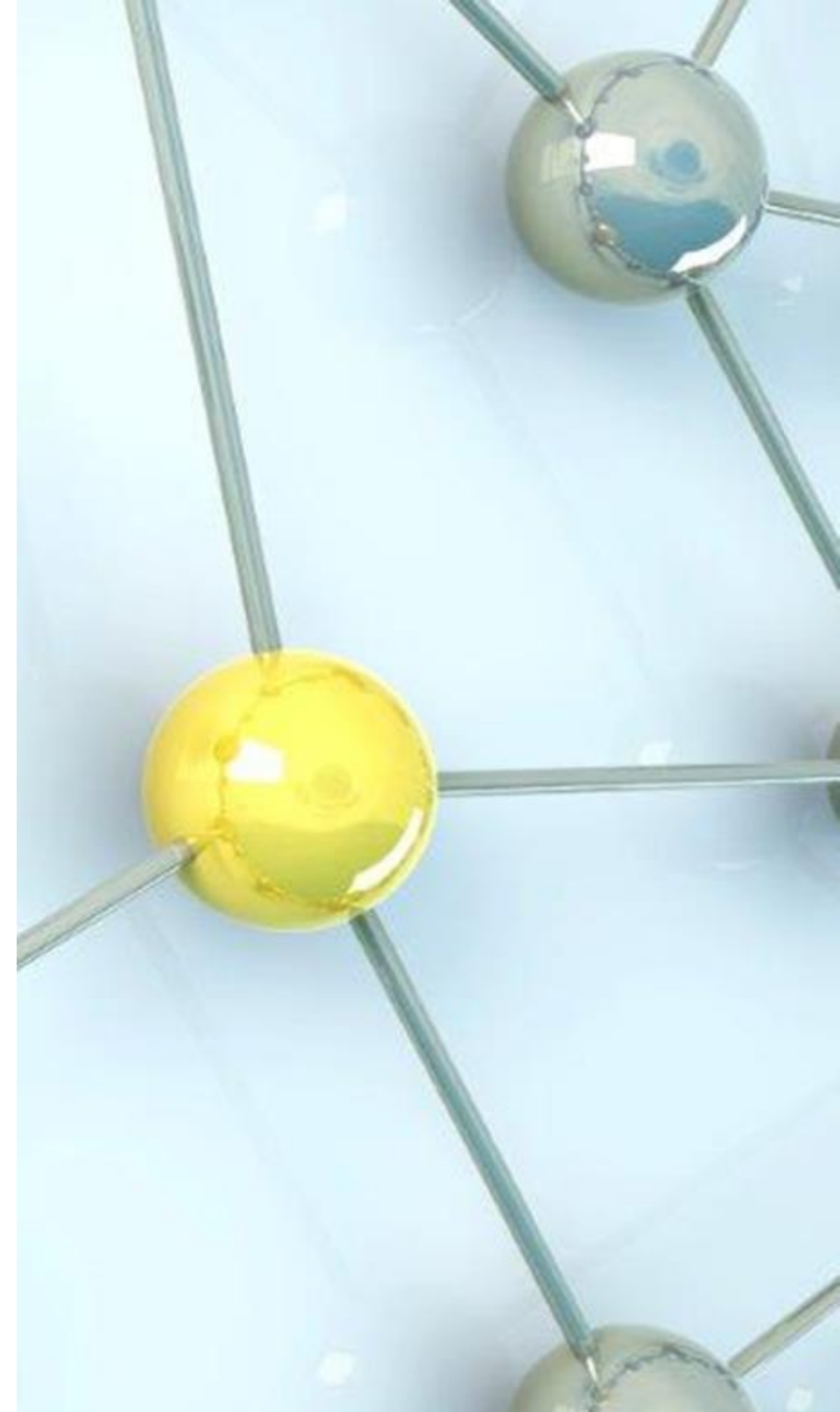# NI4OS-Europe Open Science Cloud platform

Dr Ognjen Prnjat
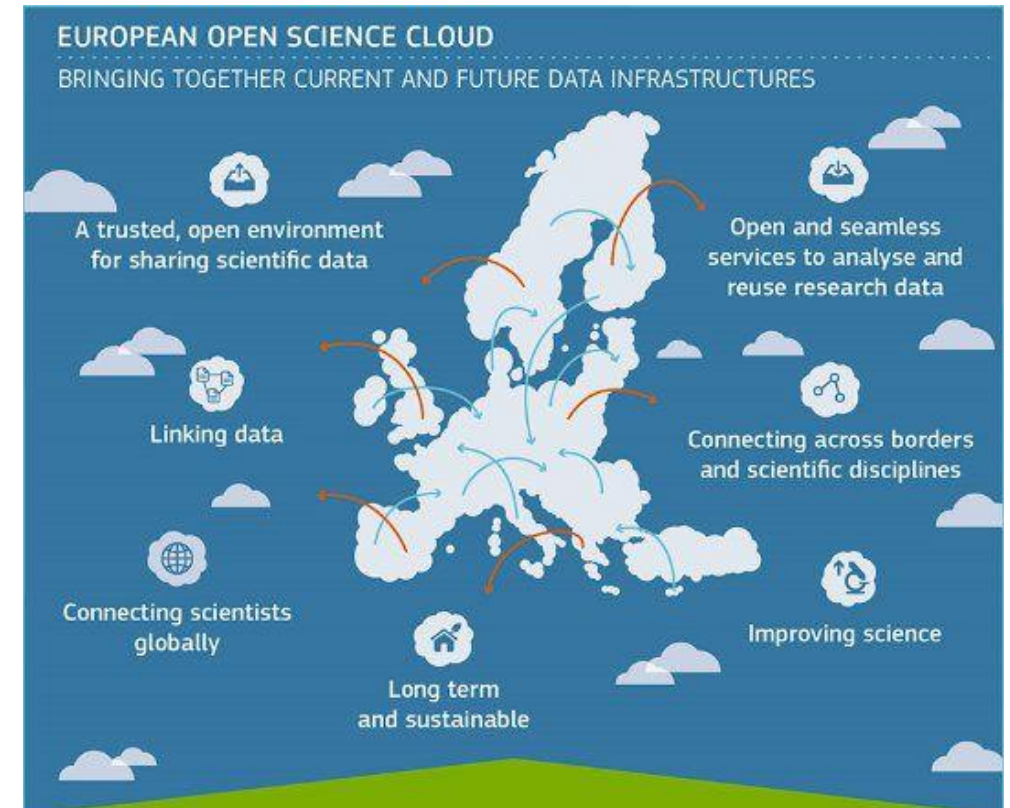Director of European Infrastructures and Projects, GRNET
NI4OS-Europe coordinator

European Open Science Cloud

Vision

- Virtual environment for Europe's 2 million researchers and 70 million science and technology professionals from every research, innovation and educational area.

- Provide researchers an environment with open services for data storage, management, analysis and re-use across disciplines.

- Join existing thematic data Infrastructures.

- Add value and leverage past infrastructure investment.

NI4OS-Europe

- One of 4 regional/geographical projects

- Call INFRAEOSC-05 "Supporting EOSC Governance"
    - Coordination of EOSC-relevant national initiatives
    - Support to prospective EOSC service providers

EUROPEAN OPEN SCIENCE CLOUD
BRINGING TOGETHER CURRENT AND FUTURE DATA INFRASTRUCTURES

A trusted, open environment for sharing scientific data

Open and seamless services to analyse and reuse research data

Linking data

Connecting across borders and scientific disciplines

Connecting scientists globally

Long term and sustainable

Improving science

NI4OS-Europe

15 Member States and Associated Countries | 22 Partners

Participating countries

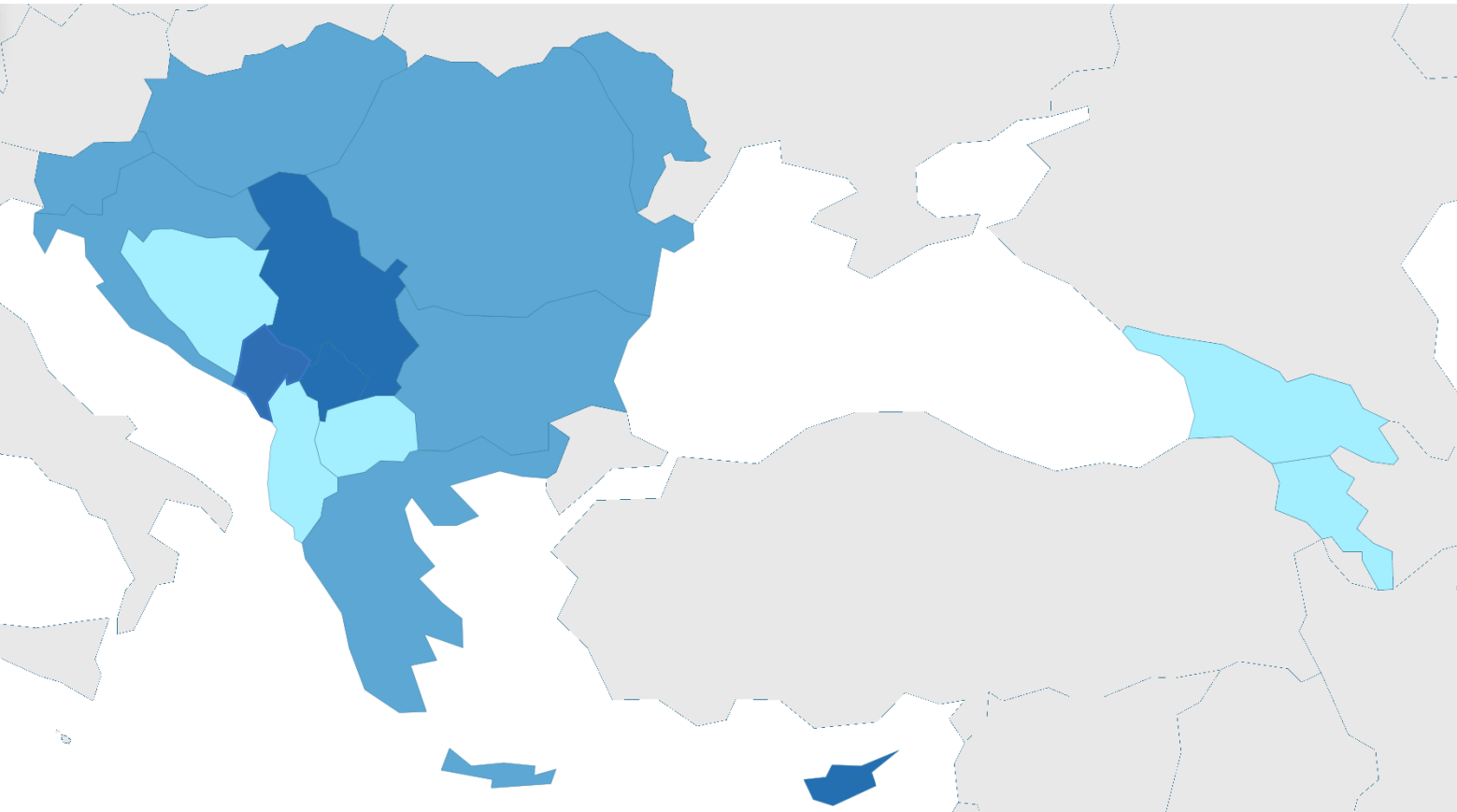|			
Greece	Hungary	Albania	Republic of Moldova
Cyprus	Romania	Bosnia-Herzegovina	Armenia
Bulgaria	Slovenia	North Macedonia	Georgia
Croatia	Serbia	Montenegro	

Lines of action (1)

Support the development and inclusion of the National Open Science Cloud Initiatives in 15 Member States and Associated Countries in the overall scheme of EOSC governance

Landscaping: National Open Science policies

3 different levels in the region:

- Initial actions within the country

- OS policy documents exist

- National OS strategy/plan or officially established initiative exists
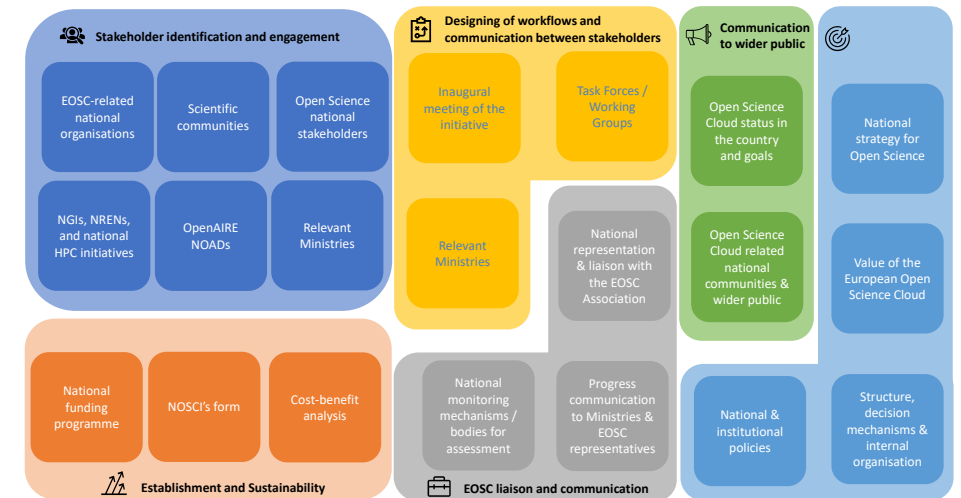
■ No national OS policy   ■ National OS strategy/plan   ■ National OS policy

National structures supporting EOSC

National Open Science Cloud Initiatives – NOSCIs: living national OS ecosystems that support EOSC Governance and embrace diversity and OS maturity of countries
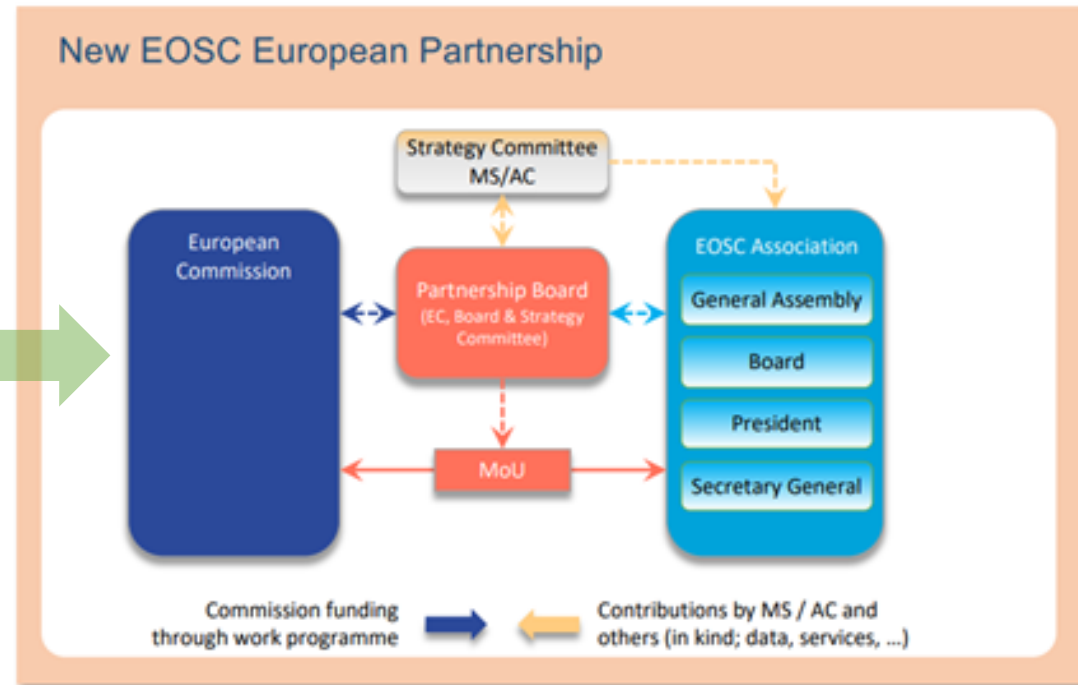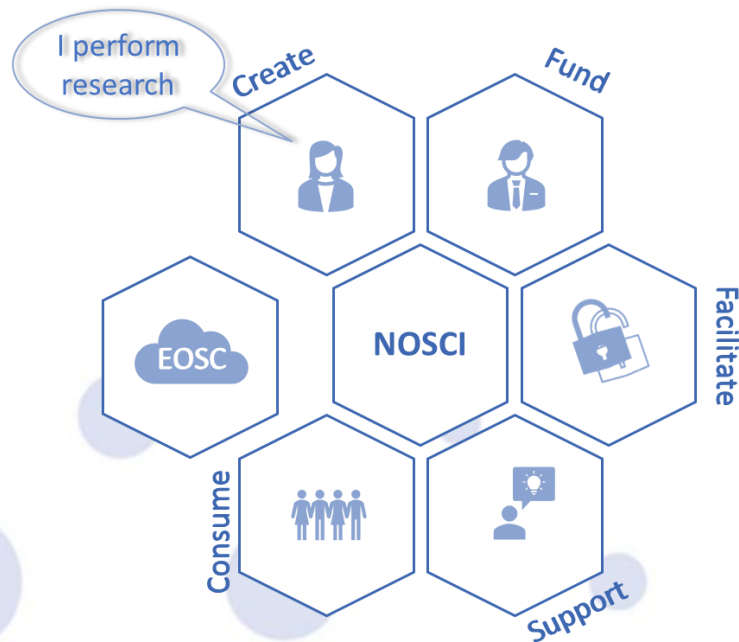
NI4OS-Europe Toolbox for supporting NOSCIs

Setting up options

Top down — Central decision of the related ministry or national research funding organisation

Bottom up — Initiative by researchers, OS stakeholders and actors in the country

Hybrid — Combination of previous two, independently of who initiated it

- Modular methodologies & workflows
- Assessment & monitoring
- Operational aspects & sustainability
- Explanatory video
- Workshops, trainings, checklists
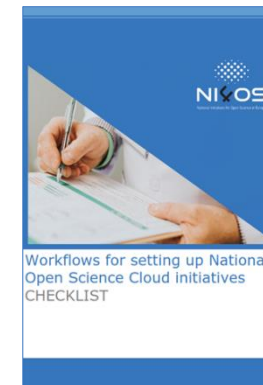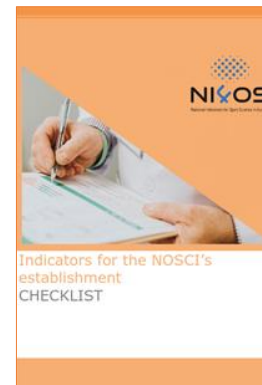
Supporting the NOSCIs' setup: the five-steps methodology

NIXOS Europe

Communicate/engage with relevant government officials

Put effort that NOSCI becomes the mandated organisation

1 2 3 4 5

Invite Stakeholders or restart stale groups or discussions

Discuss how the NOSCI will operate and draft the MoU

Spread the know-how. Share knowledge within and outside the consortium

NOSCIs: tangible outcomes & EOSC-A representation

NI4OS Europe

Set-up approach

Top-down
Cyprus
Slovenia

Bottom-up
Armenia, Georgia
Greece, Montenegro

Hybrid
Albania, Bosnia-Herzegovina,
Bulgaria, Croatia, Hungary, Moldova,
North Macedonia, Romania, Serbia

Governance model

1 1 1

12
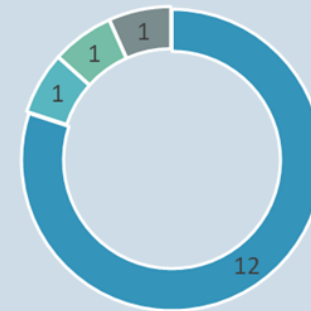
■ Consortium ■ Single organisation ■ Other ■ N/A

> 150 official members (organisations)

> 300 attendees in national events

MoU status

9 4 2

MoU in place   Later in '22   Spring '22
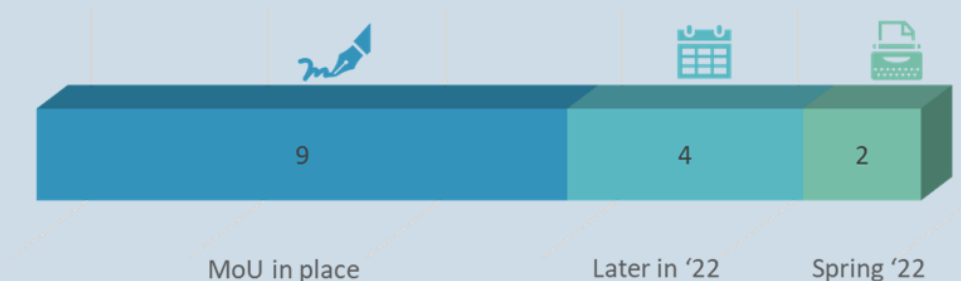
NI4OS-Europe region in EOSC-A

6 Mandated organisations

12 Members

6 Observers

Lines of action (2)

Provide **technical and policy support** in **on-boarding** of the existing and future service providers **into EOSC**

Service integration and onboarding
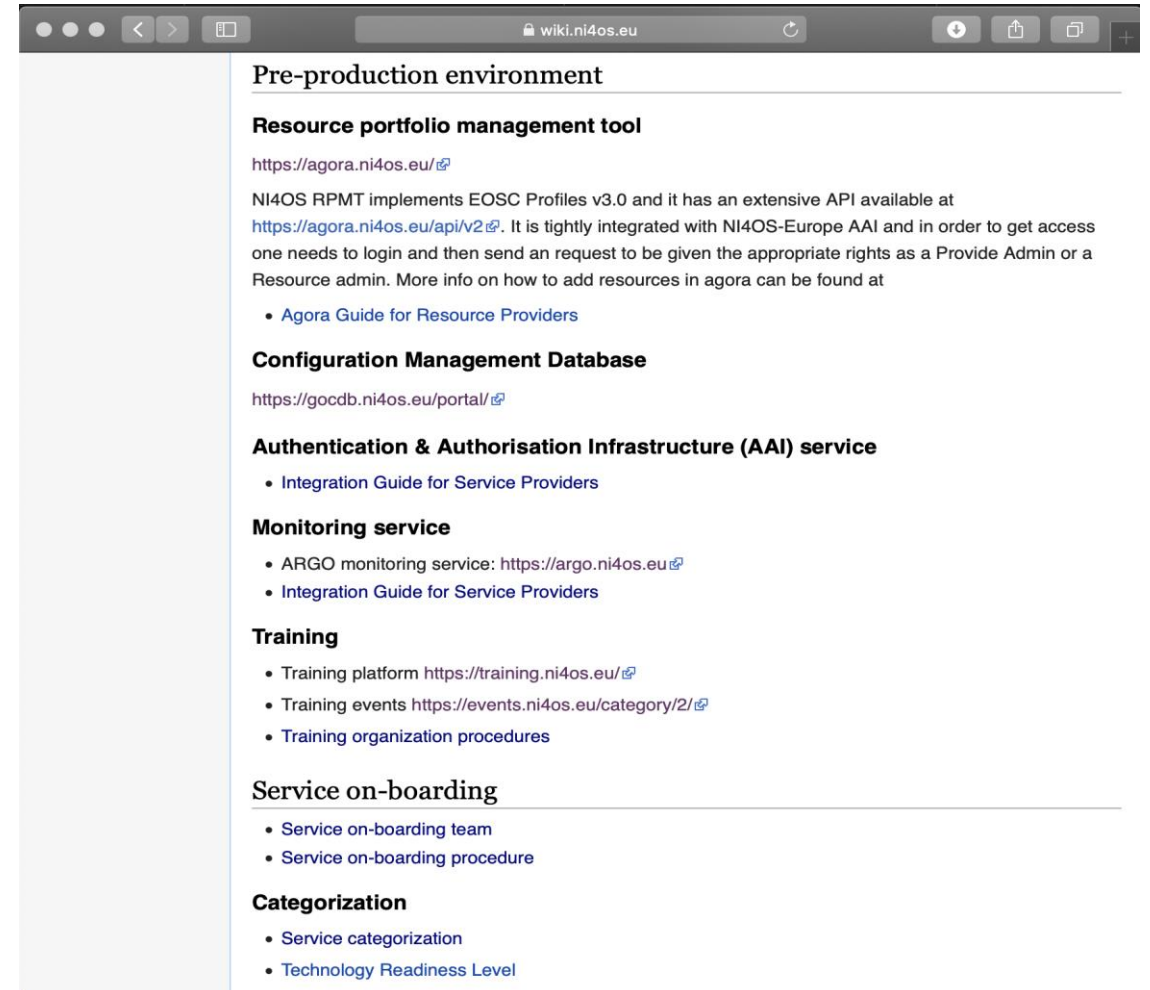
- Pre-production environment – validate readiness and maturity level for EOSC onboarding
- Service portfolio management system based on the EOSC provider and service profile
- Integration with federation core services
- Service categorization
- Onboarding of
  - generic services
  - thematic services
  - repositories

Repositories

Thematic services

Generic services

Federation core

Portfolio management

EUROPEAN OPEN SCIENCE CLOUD

Request for onboarding → Information gathering → Integration → Validation → Publication
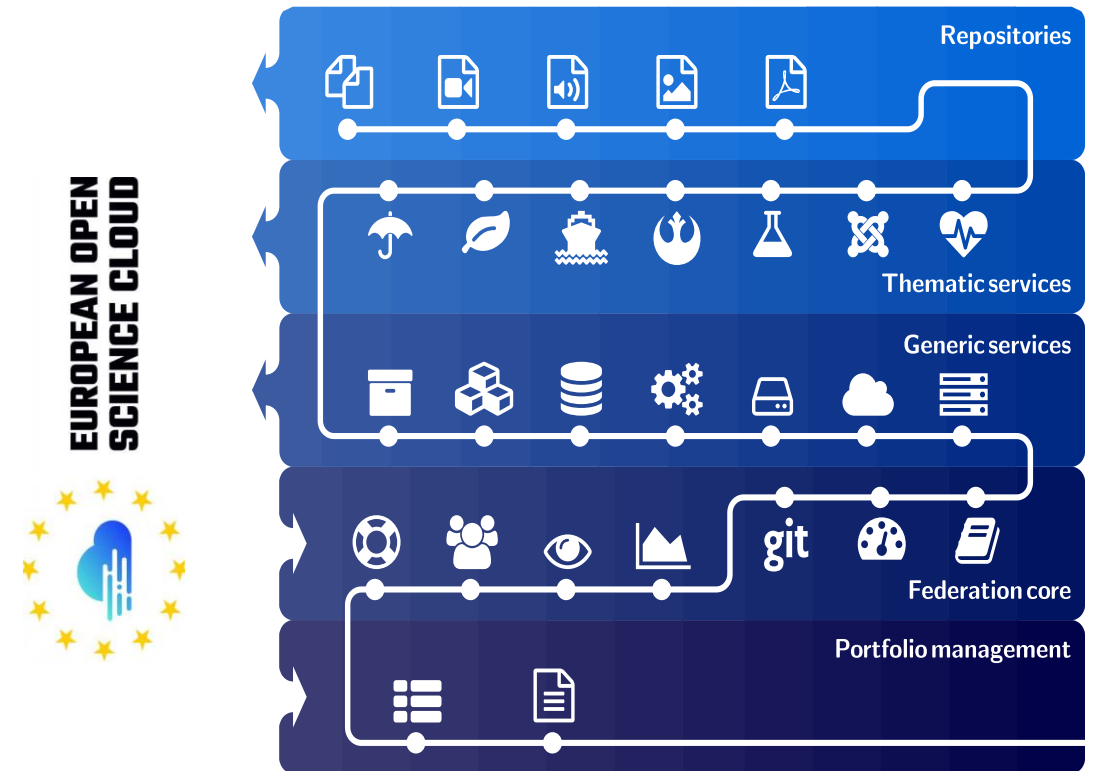
Procedures and policies

- NI4OS-Europe wiki page
  - Policies
  - Policy templates
  - Procedures for service integration with the pre-production environment

Role: to guide service providers toward seamless EOSC integration

Pre-production environment

Resource portfolio management tool

https://agora.ni4os.eu/

NI4OS RPMT implements EOSC Profiles v3.0 and it has an extensive API available at https://agora.ni4os.eu/api/v2. It is tightly integrated with NI4OS-Europe AAI and in order to get access one needs to login and then send a request to be given the appropriate rights as a Provide Admin or a Resource admin. More info on how to add resources in agora can be found at

- Agora Guide for Resource Providers

Configuration Management Database

https://gocdb.ni4os.eu/portal/

Authentication & Authorisation Infrastructure (AAI) service

- Integration Guide for Service Providers

Monitoring service

- ARGO monitoring service: https://argo.ni4os.eu
- Integration Guide for Service Providers

Training

- Training platform https://training.ni4os.eu/
- Training events https://events.ni4os.eu/category/2/
- Training organization procedures

Service on-boarding

- Service on-boarding team
- Service on-boarding procedure

Categorization

- Service categorization
- Technology Readiness Level

On-boarded resources/providers

16

36 repositories

15

31 thematic

16
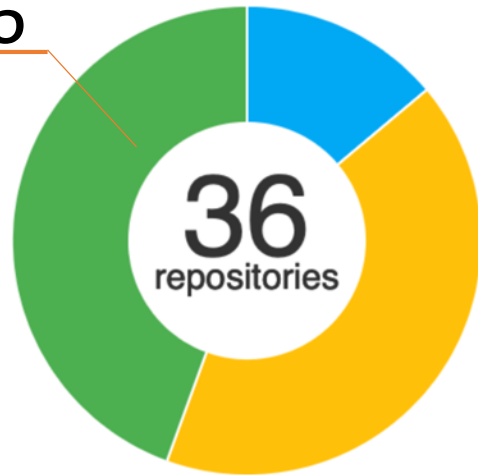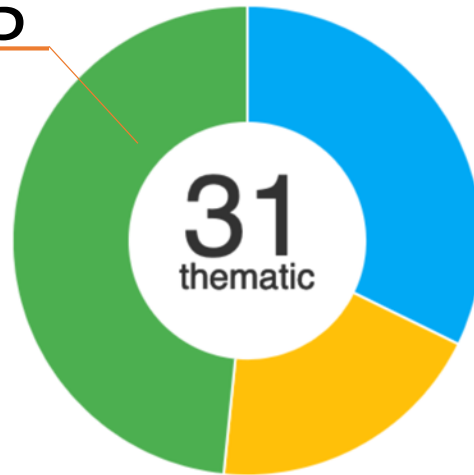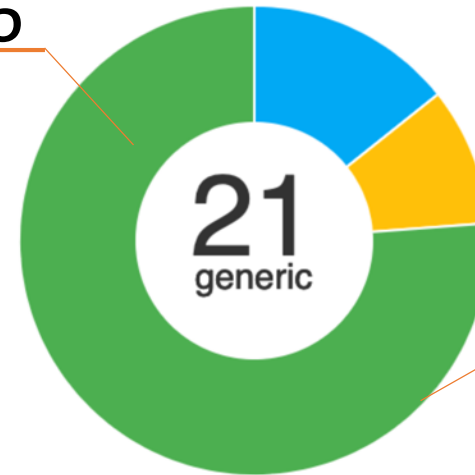
21 generic

- HPC resources: CPU, GPU, Xeon Phi
- Cloud Virtual Machines
- Generic Storage
- Data management services

6

8 core

53

58 providers
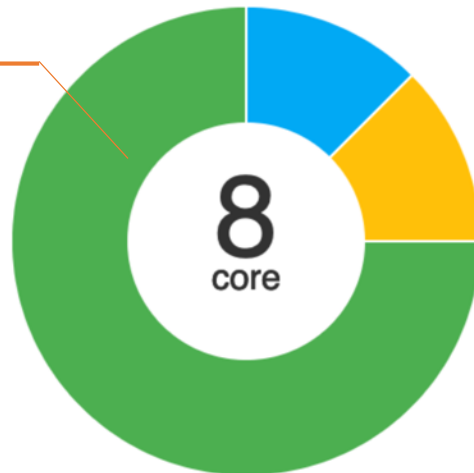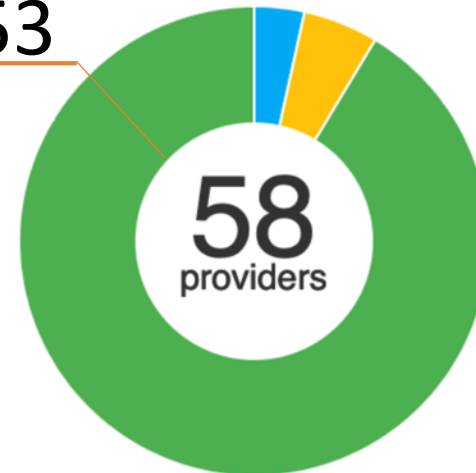
ORDM / FAIR tools and certification schemes

- Implementation and adoption of tools, standards and guidelines
- Analysis of guidelines for OS and fostering of ORDM and FAIR
- Analysis and categorization of existing tools supporting FAIR and ORDM
- Selection and delivery of new tools
- Harmonization and interoperability across communities and with core initiatives
- Development and application of certification schemes
- Analysis of the incentives and rewards that can be employed to improve the uptake of ORDM and FAIR (also summarized in a brochure)
- Examining the relationship and synergy between open science and open source

NI4OS-Europe tools for addressing legal concerns in ORDM and FAIR

- LCT - License Clearance Tool: An intuitive tool for content license clearance

  ↗ **https://lct.ni4os.eu/**

- RoLECT - EOSC RoP Legal & Ethics Compliance: Guided compliance check for legal and ethics EOSC RoP

  ↗ **https://rolect.ni4os.eu**

- RePol - Repository Policy Generator: Greatly simplifies creation of repository and privacy policies

  ↗ https://repol.ni4os.eu
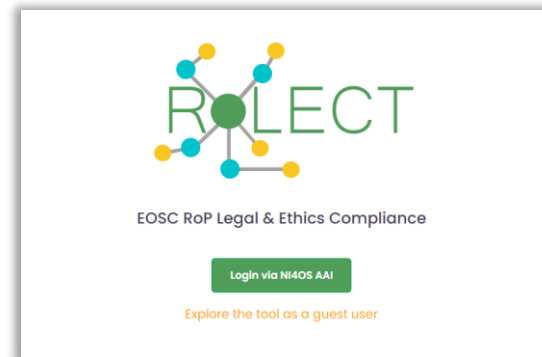
Lines of action (3)

Spread the EOSC and FAIR principles in the community and train it

User engagement, training and demonstrators

Involving and supporting scientific communities

Promoting uptake of FAIR among research communities

Ensuring take-up of core EOSC services in the community

Promoting and ensuring EOSC research outcomes through concrete support to users

Training for federated services, interoperability, ORDM principles, repository certification, FAIR
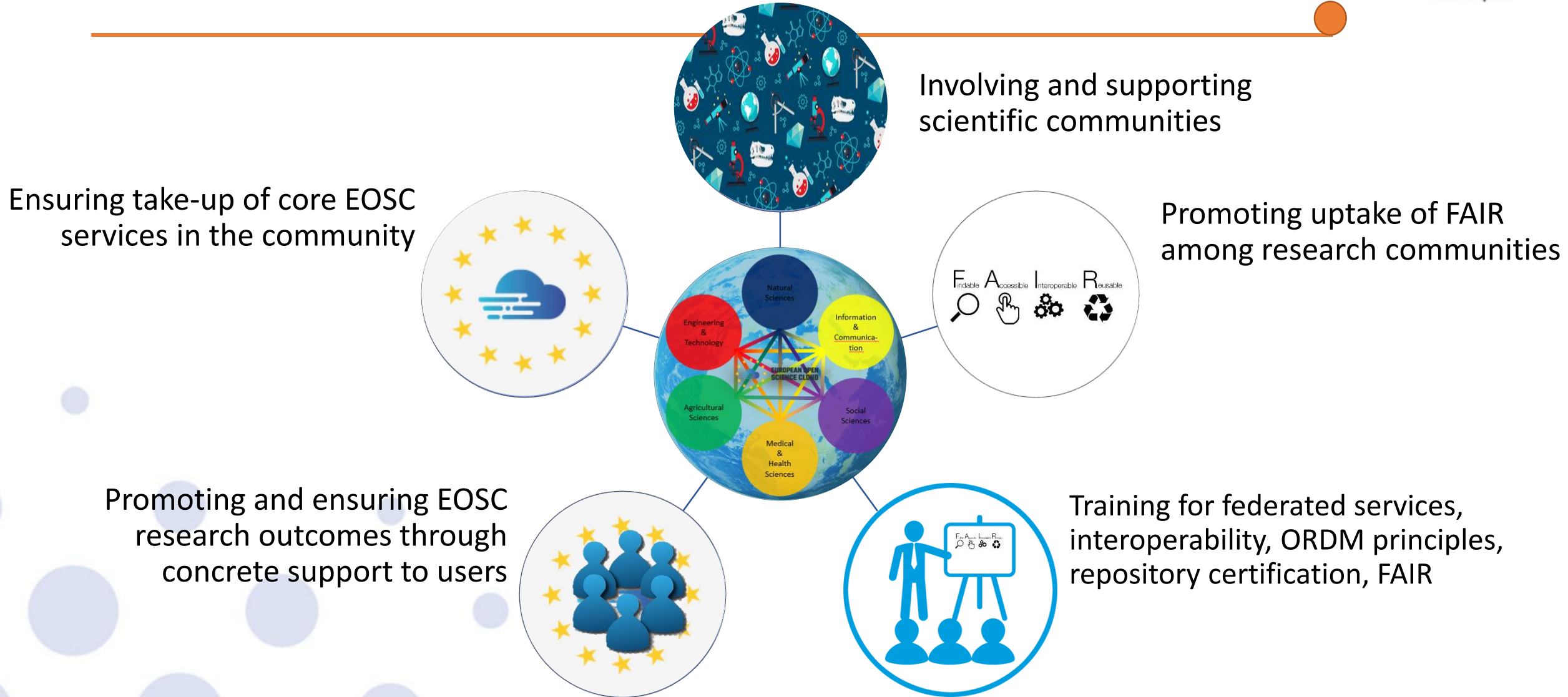
User engagement, training and demonstrators

- Training and dissemination material on FAIR and EOSC is translated in all different languages of the NI4OS-Europe area

- Definition of use cases in various scientific fields:
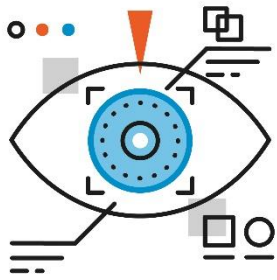
Digital
Cultural Heritage
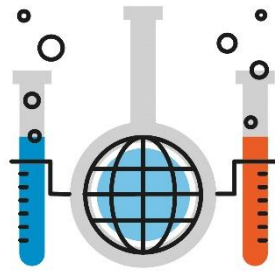
Life Sciences
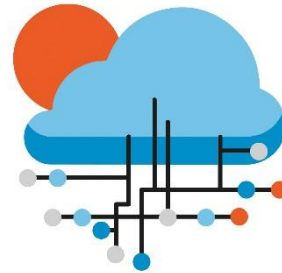
Climate Science
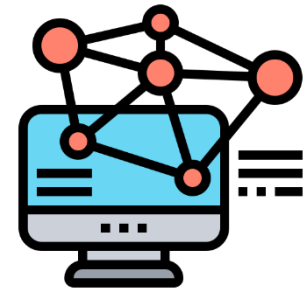
Computational Physics

Open call for applications

- 21 applications received / 20 applications accepted (after technical and scientific review)

- Disciplines: Climate (2), Cultural Heritage (4), Computational Physics (8), Life Sciences (5), Other (2)

- 14 countries including non-SEE Spain, Switzerland, Germany

- Resource allocation: 3,2m CPU-hours, 115k GPU-hours, 50TB storage, 120 VM cores

NI4OS-Europe EOSC promoters

Ambassadors from each country assigned as

EOSC promoters
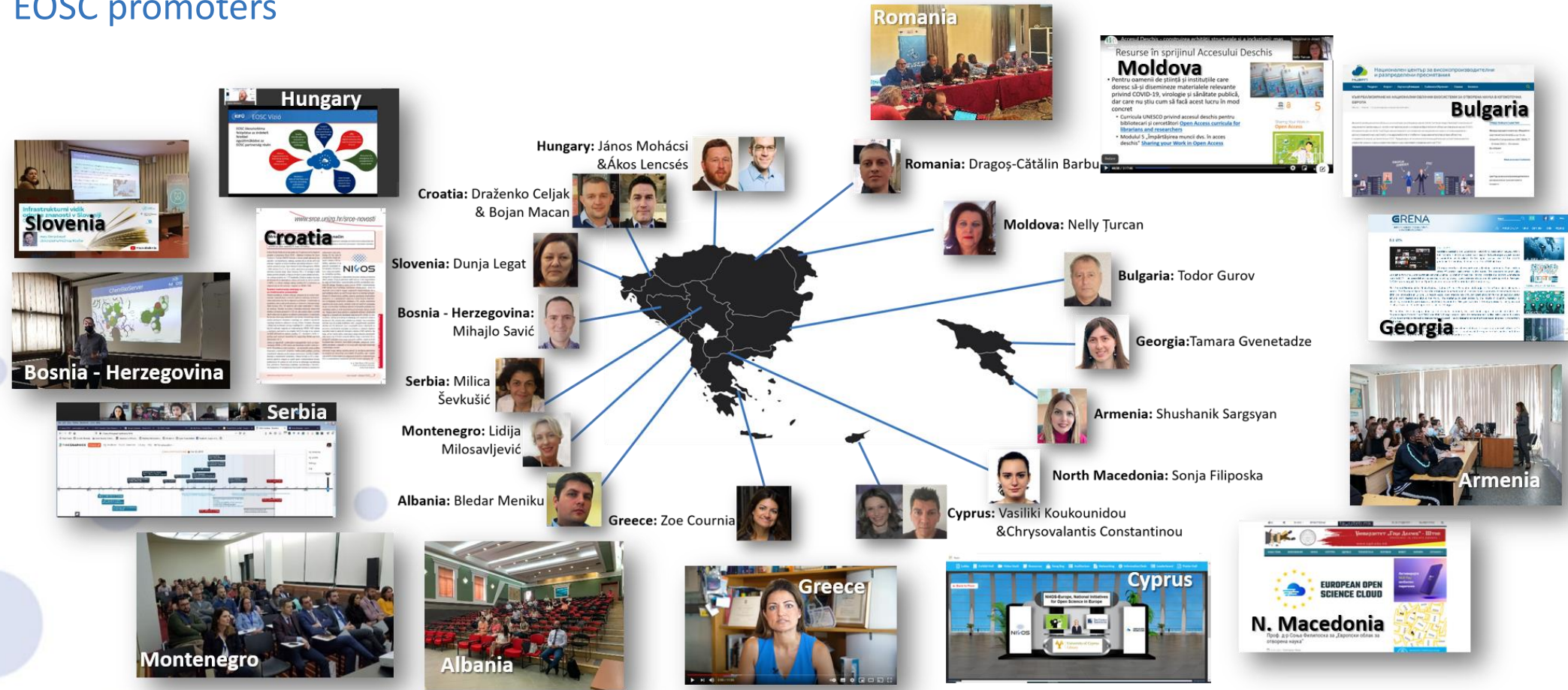
NI4OS-Europe training

- Training events
  - 10 train-the-trainers
    - > 500 participants
  - 30 national capacity building and end-users training events
    - > 1500 participants
- Training topics
  - FAIR data principles
  - EOSC promotion
  - ORDM
  - On-boarding
  - IT Service Management

NI4OS-Europe training platform

Training material on various FAIR & ORDM topics available on the training platform for self-paced learning

Over 800 users

Over 100 courses

5 Learning Paths

Communication, marketing, sustainability, innovation

- Strong digital presence
  - Website
  - Calendar
  - Agenda tool
- Events and networking
  - Webinars
  - Workshops
  - Dissemination events
- Collaboration with the EOSC-5b projects
- Support the global efforts on COVID-19

- Sustainability and innovation
  - Find solutions for sustainable and long-term impact of project results
  - Manage knowledge and results so as to create added value for different stakeholders

Dissemination events
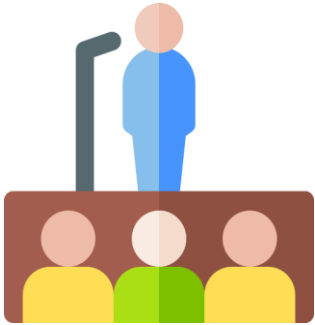
23 national events in native language

more than 1300 participants

Multiple other events held and planned

NOSCI events

EOSC Governance Workshop, Landscaping

More than 70 presentations at national and international conferences on ORDM, FAIR, EOSC, OS

Reached ~7000 people

Support the global efforts on COVID-19

- COVID-19 social media campaign
- NI4OS-Europe vs COVID-19: providing fast track access to services, tools and software for the Scientific communities that perform extensive research to tackle COVID-19
- NI4OS-Europe Covid19 Wiki : Collection of joint resources in open science related to COVID-19 in SEE

Scientific results:

"Multi-omics data integration and network-based analysis drives a multiplex drug repurposing approach to a shortlist of candidate drugs against COVID-19"
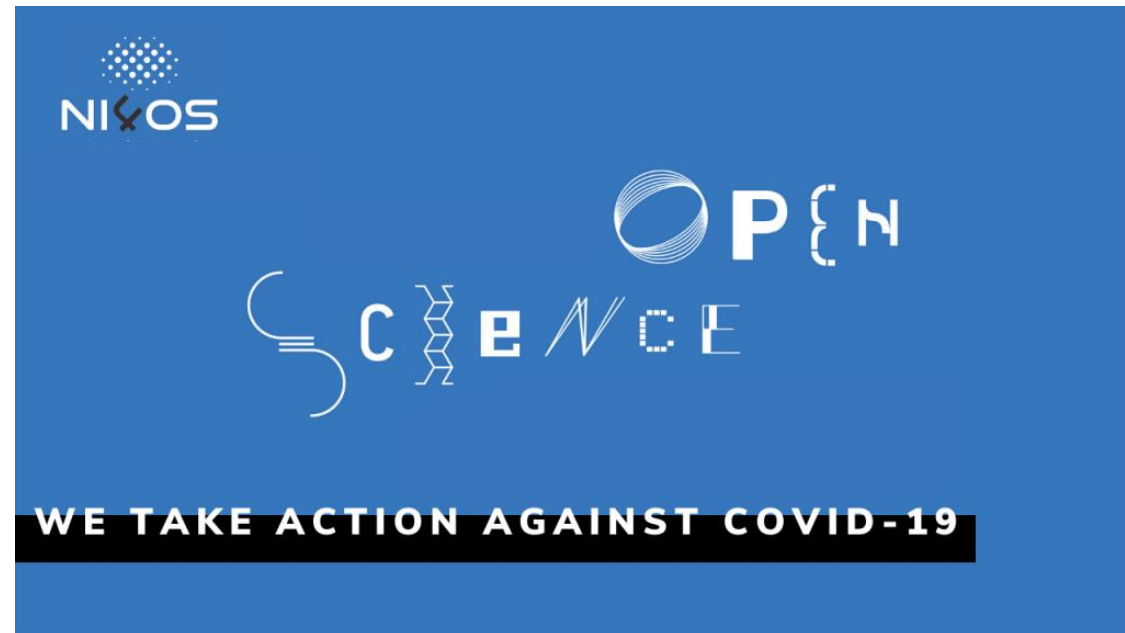
NI4OS-Europe brand identity and material

- Logo
- Video
- Brochures
- Presentations
- Newsletters
- Posters and Infographics
- Roll-up banners

NI4OS-Europe social media campaigns

A continuing effort of regional development

- Regional service platform of different technologies built over the last 20 years with a number of projects, used by cross-border communities

- Springboard for joining wider EC initiatives + being more inclusive

- More focused and efficient for the region than large pan-EU initiatives where smaller countries lose their voice

Timeline: 2 decades!

Conclusion

- These initiatives are pieces of the puzzle to sustain regional R&D, R&E, ICT development
  - o Increasing the retention of talented scientists and engineers in the region
  - o Easing the digital divide between the region and rest of EC
  - o Making available the benefits of Information Society and Open Science for all citizens
  - o Pursuing joint R&D efforts among countries in the region
  - o Regional political stability and cohesiveness

Thanks!

NI4OS

NI4OS_eu

NI4OS.eu

Join NI4OS-Europe Community:
https://ni4os.eu/contact-us