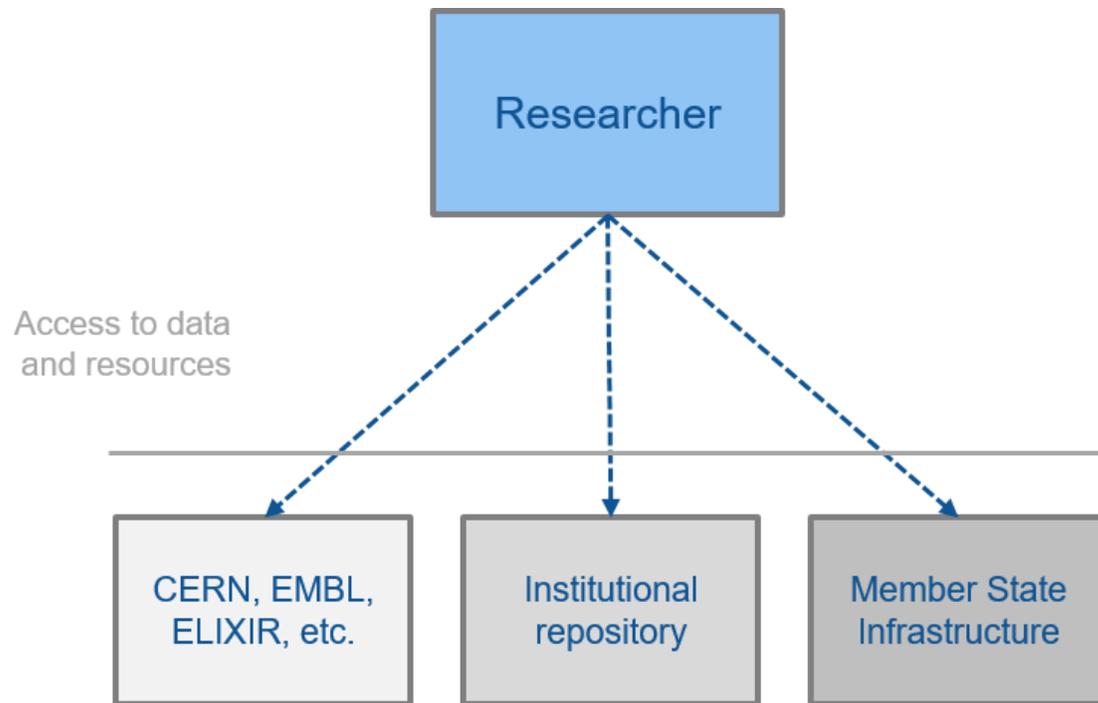
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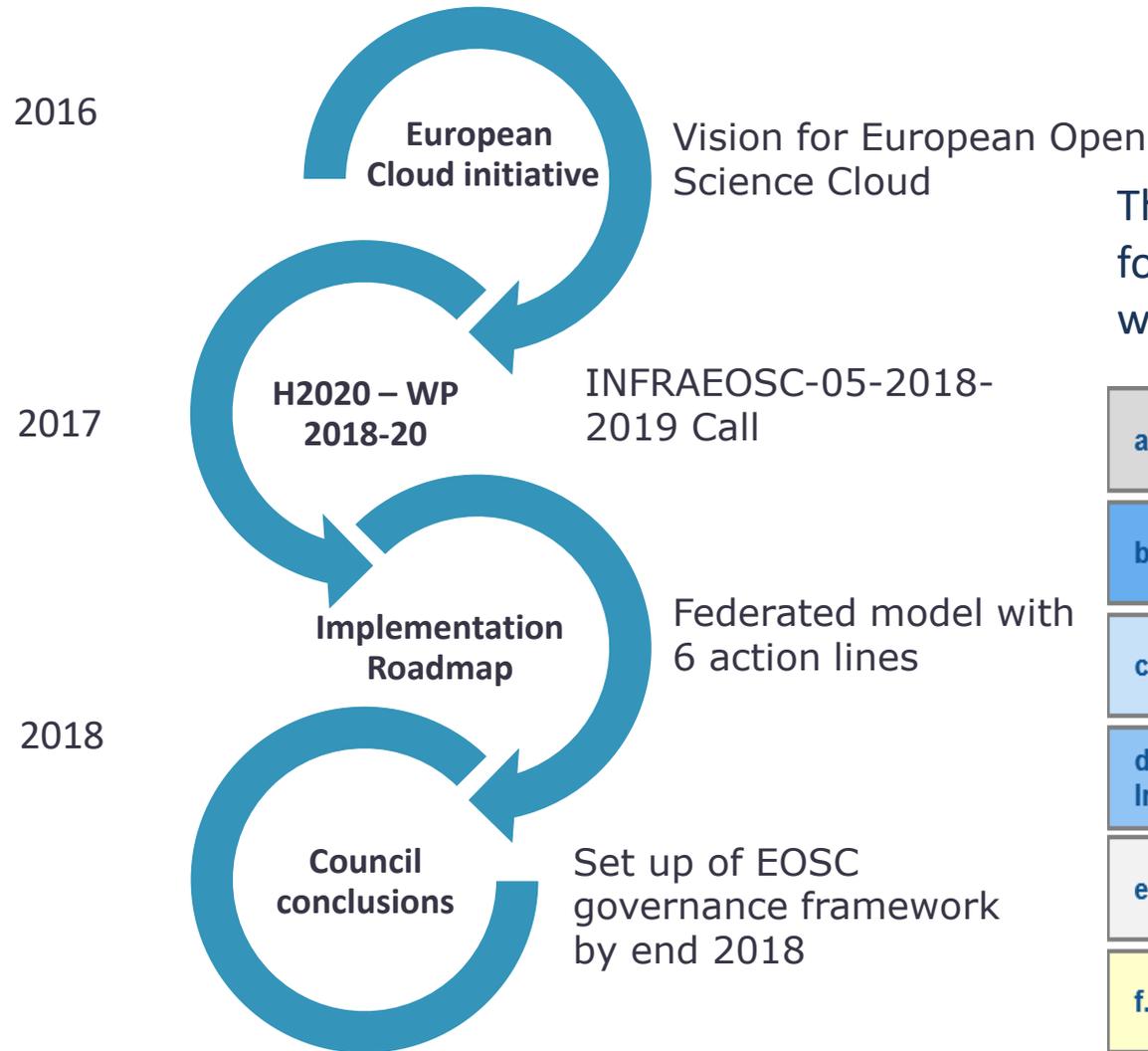


National Capacity Building NI4OS Training in Montenegro, Podgorica, 27 October 2020

- ❑ European researchers face data fragmentation and unequal access to quality information sets



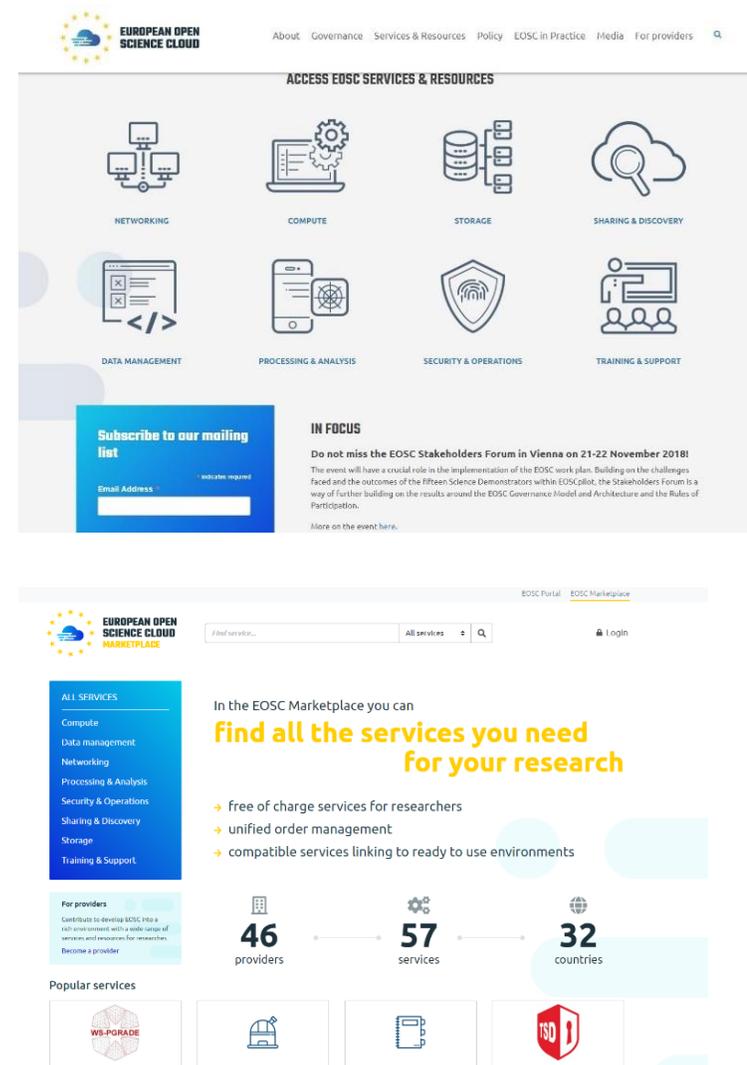
- ❑ Fragmented access (across scientific domains, countries and governance models; varying access policies)
- ❑ Limited cross-disciplinary access to data sets (i.e. interdisciplinary research)
- ❑ Non-interoperable services and data
- ❑ Closed data



The **EOSC implementation roadmap** describes **six action lines** for the implementation of the European Open Science Cloud with specific examples and related milestones

<b>a. Architecture</b>	Architecture of the federated infrastructures as the solution to the current fragmentation in research data infrastructures which are insufficiently interoperable.
<b>b. Data</b>	FAIR data management and tools. A common data language to ensure data stewardship across borders/disciplines based on FAIR principles.
<b>c. Services</b>	Available services from a user perspective. A rich environment offering a wide range of services covering the needs of the users.
<b>d. Access &amp; Interface</b>	Mechanisms/interfaces for accessing EOSC. A simple way for dealing with open data obligations or accessing research data across different disciplines.
<b>e. Rules</b>	Rules of participation for different EOSC actors. An opportunity to comply with existing legal and technical frameworks and increase legal certainty & trust.
<b>f. Governance</b>	Governance of the EOSC, aiming at ensuring EU leadership in data-driven science but requiring new governance frameworks.

# EOSC Launch: Vienna, 23/11/2018



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**Do not miss the EOSC Stakeholders Forum in Vienna on 21-22 November 2018!**

The event will have a crucial role in the implementation of the EOSC work plan. Building on the challenges faced and the outcomes of the Fifteen Science Demonstrators within EOSC-pilot, the Stakeholders Forum is a way of further building on the results around the EOSC Governance Model and Architecture and the Rules of Participation.

[More on the event here.](#)

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**In the EOSC Marketplace you can**

**find all the services you need for your research**

- free of charge services for researchers
- unified order management
- compatible services linking to ready to use environments

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Contribute to creating EOSC into a rich environment with a wide range of services and resources for researchers. Become a provider

**46** providers

**57** services

**32** countries

**Popular services**

- WB-PGRADE
- TSO

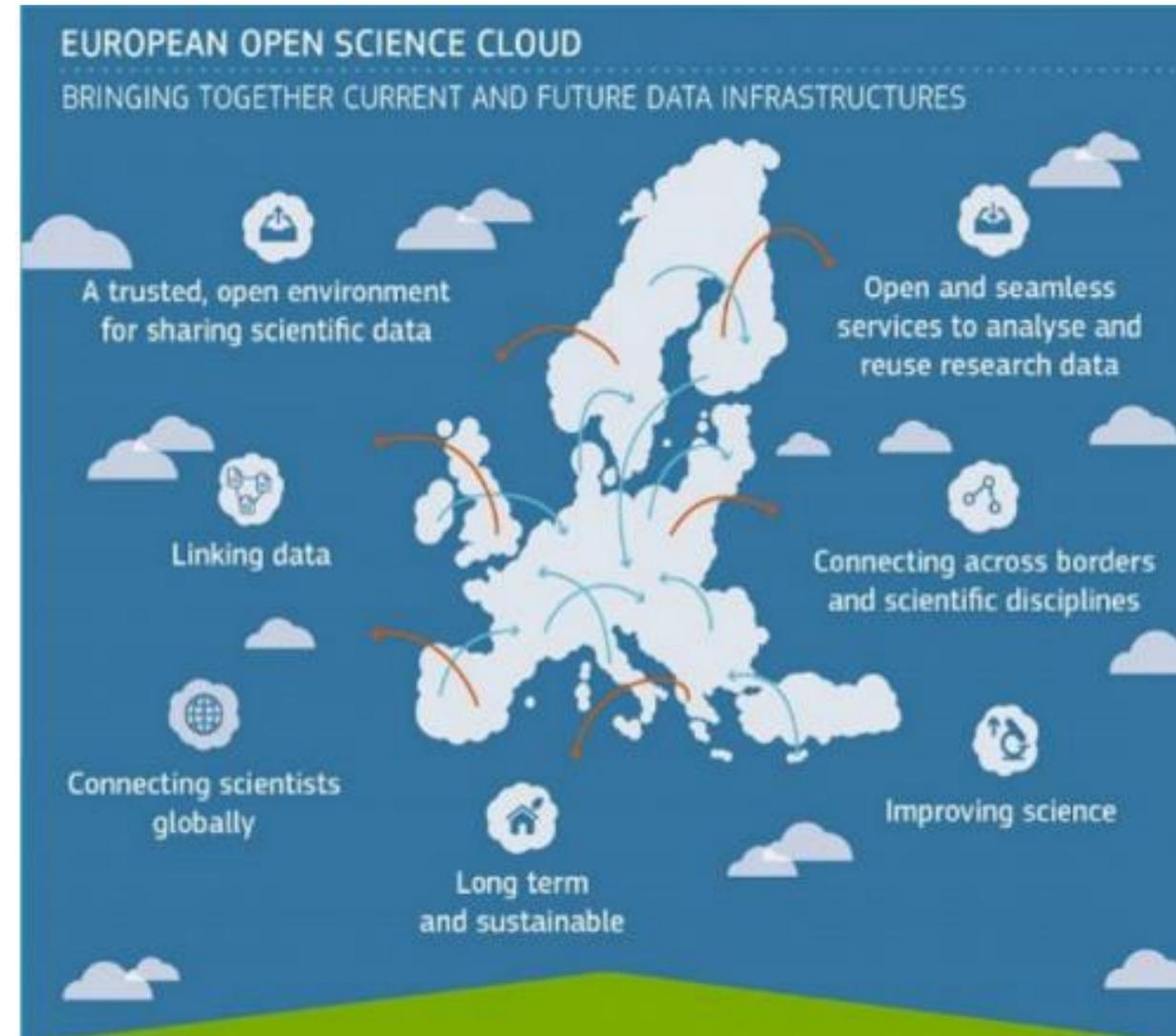
# European Open Science Cloud EOSC

EOSC has the ambition to be a virtual environment for Europe's 2 million researchers and 70 million science and technology professionals from every research, innovation and educational area.

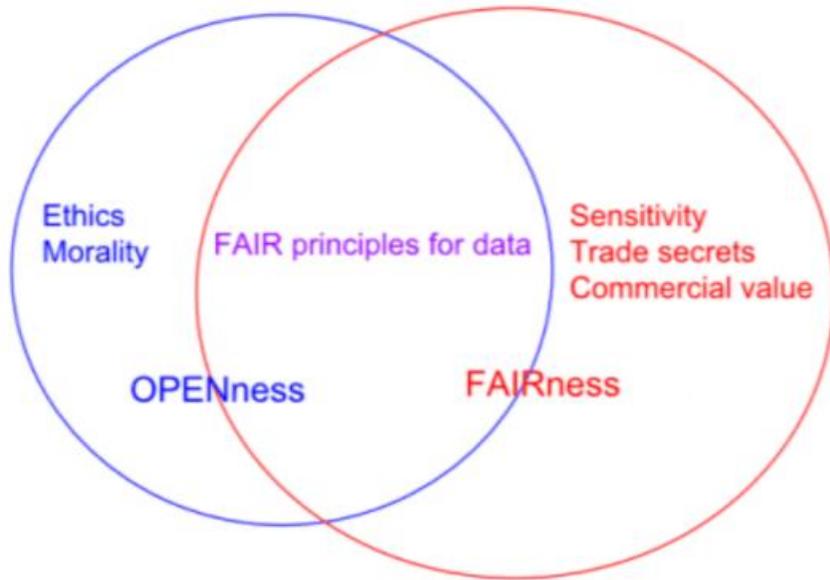
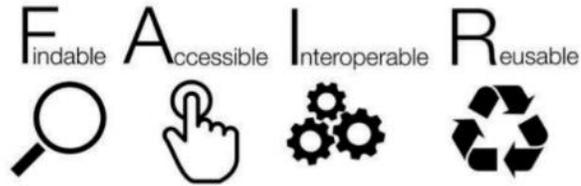
EOSC will provide researchers an environment with free, open services for data storage, management, analysis and re-use across disciplines.

EOSC will join existing thematic data Infrastructures.

EOSC will add value and leverage past infrastructure investment (10b per year by MS, two decades EU investment).



# EOSC, new level playing field for EU researchers



- ❑ The EOSC will allow universal access to data, as a universal access point for ALL European researchers
- ❑ Cross-disciplinary access to data and services unleashes potential of interdisciplinary research
- ❑ Services and data are interoperable (Findable, Accessible, Interoperable and Reusable-FAIR)
- ❑ Data funded with public money is in principle open (as open as possible, as closed as necessary)
- ❑ EOSC will help increase recognition data intensive research and data science

## Current model of European data infrastructures



Source: EOSC Strategic Implementation Roadmap 2018-2020, May 2018, European Commission

*From fragmentation and uneven access to information to a federated model, where access to data would be universal, building on a strong legacy*

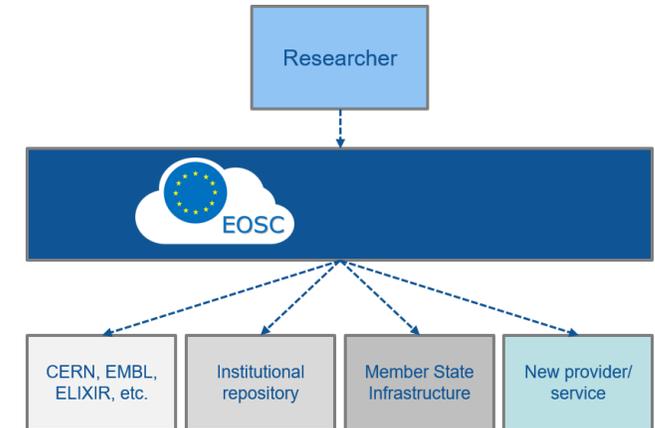


Future EOSC model: federation of data infrastructures

- ❑ Was established in Belgium on 29 July 2020 as a not-for-profit international association (AISBL) involving research and innovation stakeholders.
- ❑ Provides a means to serve the EOSC community, promote EOSC, and enable Open Science in Europe.
- ❑ Focal point of the EOSC Partnership with the European Commission.
- ❑ Strategic Research and Innovation Agenda (SRIA) was published on 19 October, sets out the elements needed to implement the EOSC Partnership.
- ❑ The EOSC Partnership aims to:
  - create a growing ecosystem, bringing together relevant European initiatives around the FAIR data economy,
  - fostering collaboration among those initiatives towards the objective of open research,
  - attracting small and medium-sized enterprises (SMEs) and start-ups to use and benefit from the federated services and data sources,
  - and raising awareness in society about the benefits of FAIR-data-driven innovation.
- ❑ The EOSC Association plays a crucial role in gathering EOSC stakeholders such as research funders, policy makers, research-performing organisations and operators of research infrastructures to contribute to and monitor the future EOSC developments.

## The Association will:

- ❑ support EOSC's mission of enabling seamless access to data through interoperable services that address the entire research data,
- ❑ identify key infrastructure requirements for the:
  - representation,
  - capture,
  - storage,
  - processing and
  - appropriate sharing of diverse forms of data,by engaging with stakeholders and service providers,



- ❑ enable key services, including but not limited to e-infrastructures,
- ❑ to promote broad and secure access to data resources and data processing services, through its role in:
  - shaping parts of the Horizon Europe work programmes and
  - in monitoring the output of funded actions,
- ❑ coordinate and foster technical environments and promote the skills that enable the federation of existing and new scientific data infrastructures.

- ❑ a ‘commons’ for research data aiming to combine all disciplines across all (European) countries
- ❑ an ongoing process, with both means and methods still very much evolving
- ❑ virtual space where science producers and consumers come together
- ❑ a platform for European research
- ❑ federation of services
- ❑ web of FAIR research data (and services)
- ❑ quality mark « Data made in Europe »
- ❑ ‘a portal’, ‘a marketplace’, ‘a web of FAIR data’
- ❑ ‘an infrastructure’ ... or its ‘data twin’

**Twinning the ‘EOSC’ to the e-infrastructure**

‘EOSC’ could be seen as a twin sister (or brother) of the e-infrastructure organisations. One offering the compute and connectivity services and the other servicing the data and the interoperability.



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source: Karel Luyben, IFFIS2019 conference, Stockholm November 2019  
<https://www.slideshare.net/kbredaktion/european-open-science-cloud-205323223>

whatever it is, it will be structuring data-driven research in Europe in the 2020s

# An ecosystem more than an infrastructure



- Sharing & Discovery
- Processing & Analysis
- Data Management
- Compute
- Storage
- Networking
- Training & Support
- Security & Operations
- Help Desk



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**Deadline for first round of application  
October 2020**

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the EOOSC  
Association**

**ACCESS EOOSC SERVICES & RESOURCES**

- ❑ Entities of all kinds – diversity in the EOSC range from data sets to storage to computing to publications
- ❑ An open ecosystem – rules of participation will favour no barrier to entry regarding operational maturity, service management quality
- ❑ A diverse ecosystem – providers will come from e-Infrastructures, from member states, from research infrastructures, and private sector
- ❑ An interdependent ecosystem – aim includes composability and collective service design through an open AAI (Authentication and authorisation infrastructure ) federation

The EOSC governing bodies have identified fourteen action areas to help deploy the EOSC ecosystem.

The seven areas relating to the primarily technical challenges and prerequisites to implementing the EOSC ecosystem are as follows:

- ❑ Identifiers
- ❑ Metadata and ontologies
- ❑ FAIR metrics and certification
- ❑ Authentication and authorisation infrastructure (AAI)
- ❑ User environments
- ❑ Resource provider environments
- ❑ EOSC Interoperability Framework.

## EOSC is much wider than what we have known before

<b>Architecture</b>	federated infrastructures and (data) resources
<b>Data</b>	FAIR data management and tools
<b>Services</b>	environment of user-oriented services
<b>Access &amp; Interface</b>	access across disciplines, and compliance with open data
<b>Rules</b>	rules of participation for services, compliance with legal & trust needs
<b>Governance</b>	governance of the ecosystem and leadership in data-driven science

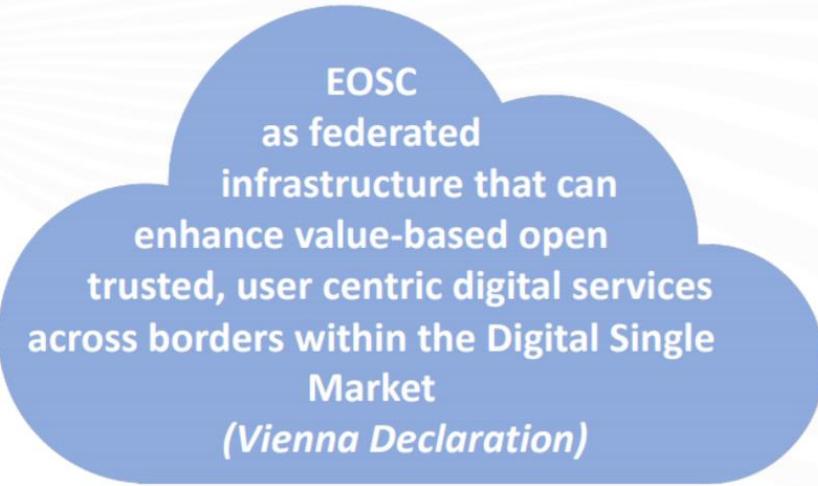


From: EOSC portal, by way of *The added value of EOSC for research in EOSC* Zoe Cournia (NI4OS-Europe)

- ❑ Co-creation
- ❑ Research-led
- ❑ Community-driven
- ❑ Flexible by design
- ❑ Extensible / scalable
- ❑ Incremental and iterative
- ❑ Hands-on and participatory
- ❑ Continuous engagement, consultation & user testing

#### EOSC Common values:

- Focussed on research needs
- Community driven
- Inclusive and respectful of diversity
- Transparent and trustworthy



EOSC  
as federated  
infrastructure that can  
enhance value-based open  
trusted, user centric digital services  
across borders within the Digital Single  
Market  
*(Vienna Declaration)*

# First phase of EOSC: 2018-2020

H2020 EOSC-related projects:  
ca. €600 million

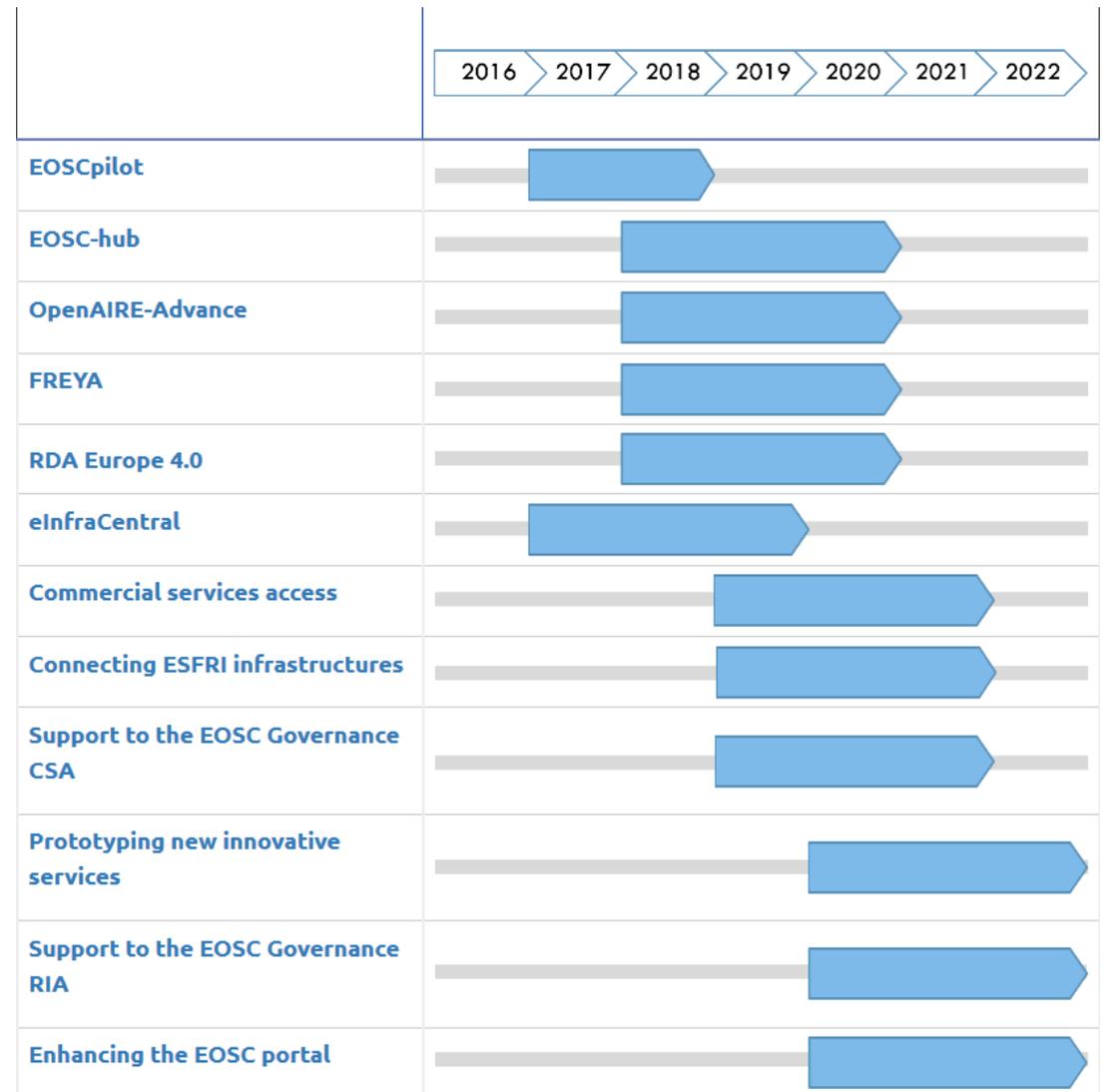
Address six roadmap action lines:  
◆ Data ◆ Services ◆ Architecture  
◆ Access ◆ Rules ◆ Governance

Current EOSC governance tasks:  
◆ steer initial implementation  
◆ involve all R&I stakeholders  
◆ transition to 2nd stage 2020+

“Start of the second phase of the implementation is dependent on an evaluation by the Commission and the Member States of the first phase and without prejudice to the Multiannual Financial Framework after 2020”

# EOSC Timeline

- The European Commission is providing financial support to implement the EOSC by means of projects under the EU Framework Programme for Research and Innovation (Horizon 2020).
- The presented table shows various ongoing and future projects that will contribute to the development of the European Open Science Cloud by 2021

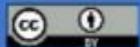
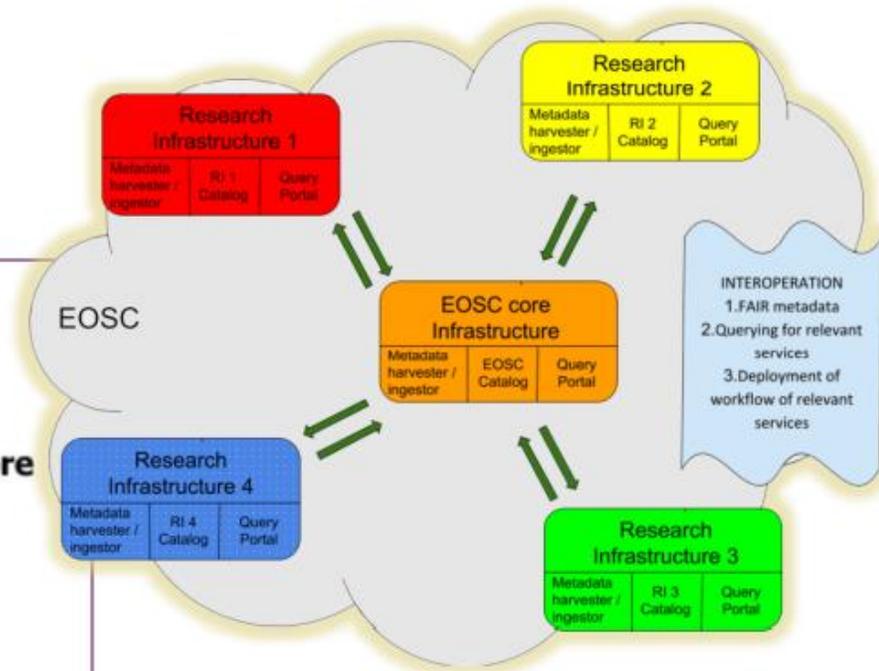


## With a structuring EOSC 'core'

### Possible core functions for 'EOSC' in 2020+



- **Develop and govern federating core**
- **Manage compliance framework**
- **Manage trusted certification**
- **Manage 'EOSC' trademark(s)**
- **Implement PID policy guidelines**
- **Develop outreach to stakeholders**
- **Contribute to Horizon EU policy**
- **Monitor services and transactions**



- ❑ Researchers are the first and ultimate target group of EOSC.
- ❑ Their role within the EOSC is two-fold: they will primarily be users of the EOSC services, but they can also offer their assets (research output such as data, software and other tools) to the EOSC.
- ❑ Not formed in homogeneous networks.
- ❑ Many individual researchers may not (yet) be aware about the EOSC or may be sceptical about it.
- ❑ Need to reach out to mediate target groups may include:
  - rectors,
  - research networks,
  - funding bodies or funders' associations,
  - research support units or other representatives of researchers.

# Researchers: Main motivation for engagement

- They are the main beneficiaries and users of EOSC services and infrastructures
- They can help to shape EOSC so that it fits their needs and visions for future, digitalized, data-driven R&D...

- ❑ The EOSC governance structure currently has no defined mechanism for engaging with the private sector/industry.
- ❑ The EOSC Governance Board and Executive Board have been formed and there is no representative in these boards who has a specific mandate to represent the private sector.
- ❑ This target group includes:
  - commercial service providers,
  - business organizations,
  - small and medium-sized enterprises' clusters,
  - European Cluster Observatory,
  - Enterprise Europe Network,
  - EU Associations of SMEs and
  - EOSC related projects.

# Industry: Main motivation for engagement

- They deliver services/technologies that can be relevant for inclusion in EOSC.

## Phase 1, until 2020:

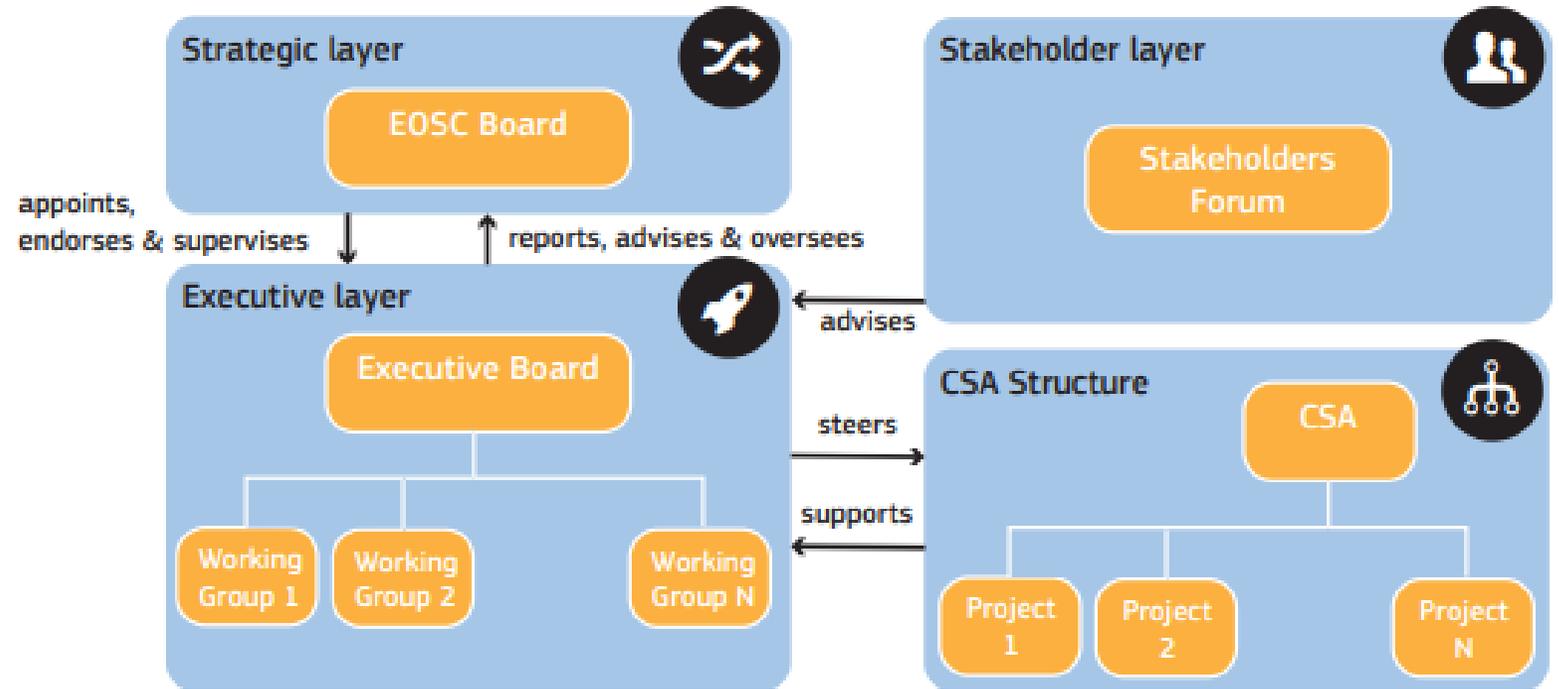
- ❑ the Commission will invest EUR 300 million to support the core functions of the EOSC as per milestones.
- ❑ Member States would flag the national initiatives that they want to federate into the EOSC (e.g. the work of the Helmholtz Data Alliance); and the resources they are willing to provide in kind.
- ❑ Research funders would start making costs eligible for FAIR data only.

## Phase 2, after 2020:

- ❑ To explore a mix of funding including possibly deposit fees from national funders, based on a full cost estimate for the running of the EOSC, conducted by the EOSC governance framework in Phase 1.

## Three-layer structure

- ❑ **Strategic Layer** in the form of an EOSC board to combine state-of-the-art expertise on scientific cloud infrastructures with the Funders and Policy Makers.
- ❑ **Executive Layer** in the form of an executive board to manage day-to-day operation of the EOSC and procurers designing and planning work-related future developments
- ❑ **Stakeholder layer** organised in the form of a stakeholders forum to provide a medium for stakeholders: Users (Consumers), Providers and Intermediaries of EOSC Resources.





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SECURITY & OPERATIONS



TRAINING & SUPPORT

# EOSC Portal Catalogue and marketplace

<https://marketplace.eosc-portal.eu>

Branch of science		Categories
 Interdisciplinary	 Humanities	 Social Sciences
 Natural Sciences	 Engineering and Technology	 Medical and Health Sciences
 Agricultural Sciences	 Support Activities	 Other

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Branch of science	Categories	
 Compute	 Data management	 Networking
 Processing & Analysis	 Security & Operations	 Sharing & Discovery
 Storage	 Training & Support	

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# EOSC is here to stay!

- EOSC aims at creating a virtual research environment to access and interoperate research data and other research outputs in Europe across the different disciplines.



# Questions?

## Credits to:

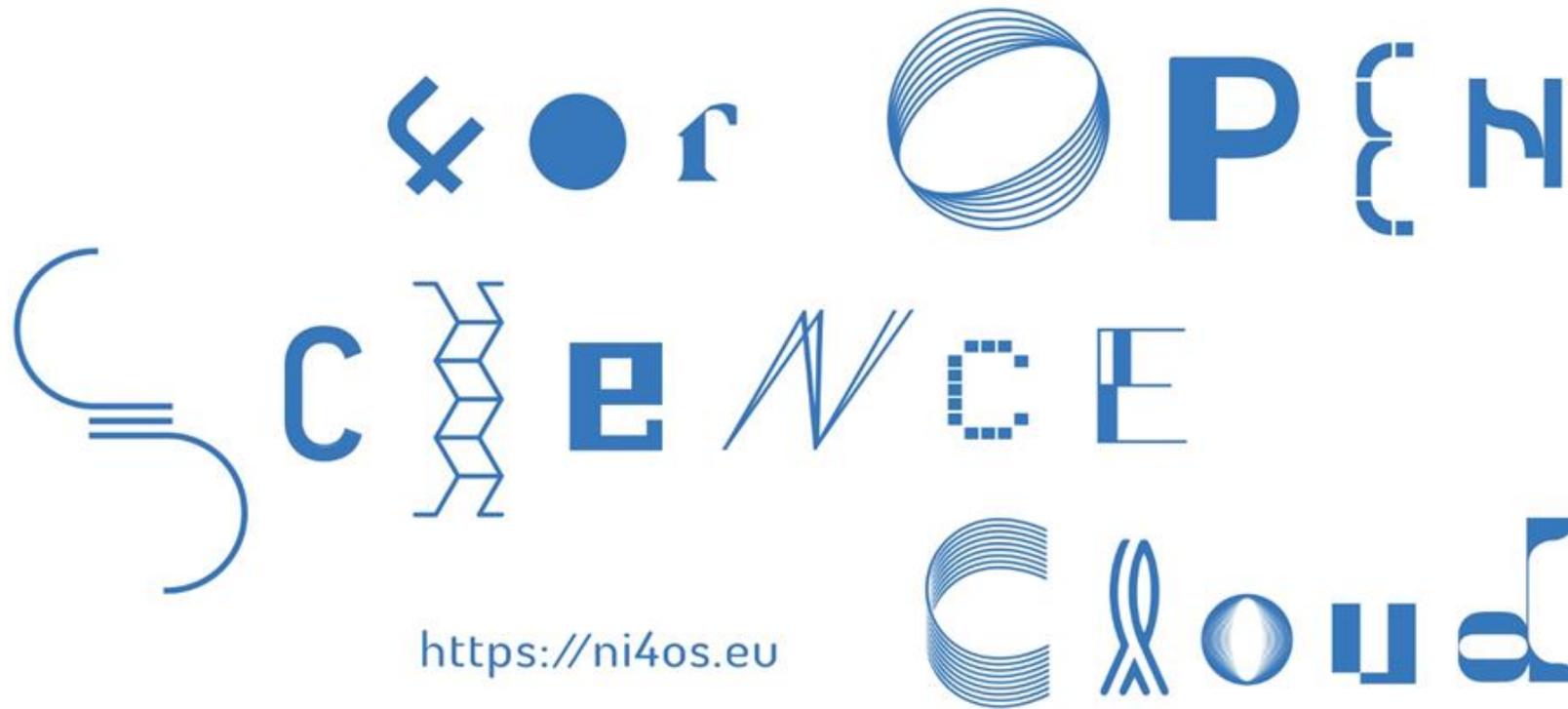
- ❑ [Emma Lazzeri Consiglio Nazionale delle Ricerche – CNR – Italy EOSC Secretariat.eu Supporting EOSC Governance and its stakeholders Introduction to EOSC, NI4OS webinar](#)
- ❑ [David Groep, chairman of EUGridPMA, NSF Cybersecurity Summit 2020 50th EUGridPMA, AARC & EnCo meeting, September 2020](#)
- ❑ <https://www.eosc-portal.eu/>
- ❑ <https://marketplace.eosc-portal.eu/>
- ❑ <https://www.eoscsecretariat.eu/news-opinion/eosc-strategic-research-and-innovation-agenda-version-08>

## Get in touch with EOSC:

- ❑ <https://eosc-portal.eu/contact-us>
- ❑ [info@eoscsecretariat.eu](mailto:info@eoscsecretariat.eu)
- ❑ [www.eoscsecretariat.eu](http://www.eoscsecretariat.eu)

<https://www.youtube.com/watch?v=3Hgnle1Xu8I>

# Thanks!



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