From vision to action

European Open Science Cloud (EOSC)

Wainer Lusoli – European Commission

CONFERENCE Open Science in the European Research Area

Ljubljana, 17 November 2016

The Commissioner's vision

"Europe's final transition must be one from fragmented data sets to an integrated European Open Science Cloud. **By 2020, we want all European researchers to be able to deposit, access and analyse European scientific data through a European Open Science Cloud**.."

Speech by Commissioner Carlos Moedas in Amsterdam, NL:
"Open science: share and succeed", 4 April 2016

Strong stakeholder support

- Public consultation and validation workshops on Open Science (July-December 2014);

- Final report on Open Science (February 2015);

- HLEG EOSC stakeholder workshop and funders' workshop (November 2015, March 2016);

- DSM Consultation on platforms, data and cloud (closed January 2016).

+ PC meetings, EAG meetings, e-IRG meetings, concertation meetings, info days, conferences, events, ...

Communication 2016/178 : European Cloud Initiative

Part of DSM strategy (19 April 2016) with strong political support.

- o 'Game-changing policy', a 'vision'.

- o Commissioners Moedas and Oettinger <u>worked jointly</u>.

- o Supported by Pres. Juncker, VP Ansip, Ch. Merkel, LUX Presidency, NL Presidency, 2 sets of COMPET Council Conclusions, EP ITRE/IMCO Joint Report on DSM Act, EESC, ...

Key challenges

- o Still a lack of widespread **awareness** of the value of data and of **incentives** for data sharing.

- o Lack of common standards to ensure **inter-operability** of data.

- o **Not enough hardware capacity** for scientific computing, storage, connectivity.

- o **Fragmentation and lack of coordination** over different scientific communities and countries.

- o Need to translate recent **changes in privacy, data protection and copyright rules** to the research data domain.

European Cloud Initiative: pillars

1. European Open Science Cloud.

2. European Data Infrastructure.

3. Widening the user base (e-gov & industry) and building trust (certification and standards).
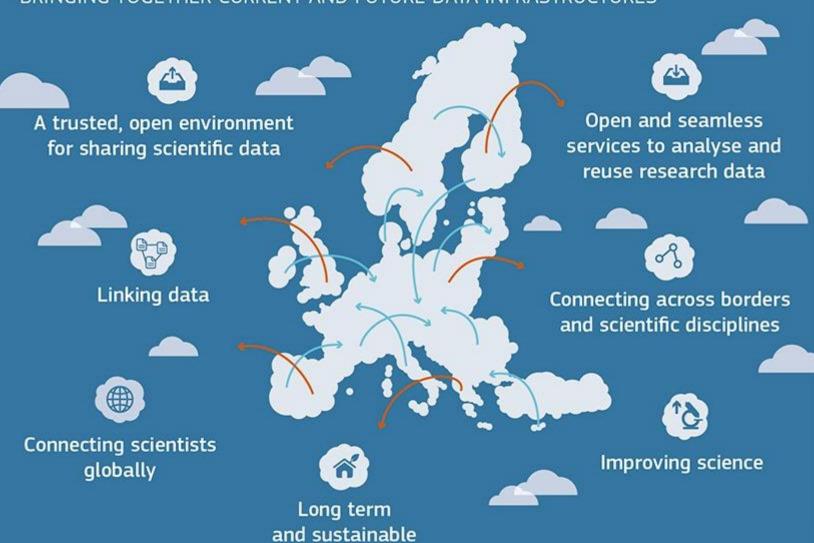
European Open Science Cloud

o The cloud will **federate** existing and emerging horizontal and thematic data infrastructures, effectively **bridging todays fragmentation and ad-hoc solutions.**

o It will provide 1.7m EU researchers an environment with **free, open services for data storage, management, analysis and re-use** across disciplines.

o It will **add value** (scale, data-driven science, inter-disciplinarity, data to knowledge to innovation) and leverage current and past infrastructure investment (10b per year by MS, two decades EU investment)..

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

Policy actions directly foreseen in the Communication

- **Open research data** the default option in H2020, preserving opt-outs.

- **Action Plan for scientific data interoperability**, including 'meta-data', specifications and certification.

- **Encourage scientific data sharing** by creation of incentive schemes, rewards systems and education and training programmes for researchers and businesses to share data.

- Foster **global cooperation** and to create a level playing field in scientific data sharing and data-driven science.

- **Roadmap for governance and financing mechanisms** for the EOSC.

- Horizon 2020 to **consolidate and federate** e-infrastructures, research infrastructures and scientific clouds, support development of cloud-based services for Open Science.

- **Connect** priority European and national research infrastructures to the EOSC.

- **Widening** the European Open Science Cloud to all EU-28 Member States (e.g. ESIF)

Policy actions foreseen in the COM

Content (open data)
Make Open research data default in H2020
Foster scientific data sharing in MS

(Open data) Infrastructure
Action Plan for scientific data Interoperability (e.g. FAIR)
Connect key EU RI (e.g. ESFRIs)
Consolidate / federate data-infrastructures
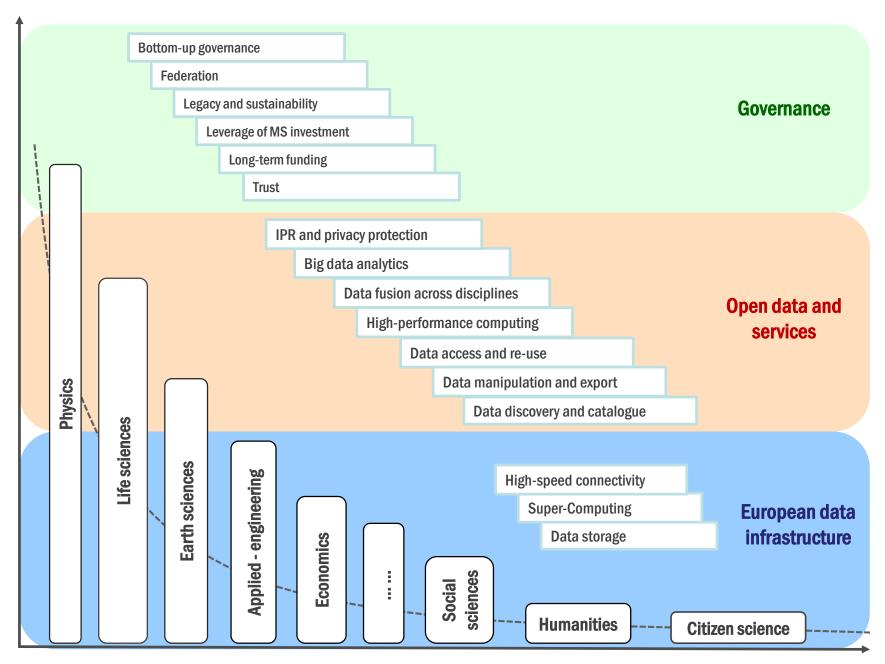
Governance
Develop roadmap for governance and financing
Create a global level playing field for research data sharing
Widen user-base to public services, Industry and EU-13

Hardware
Infrastructure (CNECT)

High-Performance Computing

Big-data storage

High-speed connectivity

A truly European project

o **The European Commission** (e.g. DG RTD, DG CNECT)

o **OSPP** - representing all sectors, **including business** *(19 Sept 2016)*

o 8 (technical) Expert Groups – notably **HLEG - EOSC**

o **Member States** (ministries & national funding agencies) *– workshop on 29 June 2016*

o **Council** - *29 November 2016 COMPET Council: first state of play on the EOSC*

o **EP (ITRE, IMCO)** *– INI Report expected in Jan 2017*

o **EESC, CoR** and other stakeholders with advisory roles

o Discipline specific scientific communities & participants in H2020 execution (e.g. Dec 2016 – start of INFRADEV-4 project)

o **Global partners**(e.g. OECD, G7) - *March 2017 joint workshop*

12

Commission High Level Expert Group European Open Science Cloud (HLEG EOSC)

o Set up on 16 September 2015, until December 2016.

o 10 members – 8 EU and 2 non-EU observers.

o Chaired by Professor Barend Mons.

o Listed in the Commission transparency register.

o 3 meetings, 2 stakeholder workshops, several external presentations, extensive community engagement.

Publication of the HLEG EOSC report (11 October 2016)

Publication of First report by the Commission High Level Expert Group on the European Open Science Cloud
Including recommendations on Policy, Governance and Implementation

http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud

EOSC Expert Group being reshaped in early 2017 to support work of EOSC team – mainly on implementation of the roadmap.

Recommended Action in the HLEG Report

o Innovative (new) **funding schemes**.

o **Connect** key national scientific data infrastructure / ESFRIs ("the gems" of Europe).

o Modern **reward and recognition** practices to support data sharing and re-use.

o Training and career perspective for **core data experts** (fund a concerted effort to locate and develop Data Expertise in Europe).

o Cross-disciplinary **collaboration**: review, funding and infrastructure.

o Data formatting, terminology/identifier mappings and provenance to be organised –**interoperability plans** (DMPs).

o **One governance** (light, international).

o **Rules of Engagement** for both use and service provision in the EOSC.

o Appropriate **data management and stewardship** of research proposals and funding.
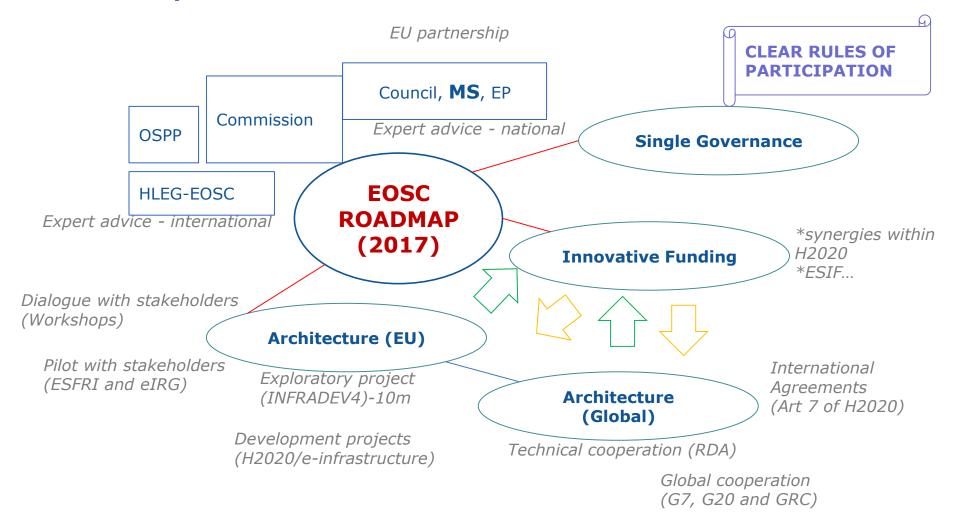
The way ahead for the Commission

o **Roadmap** with clear rules of participation in the EOSC (2016-2017);

o Action Plan for **Interoperability** (2017);

o H2020 **Open Data= default option** from 2017;

o Build on **synergies** (FP actions, regional smart specialisations strategies, ESIF...) and **federate;**

o **Widen** participation to all scientific communities and sectors

o Strengthen the **Global** level playing field (OECD, G7);

EOSC Roadmap

EU partnership

CLEAR RULES OF PARTICIPATION

OSPP

Commission

Council, **MS**, EP

Expert advice - national

Single Governance

HLEG-EOSC

Expert advice - international

EOSC ROADMAP (2017)

Innovative Funding

*synergies within H2020
*ESIF...

Dialogue with stakeholders (Workshops)

Architecture (EU)

Pilot with stakeholders (ESFRI and eIRG)

Exploratory project (INFRADEV4)-10m

Architecture (Global)

International Agreements (Art 7 of H2020)

Development projects (H2020/e-infrastructure)

Technical cooperation (RDA)

Global cooperation (G7, G20 and GRC)

Programming in support of the EOSC

Research infrastructures

o   integration at EU level of national scientific data infrastructures through the Integrating Activity grant;

o   development and interoperability (even at global level) of pan-European Thematic Data infrastructures through the individual and cluster Implementation phase grants:

170 M€ in FP7 and so far more than 146 M€ in H2020

E-infrastructures

o   development of data and distributed computing e-infrastructures;

o   management and preservation of big research data;

o   fostering global interoperability through the Research Data Alliance;

o   development of e-Infrastructure for open access;

o   virtual research environments.

~98 M€ in FP7 and, so far, more than 110 M€ in H2020 plus HPC & Geant support

Call INFRADEV-04-2016
European Open Science Cloud for Research

o   Pilot action to demonstrate how a cloud infrastructure can ensure wide availability of

   scientific data and data-analysis services for European researchers.

o   Total budget 10 M€ -- EU contrib. per proposal (RIA) between 5 and 10 M€

o   Interrelated to EINFRA-12-2017

Proposals will:

- Address the federation, networking and coordination of existing research infrastructures and scientific clouds to increase findability, accessibility and interoperability of data, and facilitate re-use of data.

- Design a stakeholder driven governance framework.

Some more support in WP 2017

○ EINFRA-12-2017 – Data and distributed computing e-infrastructures for Open Science (€40 M€)

  ▪ **Integration and consolidation of e-infrastructure services**

○ EINFRA-21-2017 – Platform-driven e-infrastruct. innovation (€20 M€)

  ▪ **Service development**

○ INFRASUPP-02-2017(3) – Support to the **Research Data Alliance (RDA)** (€3.5M€)

Thank you!

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Not a cloud 'made in Brussels'

European Commission

Discuss/explore/converge on way forward

- collect HLG expert advice (sustainable funding, novel implementation instrument, data skills)

- discuss with stakeholder WS (RI, funders, MS, data infrastructures)

- launch pilot INFRADEV grant

- prepare a roadmap

Foster a European open research data culture

- clear rules & tangible incentives at EU and MS level, eg H2020

- wide adoption of DMPs

- NPR reporting and review of 2012 REC

- dedicated actions in H2020 WP 2018-20

- embed open science in EU Skills agenda

Ensure data interoperability

- co-design and implement with stakeholders (eg RDA, CODATA) FAIR data specifications, incl. catalogue of formats, common meta-data and unique identifiers

- support 'thematic' clouds, eg marine, food, health and earth sciences

- liaise with G7/G20 and bilaterally (eg US, AUS, JPN, S-A)

Create an open research data infrastructure

- define functional specifications for a new <u>service layer</u> (user needs, data services, rules of engagement, architecture & governance)

- ensure transition from current fragmented support to e-infrastructures & data infrastructures situation…

- … to integrated data services (2016-2018)

- … governed & financed through a novel impl. entity (2018+)

    - *building on/ federating all major existing scientific data infrastructures (national & disciplinary based)*

    - *moving away from grants*

    - *allowing joint programming & co-funding by MS*

Competitiveness Council Conclusions, 29 May 2015

Strong support for the development of a European Open Science Cloud.

- CALLS for action to **remove obstacles** to wide access to publicly funded research publications and underlying data.

- WELCOMES the further **development of a European Open Science Cloud** that will enable sharing and re-use of research data across disciplines and borders, taking into account relevant legal, security and privacy aspects.

Competitiveness Council Conclusions, 27 May 2016

TAKES NOTE OF the Commission Communication of 19 April 2016 on a "European Cloud Initiative - Building a competitive data and knowledge economy in Europe"

ACKNOWLEDGES that Europe may benefit from a **European Open Science Cloud** that enables, amongst others, safe and long-term storage, efficient analysis, and user-friendly (re)use of research data across borders and disciplines;

CALLS on the Commission, in cooperation with Member States and stakeholders, to **explore appropriate governance and funding frameworks**, taking sufficient consideration of existing initiatives and their sustainability and of a European-wide level playing field.

Report of the European Parliament 'Towards a Digital Single Market Act' (19 January 2016)

124. Is concerned that cloud infrastructures for researchers and universities are fragmented; **calls on the Commission, in cooperation with all relevant stakeholders, to set up an action plan to lead to the establishment of the European Open Science Cloud by the end of 2016**, which should seamlessly integrate existing networks, data and high-performance computing systems and e-infrastructure services across scientific fields, within a framework of shared policies, standards and investments;

Opinion of the European Economic and Social Committee (21 September 2016)

4.3   The EESC is also concerned about the resources, professional as well as financial, required to implement and develop the cloud. .... We also urge the Commission to **carefully take into account cross-border cloud systems in specific science communities**, which already exist and work well, as well as national activities aiming to achieve the same objective.

4.7   **The EESC calls for better cloud governance**: according to the Commission, it will be defined following the conclusion of a thorough process of preparation which is already under way. The scientific community, businesses and the general public are entitled to take part in this governance and the Commission has a duty to indicate how and to what extent ....

Opinion of the CoR (11 October 2016)

3.   **judges the Commission's phased approach to rolling out European cloud services to be sensible** and is pleased to note that the framework will enable first the scientific community, and then both businesses and local and regional authorities, to use shared knowledge as well as producing it;

10. urges the Commission to ensure that relevant national players in all the Member States embark on **adequate measures to promote open science cloud** services as well as knowledge-sharing more generally[...];

26. underlines [...] the need for a clear **political commitment to fund cloud research infrastructure** in order to harness the huge potential of cloud computing;

29. draws attention to the **role of public-private partnerships** in developing open science cloud services [...] .