The European Open Science Initiative (including data): from vision to action

Jean-Claude Burgelman

S. Luber, R. Von Schomberg, W. Lusoli, D. Spichtinger, J-F Dechamp
European Commission
DG Research & Innovation

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Digital Agenda

Commissioner view

Open Science, of which Open Access is an important part, will be vital to ensuring European progress and prosperity in the future

Speech at NETHER, January 26, 2015

I am convinced that excellent science is the foundation of future prosperity, and that openness is the key to excellence"

A new start for Europe: Opening up to an ERA of Innovation, Brussels, 22 June 2015

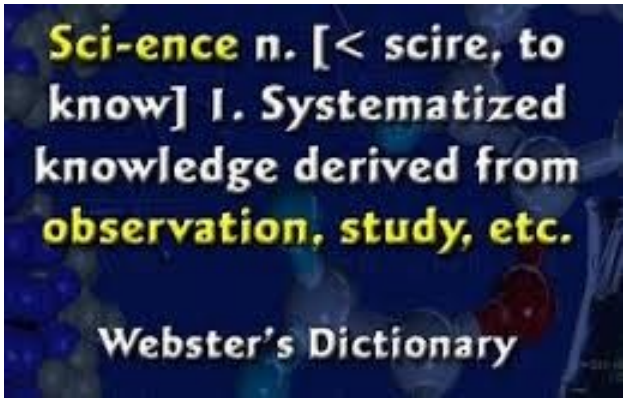
Priorities of Commissioner Moedas:

Open Science as part of an Open Approach

- Open Innovation
- Open Science
- Open to the world

Open Science / Science 2.0

- A systemic change in the modus operandi of science and research
- Affecting the whole research cycle and its stakeholders



It's real!

An emerging ecosystem of services and standards

Sci-starter.com

figshare

Figshare.com

Data-intensive

Citizens science

Open code

Runmycode.org

my experiment

Myexperiment.org

Open workflows

Pre-print

arXiv.org

ArXiv

Analysis

Data gathering

Publication

Open data

DRYAD

Datadryad.org

Roar.eprints.org

Open access

Conceptualisation

Review

Open annotation

Openannotation.org

Impact Story

Alternative Reputation systems

Altmetric.com

Altmetric

Scientific blogs

Researchgate.com

ResearchGate

Academia.edu

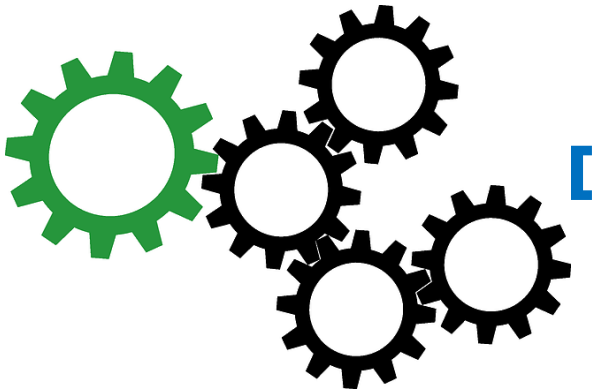
Collaborative bibliograph

Mendeley.com

MENDELEY

It's irreversible

- Digital technologies
- Exponential growth of data
- Globalisation
- Grand Challenges
- Expectations of citizens for science
- Accountable, responsive and transparent science
- Digital "natives"



It's not happening in isolation

- Open source software
- MOOCs
- Collaborative knowledge production
- Creative commons
- Open innovation
- The sharing/collaborative economy
- Web 2.0

It offers great opportunities

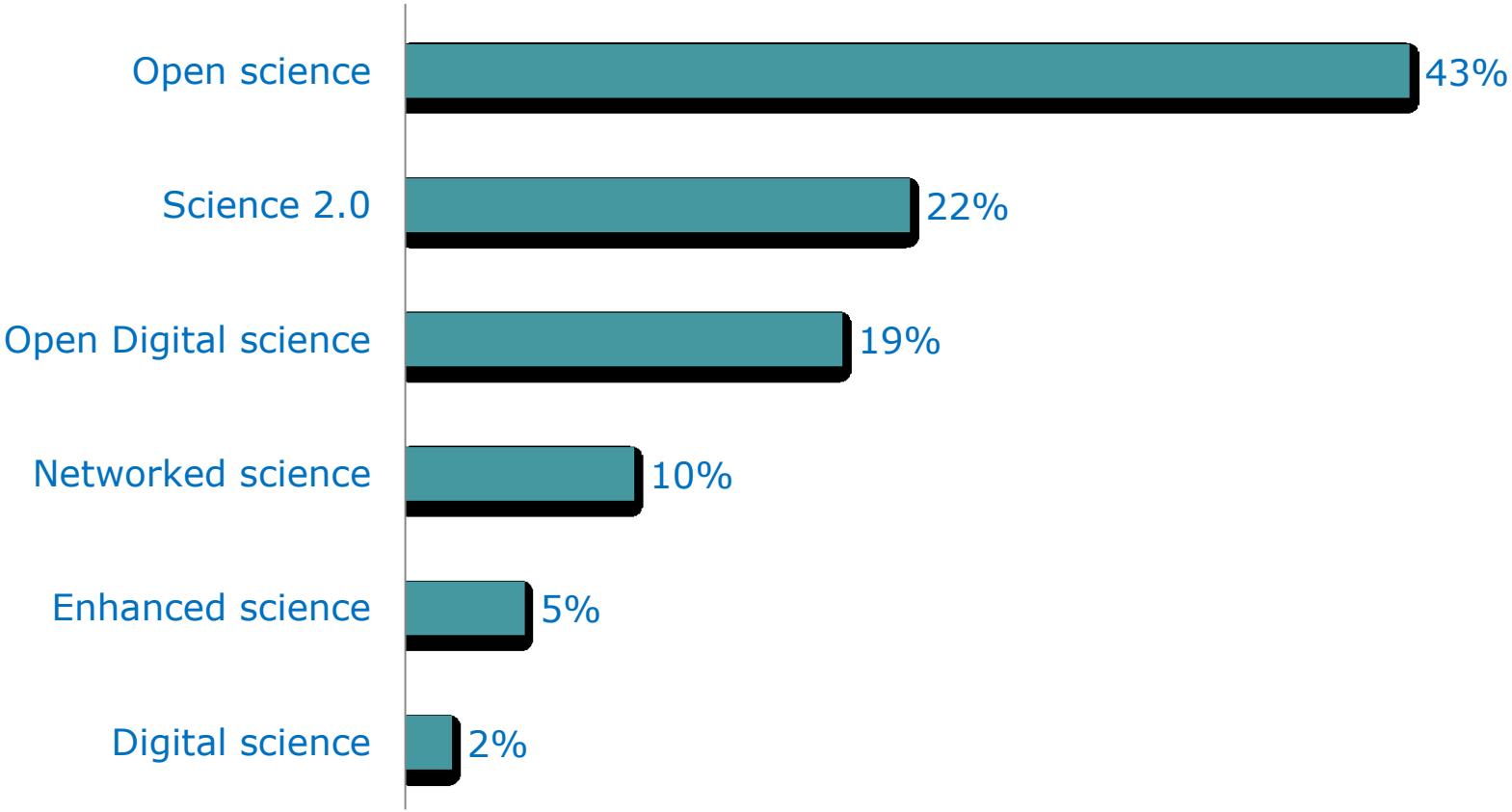
- Better value for money
- More transparency, openness and networked collaboration
- More efficiency, reliability and responsiveness

Public consultation:
Science 2.0: Science in Transition

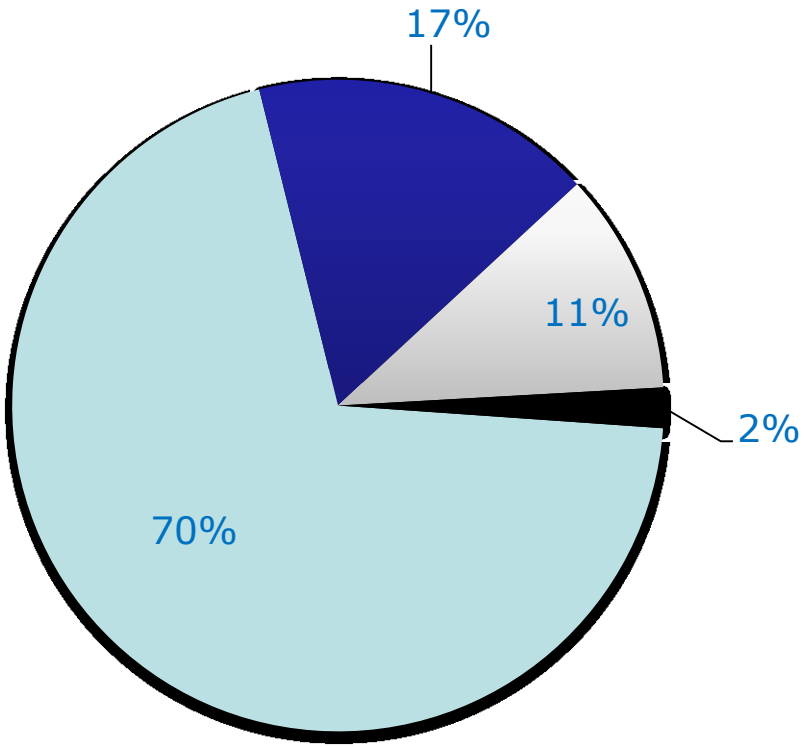
Objectives:

- Assess the **degree of awareness**
- Assess the **perception of the opportunities and challenges**
- Identify **possible policy implications and actions**

What is the most appropriate term to describe 'Science 2.0'?



Do you recognise the trends described in the consultation paper as 'Science 2.0'?



What are the key drivers?

Over 80% agree/totally agree

- **Digital technologies**
- **New ways of disseminating results**
- **New ways of collaboration**

Less than 50% agree/totally agree

- **Citizens acting as scientists**

What are the key barriers?

Over 80% agree/totally agree

- **Quality assurance**
- **Lack of credits**
- **Lack of infrastructures**
- **Limited awareness of benefits**

Less than 70% agree/totally agree

- **Concerns about ethical and privacy issues**

What are the implications?

Over 80% agree/totally agree

- **Science more reliable**
- **Science more efficient**
- **Faster and wider innovation**

Less than 60% agree/totally agree

- **Crowd-funding as an important research funding source**

Agreed Objectives of possible future open science policy agenda

- Supporting big data **infrastructure** needs
- Improving **framework conditions**: barriers and incentives
- Making science
  - more efficient (better use of and sharing of resources),
  - reliable (replicability/re-use of data) and
  - **more responsive** to societal challenges

Stakeholders share these expectations of 'Open Science' with large majority, on "condition":

- **bottom-up**
- **stakeholder-driven**

European Open Science Policy Agenda (1)

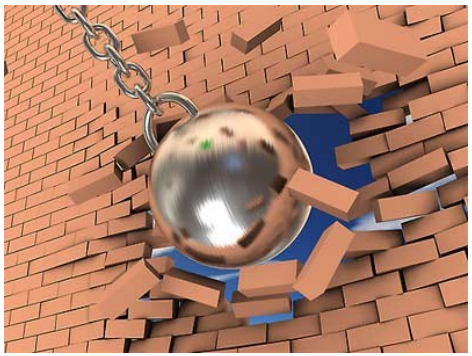
Foster Open Science: Creating incentives, e.g.

- Promote best practices, research integrity, Citizen Science etc.
- Establish a **Policy Platform**

European Open Science Agenda (2)

Remove barriers, e.g.

- Development of '**alternative**' **metrics**
- Propose a **European "code of conduct"**



European Open Science Agenda (3)

Mainstream Open Access to publications and data, e.g.

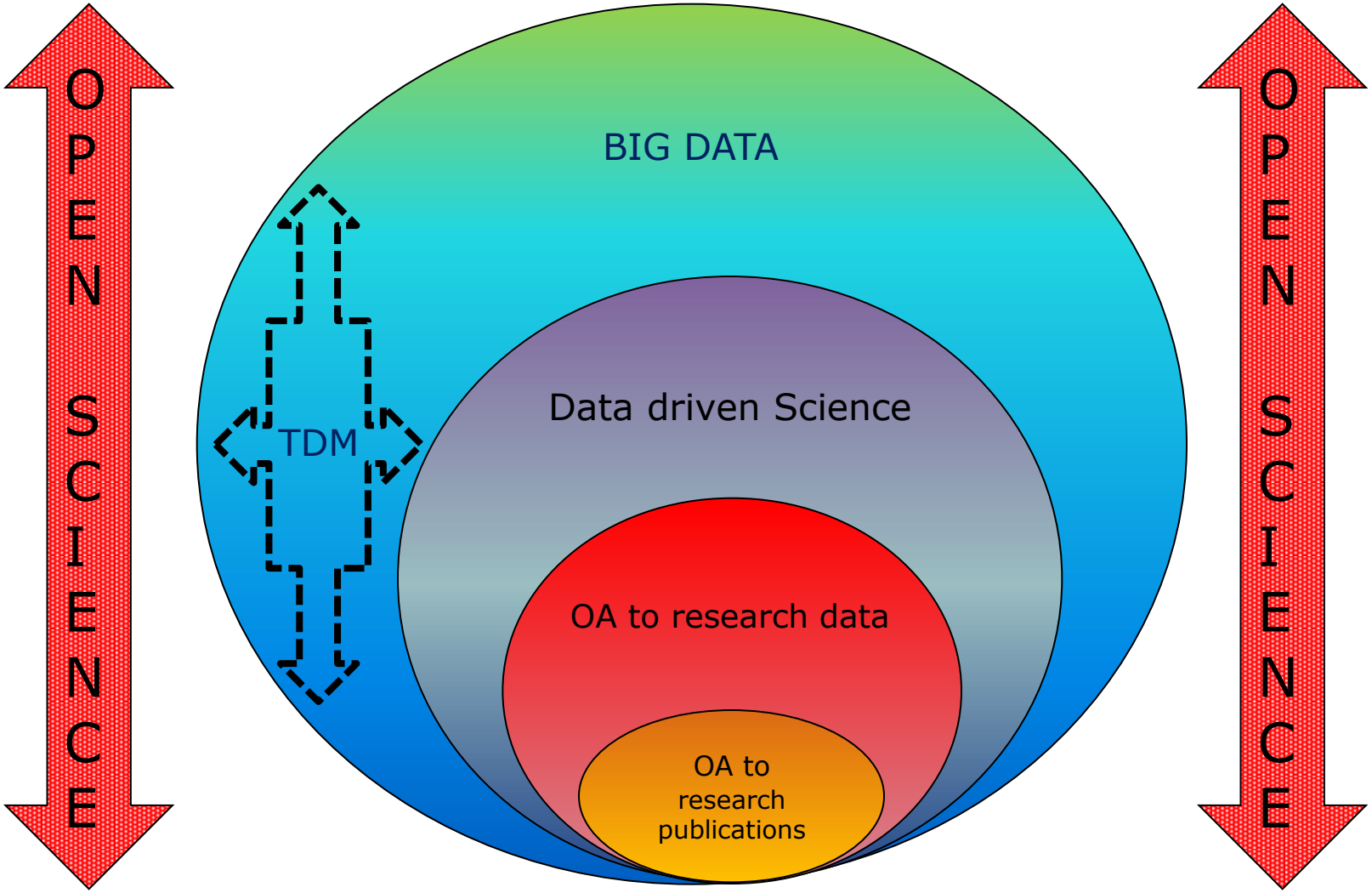
- Consider extending the **Horizon 2020 pilot** on Open Access to data

- Develop **EU guidelines** for addressing IPR issues and the funding of data-management

Open Research Data

- ORD refers to making research data freely available for reuse beyond the purpose for which they were originally collected.
- Making Research data freely available aid further discovery, make scientific process more cost efficient and reliable.
- ORD is part of a broader change: **data driven science underpinning Open Science**

ORD "small" part of Open Data



Data Driven Science: big data in science

Explosion in the amount of data produced combined (internet of everything!) with **advances in data science** results in **new opportunities** and **economic return**

Enormous opportunities for science:

- virtually every problem can be "dated"
- "here are the data, where is the hypothesis?"
- 4th paradigm in science (inductive, computional)
- Potential to reboot completely SSH ("social physics")

For DDS to take off, certain **framework conditions** need to be met:

- Data protection and copyright modernisation
- Research infrastructures

H2020: Pilot on Open Research Data

Types of data concerned:

- Data needed to validate the results presented in scientific publications ("underlying data")
- Other data as specified in **DMP** (=up to projects)

Beneficiaries participating in the Pilot will:

- Deposit this data in a research data repository of their choice
- Take measures to make it possible to access, mine, exploit, reproduce and disseminate free of charge
- Provide information about tools and instruments at the disposal of the beneficiaries and necessary for validating the results (where possible, provide the tools and instruments themselves)

H2020: Pilot on Open Research Data

Projects may opt out of the Pilot on ORD, if:

- The project will not generate / collect any data
- Conflict with obligation to protect results
- Conflict with confidentiality obligations
- Conflict with security obligations
- Conflict with rules on protection of personal data
- The achievement of the action's main objective would be jeopardised by making specific parts of the research data openly accessible (to be explained in data management plan)

H2020: Pilot on ORD: take-up in first calls

- Basis: 3699 Horizon 2020 signed grant agreements
- Calls in core-areas: opt out 34.6% (149/431)

→ This means: 65,4% of projects in the core areas participate to the ORD pilot

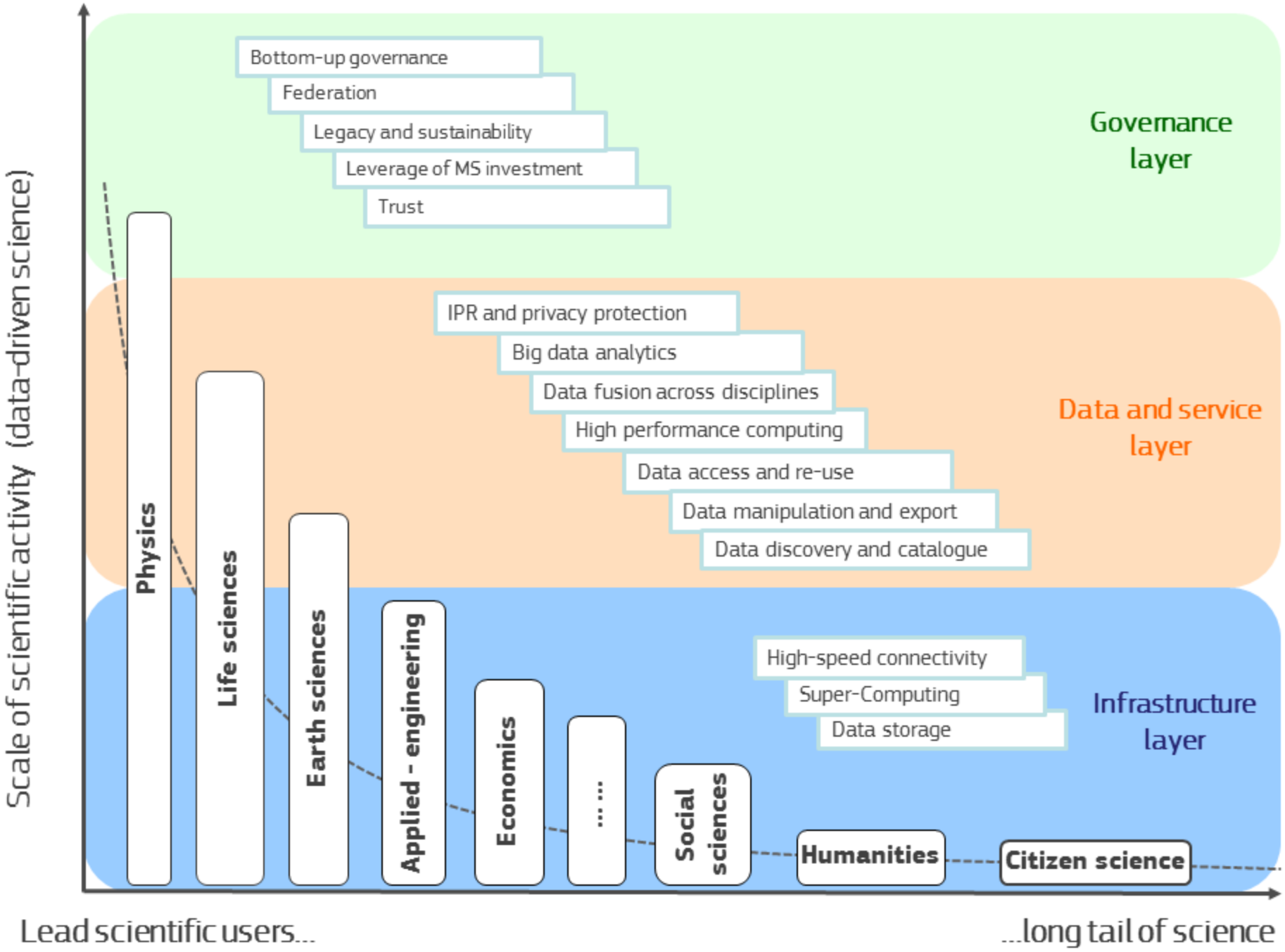
- Other areas: voluntary opt in 11.9% (409/3268)

→ encouraging results

European Open Science Agenda (4)

Develop research infrastructures for Open Science, e.g.

- Common interfaces and data standards
- Coordinate funding/ maintenance and interoperability
- **European Open Science Cloud** for data, protocols and methodologies


Scale of scientific activity (data-driven science)
Governance layer
Bottom-up governance
Federation
Legacy and sustainability
Leverage of MS investment
Trust
Data and service layer
IPR and privacy protection
Big data analytics
Data fusion across disciplines
High performance computing
Data access and re-use
Data manipulation and export
Data discovery and catalogue
Infrastructure layer
High-speed connectivity
Super-Computing
Data storage
Physics
Life sciences
Earth sciences
Applied - engineering
Economics
... ...
Social sciences
Humanities
Citizen science
Lead scientific users...
...long tail of science

European Open Science Cloud is part of Europe´s ambition to **support the transition to Open Science** and make the most of **data-driven science**.

- **Strongly stated need:** cost-effective, privacy and IPR-conscious.
- Virtual environment **for all European researchers** to store, manage, analysis and re-use data
- **Federation of existing and emerging** data infrastructures
- **Added value:** scale, data-driven science, inter-disciplinarity, data to knowledge to innovation

Short-term Roadmap for Policy on Open Science

Autumn 2015:

- Set up of the Open Science Policy Platform
- Implementation of Open Science Monitor
  Launch of Science Cloud HLG

Autumn 2015\Spring 2016:

- Concretization of Open Science actions under the *DSM strategy* (Juncker priority)

4-5 April 2016:

- Conference on Open Science during the Dutch Presidency

May 2016:

- Presentation of the European Open Science Agenda to the Competitiveness Council

Thank you!