

### The future of science is open Rationale, goals and milestones of the EU policies

#### **Nordic Open Science Conference**

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## The rationale...

The nature of science (modus operandi) system to an open, sharing on

#### is changing from a closed



Peerage of Science The online Journal club

**Opening up the full research cycle** 



## **Open Science = Systemic transition of science system which affects the way**

- research is performed
- knowledge is shared/diffused/preserved
- research projects/results are evaluated
- research is funded
- researchers are rewarded
- future researchers are trained

#### Affecting the whole research cycle and all its stakeholders

- ✓ A typical techno-economic paradigm shift a la Perez (technology, market and institutional change go hand in hand)
- ✓ Disruptive and hence disturbing....



### It offers great opportunities 4 science, scientists & society

- Better ROI of the R&I investments: self evident: if all the results of our public research are made reusable, it will follow that better use is made
- Faster circulation of new ideas: we have 22 million EU SME's that will have access to top notch research without having to significantly pay for it!
- More transparency of the science system: the public taxpayer has this right
- Fit for 21<sup>st</sup> century science purpose: all grand societal challenges NEED cross disciplinary research

#### **Top level policy goals**





"As I see it, European success now lies in sharing as soon as possible, (...). The days of **open science** have arrived."

Speech at "Presidency Conference Open Science", 04 of April, 2016, Amsterdam





#### 2016 - Holistic Policy Agenda: scope & ambitions

... 4 with regard to the use & management of research results and data

- ✓ **Open Data**: FAIR data sharing is the default for funding scientific research
- Science cloud: All EU researchers are able to deposit, access and analyse European scientific data through the open science cloud, without leaving their desk
- Altmetrics: Alternative metrics (next generation metrics) to complement conventional indicators for research quality and impact (e.g. Journal Impact Factors and citations)
- Future of scholarly communication: All peer reviewed scientific publications are freely accessible



... 4 with regard to relations with <u>research actors</u> (researchers, institutions and funders)

- Rewards: The European research career evaluation system fully acknowledges
   Open Science activities
- Research Integrity: All publicly funded research in the EU adheres to commonly agreed Open Science Standards of Research Integrity
- Education and skills: All young scientists in Europe have the necessary skills and support to apply Open Science research routines and practices
- Citizen Science: CS significantly contribute and are recognised as valid knowledge producers of European science



Extensive stakeholder consultation
✓Public consultation (July-September 2014)
✓Validation workshops (October-December 2014)
✓Final report (February 2015):
http://ec.europa.eu/research/consultations/science-2.0/science 2 0 final report.pdf

Strong support by Member States and Competitiveness Council
✓Policy debate & Council conclusions 'data-driven economy' May 2015
✓Presidency conference Open Science &
✓Council conclusions 'open science') May 2016

European Open Science Agenda ✓Broad consensus on five policy lines and 8 Actions ✓Open Science Policy Platform ✓Embedded in the Digital Single Market strategy



## Milestones...



# The evolution of open access in the EU funding programmes for R&I







#### AS OPEN AS POSSIBLE, AS CLOSED AS NECESSARY

Top three reasons for **opt-out**:







#### **Open access to publications**

- Implement Plan S
- Increasing uptake to 100% (incentives, 'sanctions')
- Launch ORE

#### **Open access and research data**

- Launch EOSC in 2018, 1<sup>st</sup> phase
- The DMPs
- Mainstreaming FAIR data across the FPs
- Stimulating a change in scientific culture

#### **Citizen Science**

Pan European agreement on uptake

#### **Metrics and Incentives**

- Next generation metrics
- ''Bucarest'' Declaration



#### The Open Research Europe publishing platform

- Help H2020 beneficiaries and their researchers comply with the open access mandate without paying APCs during and after the grant
- Improve uptake of OA in H2020
- Promote OA as THE mode for publishing from now on
- Support open science and lead by example
  - ✓ Early sharing of research (pre-prints + peer-reviewed articles)
  - ✓ Open peer-review+ post publication commenting
  - ✓ New generation metrics
- Explore business models in OA publishing and sustainability
- Tenders are under evaluation

**EOSC:** a researcher-centric project



EOSC will allow for universal access to open research data and create a new level playing field for EU researchers



- Easy access through a universal access point for ALL European researchers
- Cross-disciplinary access to data unleashes potential of interdisciplinary research
- Services and data are interoperable (FAIR data)
- Data funded with public money is in principle open (as open as possible, as closed as necessary)

#### Seamless environment and enabling interdisciplinary research



FP9 goes beyond OA (publications & data) to embrace & incentivise Open Science as modus operandi for science

- Clarifies and strengthens the **OA obligations**;
- Empowers the authors of scientific publications;
- Is home of FAIR data sharing while complying with IPR rules and exploitation obligations set in the GA;
- **Broadens Open Access** (with opting out options) to other research output;
- Promotes compliance with 'Open Science principles' through a combination of obligations and incentives;
- Implements **sanctions** for those beneficiaries that repeatedly and consistently fail to provide the required open access, requiring institutions to assume responsibility for their intellectual output;
- Introduces the use of 'new generation' metrics for better assessing the impact of research output and the engagement in Open Science.



Open science offers opportunities for citizens and scientists together to step up their contribution to science to a scale unthought of even a decade ago.

Barriers and challenges still prevent citizen science from living up to its full potential (OSPP).

#### Goal: Ensure maximum recognition and impact of citizen science:

- Laying out a long-term vision for citizen science in Europe as part and parcel of open science
- Development of guidelines, toolkit or protocol(s) that can be applied across scientific disciplines to ensure, in particular, maximum recognition and use of the data produced by citizen science.
- Have all funders, research performing organizations and universities to agree on it (in co-development)



#### Recommendation OSPP (based on Exp groups)

- Quantitative and qualitative indicators need to be identified and developed for research assessment that captures the full range of contributions to the knowledge system (e.g. context, discipline dependent)
- Display a broad range of indicators for all research outputs.
- Indicators have to match Rewards for Open Science
- Do not use journal brand or IF for individual researcher assessment as proxy for quality

### Planned



- By December EG proposes set of generic OS indicators PLUS how to calibrate this over different research trajectories (frontiers, mission oriented etc.)
- Before Summer 2019: have University associations and Funders agree on it ('Bucarest declaration'')

Let's complement the DORA declaration ('what we don't want") with <u>a declaration that states what we do</u> want as indicators for the future!





#### Open Science is here to stay:

### If you want to go fast, go alone. If you want to go far, go together (African saying)



By 2030 one can assume that the science system to be:

- Completely data driven (AI!)
- With open research data as a renewable resource for research and innovation (via EOSC)
- Full & immediate open access to the whole life cycle of a research process
- ''liquid'' science (like in SW development)
- Multiple ways to measure and reward scientific productivity and impact

## Allowing reproducible research, full cross disciplinary set up and \_\_\_\_\_ faster take up



## By 2030 Independent Quality assurance via peer review will still be the core mechanism to progress science

The Journal of Alternative Facts 01 (2017) 01-20



The Journal of Alternative Facts

#### We Have All the Best Climates, Really, They're Great

Iwas A. Scientistonce \*

\* and now I have all my research approved by a public relations office

#### Abstract

The research presented in this paper is really the best research that you will ever see. We have methods, the best methods, and we used them to study climate. As you may already know, the Earth, led by America, has all the best climates. In this paper we refute prior work by out-of-touch scientists who insist that the climate is changing – why would it change, when it's so great already? It is not getting warmer. In fact, our findings show that you were cold at least one day last year. Our (really fantastic) data also reveals that America has all the best CO2 levels, really great levels. In our discussion, we reveal that there is no reason to believe a bunch of scientists who spent all their time learning and studying "facts" instead of being out in the real world making jobs. Our alternative facts definitively prove that scientists are losers. Finally, we had peer reviews, by all the best people, our people, because politicians know the most about science, the very best things about science.

Keywords: climate, "data", "facts", #makeclimategreatagain, "science"

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#### Thank you!

## More information at <u>http://ec.europa.eu/research/openscience</u>

#### OS monitor <u>http://ec.europa.eu/research/openscience/monitor/</u>