

Contribution to public stakeholder consultation on Horizon 2020

15 January 2017

Introduction

[Frontiers](#) is a Gold Open Access publishing and IT company with offices in five countries: Lausanne (HQ), Madrid, London, USA and India. Currently, Frontiers is one of the top 6 largest open-access publishers worldwide [Simba Information, 2016], covers 440 academic disciplines and has published over 55,000 articles. Using a unique digital system and a global editorial network of over 73,000 eminent scientists and scholars, numerous Frontiers open-access journals are the [largest and most-cited journals](#) in their fields, with the average ranking of Frontiers journals lying in the top 12% of the 11,000 scholarly journals indexed by Thomson Reuters.

The existing science publishing system is outdated and has evolved into a fundamental obstacle to scientific progress. Globally, approximately \$2 trillion is spent annually on scientific research (as estimated from World Bank statistics [World Bank, 2016]), and yet around 80% of the 2.5 million scientific articles published each year are still locked behind paywalls upon publication by subscription-based academic publishers [Ware & Mabe, 2015]. These paywalls allow a select group of publishing companies to benefit from public research finances while curtailing knowledge dissemination, innovation and societal benefit. A European Commission-funded report published in 2014 described this situation as “unsustainable because of the gross social inefficiency and ineffectiveness” [Archambault 2014]. In addition, there is resistance from publishers and their representative bodies to adapt protocols and systems to allow optimal use of the literature database, for example using techniques such as text and data mining (TDM).

The burden this creates on society and research is well recognized, and an [increasing number](#) of research programs, funding agencies and universities mandate open access to research articles (e.g. Horizon 2020, NIH, Howard Hughes, Wellcome Trust, Harvard and MIT), including the recent European directive to make [all research articles freely accessible by 2020](#).

Based on our own research and that of the Max Planck Digital Library [Schimmer et al., 2015], the potential economic benefits of OA Publishing are enormous, reducing costs from approximately \$5,000 per article in subscription journals to a value near \$2,000. A full transition to open access would thus free [\\$6 billion every year](#), funding that can be re-allocated to research. The economic impact of making all science open and immediately available, in formats that permit full interoperability and reuse, has the tremendous additional potential to create opportunities for the world economy. Frontiers’ goal is to help drive this transition to *open-science publishing*, freeing articles and accelerating new research and innovation. Our own data show that, of the more than 200 million views and downloads of our articles, a noticeably high number of these are concentrated in the Silicon Valley and Shenzhen, demonstrating the link between open science and the innovation-driven economy.

The success of Frontiers is proof that the application of open-science principles to scientific publishing can provide superior services and outcomes for European researchers. Our open science platform has been developed in-house, with feedback from scientific communities that share our vision for open science, in which everybody has equal opportunity to seek, share and generate knowledge, and that empowers researchers in their daily work. The Gold open access approach is sustainable, allows for quick and efficient scaling, and provides the means for driving innovation in publishing services and in open-science services, more generally.

We wholeheartedly agree with the Council of the EU [Conclusions](#) of May 2016 [Council of EU 2016] that the results of publicly funded research should be made available in an ‘as open as possible manner’, and that ‘unnecessary legal, organisational and financial barriers to access results of publicly funded research should be removed as much as possible to attain optimal knowledge sharing’. Our model demonstrates that this approach is viable.

We welcome and encourage all actions taken by the European Commission to promote open access and open science. The Commission’s default requirement for open access publication of results of Horizon 2020-funded research has been a fundamentally important step toward the paradigm shift toward universal open access to publications and data.

Frontiers, as the third leading publisher of papers within the ongoing FP7 [Post-Grant Open Access Pilot scheme](#) [OPEN APC 2016] and full partner in two Horizon 2020 research consortia ([OpenMinTeD](#) and [OpenUP](#)), offer the following comments on issues concerning open access/open science within Horizon 2020 and future Framework programmes.

Open access routes

We welcome the support in Horizon 2020 for open access via either ‘green’ routes (whereby article or manuscripts are self-archived in an online repository) or ‘gold’ routes (whereby articles are made immediately open access by the publisher). The Commission has rightly pointed out, however, that green routes can result in delays in open access [EC 2013; EC 2016A Guidelines]. In addition, the self-archiving of documents across multiple platforms and in multiple formats results in loss of interoperability and reuse, thus hindering the full potential of this knowledge, for example via the application of semantic tools or other forms of TDM. The draft [European Open Science Agenda](#) proposes that incentives are required to make scientific work openly available as early as possible [EC OS Agenda 2016B].

For optimal access, interoperability and re-use of scientific knowledge **the Commission should recommend and promote gold open access for EU-funded research.**

Funding limits

We welcome the funding of costs for open access to Horizon 2020 publications incurred within the duration of an action. However, given the potential delays commonly associated with academic publication, we believe that the limitation of reimbursement to the duration of the action is inappropriate. We welcome the FP7 Post-Grant Open Access pilot, designed to address this point. As of November 2016, Frontiers had published 51 articles within this Pilot, representing 9.35% of the total [OPEN APC 2016]. In order to fully support researchers to disseminate their results for the benefit of science and society, we believe that:

- **Future EU programmes should not place any restriction on the reimbursement period for open access publishing costs.**
- **The limit on the number of papers funded per project should not be arbitrarily limited to three but agreed to on a project-by-project basis, so that more data-productive projects have warranted scope for more resulting publications**

Type of journal

Options for open access publishing include full open access journals (such as Frontiers journals) and hybrid subscription-based journals that offer the option of open access for individual articles upon payment of an APC. As a recent Jisc (formerly Joint Information Systems Committee) report states [JISC, 2016]: “[Publishers] have converted existing journals into “hybrid journals”, allowing authors (or, rather, institutions and funders) to pay for open access in otherwise subscription journals. Very few journals have transitioned through this route to become fully open access, so the evidence is that hybrid journals maintain the legacy journal market, and are simply adding a new cost to UK higher education and a new UK revenue stream to publishers.”

Between Oct 2012 and Sep 2013, 82% of the costs paid by the Wellcome Trust to publish articles in journals with open access was for publications that libraries would be charged again for through subscriptions (so-called ‘double charging’) [Brook 2014]. Among the top five publishers by total costs, purely open-access publishers charged considerably lower APCs for their journals than traditional publishers charged either for their hybrid journals or (in most cases) their purely open access journals [Brook 2014].

The restriction of the FP7 Post-Grant Open Access pilot to publications in full open-access journals (i.e. excluding hybrid journals) is an important, forward-thinking step to help address double-charging for publications and which recognises the academic credibility and viability of fully open access journals, as well as their value in opening up science in an unrestricted manner to researchers, businesses and citizens.

Accordingly, we believe that, in order to provide optimal services to authors, readers, and their institutions, **future Framework programmes should fund open access APCs only in full open-access journals that fulfil defined quality standards** [OpenAIRE 2015].

Open access to research data

Frontiers agrees with the Commission/OpenAIRE definition [OpenAIRE 2016A] of open data as those that are free not only to access, but also to reuse, repurpose and redistribute, and with the European Council Conclusions that incentive mechanisms need to be put in place to reward researchers and research stakeholders for sharing the results of their research for reuse [Council of EU 2016].

Frontiers applauds the subsequent Open Research Data [pilot](#) [OpenAIRE 2016A], which requires Horizon 2020-funded projects to deposit data in repositories according to certain conditions, and its extension from January 2017 to cover all Horizon 2020 research areas. We look forward to results of the monitoring and assessment of this pilot, and we offer our support to this process. The Pilot includes provisions for projects to opt out, for example if data sharing is incompatible with obligations to

protect results that could be commercially or industrially exploited, security issues or personal data protection, or where participation could compromise project aims. The conditions for open access data are therefore logically defined and mandated by the EU funder.

We applaud the Commission's work toward a European Open Science Cloud (ESOC) and we offer our support in this endeavour. We agree with the [recommendations](#) of the High-Level Expert Group on the ESOC on the need for modern reward and recognition practices to support data sharing and re-use and the development of a concrete plan for data interoperability [EC High-Level Expert Group 2016]. With specific respect to Horizon 2020 and future Framework Programmes, we concur that:

Adequate data stewardship should be mandatory for research proposals.

The Commission should fund efforts to develop data expertise in Europe (as envisaged in the Council Conclusions) [Council of EU 2016].

Compliance

To date, efforts to monitor and enforce compliance with open access provisions have been limited.

The Commission should work with all stakeholders to strengthen measures to monitor and ensure compliance with the open access provisions in Horizon 2020 and future Framework programmes, as envisaged by Council Conclusions [Council of EU 2016] and the EU Open Science Agenda [EC OS Agenda 2016B].

The Commission should define what level of compliance it expects, and the consequences that will apply in case of non-compliance.

Copyright legislation

Given the recognised need to remove barriers to the exploitation of research data, we support the modernisation by the European Commission of European copyright law via its proposed [Directive](#) on copyright in the Digital Single Market, which aims to facilitate the use of copyright-protected content via new technologies [EC Directive 2016C]. [In a separate statement](#), we and other stakeholders urge the Commission to include within the proposed Directive beneficiaries of both commercial and non-commercial nature under the revised scope of the copyright exception for TDM.

Horizon 2020 projects on open science

Frontiers is involved in two Horizon 2020 research consortia that aim to promote open science:

- [OpenMinTeD](#) will build an online platform of text mining tools and services.
- [OpenUP](#) will a) define a framework of roles and processes, benefits and opportunities for open science/open access, b) validate the proposed mechanisms and c) issue policy recommendations and guidelines.

As a leading open-access publisher, Frontiers provides publishing perspective and advice to these consortia on topics such as intellectual property implications; best practices for content validation,

production and archiving; data services; and strategies for innovative and impactful dissemination of scientific results.

Frontiers welcomes the establishment of the Open Science Policy Platform (OSPP) and its Working Groups, and we offer our support to these bodies. Various initiatives aim to identify and evaluate open access business models, including the OSPP Working Group on this topic. We welcome this work, and the commissioning by OpenAIRE of an analysis report on the open access publishing market [OpenAIRE Report 2016B] and we stand ready to provide any information, insight or other support, as appropriate. Our own enterprise offers policymakers an example of how a fully open access publishing system can produce high-volume, high-quality, transparently peer-reviewed and impactful publications within a thriving and financially successful business model.

In conclusion, we recommend that EU-funded, multi-stakeholder projects should be supported to:

1/ **Help communicate to academia and other stakeholders that ‘open science works’ now and that existing open-access business models are already proven to bring superior benefits** in terms of low ACPs and high-quality services offered to authors (e.g. transparent peer review, digital editorial platforms, innovative altmetrics, interoperable repositories and network platforms).

2/ Support the open science model, which provides a better technological foundation on which to build innovative discovery and indexation tools (exploiting semantics, artificial intelligence, and TDM) required in the context of 2.5 million research articles per year. Open Science creates a virtuous cycle of knowledge and data flow, and allows a far more transparent **assessment of research outcomes, for example via author-level or article-level metrics.**

3/ **Establish a European Research Hub**, as envisaged in the European Open Science Agenda. Frontiers has extensive experience in networking and innovative dissemination tools; Loop, the open research network is an example of a cross-platform approach that connects research content to the researcher’s universal academic profile, thereby rendering content discoverable across the boundaries of publishers and organizations and assessable by multi-source, real-time impact metrics.

Looking toward FP9

We recognise that full assessments of the current Horizon 2020 open access/research data pilots will inform planning of open science conditions for FP9 in due course. Nevertheless, we encourage the Commission to ensure that the next Framework programme is founded on a fully integrated open science policy.

We recommend that the Commission to fully embed into FP9:

1/ **A default requirement** (with only limited exceptions) for research outcomes from funded projects to be made **rapidly publicly available** through **full (gold) open access** publications, permitting **access, reuse, repurposing (including TDM), with funding support that extends beyond the grant period with no time limitation.**

2/ Continue its mandate for effective data management.

- 3/ **Funding of training for researchers and other stakeholders in open science**, including e-skills and data management, with a view to encouraging career development in open science.
- 4/ **Measures to routinely assess and ensure compliance** with the provisions of open access.
- 5/ **Action and funding to develop environments** (common interfaces, algorithms and data standards) **and infrastructures to foster open science in Europe**, e.g. via the Open Science Cloud.

Swiss association in Horizon 2020

Finally, as a Swiss-based company, Frontiers welcomes the full association of Switzerland in Horizon 2020 (from 1 Jan 2017). To date, Switzerland has ranked as the leading “Associated Country” in terms of participations in Horizon 2020 [EC Swiss Assoc 2016D].

Conclusion

As committed advocates for open science, Frontiers strongly urges the European Commission to accelerate the societal transition to full open access to research publications and data for the benefit of all European citizens, researchers and businesses, by maximising its integration and exploitation within the final years of Horizon 2020 and in FP9.

Frontiers stands ready to collaborate with the Commission and other stakeholders in this endeavour.

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