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## NOTE

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From:	Presidency
To:	Permanent Representatives Committee/Council
Subject:	<i>Preparation of the Council ("Competitiveness") on 28-29 May 2015</i> Towards open and excellent European science - follow up to the Science 2.0 public consultation - Policy debate

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### 1. Introduction

Science 2.0 - also referred to as open science - involves the on-going evolution in the modus operandi of doing research and organising science. These changes in the dynamics of science and research are enabled by the exponential growth of data, the availability of digital technologies and driven by the globalisation of the scientific community, as well as the increasing societal demand to address the grand challenges of our times. They have an impact on the entire research cycle, from the inception of research to its publication, as well as on the way in which this cycle is organised.

The institutions involved in science are affected (e.g. research organisations, research councils, research performing organisations, funding bodies), as is the way in which science is disseminated and assessed e.g. the rise of new scientific disciplines, innovative pathways in publishing (among them a substantial rise of open access journals) and changes in the way the quality and impact of research are evaluated.

In July 2014, the Commission launched a public consultation on ‘Science 2.0: Science in Transition’, accompanied by a background paper. The consultation closed on 30 September 2014, followed by four multi-stakeholder workshops organised to validate the findings. The information note<sup>1</sup> from the Commission, circulated at the Council (Competitiveness) of 3 March 2015, outlined the main findings and policy recommendations emerging from the Consultation.

## **2. Open science and the Quality and Impact of Science: key outcomes of the public consultation on ‘Science 2.0: Science in Transition’**

The results of the consultation indicate that the term 'open science' may better reflect the phenomena described in the consultation.

A majority of the respondents to the consultation believe that open science will increase the quality and impact of science by making it more:

- *reliable*, as it allows early, better and more effective data-verification;
- *efficient*, as it can prevent useless duplication of similar research efforts elsewhere on the globe and extend collaboration to a broader range of contributors;
- *responsive* to the societal demands of citizens, as science could become more transparent and open than before;
- *credible*, as issues of research integrity could be better tackled in an open and transparent context;
- *inclusive* in the incorporation of a broader range of scientific knowledge producers beyond the academic context;
- *global*, facilitating internationally organised mission-oriented research, having scientists sharing knowledge and data prior to publication and thus advancing science at a faster pace and making innovations faster available.

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<sup>1</sup> Doc 6409/15.

The multi-stakeholder discussion organised by the Commission on 'science in transition' also included a debate on how to measure the 'impact' of scientific outcomes, also taking into account the types of impacts that are to be measured. Stakeholders noted that open science would be more responsive to societal challenges, thereby highlighting that open science seeks to have impact beyond scientific excellence. In this context, the public consultation findings indicate that stakeholders see a need to develop alternative ways to measure the impact of outcomes of science (altmetrics), for example taking into account the use of social media. Altmetrics would enable to measure the impact of research in more diverse ways than the traditional bibliometric indicators, which are focused mainly on productivity (e.g. the number of publications).

### **3. The potential of open science: policy considerations**

Open science issues were already addressed during the debate on unlocking Europe's digital potential through open, networked and data-intensive research at the Council (Competitiveness) of 3 March 2015, where a growing support was noted to open science principles, such as open access.

In some areas of open science, in particular with regard to open access to scientific publications and research data, policies have been implemented both at Member States level and in Horizon 2020 projects. Other policies are not yet sufficiently developed (e.g. on altmetrics).

The new realities of science, including the broad use of digital technologies, are already improving the sharing of knowledge across sectors and borders, facilitating working together remotely, networking and creating new partnerships. We should therefore fully unlock the potential of open science in order to foster the implementation of the European Research Area principles, spreading excellence and widening participation of researchers in joint European programmes and initiatives.

It is now time to take stock of and connect these different elements, and to design a broad, coherent and open policy vision for open science in Europe and beyond. The development of an increasingly open European Research Area is supported by the development of a Digital Single Market in which national silos no longer exist.

Such a coherent policy vision could be the basis for a possible European open science agenda. Such an agenda could include fostering open science through providing incentives and removing barriers, e.g. by promoting interoperability of data and agreeing on principles for research integrity; building appropriate research infrastructures, such as scientific repositories and clouds; promoting open science within the European Research Area, spreading excellence, fostering wider participation, and enabling Member States to work together on societal challenges, as well as promoting open science in Horizon 2020.

Europe must lead the global move towards open science and strive to transform the way in which research is done in order to reap the socio-economic benefits for European citizens and businesses.

### **Questions for the debate**

1. *Do you agree with the idea of developing a European open science agenda?*
2. *What specific actions should be taken at European and at the Member State level to move forward towards an open science agenda? How could this process contribute to the further development of the European Research Area and to increase the quality and impact of science as well as spreading excellence and widening participation?*
3. *How can stakeholders (researchers, students, universities, funding bodies, businesses, etc.) be best engaged in the open science process?*