

# ANSOL participa na avaliação do programa Horizonte 2020

O Horizonte 2020 – Programa-Quadro Comunitário de Investigação & Inovação, com um orçamento global superior a 77 mil milhões de euros para o período 2014-2020, é o maior instrumento da Comunidade Europeia especificamente orientado para o apoio à investigação, através do cofinanciamento de projetos de investigação, inovação e demonstração.

Uma avaliação intercalar a este programa está a decorrer durante o ano de 2017, e, para esse efeito, a Comissão Europeia ouviu a avaliação que é feita do programa por partes interessadas.

A ANSOL acredita que a informática tem um papel fulcral no desenvolvimento, na investigação e na inovação. Acreditamos, também, que a melhor forma de potenciar o investimento feito nestas áreas, para que os objectos deste programa sejam cumpridos, é que o resultado da investigação por ele financiada ocorra num ambiente aberto e de colaboração: que os dados usados e gerados sejam tornados abertos, que se garanta o acesso a eles através do uso de normas abertas, e, é claro, que o software produzido no decorrer destes programas seja disponibilizado como Software Livre, para que toda a sociedade possa beneficiar e usufruir dele.

Assim a ANSOL enviou o seu contributo, em que se foca essencialmente nas seguintes recomendações:

1. O uso de Normas Abertas é necessário no uso de partilha de conhecimento, incluindo na divulgação de publicações científicas e no arquivo de dados, artigos e software usados na investigação;
2. O software desenvolvido com financiamento público deve ser publicado como Software Livre, e arquivado em repositórios públicos de software, garantindo a sua disponibilização mesmo após o termo dos períodos de financiamento;
3. Os repositórios de dados e software devem usar Software Livre, garantindo o acesso não discriminatório aos seus conteúdos, e a longevidade dos sistemas.

O contributo completo da ANSOL pode ser lido nos anexos que se seguem.

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A "**ANSOL - Associação Nacional para o Software Livre**" é uma associação portuguesa sem fins lucrativos que tem como fim a divulgação, promoção, desenvolvimento, investigação e estudo da Informática Livre e das suas repercussões sociais, políticas, filosóficas, culturais, técnicas e científicas. Mais informação em: <https://ansol.org>

# Public stakeholder consultation - Interim evaluation of Horizon 2020

Fields marked with \* are mandatory.

[Horizon 2020](#), with a budget of €77bn from 2014 – 2020, is the biggest European Union research and innovation framework programme ever and one of the largest worldwide. Horizon 2020 promotes Europe's scientific and technological excellence to extend the frontiers of human knowledge, boosts the European Union's economic competitiveness and addresses societal challenges.

We invite everyone to take part in this public stakeholder consultation in the context of the interim evaluation of Horizon 2020, and to have a say on research and innovation activities run by the European Commission. The results of this consultation will feed into the report on the interim evaluation of Horizon 2020, will help us to improve the implementation of Horizon 2020 and will set the scene for the future discussions on the next EU research and innovation funding post-2020.

According to the legal act establishing Horizon 2020, the European Commission has to carry out an interim evaluation of the programme by 31 December 2017. Public stakeholder consultation is a very important part of this interim evaluation.

This Horizon 2020 questionnaire consists of six parts and it will take around 20 minutes to respond.

At the end of the questionnaire there is an opportunity to upload a position paper for the interim evaluation of Horizon 2020.

The questionnaire is focused on Horizon 2020 in general. There are/will be separate online consultations on the [Euratom Programme](#), the European Institute of Innovation and Technology ([EIT](#)), and public-public and public-private partnerships ([more information here](#)).

## I About You

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**Part I** consists of questions about the respondent. We would like to know who our respondents are in order to better understand their perspective, expectations and needs in terms of research and innovation. It will also help us to tailor this survey to respondents' experiences with Horizon 2020.

**\*1. I am responding**

- As an individual
- On behalf of a single institution/company
- On behalf of an “umbrella” organisation of EU interest

**\*1.1 What type of organisation do you represent?**

- Academia
- Research organisation
- Business
- Public authority
- Non-Governmental Organisation
- Other

**\*1.3 Is your organisation included in the Transparency Register?**

If your organisation is not registered, we invite you to register [here](#), although it is not compulsory to be registered to reply to this consultation. [Why a transparency register?](#)

- Yes
- No

**\*If so, please indicate your Register ID number**

**\*2. You are from**

or if you answer on behalf of an organisation, country where it is established

- |                                  |  |                                     |   |
|----------------------------------|--|-------------------------------------|---|
| <input type="radio"/> Austria    | <input type="radio"/> Belgium                | <input type="radio"/> Bulgaria      | <input type="radio"/> Croatia                               |
| <input type="radio"/> Cyprus     | <input type="radio"/> Czech Republic         | <input type="radio"/> Denmark       | <input type="radio"/> Estonia                               |
| <input type="radio"/> Finland    | <input type="radio"/> France                 | <input type="radio"/> Germany       | <input type="radio"/> Greece                                |
| <input type="radio"/> Hungary    | <input type="radio"/> Ireland                | <input type="radio"/> Italy         | <input type="radio"/> Latvia                                |
| <input type="radio"/> Lithuania  | <input type="radio"/> Luxembourg             | <input type="radio"/> Malta         | <input type="radio"/> Netherlands                           |
| <input type="radio"/> Poland     | <input checked="" type="radio"/> Portugal    | <input type="radio"/> Romania       | <input type="radio"/> Slovak Republic                       |
| <input type="radio"/> Slovenia   | <input type="radio"/> Spain                  | <input type="radio"/> Sweden        | <input type="radio"/> United Kingdom                        |
| <input type="radio"/> Albania    | <input type="radio"/> Bosnia and Herzegovina | <input type="radio"/> Faroe Islands | <input type="radio"/> Former Yugoslav Republic of Macedonia |
| <input type="radio"/> Georgia    | <input type="radio"/> Iceland                | <input type="radio"/> Israel        | <input type="radio"/> Moldova                               |
| <input type="radio"/> Montenegro | <input type="radio"/> Norway                 | <input type="radio"/> Serbia        | <input type="radio"/> Switzerland                           |
| <input type="radio"/> Tunisia    | <input type="radio"/> Turkey                 | <input type="radio"/> Ukraine       | <input type="radio"/> Other                                 |

**3. Information about the respondent**

**\*First name**

Marcos

**\*Last name**

Torres

**\* Email address**

marcos.marado@ansol.org

**\*Organisation (please reply N/A if responding as an individual citizen)**

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**\* 4. Your contribution**

Note that, whatever option chosen, your answers may be subject to a request for public access to documents under [Regulation \(EC\) N°1049/2001](#)

- can be published with your personal information** (I consent to the publication of all the information in my contribution in whole or in part including my name or my organisation's name, and I declare that nothing within my response is unlawful or would infringe the rights of any third party in a manner that would prevent publication)
- can be published provided that you remain anonymous** (I consent to the publication of any information in my contribution in whole or in part (which may include quotes or opinions I express) provided that it is done anonymously. I declare that nothing within my response is unlawful or would infringe the rights of any third party in a manner that would prevent the publication.

**\*5. Have you received/are you receiving support from Horizon 2020 ?**

- YES
- NO

**5.1. What are the main reasons for not participating in Horizon 2020? Select maximum 3.**

*between 1 and 3 answered rows*

	My choice
I'm not a researcher/innovator	<input type="radio"/>
Lack of awareness of the EU research and innovation framework programme Horizon 2020	<input type="radio"/>
Preference to participate in other European or international programmes	<input type="radio"/>
Preference to participate in other national or regional programmes	<input type="radio"/>
Horizon 2020 project implementation rules are cumbersome	<input type="radio"/>
Success rates in Horizon 2020 are too low to be worth applying	<input type="radio"/>
Difficulties to find project partners	<input type="radio"/>
Lack of a relevant area/topic for my needs	<input type="radio"/>
Lack of an adequate type of financial support needed for my work	<input type="radio"/>
Concerns about sharing valuable knowledge with partners	<input type="radio"/>
Limited financial/human resources to prepare a proposal	<input checked="" type="radio"/>
I tried, but my proposal wasn't selected	<input type="radio"/>
Other	<input type="radio"/>

## II HORIZON 2020 - PRIORITIES AND OBJECTIVES

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**Part II** is focused on priorities and objectives of Horizon 2020. We would like to know whether the activities under Horizon 2020 contribute to wider European Union policy priorities as well as to the programme's objectives. Horizon 2020 objectives are set up in the legal act establishing the Programme and they are reflected in its structure.

**8. Do you think that Horizon 2020 is contributing to the following priorities of the European Union?**

	Not at all	To some extent	To large extent	Fully	I don't know
*Supporting <a href="#">jobs, growth and investment</a>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Promoting an <a href="#">Energy Union with a forward looking climate policy</a>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Fostering the role of the <a href="#">European Union as a stronger global actor</a>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Helping to create a <a href="#">digital single market</a>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Achieving a deeper and fairer <a href="#">internal market</a> with a strengthen industrial base	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**9. Do you think that Horizon 2020 is helping to:**

	Not at all	To some extent	To large extent	Fully	I don't know
*Build a society and an economy based on knowledge and innovation.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Implement the "Europe 2020" strategy, the EU's strategy for jobs and smart, sustainable and inclusive growth.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Develop and implementing EU policies.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>*Support the development of the European Research Area, a unified area open to the world, in which scientific knowledge, technology and researchers circulate freely.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Foster excellent science.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Boost industrial leadership.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Improve the lifelong health and well-being of all.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Secure sufficient supplies of safe, healthy and high quality food and other bio-based products.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Make the transition to a reliable, affordable, publicly accepted, sustainable and competitive energy system.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Achieve a European transport system that is resource-efficient, climate- and environmentally-friendly, safe and seamless for the benefit of all citizens, the economy and society.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Achieve a resource- and water-efficient and climate change resilient economy and society, protection and sustainable management of natural resources and ecosystems and a sustainable supply and use of raw materials.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>*Foster a greater understanding of Europe, providing solutions and supporting inclusive, innovative and reflective European societies.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Foster secure European societies in a context of unprecedented transformations and growing global interdependencies and threats, while strengthening the European culture of freedom and justice.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Spread excellence and widening participation.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>*Support science with and for society.</p>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### III RELEVANCE AND IMPLEMENTATION OF HORIZON 2020

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In **part III**, we would like to know whether Horizon 2020 priorities and forms of funding respond e.g. to current challenges as well as to the needs and expectations of stakeholders. Some questions in this part are addressed to participants in Horizon 2020 projects and focus on different aspects of Horizon 2020 implementation. Hands-on experience with project preparation and management will represent important feedback for us.

**10. Do you think that:**

	Not at all	To some extent	To large extent	Fully	I don't know
*Horizon 2020 priorities address the current challenges confronted by the European Union (e.g. migration, terrorism, ageing population)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Horizon 2020 priority areas and calls support the latest developments in research and innovation at the national /European and international level	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Horizon 2020 is stimulating disruptive and market-creating innovation (a new process, product or service that upsets existing business models and serves new set of customers)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Horizon 2020 addresses the main citizens' needs in terms of research and innovation	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Horizon 2020 thematic coverage is flexible enough to cope with changing circumstances	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**11. Are the forms of funding provided through Horizon 2020 relevant to your needs?**

	Not at all	To some extent	To large extent	Fully	I don't know
*Grants for collaborative projects	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Grants for single beneficiary projects	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Financial instruments (e.g. loans, guarantees)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Public procurement	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Prizes	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Co-fund (e.g. ERA-NET)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**11.1 Please provide here any other comments (if any) on the relevance of Horizon 2020 priorities and forms of funding.**

*500 character(s) maximum*

Priority should be given to research that benefits the whole society by having the research data, process and results publicly and freely available, including the use of open data standards or licensing models for the data gathered, used or generated, as well as being available in Open Standard formats, free software licenses for the software used and created to process the data or as the research result, and the research itself should be published under freely available Open Access models.

**IV EFFICIENCY AND EU ADDED VALUE**

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**Part IV** takes a closer look at the costs and benefits of participation in Horizon 2020 as well as at the EU added value of Horizon 2020.

**\* 17. How do you rate the overall added value of Horizon 2020 compared to national and/or regional level research and innovation programmes in EU Member States?**

- Higher
- Similar
- Lower
- I don't know

**18. What are the main expected benefits of participating in Horizon 2020 compared to national and/or regional research and innovation programmes in EU Member States?**

*between 1 and 5 answered rows*

	My choice
More cooperation with partners from other countries	<input type="radio"/>
Improved excellence in research and innovation (e.g. more high impact publications and patents)	<input type="radio"/>
Improved international visibility	<input type="radio"/>
Strengthened critical mass to address pan-European challenges in a given area of research and innovation	<input checked="" type="radio"/>
More tests of technologies through pilot lines and demonstrator projects	<input type="radio"/>
Strengthened cooperation between academia and the private sector	<input type="radio"/>
Strengthened interdisciplinary cooperation	<input checked="" type="radio"/>
Projects financed (which otherwise could not be supported at national and/or regional level)	<input type="radio"/>
Research and innovation risk shared out	<input type="radio"/>
Reimbursement of costs at a higher level than in national and/or regional research and innovation programmes	<input type="radio"/>

**18.1 Please provide here any further comments (if any) on the EU added value of Horizon 2020**

*500 character(s) maximum*

Horizon 2020 primary goal is to invest large amounts of EU funds in scientific research for the common good. Consequently, the produced knowledge should be treated as a public good that will boost innovation and lead progress. Thus, the results of cooperative efforts must be made freely available to all scientists, for all purposes. In the digital age, this approach is translated as demand for Open Access and Open Science based on Open Standards and Free Software, maximizing the ROI.

**19. What would be the impact for you or your organisation if the EU support to research and innovation (Horizon 2020 and its possible successor) were to be discontinued?**

*500 character(s) maximum*

If the EU support to research and innovation was to be discontinued, this would have a detrimental effect on scientific cooperation and Open Science in Europe, one of the main principles of Horizon 2020. Due to the importance of software in science nowadays and the universality of its development, the losses of discontinued support will be uncountable for discovery, innovation, societal sustainability and growth. The current targets for some of these projects go, already, farther than 2020.

## **V INTERNAL STRUCTURE OF HORIZON 2020 AND SYNERGY WITH OTHER EU PROGRAMMES**

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Horizon 2020 offers many funding opportunities and in **part V** we would like to collect information about the internal structure of Horizon 2020. We also look at other European Union funding programmes and their synergies and/or overlaps with Horizon 2020.

**20. To what extent do you agree with the following statements regarding the internal structure of Horizon 2020?**

	I strongly disagree	I disagree	I agree	I strongly agree	I don't know
*The different parts of Horizon 2020 complement each other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*Combining different forms of support for research and innovation under one single programme better addresses stakeholder needs than having separate programmes	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*The increased use of calls for cross cutting activities and interdisciplinary work is a positive feature in the programme	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*In general, there is more coherence and synergy between different parts of Horizon 2020 than in the 7th Framework Programme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

**21. The European Commission implements several funding programmes. How would you describe the linkages between Horizon 2020 and the following programmes?**

	Work in synergy	Overlap	Work in synergy but some overlaps exist	Complement each other	I don't know
*European Structural and Investment Funds	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*European Fund for Strategic Investments (EFSI)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Programme for Competitiveness of Enterprises and small and medium-sized enterprises (COSME)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Erasmus+	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*The LIFE Programme	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Common Agricultural Policy (CAP)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Connecting Europe Facility (CEF)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

**21.1 Please provide here any further comments (if any) on synergy, complementarity and/or overlaps within Horizon 2020 and with other funding programmes.**

*500 character(s) maximum*

**\* 22. Overall are you so far satisfied with Horizon 2020?**

- Very satisfied
- Satisfied
- Dissatisfied
- Very dissatisfied
- I don't know

## **VI FORWARD LOOKING QUESTIONS**

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Horizon 2020 will end in the year 2020 and we would like to have a first overview of relevant issues and feedback for a possible successor programme. The European Commission's goal is to maximize the socio-economic impact of the EU support to research and innovation, so we would like to hear from you what could be done to achieve this.

23. Horizon 2020 mainstreams sustainable development as a cross-cutting issue for collaborative research and dedicates 60% of its budget to sustainable development. Research and innovation is an important driver for the implementation of the Sustainable Development Goals. The FP7 ex-post evaluation concluded that Horizon 2020 and its successors should focus on critical challenges and opportunities in the global context.

**Please choose up to 5 [Sustainable Development Goals](#) on which, in your opinion, the future EU framework programmes for research and innovation should focus.**

*between 1 and 5 answered rows*

	My choice
End poverty in all its forms everywhere	<input type="radio"/>
End hunger, achieve food security and improved nutrition and promote sustainable agriculture	<input type="radio"/>
Ensure healthy lives and promote well-being for all at all ages	<input type="radio"/>
Ensure inclusive and quality education for all and promote lifelong learning	<input checked="" type="radio"/>
Achieve gender equality and empower all women and girls	<input type="radio"/>
Ensure access to water and sanitation for all	<input type="radio"/>
Ensure access to affordable, reliable, sustainable and modern energy for all	<input type="radio"/>
Promote inclusive and sustainable economic growth, employment and decent work for all	<input type="radio"/>
Build resilient infrastructure, promote sustainable industrialization and foster innovation	<input type="radio"/>
Reduce inequality within and among countries	<input checked="" type="radio"/>
Make cities inclusive, safe, resilient and sustainable	<input checked="" type="radio"/>
Ensure sustainable consumption and production patterns	<input type="radio"/>
Take urgent action to combat climate change and its impacts	<input type="radio"/>
Conserve and sustainably use the oceans, seas and marine resources	<input type="radio"/>
Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss	<input type="radio"/>
Promote just, peaceful and inclusive societies	<input checked="" type="radio"/>
Revitalize the global partnership for sustainable development	<input checked="" type="radio"/>

**24. In your opinion, what is the most important issue/problem/opportunity to be addressed by the EU framework programmes for research and innovation? Indicate one area/topic.**

*200 character(s) maximum*

Software should be considered fundamental to Open Science. In order for research to be valid, accessible and transparent, the access to software must be ensured under Free Software licenses.

**25. To what extent do you agree that the following issues are needed to further maximize the socio-economic impact of the EU framework programme for research and innovation?**

	I strongly disagree	I disagree	I agree	I strongly agree	I don't know
*Increased budget for financing research and innovation at EU level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*More room for bottom-up proposals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*Better defined priorities for research and innovation activities	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Increased involvement of citizens in priority setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*Increased use of cross-cutting calls (e.g. calls responding to more than one societal challenge)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Increased coordination/synergy with other EU programmes	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Better access to the programme for newcomers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

*Increased focus on capacity-building activities for research and innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*Increased focus on supporting closer to market activities	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Increased focus on supporting demonstration	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Increased focus on fundamental research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*Increased dissemination activities for the results of funded projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
*Increased focus on support for the exploitation of research results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

**25.1 Please provide here any further comments (if any) on issues you find important regarding a possible successor programme to Horizon 2020.**

*500 character(s) maximum*

Open Standards should be preferred for the dissemination of scientific publications and the archival of all articles, data, and software used in scientific research. Software developed with public funding must be published under Free Software licenses and should archived in a public software repository ensuring long term availability and persistent identification. Data and software repositories must employ Free Software in order to ensure access to their content and long term preservation.

**26. Please upload a document (e.g. position paper) if you wish to share any further comments /recommendations regarding the implementation of EU framework programmes, and in particular on Horizon 2020.**

*The maximum file size is 1MB.*

*Please note that the uploaded document will be published alongside your response to the questionnaire which is the essential input to this open public consultation. The document is an optional complement and serves as additional background reading to better understand your position.*

**816dd405-09cc-49dc-baa2-f6789bf75775/ANSOL-PositionPaperHorizon2020.pdf**

**Please share with us a short, telegraphic testimonial. What does Horizon 2020 mean to you? What is its main feature?**

*200 character(s) maximum*

Horizon 2020 is a pool of innovation and cooperation and should further endorse the principle of Open Science, by adding Open Data, Free Software and Open Standards to be essential to its goals.

## **Contact**

RTD-H2020-IE@ec.europa.eu

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# Position paper for the endorsement of Free Software and Open Standards in Horizon 2020 and all publicly-funded research

ANSOL - Associação Nacional para o Software Livre

“ANSOL - Associação Nacional para o Software Livre” is a Portuguese non-profit organization that aims to publicize, promote, develop, research and study Free Computing and its social, political, philosophical, cultural, technical and scientific repercussions.

We believe that software has an ever-growing impact on society. That impact can both work in favor or against several of our society goals, depending on a great number of factors, such as its equal availability. Software can, indeed, lower barriers, and promote values of freedom and equality, if the software is, in itself, free.

Being that Horizon 2020 puts emphasis on excellent science, industrial leadership and tackling societal challenges<sup>1</sup>, we strongly believe that it should pay great attention to the usefulness of Free Software in ensuring excellence in science and research, enable the creation of an environment friendly to high-quality innovation, and having a strong and positive impact in the overall society.

Furthermore, we believe that the maximization of software’s positive impact, as well as of the return of investment on Horizon 2020, can be achieved by coupling Free Software with Open Data, Open Access and Open Standards, which, we believe, should be mandatory for all publicly-funded research.

Taking this into account, ANSOL fully supports Free Software Foundation Europe’s position paper on this matter, which we hereby add as an annex, including its analysis and recommendations.

Lisbon, 15th of January of 2017

Marcos Marado Torres, President

ANSOL - Associação Nacional para o Software Livre

E-mail: [direccao@ansol.org](mailto:direccao@ansol.org)

WWW: <https://ansol.org>

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<sup>1</sup> <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

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POSITION PAPER FOR THE ENDORSEMENT OF FREE SOFTWARE AND OPEN STANDARDS IN HORIZON 2020 AND ALL PUBLICLY-FUNDED RESEARCH

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Olga Gkotsopoulou, Erik Albers, Roberto Di Cosmo,  
Polina Malaja, Fernando Sanjurjo  
Free Software Foundation Europe  
Schönhauser Allee 6/7  
Berlin, Germany

## Abstract

The Free Software Foundation Europe (FSFE) is a charity that empowers users to control technology by advocating for Free Software. In a digital world, Free Software is the fundament of Open Knowledge, Open Innovation and Open Science.

Software is an integral part of today's society. Our daily interactions, transactions, education, communication channels, work and life environments rely heavily on software. "Free Software" refers to all programs distributed under terms and licences that allow users to run the software for any purpose, to study how the program works, to adapt the program to their needs, to improve the program and to distribute the improved version of it so that the general public can benefit. Source code is a precondition for a user to study how the program works. The Free Software ideals of transparency, openness and collaboration are very much the same as the principles endorsed in scientific community, theory and process, and will support scientific and technological innovation in Europe and worldwide.

This paper summarises the FSFE's key recommendations on the midterm evaluation of the Horizon 2020 and the European Commission's efforts to draft the Framework Programme 2018-2020. Implementing these recommendations will unlock the full potential of Open Science and Open Access investments, which are at the core of Horizon 2020.

In line with the European Parliament resolution of 19 January 2016 "Towards a Digital Single Market Act" (2015/2147(INI)) and common practices in major research institutions such as MIT, CERN and others, the FSFE makes the following recommendations:

- 1. Open Standards should be preferred for all knowledge exchange, and in particular for the dissemination of scientific publications and the archival of all articles, data, and software used in scientific research. The use of Open Standards in data and software repositories and Data Management Plans (DMPs) concerning the Horizon 2020 publications, is necessary to ensure data preservation and Open Science. Research Funding Organisations should take the lead and foster changes of business models when dealing with research data.**
- 2. Software developed with public funding, and in particular in the framework of the Horizon2020 programme should be mandatorily published under a Free Software licence.**
- 3. Software developed with public funding, and in particular in the framework of the Horizon2020 programme should be mandatorily archived in**

a public software repository ensuring long term availability and persistent identification.

4. Data and software repositories and Data Management Plans (DMPs) must employ Free Software in order to ensure unfettered access to their contents and long term preservation.
5. An “Open Science” Prize should be established to raise awareness and promote Open Science.

## Introduction

### A Free Software project is like a scientific process

Free Software ideals are very similar to those which are fundamental to the scientific method. Both, Free Software and scientific theory, are based on transparency, openness and collaboration.

One of the pillars of the scientific method, is the ability to formulate a scientific theory and then test and improve it by independently reproducing and verifying it via scientific experiments.

Another essential pillar is the openness of scientific results to the whole scientific community to allow further research or validation. A scientific theory receives acceptance when the data and the method that has been used to work out the theory are available in full.

A scientific theory gains validation by its openness of data and methods which allow additional evidence to be gathered. It is an inherent part for a scientific theory to be rejected, approved or modified. Over time, as successive modifications build on top of each other, theories consistently improve and greater predictive accuracy is achieved. Different theories complement each other and create an environment of science and knowledge that is open to humanity to use, study, share and improve.

In a similar way, Free Software embodies the spirit of openness of data and methods (source code), verification and collaboration. As software is written code, it can be shared and improved like any other written knowledge or information. Free Software in this respect refers to all programs distributed under terms and licences that allow everyone to run the software for any purpose, to study how the program works, to adapt the program to their needs and improve it, while being able to distribute the improved version of the program so the general public can benefit from it.<sup>1</sup>

Using and furthering Free Software means that the code is open to be used and improved by private companies, organisations, public institutions and the general public. Improvements of the software are available for the public, so the whole society benefits. And just like in the world of science, different pieces of Free Software complement each other and create an environment of software and knowledge that is open to humanity.

Open Science, one of the main principles promoted by Horizon 2020, acknowledges how important it is for the future of Europe to have large-scale interactions in the research

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<sup>1</sup>Free Software, also known as ‘open source’. See more: Free Software Foundation, What is Free Software <https://www.gnu.org/philosophy/free-sw.html>. Accessed 23/11/2016.

community, as this will speed up discovery and innovation. As OECD puts it in its latest Outlook report, Open Science is the next frontier.<sup>2</sup>

Nowadays, software is an integral part of nearly all modern research from data aggregation to the application of methods and the calculation of final results. Talking about “Open Science” means in this respect the openness of the software, the data and the file formats that are in use. Only the openness of the digital environment will allow modern research to further share the data and methods in use of their research and to keep open the environment of science and knowledge. This openness is in need of the use and development of Free Software.

In addition, the European Commission (EC) believes that as change accelerate and instability becomes the new norm, public engagement with science becomes key for Europe<sup>3</sup>. As we have seen, the freedom of the software to be used allows the general public and private companies to participate in the improvement of the sources. This means that the use of Free Software and Open Standards allows a boost in scientific tools and new modes of private engagement like citizen science.

## Significance of software nowadays

Software is a vital part of today’s society. Our daily lives, communication, interaction and the way we distribute and share information and knowledge is unimaginable without software. The digital revolution has meant almost every process or product relies on software, revealing the latter’s big economic value. Just as scientific research has included the use of digital technology, software has become an integral part of modern research across all disciplines<sup>4</sup>.

Conducting reliable research requires the scientific method to be transparent in order to be able to reproduce under the same circumstances. When Free Software is not used in scientific research, the possibility to do so is limited as the researcher lacks full access to the software used. This makes it impossible for the rest of the research community to access essential parts of the method that was used for the findings.

For accessibility, reproduction and transparency in scientific research, the use of Free Software is inevitable. Some authors identify the movement towards a Free Software

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<sup>2</sup>OECD (2016), OECD Science, Technology and Innovation Outlook 2016 [http://dx.doi.org/10.1787/sti\\_in\\_outlook-2016-en](http://dx.doi.org/10.1787/sti_in_outlook-2016-en), OECD Publishing Paris.

<sup>3</sup>European Commission, Directorate-General for Research and Innovation, Strategic Foresight: Towards the 3rd Strategic Programme of Horizon 2020 <https://bookshop.europa.eu/en/strategic-foresight-pbKI0215938/>, Brussels 2016, p 43. Accessed 23/11/2016.

<sup>4</sup>American Scientist, How Do Scientists Really Use Computers? <http://www.americanscientist.org/issues/pub/how-do-scientists-really-use-computers/1> Accessed 23/11/2016.

development of technology as part of the megatrends that will drive innovation and change the face of the world the next years.<sup>5</sup>

## Why is Free Software important for scientific research?

The FSFE believes that in order to be valid, research has to be conducted using Free Software, as it is the only way to ensure fully transparent access to its methodology. To choose a software that is not published under a Free Software licence<sup>6</sup>, is a choice against transparency.

To illustrate the importance, we can look into the recent Volkswagen emissions scandal. A scandal that revealed Volkswagen had intentionally programmed diesel engines to cheat during laboratory emissions testing. As a result of these software manipulations, it was later known that the Volkswagen engines emitted nitrogen oxide pollutants up to 40 times above what is allowed in the US,<sup>7</sup> while test results showed the cars to meet allowed US standards. The software was revealed by a group of private researchers after years of independent research.

The Volkswagen case shows how important the reliability of software is for scientific metrics, method applications and calculation of results. Other software leaves researchers in uncertainty and in the uncomfortable position to take results as granted instead of having the possibility to testify and verify them. Free Software instead, as argued above, offers transparency and verification of the whole research process.

However, the benefits of Free Software go way beyond the matter of transparency and accessibility. Free Software also offers the only way for scientific research to be sustainable and accessible in the long run. Free Software offers no legal costs and less legal uncertainty when it comes to the reuse and distribution of software used in research projects, making it perfect for transnational scientific collaboration, which is on the rise.<sup>8</sup> The use of Free Software in publicly funded research would boost cooperation inside the European science community and reduce research cost. Free Software is reusable multiple times and not subject to the restrictions and barriers imposed by other software.

As the scientific research community relies more and more on digital data repositories to manage and disseminate scientific data, it is crucial the underlying systems that

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<sup>5</sup>OECD (2016), OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris.

<sup>6</sup>Free Software licence as approved by the Free Software Foundation <https://www.gnu.org/licenses/license-list.html> and Open Source Initiative <https://opensource.org/licenses/>.

<sup>7</sup>Hotten, R. (10 December 2015) Volkswagen: The scandal explained <http://www.bbc.com/news/business-34324772>, British Broadcasting Corporation. Accessed 23/11/2016.

<sup>8</sup>OECD, OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris.

run these repositories are based on Free Software and offer their content in Open Standards.<sup>9</sup>

Digital preservation requires an ability for information stored or encoded in one technology to be migrated to another data format, operating system or hardware. It is inevitable and unavoidable. For this purpose, only repositories that are based on Free Software and Open Standards can guarantee long-term preservation and universal access to the data, as they allow the biggest interoperability between different technologies.

In contrast, software repositories based on closed incompatible standards may produce technological incompatibilities, limitation of the universal access and possibly higher costs of maintenance and future migration processes.

## Recommendations

### Data preservation and Open Science through Open Standards

- **Open Standards should be preferred for all knowledge exchange, and in particular for the dissemination of scientific publications and the archival of all articles, data, and software used in scientific research. The use of Open Standards in data and software repositories and Data Management Plans (DMPs) concerning the Horizon 2020 publications, is necessary to ensure data preservation and Open Science. Research Funding Organisations should take the lead and foster changes of business models when dealing with research data.**

Open Standards are the foundation of cooperation in modern society.<sup>10</sup> They allow people to share data freely, prevent vendor lock-in and other artificial barriers to interoperability, and promote choice among vendors and technology solutions.<sup>11</sup>

The best example of the significant value of interoperability and Open Standards is the World Wide Web. If the World Wide Web was stripped of its interoperability features, the Web as we know it today would never have existed. The Internet itself grew

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<sup>9</sup>Free Software Foundation Europe (FSFE), Open Standards <https://fsfe.org/activities/os/os.en.html>. Accessed 23/11/2016.

<sup>10</sup>Ibid.

<sup>11</sup>Wikibooks, FOSS Open Standards/Importance and Benefits of Open Standards [https://en.wikibooks.org/wiki/FOSS\\_Open\\_Standards/Importance\\_and\\_Benefits\\_of\\_Open\\_Standards](https://en.wikibooks.org/wiki/FOSS_Open_Standards/Importance_and_Benefits_of_Open_Standards), September 2014. Accessed 20/11/2016.

mainly thanks to widely shared protocols and standards<sup>12</sup>, that are easily accessible to everyone.

Regarding Open Knowledge and Open Science, the whole research process should be structured upon comprehensive policies that encompass measures related to the reuse and re-distribution of scientific data, ensuring universal participation and cooperation. These measures must be taken into account at all levels of a scientific process when designing, creating, disseminating and evaluating data, information and knowledge.<sup>13</sup>

The FSFE therefore suggests the full endorsement of Open Standards, defined hereinafter, as a necessary condition to ensure data preservation and Open Science. An Open Standard<sup>14</sup> refers to a format or protocol that is:

- subject to full public assessment and use without constraints in a manner equally available to all parties;
- without any components or extensions that have dependencies on formats or protocols that do not meet the definition of an Open Standard themselves;
- free from legal or technical clauses that limit its utilisation by any party or in any business model;
- managed and further developed independently of any single vendor in a process open to the equal participation of competitors and third parties;
- available in multiple complete implementations by competing vendors, or as a complete implementation equally available to all parties.

The FSFE suggests that this definition is included in the Guidelines on Open Access Policy and that Open Standards become mandatory for data repositories and DMPs concerning the Horizon 2020 publications.

## Free Software as the default option for Horizon 2020

- **Software developed with public funding, and in particular in the framework of the Horizon2020 programme should be mandatorily published under a Free Software licence.**

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<sup>12</sup>JPI Climate symposium, Report on “Designing Comprehensive Open Knowledge Policies to Face Climate Change” [www.jpi-climate.eu/media/default.aspx/emma/org/10868118](http://www.jpi-climate.eu/media/default.aspx/emma/org/10868118), Vienna, October 2015. Accessed 20/11/2016.

<sup>13</sup>Aliprandi, S. (2011), Interoperability and open standards: the key to true openness and innovation, in: *International Free and Open Source Software Law Review*, 3(1), pp 5 – 24, DOI: 10.5033/ifos-slr.v3i1.53.

<sup>14</sup>Free Software Foundation Europe (FSFE), Open Standards definition <https://fsfe.org/activities/os/def.en.html>, October 2016. Accessed 20/11/2016.

The FSFE calls for all software being developed in-house or by service partners paid with public money or public-private partnerships to be published under a Free Software licence. This way, the solutions developed by one research institution can be reused and distributed to other educational establishments and research institutions.

Several European research organisations and institutions are ‘locked’ into their ICT systems because knowledge about how the system works is available only to their specific vendor. This means every time they need to purchase new components or licences, only a single vendor can provide them. This severe lack of competition leads to higher prices and some € 1.1 billion per year is lost unnecessarily, in the public sector alone.<sup>15</sup> Reusable solutions, on the other hand, that are easily adaptable and customisable independently from a single vendor will help to reduce the possibility of ICT vendor lock-in in all fields heavily dependant on software solutions<sup>16</sup>.

Releasing publicly funded software as Free Software also benefits society at large, as software can be reused, further developed and improved by everyone outside of the single public institution. Improvements can be done by single persons, other public institutions or even private companies. This way, everyone can benefit. In other words, the demand for publicly funded software to be published as Free Software underlines the need for “Science with and for Society”, as described in the Work Programme 2018-2020.<sup>17</sup>

In this respect, the FSFE calls for full implementation of the European Parliament resolution of 19 January 2016 “Towards a Digital Single Market Act” (2015/2147(INI)) where the European Parliament urges the European Commission to increase the share of Free Software and its reuse in and between public administrations as a solution to increase interoperability.<sup>18</sup> Additionally, the European Parliament demands that the EU 2020 strategy’s research and innovation targets include [...] “the increased use of free and open source software, particularly in educational establishments and public administrations,

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<sup>15</sup>European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions, Against lock-in: building open ICT systems by making better use of standards in public procurement <https://ec.europa.eu/digital-single-market/en/news/against-lock-building-open-ict-systems-making-better-use-standards-public>, Brussels June 2013. Accessed 04/01/2017.

<sup>16</sup>Ibid.

<sup>17</sup>European Commission, Annex 1 - Background Paper to the Consultation on potential strategy and priorities for research and innovation in the Horizon 2020 “Science with and for Society” Work Programme 2018-2020 <https://ec.europa.eu/research/consultations/swafs-wp2018-2020/background.pdf>, Brussels, March 2016. Accessed 24/11/2016.

<sup>18</sup>European Parliament, Resolution of 19 January 2016 on Towards a Digital Single Market Act (2015/2147(INI)) <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2016-0009+0+DOC+XML+V0//EN>, point 110. Accessed 22/11/2016.

and easier access for SMEs and start-ups to Horizon 2020 funding adapted to the short innovation cycles of the ICT sector[emphasis added].”<sup>19</sup>

The FSFE supports the European Parliament’s demands and asks the European Commission to take these demands duly into consideration when drafting the Work Programme 2018-2020.

Such a decision also goes in hand with prominent international public institutions that are using Free Software licences to release software that was funded and/or developed with public funds. In the USA, many public universities (e.g. MIT) and institutions (e.g. NASA) publish most of their software that does not contain any sensitive data, as Free Software. In Europe, the European Organization for Nuclear Research (CERN), an institution that is at the forefront of scientific and technological advancement, is basing its infrastructure on Free Software, and has a long tradition of Open Access.

## Endorsing Free Software as part of Open Science

### The Principle of Openness in Horizon2020

Horizon 2020 is the financial instrument implementing the Innovation Union which is the Europe 2020 flagship initiative aiming at securing Europe’s global competitiveness. Its primary goal is to invest EU funds in scientific research for the common good.<sup>20</sup> Such common good can be scientific advances and technological inventions that ensure better living conditions, cure for incurable diseases, a growing employment environment and a sustainable future for the generations to come.

The produced knowledge should also be treated as a public good that will boost innovation and lead progress in Europe and beyond. As stated in the Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020, “the Europe 2020 strategy for a smart, sustainable and inclusive economy underlines the central role of knowledge and innovation in generating growth.”<sup>21</sup>

According to Robert K. Merton, the results of scientific work are the results of cooperative efforts and must be made available to all scientists<sup>22</sup>. In the digital age, this

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<sup>19</sup>Ibid, point 125.

<sup>20</sup>European Commission, Communication from the Commission “Europe 2020 - A strategy for smart, sustainable and inclusive growth” <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>, Brussels, March 2010. Accessed 23/11/2016.

<sup>21</sup>European Commission, Directorate-General for Research and Innovation, H2020 Programme - Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 v. 3.1. [https://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-pilot-guide\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf), Brussels, August 2016. Accessed 23/11/2016.

<sup>22</sup>Merton, R. K., *The Normative Structure of Science*, in Merton, Robert K., *The Sociology of Science: Theoretical and Empirical Investigations*, University of Chicago Press, Chicago 1973.

approach is translated as demand for Open Access and Open Science based on Open Standards and Free Software, because the latter two contribute not only to scientific but also to social progress. New possibilities of sharing and access to information will boost knowledge management and enable new modes of civil participation like the so-called citizen science.<sup>23</sup>

So far, Open Access and Open Science try to grow from a theory to a reality.<sup>24</sup> However, for the time being the reality of access to scientific data is that only a very small number of publications are openly accessible,<sup>25</sup> despite the fact that more and more scientists choose Open Access models for the publication of results.<sup>26</sup>

Two recent European Commission public consultations showed that researchers, libraries, funders and businesses believe that the access to scientific information is problematic and this is a key barrier to the circulation of knowledge in Europe. Respondents to these consultations indicated Open Access as the key tool to overcome limitations. Over 90% of respondents believed publications resulting from publicly funded research should be available by open access.<sup>27</sup>

Open Access practices are well into play already in the anglo-saxon world. Specifically in the U.S., any work wholly financed by federal funds must be freely accessible to all,<sup>28</sup> while the so-called Public Access to Science Act, aims to extend this to any research work that receives major funding from public resources.<sup>29</sup> In the UK, all publicly funded work is being published under the Open Government Licence that grants access and reuse rights to everyone.

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<sup>23</sup>Fecker Benedikt, et al., Open Access oder: die Zurückeroberung der Autonomie, Alexander von Humboldt – Institut fuer Internet und Gesellschaft <https://www.hiig.de/blog/open-access-oder-die-zurueckeroberung-der-autonomie/>, HIIG Blog, November 2016. Accessed 23/11/2016.

<sup>24</sup>Organisation for Economic Co-Operation and Development (OECD), Making Open Science a Reality <http://dx.doi.org/10.1787/5jrs2f963zs1-en>, OECD Science, Technology and Industry Policy Papers, No. 25, OECD Publishing, Paris 2015. Accessed 23/11/2016.

<sup>25</sup>European Commission, The 3 Os: Open Innovation, Open Science, Open to the World <https://bookshop.europa.eu/en/open-innovation-open-science-open-to-the-world-pbKI0416263/>, Brussels 2016. Accessed 23/11/2016.

<sup>26</sup>OECD, OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris.

<sup>27</sup>European Commission, Background note on open access to publications and data in Horizon 2020 [https://ec.europa.eu/research/science-society/document\\_library/pdf\\_06/background-paper-open-access-october-2012\\_en.pdf](https://ec.europa.eu/research/science-society/document_library/pdf_06/background-paper-open-access-october-2012_en.pdf), Brussels. Accessed 23/11/2016.

<sup>28</sup>Van Noorden, R., US science to be open to all <http://www.nature.com/news/us-science-to-be-open-to-all-1.12512>, in: Nature 494, February 2013, pp. 414–415 Accessed 01/12/2016.

<sup>29</sup>Di Cosmo, R., Scientific Publications: The Role of Public Administrations in The ICT Era in: Free Software Licenses in Context <http://www.dicosmo.org/FSP/FATOS-Upgrade-03-2006.pdf>, UPGRADE Vol. VII, No. 3, June 2006. Accessed 29/11/2016.

Thus, it is time for the European Union to take initiative. Scientific data and results paid with public money should be made available to the public.<sup>30</sup> In particular, publicly funded research must not disappear or lose its value due to payment barriers and private commercial interests.<sup>31</sup>

On the contrary, publicly funded research should become accessible to the public in efficient and sufficient ways. This will help the global scientific community and will strengthen the reputation of European science and European institutions within the EU. A good Open Access strategy will put the European Union in the forefront of a modern and digital science community.<sup>32</sup> Research institutions and universities all over the world call for Open Access and are engaged in collective initiatives for its promotion or have created their own Open Access policies.<sup>33</sup>

In addition, free public access to all publicly funded research is already described by the European Commission as “a vision of the future” of Open Science not only in Europe, but globally for the year 2030.<sup>34</sup>

### **Inclusion of software under Open Access**

- **The software used or developed during scientific research, as integral part of scientific data should be covered by Open Access rules.**

The FSFE endorses the conclusions drawn by the Council of the European Union towards an Open Science system and acknowledges that unnecessary legal, organisational and financial barriers to access results of publicly funded research should be removed as much as possible.<sup>35</sup>

Based on the specific aspects presented in the first Annex of the Background Paper to the consultation on potential strategy and priorities for research and innovation

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<sup>30</sup>OECD, OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris.

<sup>31</sup>European Commission, Online survey on scientific information in the digital age available%20at:%20[https://ec.europa.eu/research/science-society/document\\_library/pdf\\_06/survey-on-scientific-information-digital-age\\_en.pdf](https://ec.europa.eu/research/science-society/document_library/pdf_06/survey-on-scientific-information-digital-age_en.pdf), European Union, 2012. Accessed 23/11/2016.

<sup>32</sup>OECD, OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris.

<sup>33</sup>Here are some examples: the DEAL project <https://www.projekt-deal.de/>, the Budapest Open Access Initiative <http://www.budapestopenaccessinitiative.org/>, the Max-Planck Institute <https://openaccess.mpg.de/Berlin-Declaration>.

<sup>34</sup>European Commission, Directorate-General for Research and Innovation, “Open innovation, open science, open to the world: A vision for Europe” <http://bookshop.europa.eu/en/open-innovation-open-science-open-to-the-world-pbKI0416263/?CatalogCategoryID=Gj0KABst5F4AAAEjsZAY4e5L>, 2016, page 34. Accessed at 02/12/2016.

<sup>35</sup>Council of the European Union, The transition towards an Open Science system - Council conclusions <http://data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf> (adopted on 27/05/2016), 8791/16 RECH 133 TELECOM 74, Brussels May 2016. Accessed 23/11/2016.

in the Horizon 2020 “Science with and for Society” Work Programme 2018-2020<sup>36</sup>, Free Software can be considered as deeply related to the most important aspects of it, such as public engagement, science education, ethics, open access and governance.

To specify, Free Software could be incorporated in many of the “Science With and For Society” Advisory Group’s suggestions and in particular concerning the following points: encouraging the youth to follow scientific and technological careers, promoting the so-called citizen science, and more importantly, developing the accessibility and (re-)use of the results of publicly-funded research.<sup>37</sup>

On the other side, in the EC Guidelines on Open Access, special attention is drawn upon the benefits of the broader access to scientific publications and data, including software and software tools/applications. The guidelines specifically encourage projects to provide information and access to specialised software or code in order to validate the results.<sup>38</sup>

Taking a closer look, it is obvious that benefits of Open Access do coincide with the four freedoms provided by Free Software licences: to use software, to study how it works, to share it with others, and to improve it according to one’s needs. Thus, Open Access should not be merely understood as “free online access to publications”, but instead to receive a more sophisticated definition, including the four specific freedoms.

In particular, the ability to build upon previous research results, which leads to improved quality of results, is a synonym to the freedom to improve the given software, based on previously developed code [“standing on the shoulder of giants”]. The encouragement of collaboration among the scientists and the avoidance of duplication or greater effort, coincides with the freedoms to use and to share software. Involving citizens and society, ensuring greater transparency of the scientific process is similar to the freedom to study how the software works. This means that there are no obstacles in logically extending EU Open Access policies to software. It is also noteworthy, that historically, Open Access movement has been closely related to Free Software that helped to shape

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<sup>36</sup>European Commission, Annex 1 - Background Paper to the Consultation on potential strategy and priorities for research and innovation in the Horizon 2020 “Science with and for Society” Work Programme 2018-2020 <https://ec.europa.eu/research/consultations/swafs-wp2018-2020/background.pdf>, Brussels, March 2016. Accessed 24/11/2016.

<sup>37</sup>“Science With and For Society” Advisory Group, Strategic Opinion for research and innovation in the Horizon 2020 Work Programme 2018–2020 - Recommendations to the European Commission [https://ec.europa.eu/research/swafs/pdf/strategic\\_opinion\\_final.pdf](https://ec.europa.eu/research/swafs/pdf/strategic_opinion_final.pdf), Brussels May 2016. See p.19: points a), b) and e). Accessed 23/11/2016.

<sup>38</sup>European Commission, Directorate-General for Research and Innovation, H2020 Programme - Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 v. 3.1. [https://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-pilot-guide\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf), Brussels, August 2016. Accessed 23/11/2016.

the existing principles and ideas of Open Access as we know it today.<sup>39</sup> Consequently, there is no reason to deny the treatment of software on the equal level with scientific publications and data from scientific research as a part of broader Open Science movement.

In addition, the four freedoms granted by Free Software speed-up innovation, which in turn leads to faster market access and growth.<sup>40</sup> The Commissioner for Research, Science and Innovation Carlos Moedas has repeatedly emphasised on the importance of Open Innovation and Open Science for the overall growth of a society.<sup>41</sup>

Therefore, in a future revision of the European Commission's policy on Open Access and more specifically, the Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020,<sup>42</sup> the FSFE suggests the inclusion of an annex for publishing software under FSF and OSI approved licences.<sup>43</sup> Moreover, we consider that Free Software and Open Standards should be explicit part of the Strategic Foresight,<sup>44</sup> the report which aims to support the preparation of the third strategic programme of Horizon 2020 (2018-2020), under the umbrella of Open Science.

It should be made clear that publishing software under Free Software licences does not mean that the researchers cannot have a financial profit out of their work<sup>45</sup>. It only means that their code carries the four freedoms.<sup>46</sup> If there are no specific ad hoc restrictions, there is no problem with the adoption of a Free Software licence over the project results. Free Software licensing might provide for better visibility, outreach and

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<sup>39</sup>Laakso, M., et al "The Development of Open Access Journal Publishing from 1993 to 2009" <http://dx.doi.org/10.1371/journal.pone.0020961>, PLOS, 2011. Accessed 22/12/2016.

<sup>40</sup>"Science With and For Society" Advisory Group, Strategic Opinion for research and innovation in the Horizon 2020 Work Programme 2018-2020 - Recommendations to the European Commission [https://ec.europa.eu/research/swafs/pdf/strategic\\_opinion\\_final.pdf](https://ec.europa.eu/research/swafs/pdf/strategic_opinion_final.pdf), Brussels May 2016. Accessed 23/11/2016.

<sup>41</sup>Moedas, C., Commissioner for Research, Science and Innovation, Open Innovation, Open Science, Open to the World in : "A new start for Europe: Opening up to an ERA of Innovation" Conference [http://europa.eu/rapid/press-release\\_SPEECH-15-5243\\_el.htm](http://europa.eu/rapid/press-release_SPEECH-15-5243_el.htm), Brussels June 2015. Accessed 24/11/2016.

<sup>42</sup>European Commission, Directorate-General for Research and Innovation, H2020 Programme - Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 v. 3.1. [https://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-pilot-guide\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf), Brussels, August 2016. Accessed 23/11/2016.

<sup>43</sup>Free Software licence as approved by the Free Software Foundation and Open Source Initiative.

<sup>44</sup>European Commission, Directorate-General for Research and Innovation, Strategic Foresight: Towards the 3rd Strategic Programme of Horizon 2020 <https://bookshop.europa.eu/en/strategic-foresight-pbKI0215938/>, Brussels 2016. Accessed 23/11/2016.

<sup>45</sup>European IPR Helpdesk, Fact Sheet: Open access to publications and data in Horizon 2020: Frequently Asked Questions (FAQ) [https://www.iprhelpdesk.eu/sites/default/files/newsdocuments/Open\\_Access\\_in\\_H2020.pdf](https://www.iprhelpdesk.eu/sites/default/files/newsdocuments/Open_Access_in_H2020.pdf), Brussels May 2014. Accessed 22/11/2016.

<sup>46</sup>The four essential freedoms <https://www.gnu.org/philosophy/free-sw.html>.

re-use of the results and could therefore be beneficial to the overall impact of the project in the scientific community.<sup>47</sup>

This is in accordance with the Open Access interpretation under Horizon 2020, as the online access to scientific publications, at no charge to the end-user.<sup>48</sup> Open Access therefore only aims at making the work of the researchers as widely accessible as possible – it does not aim at putting the publications in the public domain,<sup>49</sup> nor to allow the public to reproduce or redistribute a work without its owner’s consent.<sup>50</sup>

### Open Access as the default option for publications

- **Open Access is and should remain the default option for the scientific publications of Horizon 2020 projects. Opting-out should be an exception, strictly interpreted.**

Open Access is the default option for scientific publications of Horizon 2020 projects, but there is still the possibility for the scientists to opt-out.<sup>51</sup>

The FSFE asks for full implementation of the extension of the Open Research Data Pilot<sup>52</sup> and in particular, “projects should provide information via the chosen public repository about the tools available to the beneficiaries that are needed to validate the results, e.g. specialised software or software code, algorithms and analysis protocols. Where possible, they should provide these instruments themselves.” That being said, this information should include, not only code but also all the necessary documentation that ensures the reusability of software.

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<sup>47</sup>European IPR Helpdesk, Will it be possible to release our Horizon 2020 project results (software) under an open source licence? <https://www.iprhelpdesk.eu/kb/2646-will-it-be-possible-release-our-horizon-2020-project-results-software-under-open-source> Accessed 22/11/2016.

<sup>48</sup>Suber, P., Open Access [https://mitpress.mit.edu/sites/default/files/9780262517638\\_Open\\_Access\\_PDF\\_Version.pdf](https://mitpress.mit.edu/sites/default/files/9780262517638_Open_Access_PDF_Version.pdf), The MIT Press Essential Knowledge Series 2012. Accessed 22/12/2016.

<sup>49</sup>European IPR Helpdesk, Will it be possible to release our Horizon 2020 project results (software) under an open source licence? <https://www.iprhelpdesk.eu/kb/2646-will-it-be-possible-release-our-horizon-2020-project-results-software-under-open-source> Accessed 22/11/2016.

<sup>50</sup>Open Access Scholarly Information Sourcebook (OASIS), Benefits of Open Access for research dissemination [http://www.openoasis.org/index.php?option=com\\_content&view=article&id=146&Itemid=308](http://www.openoasis.org/index.php?option=com_content&view=article&id=146&Itemid=308). Accessed 01/12/2016.

<sup>51</sup>EU2016, All European scientific articles to be freely accessible by 2020 Europe makes a definitive choice for open access by 2020 <https://english.eu2016.nl/latest/news/2016/05/27/all-european-scientific-articles-to-be-freely-accessible-by-2020>, Press release, May 2016. Accessed 25/11/2016.

<sup>52</sup>European Commission, Directorate-General for Research and Innovation, H2020 Programme - Guidelines on FAIR Data Management in Horizon 2020, Brussels July 2016.

Opting-out should be interpreted strictly and be permitted exceptionally, in accordance with public interest.<sup>53</sup> It should also be valid only under very specific circumstances, as in accordance with the EC policy on Open Access<sup>54</sup> and the meeting of the Competitiveness Council in Brussels on 27 May, 2016. In this meeting, the EU ministers responsible for research and innovation decided unanimously that by 2020 all scientific publications on the results of publicly funded research in Europe must be freely available under Open Access.<sup>55</sup>

### Maximum transparency during evaluation and interests balance

- **In the case of public funding of private organisations or public-private funding, the maximum transparency during the evaluation process of the projects should be guaranteed and an in-depth case-by-case assessment of interests balance should take place, always in favor of Open Access.**

Under the Horizon 2020 criteria, only legal entities and international European interest organisations are eligible for funding opportunities, excluding natural persons. That means not only universities or other state research organisations can get funded, but also private for-profit organisations.

The FSFE calls for the maximum transparency during the evaluation processes of the projects and an in-depth case-by-case assessment of interests balance, in particular when private interests interfere with public interests. In other words, the FSFE welcomes and supports the Commission's position that it should not make a difference for Open Access application, whether the scientific publications on the results of research are supported by public or public-private funds.<sup>56</sup>

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<sup>53</sup>Council of the European Union, The transition towards an Open Science system - Council conclusions <http://data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf> (adopted on 27/05/2016), 8791/16 RECH 133 TELECOM 74, Brussels May 2016. Accessed 23/11/2016.

<sup>54</sup>European Commission, Boosting the benefits of public investments in research [http://ec.europa.eu/research/science-society/document\\_library/pdf\\_06/era-communication-towards-better-access-to-scientific-information\\_en.pdf](http://ec.europa.eu/research/science-society/document_library/pdf_06/era-communication-towards-better-access-to-scientific-information_en.pdf), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Brussels, July 2012. Accessed 01/12/2016.

<sup>55</sup>EU2016, All European scientific articles to be freely accessible by 2020 Europe makes a definitive choice for open access by 2020, Press release, May 2016.

<sup>56</sup>European Commission, Improving knowledge transfer between research institutions and industry across Europe available%20at:%20[http://ec.europa.eu/invest-in-research/pdf/download\\_en/knowledge\\_transfe\\_07.pdf](http://ec.europa.eu/invest-in-research/pdf/download_en/knowledge_transfe_07.pdf), Brussels 2007. Accessed 23/11/2016.

The Horizon 2020 research results (including software) must be freely accessible to everyone,<sup>57</sup> since it is required by the relevant EC documents that all the scientific publications of the results of publicly funded research (including private-public funds) are freely available and all the research data reusable. To achieve that, data must be made accessible, unless there are well-founded reasons establishing the opposite, for example, security or privacy issues.<sup>58</sup> The latter exceptions, however, need to be strictly interpreted and balanced out with other public objectives.

It is necessary to keep in mind that Open Access to publicly funded research data not only helps to maximise the research potential of new digital technologies and networks, but provides greater returns from the public investment in research.<sup>59</sup>

## Repositories for Scientific Publications, Data and Software

- **Software developed with public funding, and in particular in the framework of the Horizon2020 programme should be mandatorily archived in a public software repository ensuring long term availability and persistent identification.**

The Free Software Foundation Europe encourages the archiving of the scientific knowledge, including software, in public repositories for further use both by researchers and civil society.

According to “Digital science in Horizon 2020”, openness of research is defined as the only way to enhance the value of scientific knowledge by ensuring its accessibility for all, through online media.<sup>60</sup> This visibility also contributes to the quality, transparency and reproducibility of the research results. Nevertheless, this visibility can only be secured when open, immediate and free access to scientific results, including the software and models used for results generation, is ensured.

The FSFE welcomes the Open Research Data Pilot and other EC-initiated public repository initiatives such as the European Open Science Cloud (EOSC) and the JoinUp repository for code developed by and for public administrations across Europe.

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<sup>57</sup>European Commission, Directorate-General for Research and Innovation, H2020 Programme - Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 v. 3.1., Brussels, August 2016.

<sup>58</sup>European Commission, Digital science in Horizon 2020 <https://ec.europa.eu/digital-single-market/open-science>, Brussels March 2013. Accessed 23/11/2016.

<sup>59</sup>Organisation for Economic Co-Operation and Development (OECD), OECD Principles and Guidelines for Access to Research Data from Public Funding <https://www.oecd.org/sti/sci-tech/38500813.pdf>, Paris 2007. Accessed 22/11/2016.

<sup>60</sup>European Commission, Digital science in Horizon 2020, Brussels March 2013.

Taking into account the First report and recommendations on the European Open Science Cloud, the FSFE would like to endorse the FAIR principles which will guide implementations to make research objects Findable, Accessible, Interoperable, Re-usable and ultimately citable.<sup>61</sup> The FSFE would like to emphasise that the FAIR terms are fully compliant with Free Software.

- **Data and software repositories and Data Management Plans (DMPs) must employ Free Software in order to ensure unfettered access to their contents and long term preservation.**

The FSFE insists that not only the scientific data on these platforms shall be open, but also the software these platforms run with should be made publicly available as Free Software, guaranteeing the preservation of digital knowledge over the years.

OpenAIRE is a great example of a Free Software archiving platform which is interoperable and reusable. With almost 17.5 m publications from the EU and in cooperation with the biggest South American repository La Referencia, it has become the largest inter-regional network for the hosting and distribution of Open Access publications in the world.<sup>62</sup>

Zenodo, the CERN supported platform, is another good practice amongst repositories. It is “open in every sense”, runs and is built on Free Software. The relevant work-in-progress, open issues, and roadmaps are shared openly on GitHub and contributions to any aspect or suggestions for new features are welcome from anyone. All meta data is openly available, and all open content is openly accessible through open APIs.<sup>63</sup>

The Software Heritage Initiative, that is now archiving not only source code of research software, but all available software worldwide, is another great example to adopt and support in the framework of Open Science. It is a reference software repository built entirely on Free Software, its development and design go through an open process, it provides persistent, long term, intrinsic identifiers, essential for reproducibility of science, and is building an international open network of mirrors in order to ensure long term availability of its archive.

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<sup>61</sup>European Commission, Directorate-General for Research and Innovation, High Level Expert Group, First report and recommendations on the European Open Science Cloud “Realising the European Open Science Cloud” [http://ec.europa.eu/research/openscience/pdf/realising\\_the\\_european\\_open\\_science\\_cloud\\_2016.pdf](http://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf), European Union 2016. Accessed 22/11/2016.

<sup>62</sup>Rettberg, N., European Public Sector Information Platform Topic Report No. 2014/ 10 Open Research in Europe- OpenAIRE [https://www.europeandataportal.eu/sites/default/files/2014\\_open\\_research\\_in\\_europe.pdf](https://www.europeandataportal.eu/sites/default/files/2014_open_research_in_europe.pdf), October 2014. Accessed 23/11/2016. For more information, see OpenAIRE.eu <https://www.openaire.eu/>.

<sup>63</sup>See Zenodo.org <https://zenodo.org/about>.

Last but not least, the open knowledge policy of the JPI Climate, the EFSA (European Food Safety Agency) Knowledge Junction and the CERN Data Portal also constitute good practices of Open Science.

## “Open Science” Prizes

- **An “Open Science” Prize should be established to raise awareness and promote Open Science.**

With regards to the General Findings of the Public consultation on the Science with and for Society Work Programme 2016-2017<sup>64</sup>, under the section “Open Science”, it was a general demand from the contributors that the knowledge around concepts of open data and shared data is developed; and that proposals on how Open Science could be part of reward systems and incentives for Responsible Research and Innovation (RRI) activities are explored.

The same reference is also part of the priorities scheme in the Report for the EOSC, where it is stated “[...]improve funding and rewards for open data sharing at research performing organisations and funders”.<sup>65</sup> The FSFE considers excellence should be awarded in every case and especially, when researchers provide their scientific results for the public good.

Taking into account the existing Horizon 2020 Prizes and the increasing number of Horizon 2020 projects based on Free Software, we believe an “Open Science” Prize should be established, including secondary categories specifically intended for projects using or developing Free Software. These prizes shall reward researchers who develop software and release it as Free Software. This way, not only scientists who promote Open Science will be honoured for their work, but also awareness concerning the benefits of Open Access and Open Science will be raised among participating universities, schools, private entities and other stakeholders.

The European Commission has already taken the lead, launching the “Sharing and Reuse Awards Contest” in order to raise awareness about the benefits of sharing and reuse of IT solutions in the public sector, awarding a total of €100 000 to public administrations that share and re-use Free Software solutions.<sup>66</sup>

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<sup>64</sup>European Commission, Public consultation on the Science with and for Society Work Programme 2016-2017 General Findings [http://ec.europa.eu/research/consultations/swafs/general\\_findings.pdf](http://ec.europa.eu/research/consultations/swafs/general_findings.pdf), Brussels February 2015. Accessed 22/11/2016.

<sup>65</sup>European Commission, Directorate-General for Research and Innovation, High Level Expert Group, First report and recommendations on the European Open Science Cloud “Realising the European Open Science Cloud” [http://ec.europa.eu/research/openscience/pdf/realising\\_the\\_european\\_open\\_science\\_cloud\\_2016.pdf](http://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf), European Union 2016. Accessed 22/11/2016.

<sup>66</sup>“Re-use and Share” Award [https://joinup.ec.europa.eu/community/sharingandreuse/og\\_page/awards-contest](https://joinup.ec.europa.eu/community/sharingandreuse/og_page/awards-contest). See also the Open Science Prize <https://www.openscienceprize.org/res/p/FAQ/>:

In addition to its positive effects on Open Science, an “Open Science” Prize would also clearly benefit RRI.<sup>67</sup> RRI requires from the researcher during the whole scientific process to consider the requirements of Science For society and Science With Society,<sup>68</sup> in order to meet global societal needs through increased inter-disciplinary collaboration between researchers, and to conduct responsible research. The use of Free Software fully endorses the notion of RRI, because through easily verifiable and accessible research it maximises both the collaboration between researchers in various fields, and the accuracy of the results produced via research. As such, by using and endorsing Free Software, one conducts fully responsible research, making its methods available for further verification and improvement by others.

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a new initiative in the field of health from the Wellcome Trust, US National Institutes of Health and Howard Hughes Medical Institute to encourage the prototyping and development of services that enable open content – including publications, datasets, code and other research outputs – to be discovered, accessed and re-used in ways that will advance research.

<sup>67</sup>Owen, R. et al.,(2012) Responsible research and innovation: From science in society to science for society, with society in: *Science and Public Policy* Vol. 39, pp. 751–76.

<sup>68</sup>Organisation for Economic Co-Operation and Development (OECD), *Making Open Science a Reality* <http://dx.doi.org/10.1787/5jrs2f963zs1-en>, OECD Science, Technology and Industry Policy Papers, No. 25, OECD Publishing, Paris 2015. Accessed 23/11/2016.