

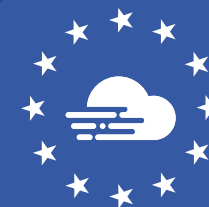
The grand challenge to deliver the European Open Science Cloud

Karel Luyben

President of the EOSC Association

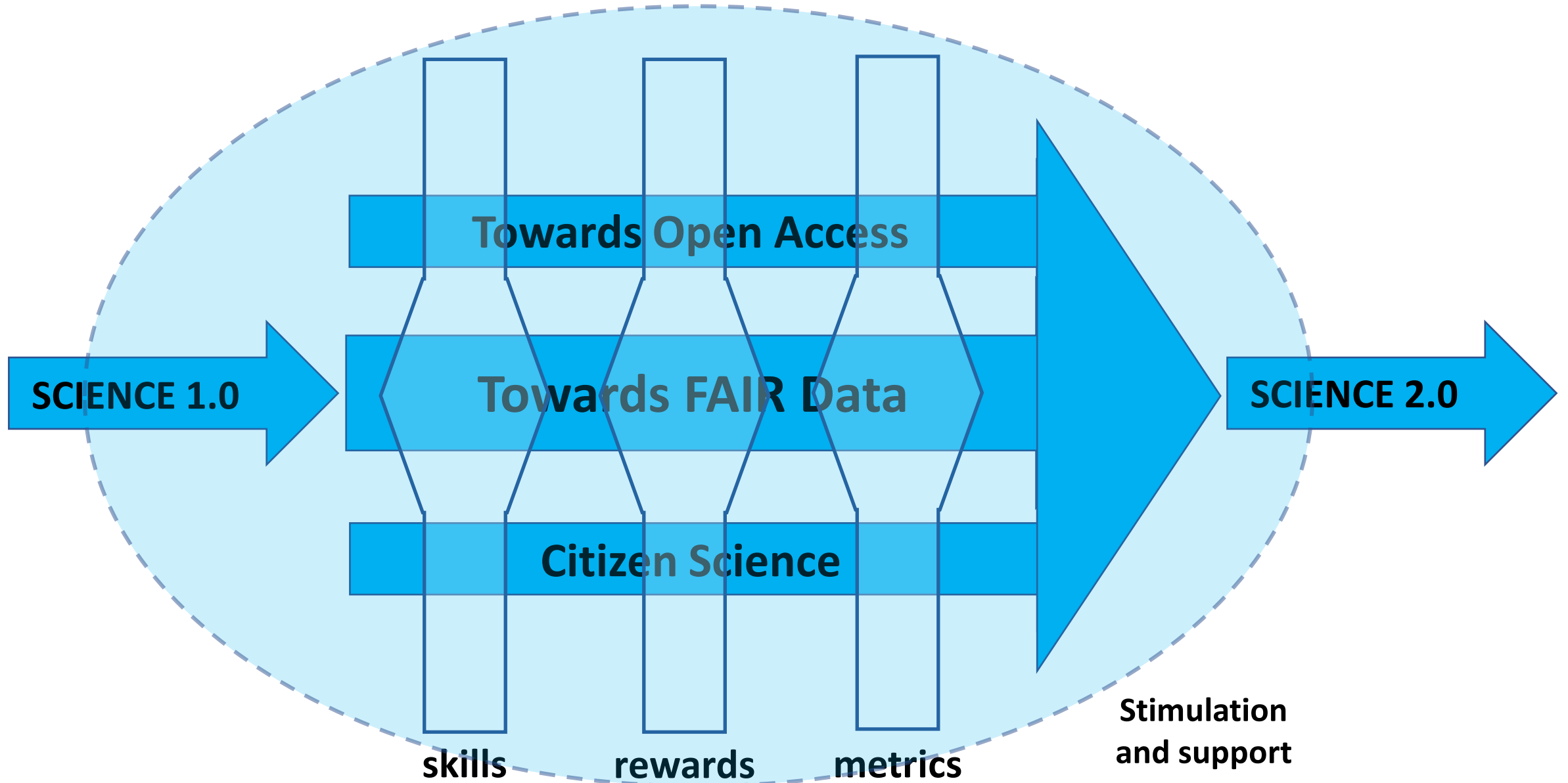
October 22, 2021

Rectors and Deans Forum 2021, Leuven

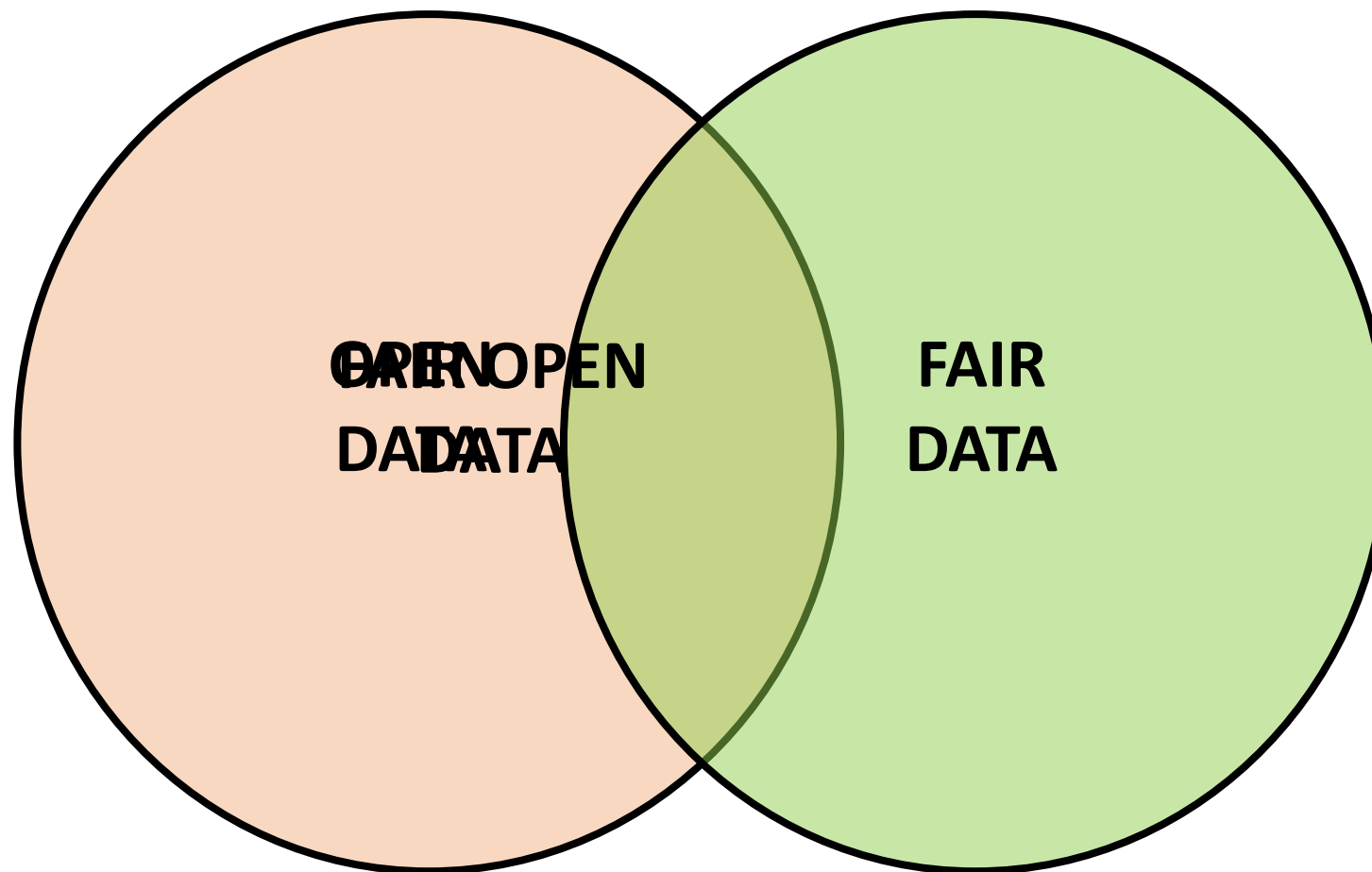


**EUROPEAN OPEN
SCIENCE CLOUD**

OPEN SCIENCE

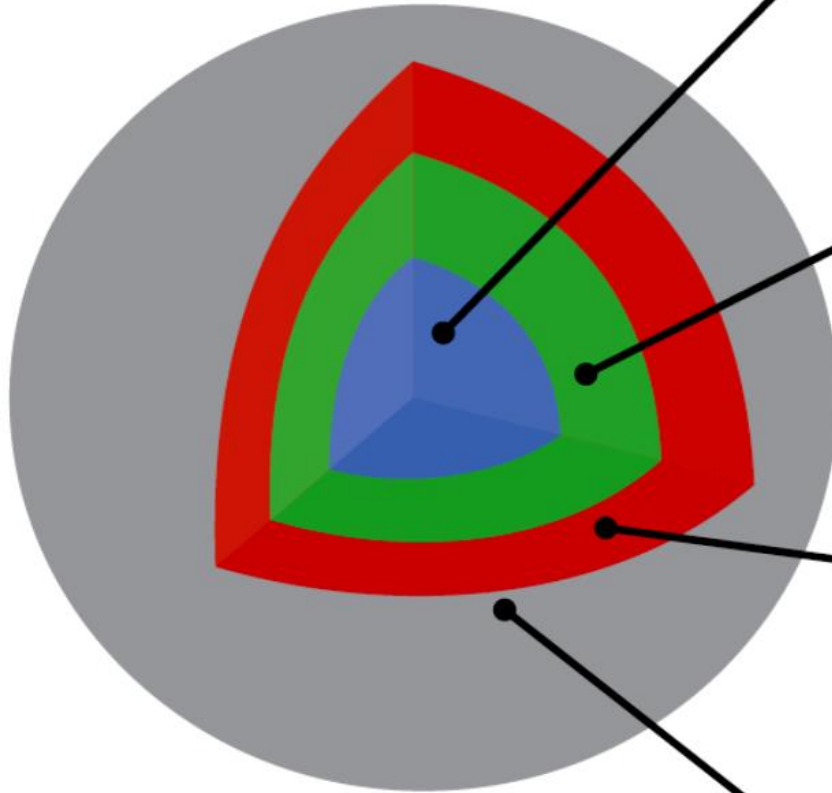


OPEN DATA and/or FAIR DATA



FAIR \equiv
Findable
Accessible
Interoperable
Reusable

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



DIGITAL OBJECT

Data, code and other research outputs

At its most basic level, data or code is a bitstream or binary sequence. For this to have meaning and to be FAIR, it needs to be represented in standard formats and be accompanied by Persistent Identifiers (PIDs), metadata and documentation. These layers of meaning enrich the object and enable reuse.



IDENTIFIERS

Persistent and unique (PIDs)

Digital Objects should be assigned a unique and persistent identifier such as a DOI or URN. This enables stable links to the object and supports citation and reuse to be tracked. Identifiers should also be applied to other related concepts such as the data authors (ORCIDs), projects (RAIDs), funders and associated research resources (RRIDs).



STANDARDS & CODE

Open, documented formats

Digital Objects should be represented in common and ideally open file formats. This enables others to reuse them as the format is in widespread use and software is available to read the files. Open and well-documented formats are easier to preserve. Data also need to be accompanied by the code used to process and analyse the data.



METADATA

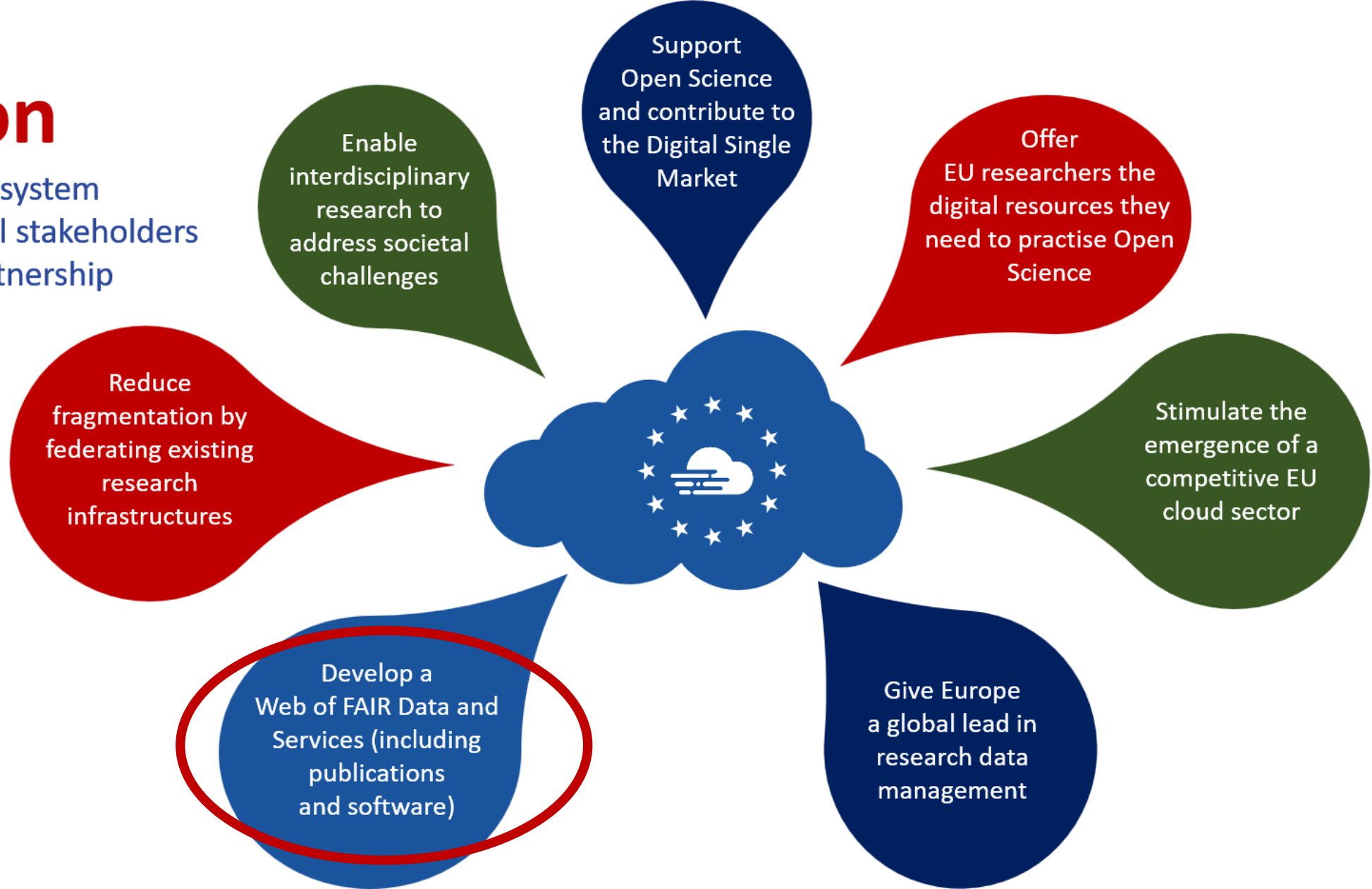
Contextual documentation

In order for Digital Objects to be assessable and reusable, they should be accompanied by sufficient metadata and documentation. Basic metadata will enable data discovery, but much richer information and provenance is required to understand how, why, when and by whom the objects were created. To enable the broadest reuse, they should be accompanied by a plurality of relevant attributes and a clear and accessible usage license.



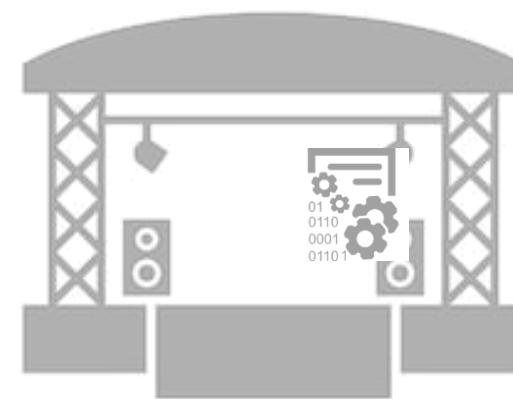
The Vision

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



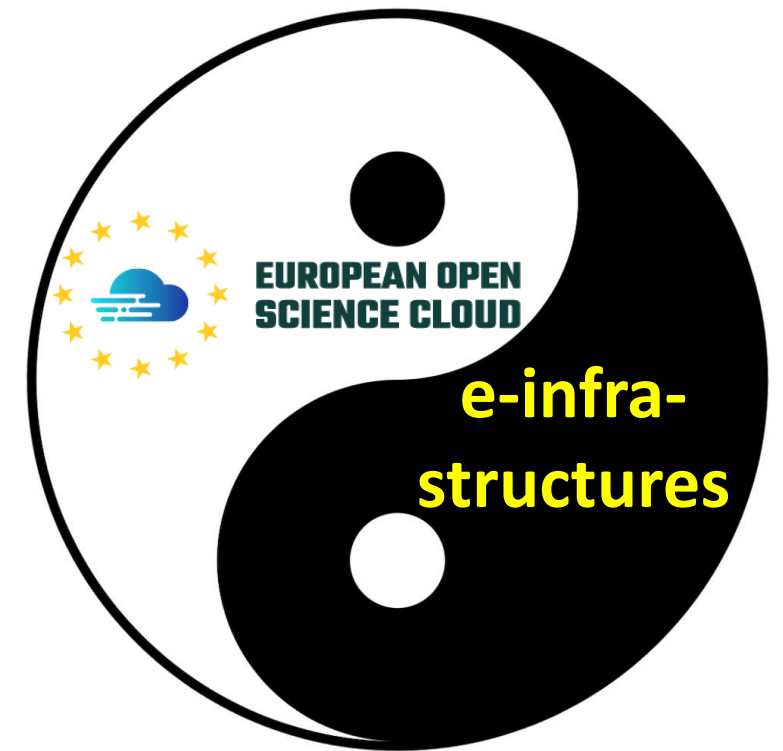
“A web of scientific insight”

- **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**
- **Meeting all European data requirements**
- **In interaction with other regions of the world**



Twinning the data- to the e-infrastructure

EOSC is a data-infrastructure and could be seen as a twin sister (or brother) of the European e-infra-structure organisations (yin/yang). The last offering the store, compute and connect services used by EOSC to offer the servicing of data and creating interoperability. The combination forms the EOSC-ecosystem



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 closed 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-infrastructures;
- **Machine-actionable**
EOSC will strike the right balance between machines and people in delivering the services that will serve the needs of European scientists.



EOSC Association

**An Exciting
Journey**

EOSC Association: Mission

Advancing the European Open Science Cloud to accelerate the creation of new knowledge, inspire education, spur innovation and promote accessibility and transparency

- To provide a single voice for advocacy and representation for the broader EOSC stakeholder community in Europe
- To promote the alignment of European Union research policy and priorities with activities coordinated by the Association (SRIA)
- To ultimately enable seamless access to data through interoperable services that address the entire research data life cycle, from discovery to storage, management, analysis and re-use across borders and scientific disciplines

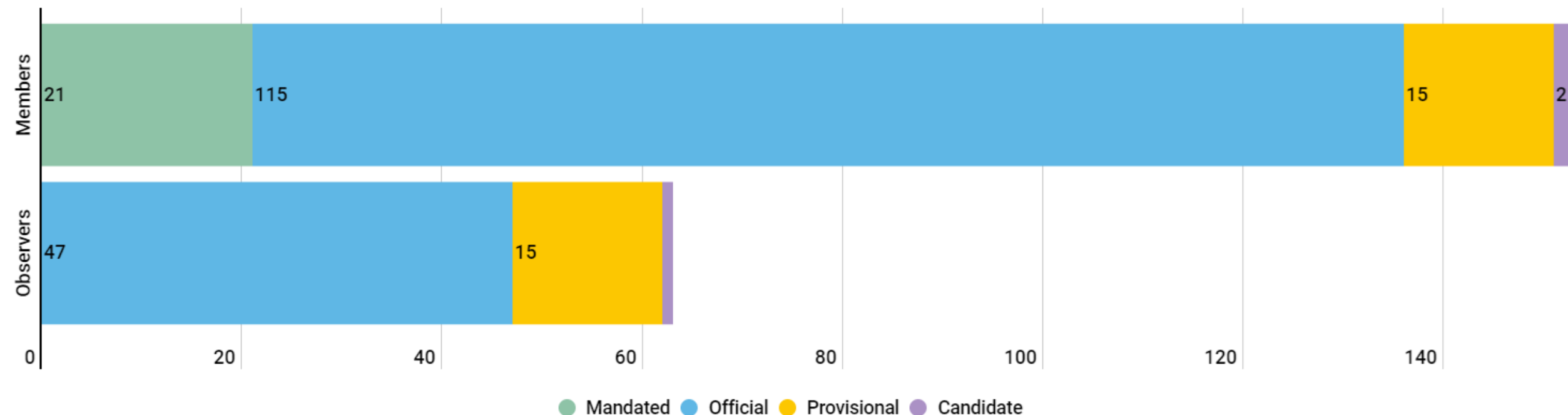




EOSC Association: Milestones

- Four founding members (CESAER, GEANT, GARR, CSIC)
- Was incorporated as AISBL on Wednesday 29th July 2020
- Obtained Royal Decree on Friday 11th September 2020
- First General Assembly on 17-12-2020 elected President and Board
- Research Performing; Research Funding and Service Providing organisations
- Now ~ 154 members and ~ 65 observers (62% - 8% - 30%) (May 2021)
- A European Co-programmed Partnership, between the EC and the EOSC Association, MoU signed in 2021
- Joining the EOSC Association = Joining the EOSC Partnership!

EOSC Association: Membership



As of the May 2021

Members: 153

Observers: 63

Board of Directors

Karel Luyben, CESAER (President)

Klaus Tochtermann, ZBW; 3-year

Marialuisa Lavitrano, University Milano – Bicocca; 3-year

Suzanne Dumouchel, CNRS; 3-year

Sarah Jones, GÉANT; 2-year

Ignacio Blanquer, UPV; 2-year

Ronan Byrne, HEAnet; 1-year

Bob Jones, CERN; 1-year

Wilhelm Widmark, University of Stockholm; 1-year



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Tasks for EOSC Association to see to:

- Develop and govern federating core
- Manage the AAI
- Manage PID policies
- Manage compliance framework
- Manage trusted certification
- Outreach to stakeholders
- Monitor services and transactions
- Manage the 'EOSC' trademark(s)
- Contribute to Horizon EU policy

What are the EOSC Advisory Groups / Task Forces?

- A structure to allow Association members and others to help steer the implementation of EOSC
- Groups should liaise with EOSC projects and offer feedback and advice
- Identify strategic gaps and areas for investment to input to SRIA
- EOSC Association members can propose and lead groups. Externals can also be members

Task Force topics within Advisory Groups



Suzanne
Dumouchel

Implementation of EOSC

- Rules of Participation compliance monitoring
- PID policy and implementation
- Researcher engagement and adoption



Ignacio
Blanquer

Technical challenges on EOSC

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

Metadata and data quality

- Semantic interoperability
- FAIR metrics and data quality

Research careers and curricula

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

Sustaining EOSC

- Defining funding models for EOSC
- Long-term data preservation



Sarah
Jones



Wilhelm
Widmark



Bob
Jones

Who will chair the Task Forces?

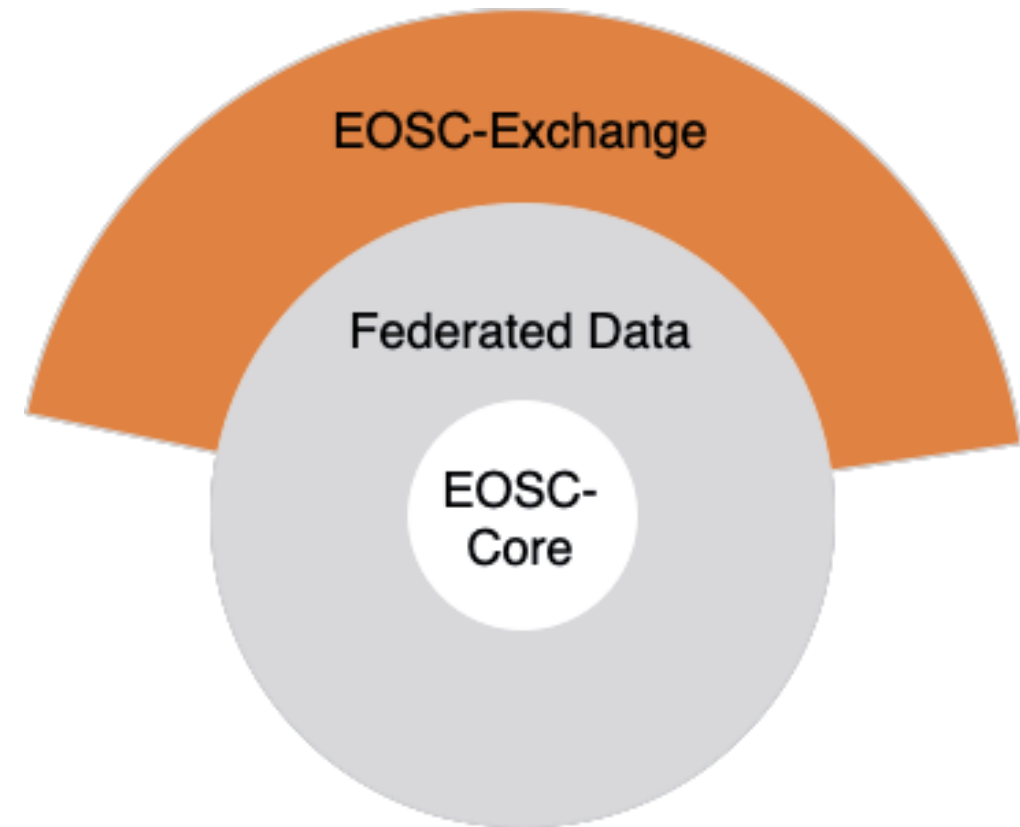
- We will ask each Task Force to make a suggestion on chairs
- Any member can volunteer to be chair and be proposed by the group
- The Board appoints all members, including the Chairs
- Board asks for two chairs: one male and one female
- Intend to bring balance across all Task Force chairs in terms of stakeholders and countries represented

Rules of Participation (RoP)

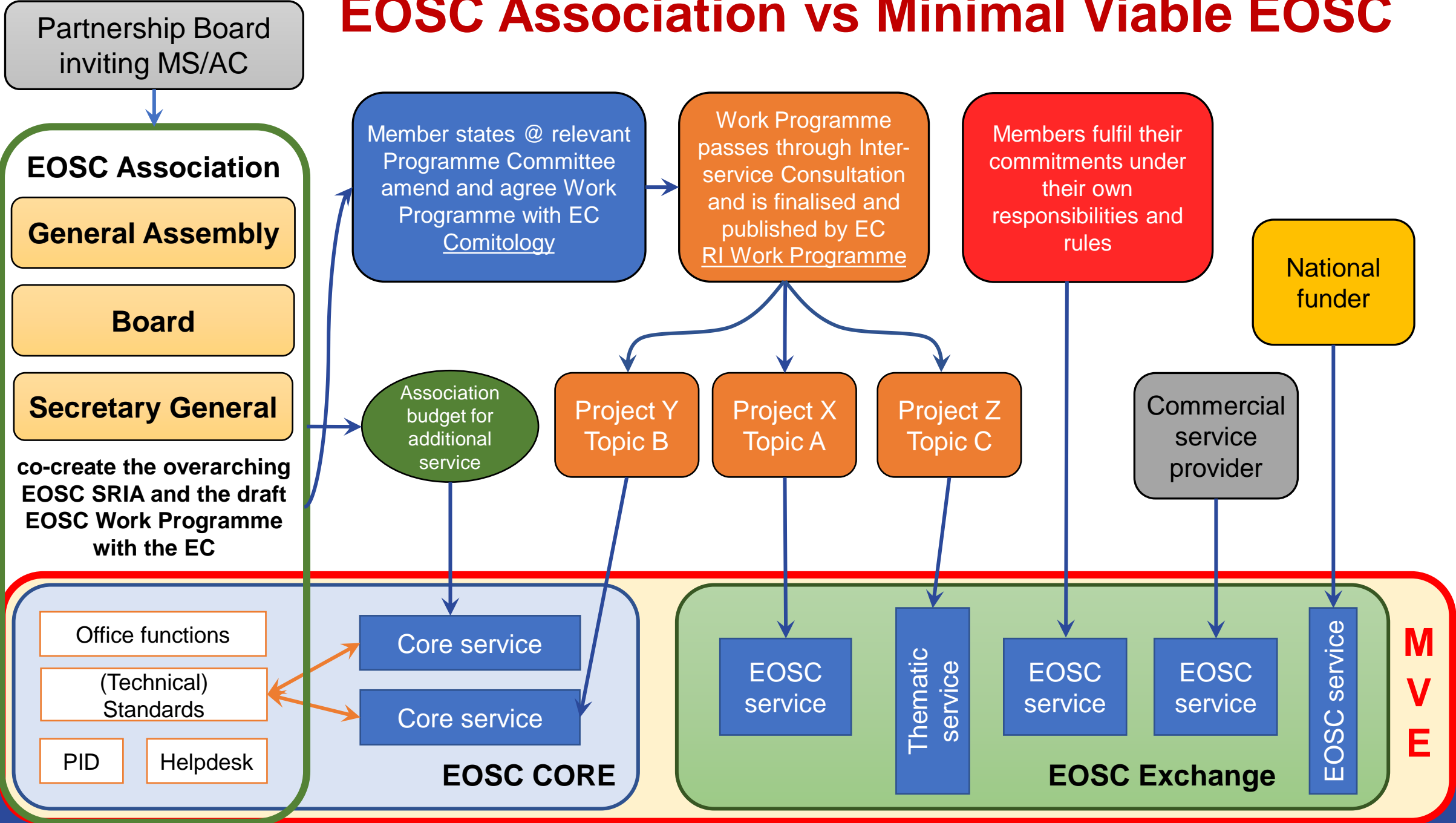
- Minimal set of rules that specify the rights, obligations and accountability governing EOSC activities
- RoP are set at a level to encourage wide participation, including from less advanced research communities
- Many of the Rules will need to provide encouragement rather than impose strict requirements, but can develop over time to include more stringent conditions
- The EOSC Association will be responsible for the RoP
 - Guidelines on ownership and evolution of RoP: <https://doi.org/10.2777/67118>

First iteration-minimum viable EOSC (MVE)

- The MVE includes EOSC-Core and EOSC-Exchange which work with federated FAIR datasets
- MVE must enable the federation of existing and planned research **data** infrastructures
- Begin with simple use cases – FAIR open data not sensitive or closed

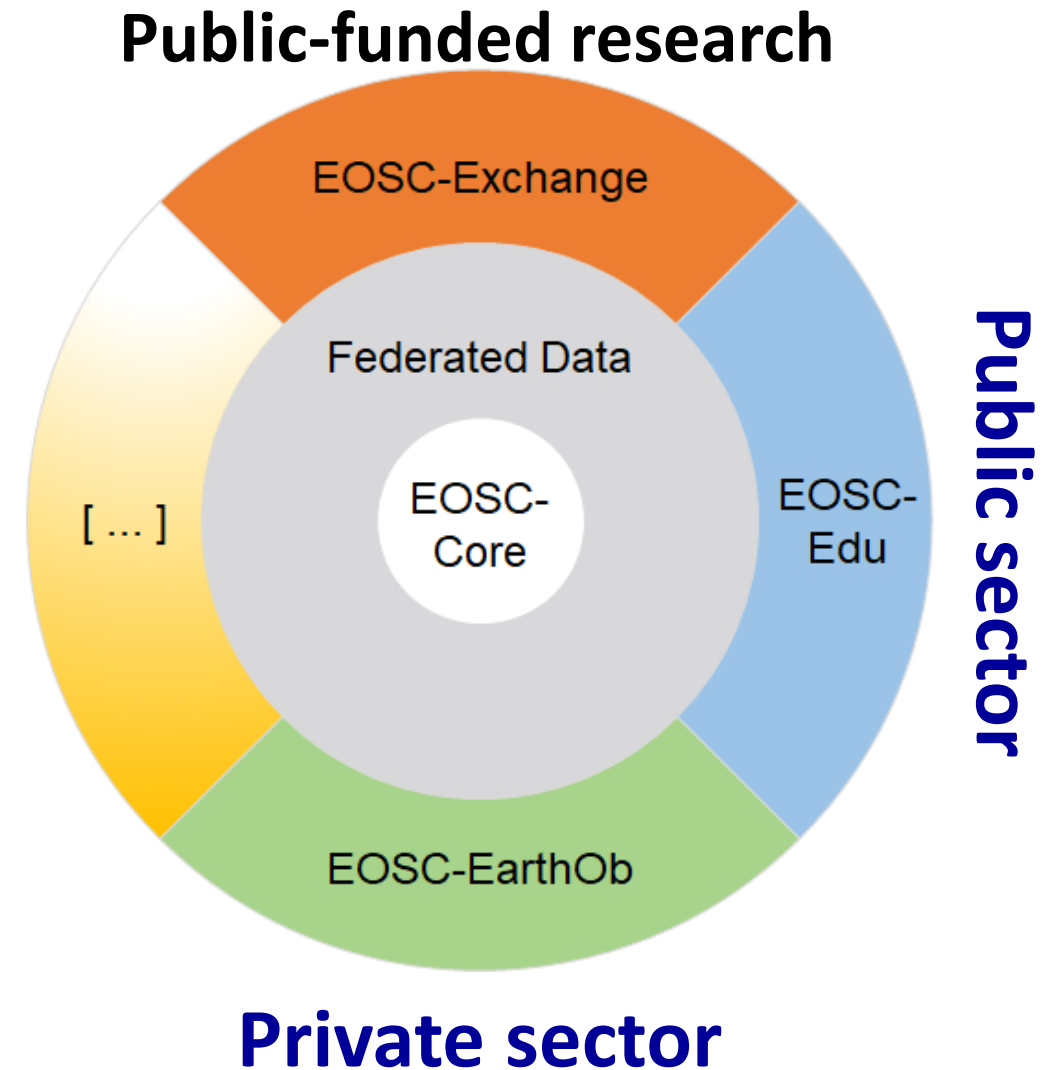


EOSC Association vs Minimal Viable EOSC



Proposed second and third iterations

- Extensions to serve public sector and industry
- These are not completely new users as some public sector and industrial partners will already be involved in MVE
- Would ideally be one 'marketplace' but differing requirements and legislation may require linked but alternately governed spaces

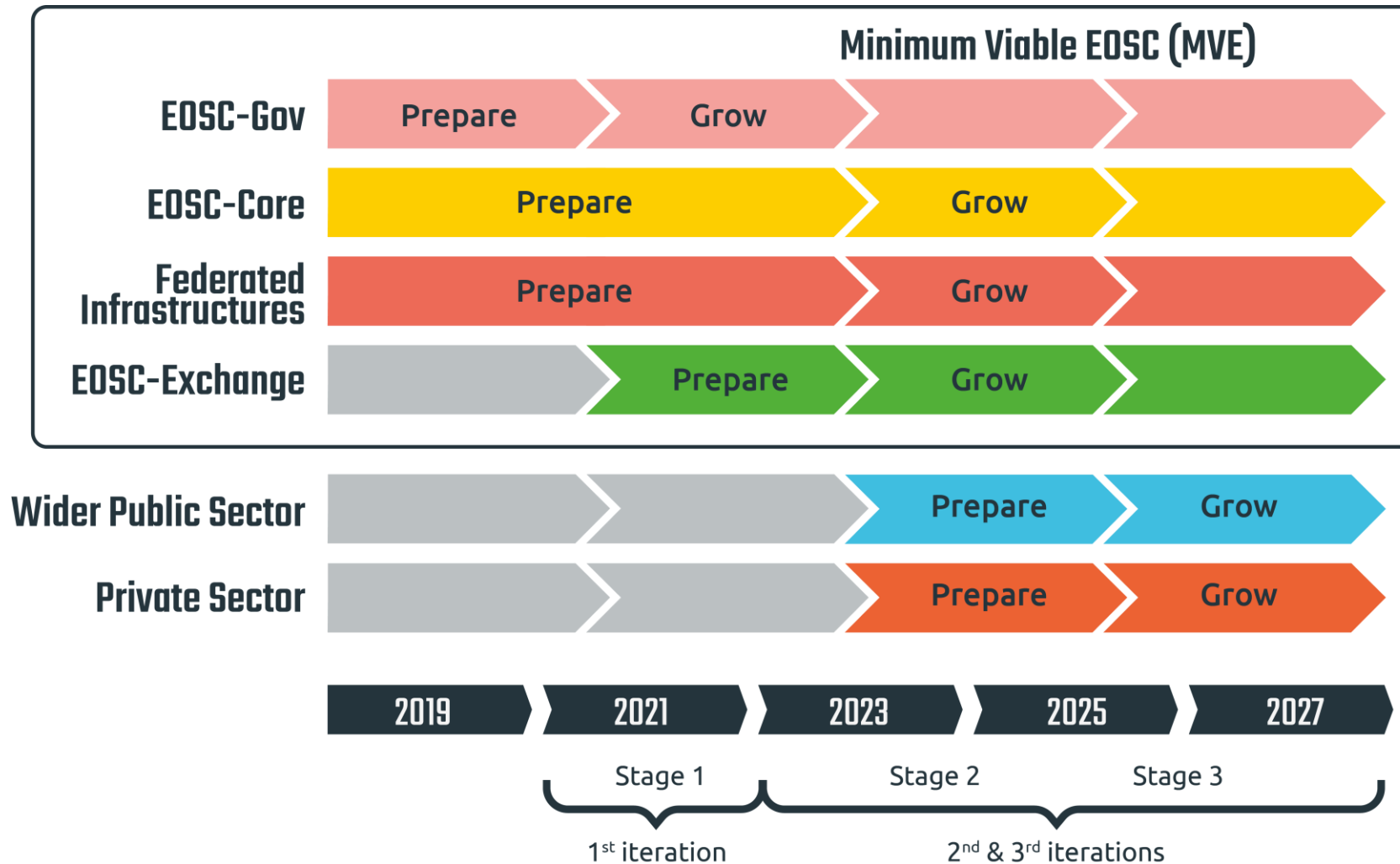


EOSC on a global stage

- Service providers from third countries can participate in EOSC but have adhere to EOSC Rules of Participation and applicable legislation
- EOSC will work 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



Timeline



(EOSC Strategic Research
Innovation Agenda v1)
<https://eosc.eu/documents>

Grand Challenges for delivering EOSC

- Create in the long run truly broad multidisciplinary interoperability
- For the short term this means: optimal Authentication and Authorisation Infrastructure (AAI); stepwise growing interoperability
- Getting the noses in the same direction
- Combining local and regional initiatives towards a true Open Science Commons with global convergence on standards in support of the implementation



Let's co-create EOSC

THANK YOU



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