



The European Open Science Cloud (EOSC) as supporting infrastructure for European researchers

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Science in transition

The Open Science paradigm affects the whole research cycle and all its stakeholders

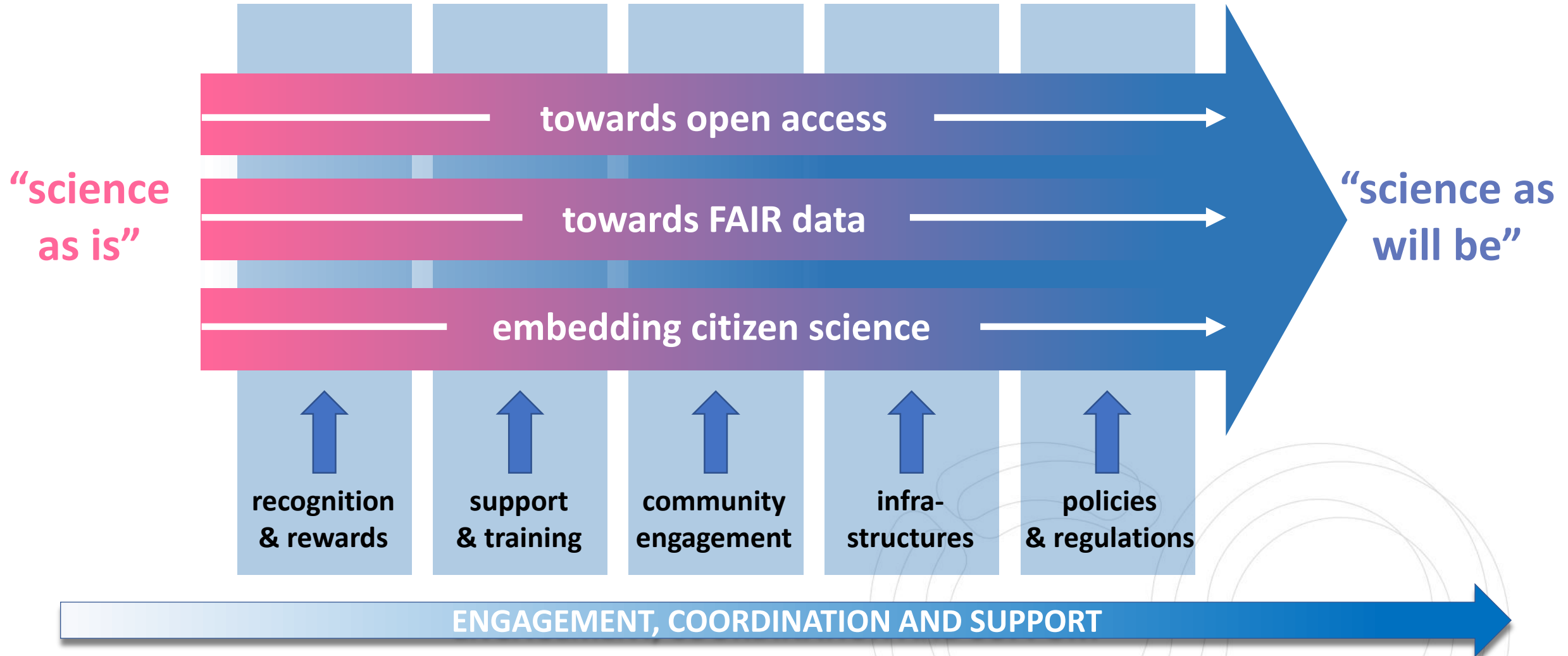
It implies sharing knowledge and tools:

- **as early as possible** in the research process;
- **as openly as possible**;
- **as FAIR as possible**;

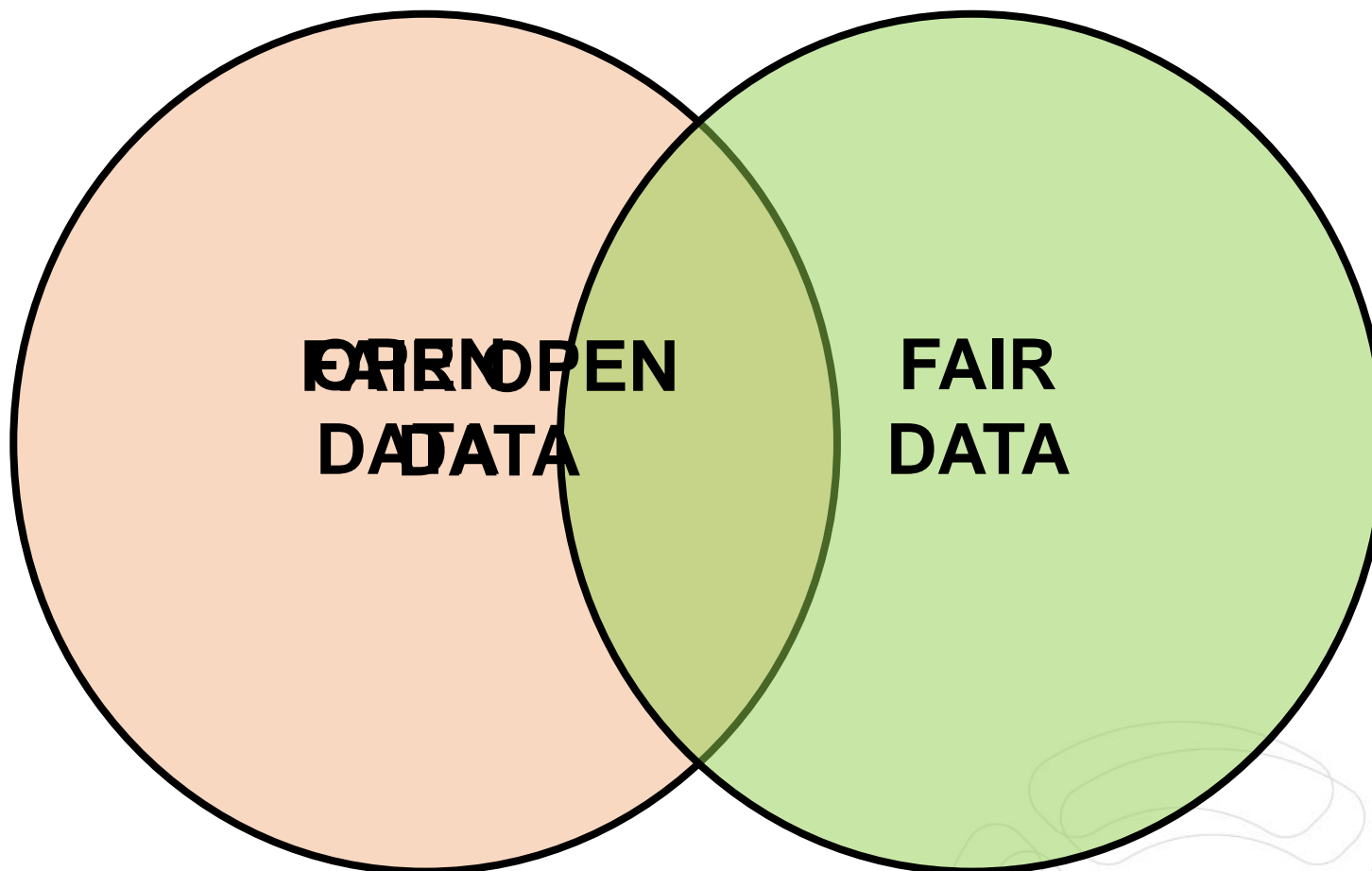
not only within a discipline but also between disciplines and society at large.



Open Science



OPEN DATA and/or FAIR DATA



FAIR \equiv
Findable
Accessible
Interoperable
Reusable

Towards “as FAIR as possible” and “as open as possible”

“A web of scientific insight”

- **Web of FAIR Data and related Services**
- **Federation of relevant existing and future data sources**
- **Virtual space where science producers and consumers come together**
- **An open-ended range of content and services**
- **Based on the FAIR principles**
- **Meeting all European data requirements**
- **In interaction with other regions of the world**



 **EOSC – additionality to the web of FAIR data**

EUROPEAN OPEN SCIENCE CLOUD

WORLD WIDE WEB

INTERNET

NETWORKS

COMPUTERS

[Modelled after: World Wide Web - Wikipedia](#)

What do we concretely aim for?

- *Researchers performing publicly funded research make relevant results available, as openly as possible;*
- *Professional data stewards are available in research-performing organisations in Europe to support RDM for Open Science;*
- *Research data produced by publicly funded research in Europe is FAIR (by design);*
- *The EOSC Interoperability Framework supports a wide range of FAIR digital objects including data, software and other research artefacts;*
- *EOSC Federation is populated with a valuable corpus of interoperable data;*
- *EOSC (version x) is operational and provides a stable infrastructure, supporting the research process and helping to address societal challenges;*
- *The scope of EOSC is widened to serve the public and private sectors;*
- *EOSC is a valuable and valued resource to a wide range of users from the research and education, public and private sectors (including for-profit).*

- *After an initial period of many projects without much convergence (2015-2020).*
- *We are now getting our aims sufficiently developed in the present period of convergence (2021-2026).*
- *For this it is essential that we get a Minimal Viable EOSC (MVE / EOSC-EU-node) operational asap.*
- *And as good as possible aligned with work done by all the relevant communities (European, National and Institutional).*



Guiding principles for EOSC

The **overarching** principle for developing EOSC is that research has to be at the centre of the EOSC initiative.

- **Multi-stakeholderism**

EOSC will succeed if and only if it follows a multi-stakeholder approach;

- **Openness**

EOSC will ensure research artefacts be 'as open as possible, as restricted as necessary';

- **FAIR principles**

EOSC research artefacts need to be findable, accessible, interoperable and reusable;

- **Federation of infrastructures**

EOSC will federate existing and upcoming data- and e-infrastructure;

- **Machine-actionable**

EOSC will ensure that machines can find, access and interoperate on data helping people in servicing the needs of European scientists.

Important requirements for EOSC to deliver

- Relevant data
- Sufficiently rich metadata
- Search mechanism
- Software (often self made)
- Compute power (usually available)
- Storage (usually available)
- Access
- Automatic referencing
-



EOSC – a Common European Data Space



Health



Industrial &
Manufacturing



Agriculture



Finance



Mobility



Green Deal



Energy



Public
Administration



Skills



EOSC: a crosscutting data space for Research and Innovation

Data Spaces Support Centre (dssc.eu)

- coordinating the development of data spaces
- assuring common standards and interoperability

“**EOSC** is the basis for a science, research and innovation data space that will bring together data resulting for research and deployment programmes and will be connected and articulated with the sectoral data spaces”

(European Data Strategy, COM(2020) 66 final)

Taken from EC slides



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.*
- *The development of the EOSC is a key enabler for **Action 1**. Supplying 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 implementing **Action 1**.*

European Commission website

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

EOSC Association – the Voice of the Community

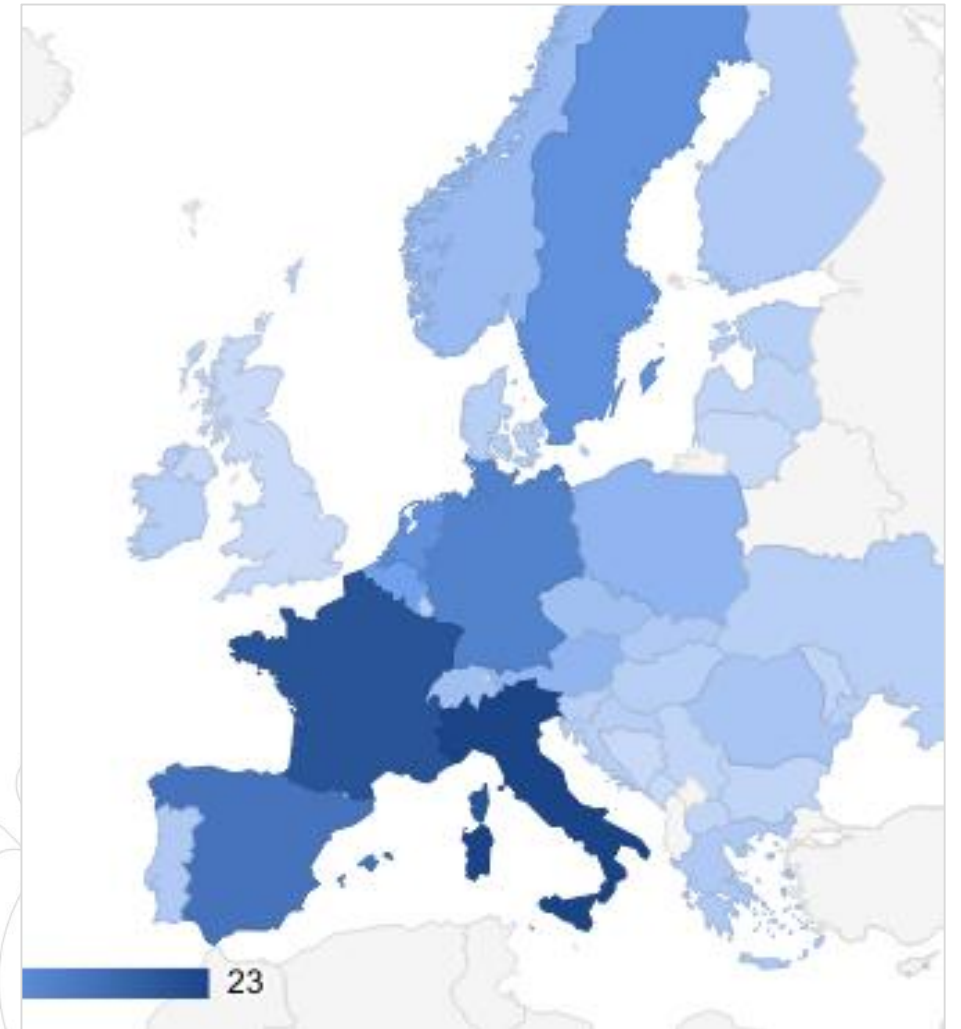
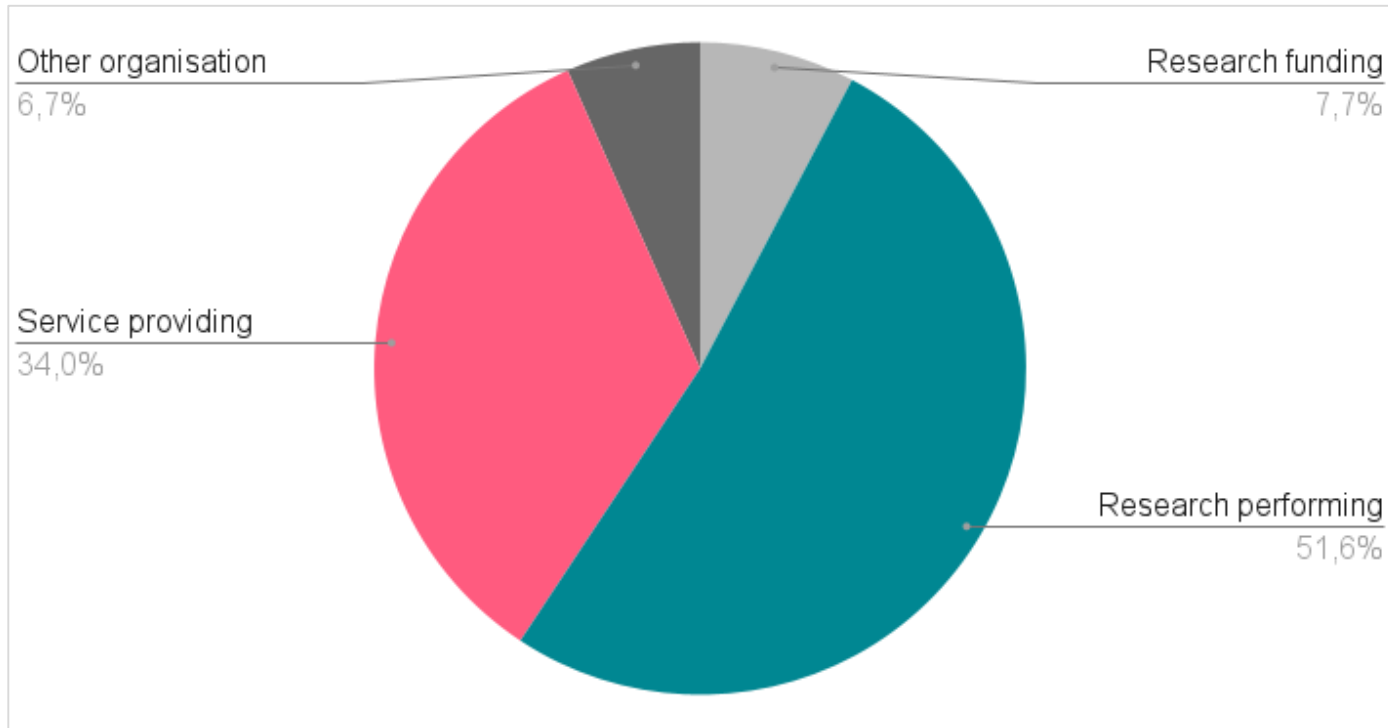


General Assembly #6, 22-23 May 2023



eosc 168 Members and 81 Observers

A strong memberbase



Horizon Europe co-programmed EOSC Partnership

- *Launched June 2021*
- *One billion euros commitment by the European Union and the EOSC Association*



Strategic Research and Innovation Agenda



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

Sustainable and federated infrastructures enable open sharing of scientific results

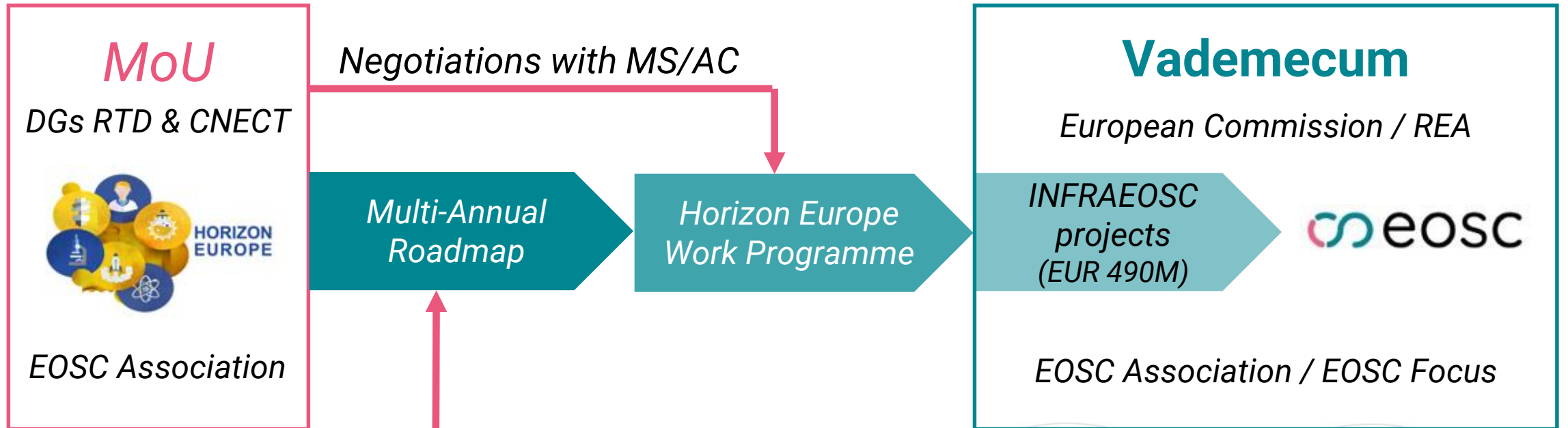
Multi-annual roadmap sets priority activities and outcomes grouped by three implementation levels – European, National, Institutional

Three phases of MAR

- 2021-2022: development towards a functional federation of infrastructure
- **2023-2024: expansion to production that generates added value**
- 2025-2027: expansion to develop impact from Open Science

Delivering EOSC – the Process

The critical role of the INFRAEOSC Projects



Community Consultation

Present action: update of MAR 2025 - 2027

New division of Task Forces over the advisory groups

Technical challenges on EOSC

Technical interoperability of data and services
Infrastructure for quality research software
AAI Architecture
Long-term data preservation



Metadata and data quality

Semantic interoperability
FAIR metrics and data quality
PID policy and implementation



Research careers and curricula

Data stewardship curricula and career paths
Research careers, recognition and credit
Upskilling countries to engage in EOSC
Researcher engagement and adoption



Sustaining EOSC

Financial sustainability
Rules of Participation compliance monitoring



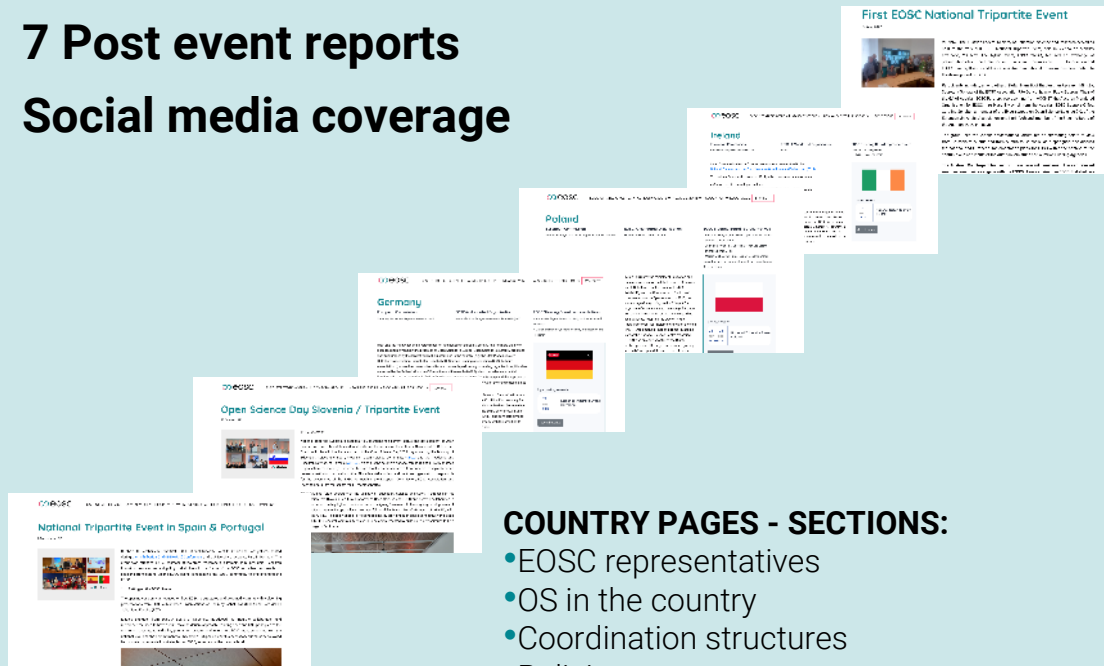


Tasks for EOSC Association to see to:

- Outreach to stakeholders
- Manage the 'EOSC' trademark(s)
- Monitor additional activities and KPI
- Contribute to Horizon Europe ERA Actions
- Further develop and govern the EOSC-EU-node
- Manage the AAI
- Manage PID policies
- Manage an Interoperability Framework
- Manage the compliance framework

National Tripartite Events

- 24 countries targeted in NTE
- 2101 participants in National and NTE
- + 35 preparatory meetings
- 31 country pages
- 15 Articles
- 7 Post event reports
- Social media coverage



COUNTRY PAGES - SECTIONS:

- EOSC representatives
- OS in the country
- Coordination structures
- Policies
- Practices & Use Cases

2022



1293

Participants

177

Speakers & moderators

16

Countries targeted

March – June 5th 2023



808

Participants

8

Countries targeted

UPCOMING TRIPARTITE EVENTS
(June - September 2023)



eosc A perspective from Ireland

Milestones in Open Research

- *National Principles on Open Access 2012*
- *National Open Research Forum (NORF) established to drive and guide the Irish agenda for Open Research 2017*
- *cOAlition S 2018 (SFI)*
- *National Framework on the Transition to an Open Research Environment 2019*
- *National Action Plan for Open Research 2022, delivered under Impact 2030*
- *NORF Open Research Fund provided by DFHERIS through the Higher Education Authority 2022*
- *First EOSC National Tripartite Event 2022*
- *TU-NET established as a joint initiative of Ireland's five technological universities to advance excellence in Open Research 2023*
- *National Open Research Festival 2023*



An Roinn Breisoideachais agus Ardoideachais,
Taighde, Nuálaíochta agus Eolaíochta
Department of Further and Higher Education,
Research, Innovation and Science

National Action Plan for Open Research 2022-2030



Tasks on the way to create EOSC

Operational and development tasks in discussion with the EC

- 1. Deploying and operating the EOSC EU node
(Core, Exchange, FAIR Data Federation)*
- 2. Maintaining and updating the EOSC EU node and expanding the EOSC federation
(with elements that are close to the 'market')*
- 3. Enabling a 'web of FAIR data and services' for science*
- 4. Develop, prototype and test new elements supporting the evolution of the EOSC Core and Exchange and the tools enabling the federation
(focus on elements that can be made ready for the 'market')*
- 5. Enabling Open Science policies and the uptake of Open Science practices*

eosc **Outlook to the future**



EOSC on a global stage

- **EOSC Association works with other regional initiatives towards common goals for Open Science, driving global convergence on standards in support of the implementation of an open science commons**
- **EOSC Association has involvement in GORC, GOSC and OSCER**
- **Service providers from third countries will be able to participate in EOSC, if they adhere to the EOSC Rules of Participation and applicable legislation**





Getting ahead of the curve and advancing to the next level, means:

- *Take advantage of ongoing EU and national policy making*
- *Understand the evolving objectives of the funders of this transition*
- *Realise that FAIR is the most important requirement;*
- *Educate staff and 'train the trainer';*
- *Create 'Data/Digital Competence Centres';*
- *Connect to other relevant initiatives at domain-specific levels as well as on the national level*
- *Join this powerful movement to make Open Science the new normal*



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THANKS



Ten things EOSC is not ...

- ... a cloud infrastructure**
- ... synonymous to Open Science**
- ... the EOSC Portal**
- ... the EOSC Association**
- ... a new research data repository or data management system**
- ... owning the data it will help to provide access to**
- ... a new pan-European e-infrastructure**
- ... substitution of any existing data- or (e-)infrastructures**
- ... directly for individual researchers, but it is for research**
- ... in competition with anything or anybody**

EOSC STEERING BOARD



Anna Panagopoulou

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DG-CNECT



Volker Beckmann

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and Associated
Countries**

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**Partnership
Board**

**MS/AC
collective
representation**

**Exchange of
information**

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General Assembly

(including organisations performing research, funding research, providing services, organisations mandated by MS/AC and other organisations)