



Impact of Science

14-15 June 2018, Ottawa

Drawing Room, 15.30-16.00

**International collaboration to address impact in
broader challenges**

Stephane Berghmans

*Vice President, Academic Relations for the EU,
Elsevier, Belgium*

AESIS



A View on the Impact of (Open) Science in the European Union

*Stephane Berghmans, DVM PhD
VP Academic & Research Relations EU
Elsevier
[Governing Board member, EuroScience]*

Impact of Science AESIS Conference
Ottawa, 14 June 2018

Elsevier has a unique vantage point on the world of research



Each year

- 1.4 million article manuscripts received by ~2,500 journals (all offer Open Access options)
- 400,000 new articles published, in addition to 14M existing articles
- 2,000 new books published

Primary publishing

- ScienceDirect: 14M articles, ~900M digital article downloads
- Scopus: 60+M records, 22,800 titles, 5,000 publishers, 1.4B citations (back to 1970)
- SciVal: 170+ trillion metrics values
- Pure: current research information system: >200,000 researchers supported
- Mendeley: 5M users globally
- Grants: 7,000 sponsors, 20,000+ active opportunities, ~5M awarded grants
- Patents: >93m records, 100 patent offices

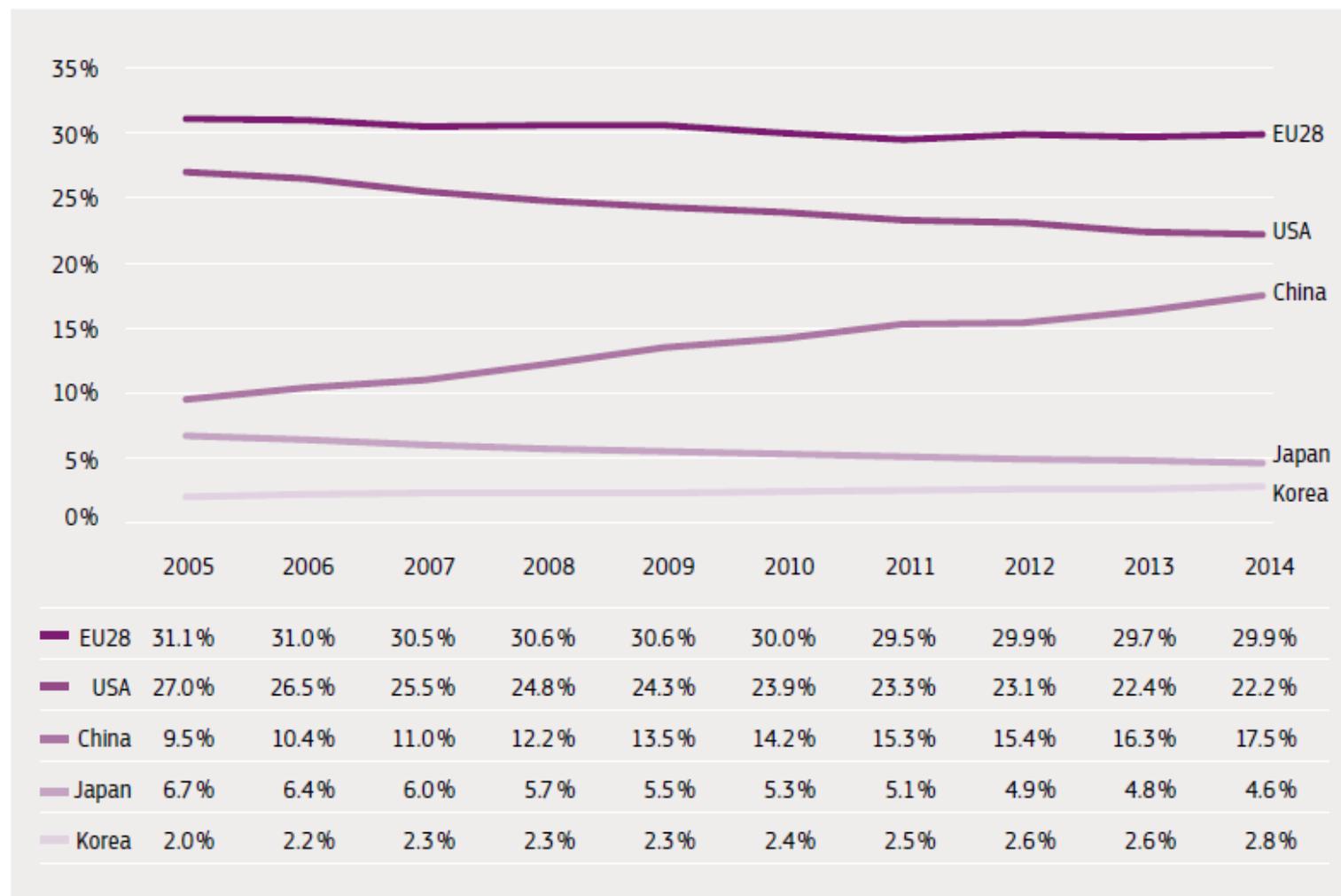
Derived and aggregated data



<https://ec.europa.eu/research/evaluations/index.cfm?pg=h2020evaluation>

Europe's Scholarly Publications - output

FIGURE 11: Percentage of publications indexed in Elsevier's Scopus database by year (2005-2014) and country/region (based on the institutional affiliation of the authors)



Source: Scopus database, ERCEA elaboration

Europe's Scholarly Publications - top 1% most-cited

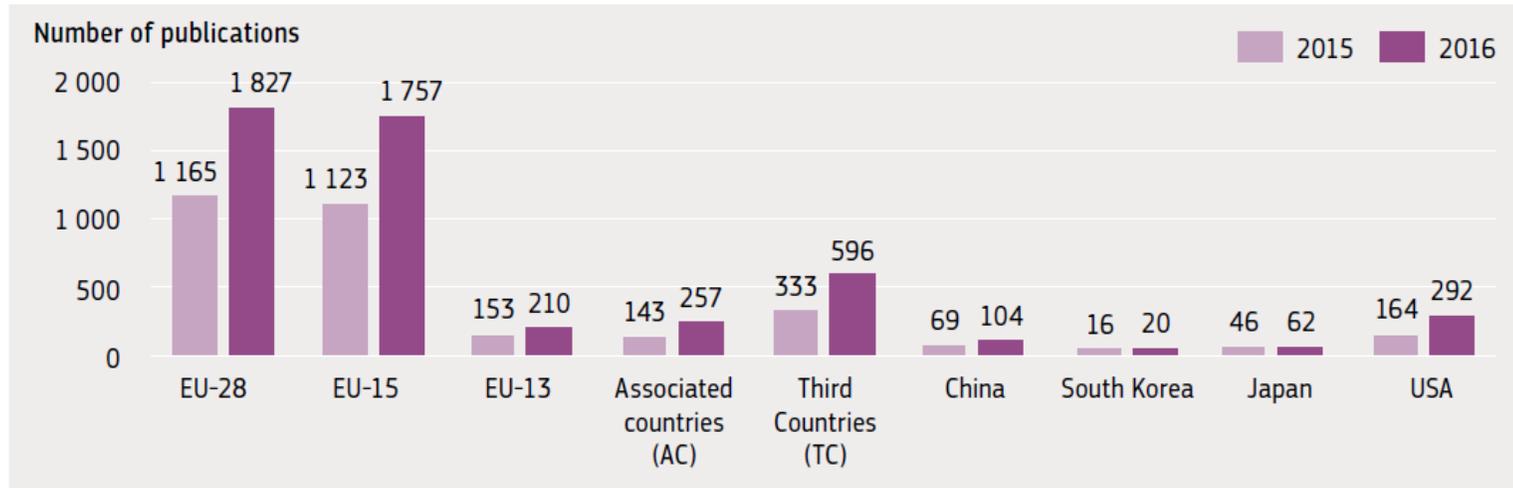
FIGURE 12: Evolution of number of top 1 % most-highly-cited publications, selected countries and regions



Source: Scopus database, ERCEA elaboration

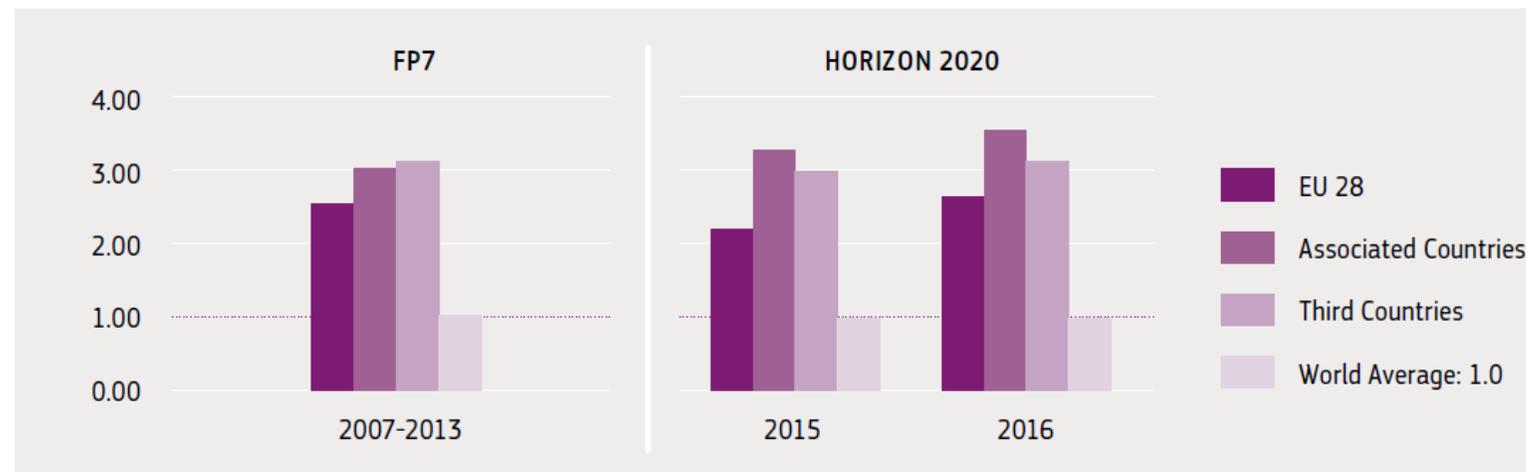
Horizon 2020 Scholarly Publications

FIGURE 54: Total publication output of Horizon 2020-funded research per geographical group, per year 2015-2016



Source: Scopus [study by Elsevier]

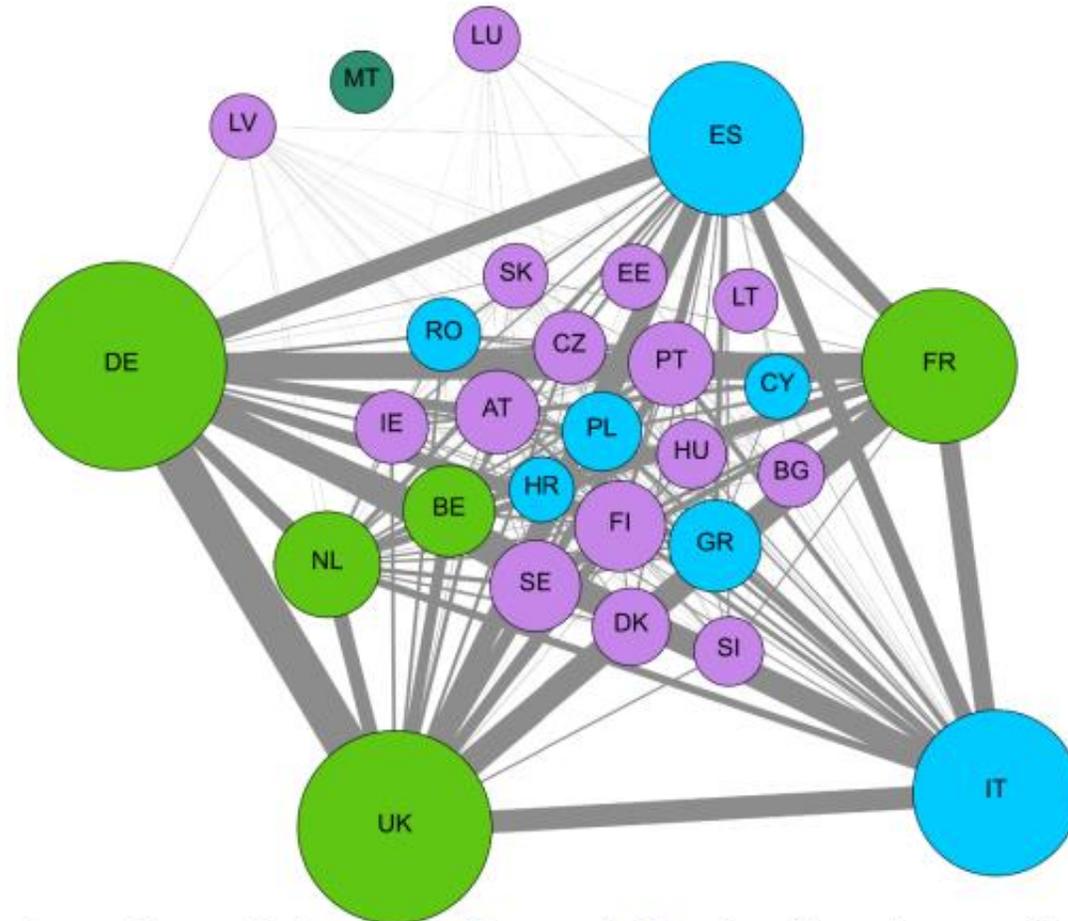
FIGURE 57: Field Weighted Citation Impact for FP7 publications (left side) and Horizon 2020 (right side)



Source: Scopus (Elsevier study, forthcoming)

Horizon 2020 Scholarly Publications - collaborations

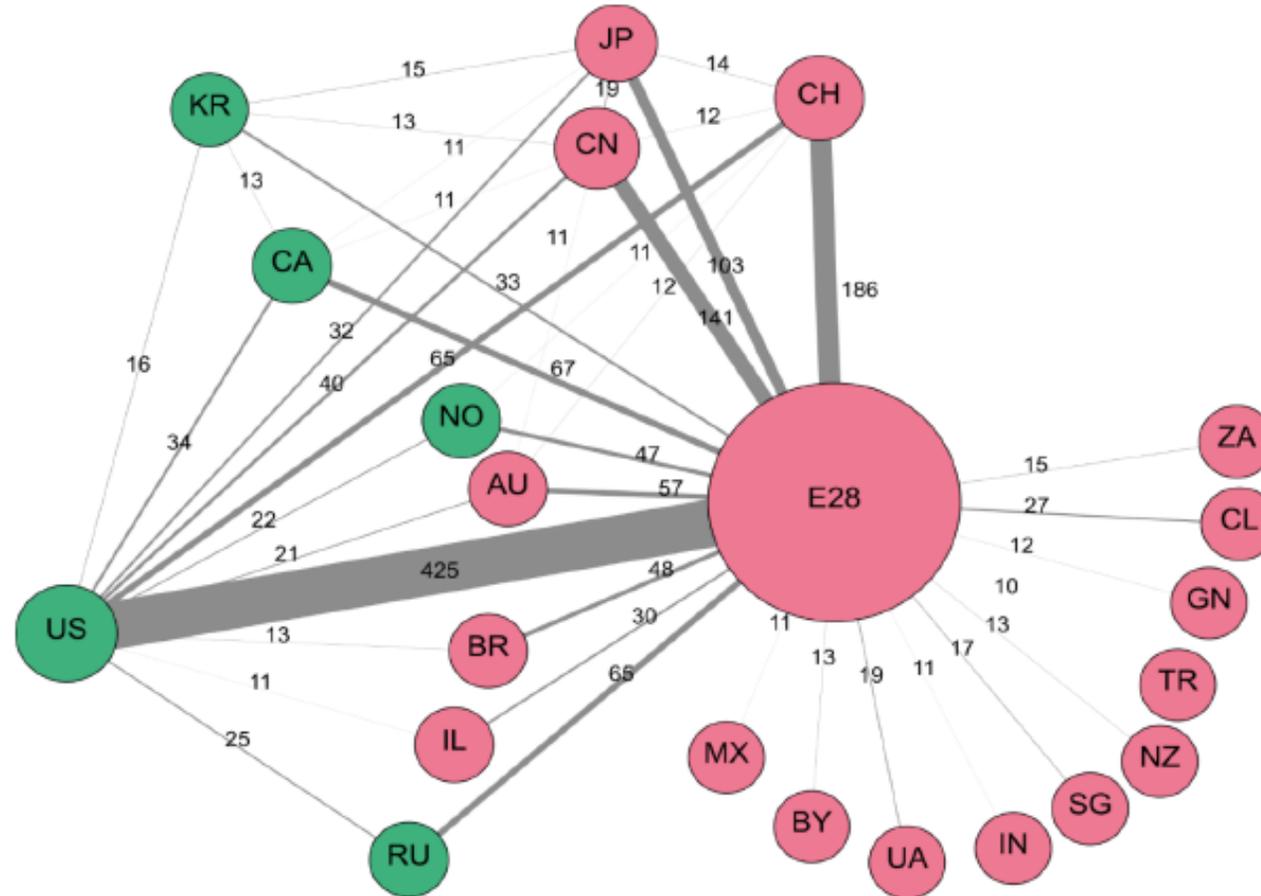
Figure 122 Horizon 2020 intra-EU-28 collaboration, 2015-2016



Source: Scopus. Node colour is determined algorithmically to designate clusters. Nodes that have similar collaborations and volume of collaborations have the same colour. Node size is number of Horizon 2020 publications. Edge thickness is number of collaboration publications between entities. Node position has been preserved between this figure and Figure 4.2 to compare FP7 and Horizon 2020 collaborations. MT has no Horizon 2020 collaborations with any other EU-28 member.

Horizon 2020 Scholarly Publications - collaborations

Figure 120 Horizon 2020-funded collaborations between EU-28 geographical group and non-EU-28 countries, 2015-2016



Source: Scopus. Node colour is determined algorithmically to designate clusters. Nodes that have similar collaborations and volume of collaborations have the same colour. Node size is number of Horizon 2020 publications. Edge thickness is number of collaboration publications between entities. Edge labels are number of collaborations

What's next ?

Trends:

- Unique identifier
- Demonstrating societal impact
- Open Science

Under consideration:

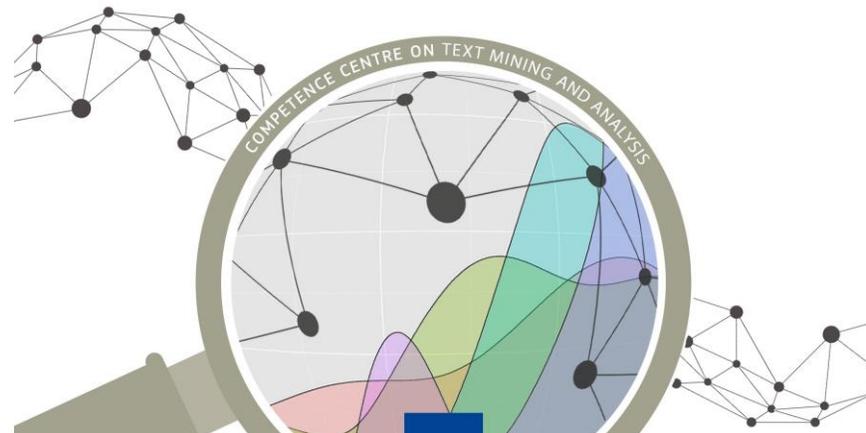
- New indicators
- Combination of indicators
- New sources of data
- Topics of prominence

Societal impact



TIM Analytics
Tools for Innovation and Monitoring

Olivier Eulaerts
Joint Research Center
European Commission



Joint Research Center (JRC)

is the European Commission's in-house science service.

The JRC's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Its work has a direct impact on the lives of citizens by contributing with its research outcomes to a healthy and safe environment, secure energy supplies, sustainable mobility and consumer health and safety.

https://ec.europa.eu/info/sites/info/files/organisation-chart-jrc_en.pdf

Vision

To provide innovative IT solutions and consultancy for extracting knowledge from large and complex datasets relevant for policy and decision making.

To be a reference in technology monitoring and in the detection of scientific trends using quantitative methods.



Strategy

R&D

In-house IT developments

Product-, service-, and user-oriented

Policy relevance

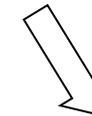
Reactivity and flexibility

TIM Incubator

Incubates projects that apply TIM methodology to various data/fields

Detection Communities of practice (DG HR)
Visualisation of trade flows (SITAF)
Mapping and tracking of JRC Alumni
Fusion contracts Database (F4E)

...



TIM Technology

All applications
related to technology
monitoring

TIM Compared

Semantic platform
for evaluation of
research proposals

TIM Trends

Detection of
technological
changes (with I.2)

TIM Omics

Visualisation system
for genome wide
associations
(with F.7)

Applications

TIM Technology Editor

TIM Big – Large computation

TIM Edge –TIM Energy - TIM Cybersecurity

TIM Custom (for user datasets)

TIM Open Access (soon)

TIM EU calls – prior art EU calls (tbc)

TIM Fuel Cell &
H2
(FCH JU)

TIM Defence
(EDA)

TIM Fusion (DG
RTD)

TIM Science
Parks

**TIM European Science Media Hub
(EPRS - European Parliament)**

Data

Scientific Publications

Patents

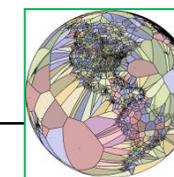
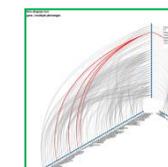
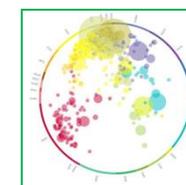
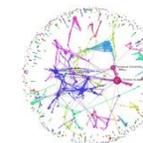
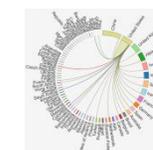
R&I funding

**Scopus Custom Data,
Patstat, Cordis**

Visualisations



Keyword	Frequency
Energy	100
Technology	80
Research	60
Innovation	40
Development	20
Industry	10
Academia	5
Government	3
Investment	2
Partnership	1
Collaboration	1



**+ Technology
benchmarking module**



Specific Analysis

On request

Recent:

Evaluation H2020 (RTD)

Megatrends (JRC)

Impact on innovation (JRC)

Tech risk assessment (DG ENV, EFSA)

Use of TIM

JRC TECHNICAL REPORTS

Technology Innovation Monitoring (TIM) for mapping emerging photovoltaics and offshore wind energy technologies

Authors: Boelman, E. and Tékamp, T.
Contributors: Joanny, G., Giannakaki, A. and Barletta, G.

2016

TIM SETIS

Text Mining for assessing and monitoring environmental risks

Concept paper

JRC TECHNICAL REPORTS

Monitoring scientific collaboration trends in wind energy technologies

Bibliometric analysis of scientific articles based on TIM

Thomas Tékamp, Elise Boelman, Cedric Vasseur, Hendrikus Gerardus Joanny

2018

A novel bibliometric-based technique to identify emerging photovoltaic technologies in a comparative assessment with expert review

Alberto Moro*, Elisa Boelman, Geraldine Joanny, Juan Lopez Garcia

European Commission, Joint Research Centre, via Enrico Fermi 2749, Ispra, Italy

Renewable Energy

A novel bibliometric-based technique to identify emerging photovoltaic technologies in a comparative assessment with expert review

Alberto Moro*, Elisa Boelman, Geraldine Joanny, Juan Lopez Garcia

ARTICLE INFO

ABSTRACT

This paper explores the results of bibliometric analysis from bibliometric analysis and expert review to identify emerging photovoltaic technologies. The bibliometric analysis was performed using the software CiteSpace 5.8.R3 (v5.8.R3) and the results were compared with the expert review. The results show that the most emerging technologies are identified by both methods. The bibliometric analysis identified 10 emerging technologies, while the expert review identified 12. The most emerging technologies identified by both methods are: thin-film solar cells, organic solar cells, perovskite solar cells, quantum dot solar cells, and heterojunction solar cells. The bibliometric analysis also identified 10 emerging technologies that were not identified by the expert review: bifacial solar cells, multi-junction solar cells, tandem solar cells, and solar concentrator photovoltaics. The expert review identified 12 emerging technologies that were not identified by the bibliometric analysis: silicon solar cells, monocrystalline silicon solar cells, polycrystalline silicon solar cells, thin-film solar cells, and organic solar cells. The results show that the most emerging technologies are identified by both methods. The bibliometric analysis identified 10 emerging technologies, while the expert review identified 12. The most emerging technologies identified by both methods are: thin-film solar cells, organic solar cells, perovskite solar cells, quantum dot solar cells, and heterojunction solar cells. The bibliometric analysis also identified 10 emerging technologies that were not identified by the expert review: bifacial solar cells, multi-junction solar cells, tandem solar cells, and solar concentrator photovoltaics. The expert review identified 12 emerging technologies that were not identified by the bibliometric analysis: silicon solar cells, monocrystalline silicon solar cells, polycrystalline silicon solar cells, thin-film solar cells, and organic solar cells.

The Five Categories of Metrics



**9.4
BILLION**
Total number of interactions
with research in PlumX



USAGE

**MOST IMPORTANT
METRIC AFTER CITATION***

(clicks, views, downloads,
library holdings, video plays)



CAPTURES

**LEADING INDICATOR
OF CITATIONS**

(bookmarks, favorites,
reference manager saves)



MENTIONS

**WHERE THE STORIES OF
RESEARCH ARE FOUND**

(blog posts, news mentions,
comments, reviews, Wikipedia
mentions)



SOCIAL MEDIA

**INDICATES HOW
RESEARCH IS PROMOTED**

(tweets, +1s, likes, shares)



CITATIONS

**TRADITIONAL MEASURE
OF IMPACT**

(citation indexes, patent
citations, clinical citations,
policy citations)

Book Specific Metrics



Radical innovations, social revolution, and the baroque guitar

Citation data: The Cambridge Companion to the Guitar, Page: 151-181

Publication Year: 2003

USAGE	3939	CAPTURES	191	MENTIONS	18	CITATIONS	3	RATINGS	
Holdings	2117	Exports-Saves	158	References	17	Citation Indexes	3	Amazon Rating	★★★★★ (5.0/5)
WorldCat	678	EBSCO	158	Wikipedia	17			Goodreads Rating	★★★☆☆ (3.0/5)
WorldCat	675	Readers	33	Reviews	1				
WorldCat	674	Mendeley	19	Amazon	1				
WorldCat	90	Goodreads	14						
Abstract Views	1723								
Link-outs	99								

Spanish Wikipedia!

BOOK SUMMARY

WIKIPEDIA

FILTER BY LANGUAGE EDITION

All	17
English	15
Spanish	2

This book has 17 Wikipedia references across 2 language editions.

El ruido en la música

March 8, 2018 | Spanish

En la música, el ruido es descrito como un sonido sin tono, indeterminado, descontrolado, estridente, no musical e indeseado. El ruido es un componente importante del sonido de la voz humana y de todos los instrumentos musicales, particularmente en instrumentos de percusión de...

Read full Article

Amplificador de guitarra

Dec. 7, 2017 | Spanish

Un amplificador de guitarra es un amplificador electrónico diseñado para amplificar una señal eléctrica de sonido emitida por una guitarra eléctrica o guitarra electroacústica de manera que dicho sonido se produzca a través de un altavoz (Más conocido como parlante). La mayoría...

Read full Article

Clinical Guidelines



Effects of insulin in relatives of patients with type 1 diabetes mellitus.

Citation data: The New England journal of medicine, ISSN: 1533-4406, Vol: 346, Issue: 22, Page: 1685-91
Publication Year: 2002

Explore PlumX Metrics

What are PlumX Metrics? How can they help tell the story about this research? How can I use them?

[Learn more](#)

USAGE	182	CAPTURES	113	CITATIONS	545
Abstract Views	113	Readers	88	Citation Indexes	540
Full Text Views	36	Exports-Saves	25	Clinical Citations	5
Link-outs	33				

- ARTICLE SUMMARY
- PUBMED GUIDELINES
- DYNAMED PLUS TOPICS

This article has 4 Clinical Citations from PubMed Guidelines.

ISPAD Clinical Practice Consensus Guidelines 2014. Phases of type 1 diabetes in children and adolescents.
Published Date: Sep, 2014
[Read More](#)

ISPAD Clinical Practice Consensus Guidelines 2014. Definition, epidemiology, and classification of diabetes in children and adolescents.
Published Date: Sep, 2014
[Read More](#)

Guidelines and recommendations for laboratory analysis in the diagnosis and management of diabetes mellitus.
Published Date: Jun, 2011
[Read More](#)

Phases of diabetes.
Published Date: Feb, 2007
[Read More](#)

This article is influencing how doctors are treating diabetes

JRC output



Rapid carbon mineralization for permanent disposal of anthropogenic carbon dioxide emissions.

Citation data: Science (New York, N.Y.), ISSN: 1095-9203, Vol: 352, Issue: 6291, Page: 1312-4
Publication Year: 2016

USAGE	1015	CAPTURES	185	MENTIONS	26
Abstract Views	603	Readers	178	News Mentions	16
Clicks	348	Exports-Saves	7	Blog Mentions	6
Link-outs	60			References	2
Full Text Views	4			Comments	2
SOCIAL MEDIA	1120	CITATIONS	78	RATINGS	
Shares, Likes & Comments	806	Citation Indexes	78	Reddit	3
Tweets	314				

ARTICLE SUMMARY

NEWS

BLOGS

WIKIPEDIA

TWEETS

This article has 16 News Mentions across 3 URLs.

Burying the sky: Turning carbon dioxide into rock

June 2, 2017 | [Earth Magazine](#)

Hellisheidi Geothermal Power Plant, located in southwest Iceland, produces electricity and hot water from the Hengill Central Volcano. Credit: Gunnar Svanberg. Blocky, moss-covered basalt covers

[Read full Article](#)

Carbon dioxide successfully stored in volcanic rock — could help mitigate climate change

Oct. 19, 2016 | [Farming Futures](#)

Storing atmospheric carbon dioxide (CO2) has the potential to mitigate the impacts of changes in climate. Researchers have now developed a way to inject CO2

[Read full Article](#)

Stonewalling Climate Change?

June 10, 2016 | [EnvironmentGuru.com](#)

By Oscar A. EscobarFlorida, EE.UU. - Gt. "Rapid carbon mineralization for permanent disposal of anthropogenic carbon dioxide emissions" Juerg M. Matter et al. Science 10

[Read full Article](#)

[Report] Rapid carbon mineralization for permanent disposal of anthropogenic carbon dioxide emissions

June 10, 2016 | [Bionity.com](#)

Carbon capture and storage (CCS) provides a solution toward decarbonization of the global economy. The success of this solution depends on the ability to safely

[Read full Article](#)

Converting CO2 emissions into rock

June 9, 2016 | [TCE Today](#)

The Hellisheidi geothermal power plant performing carbon mineralisation 10/06/2016 Solution is faster and leak-free Chris Taylor Share this page SCIENTISTS have developed a method for

[Read full Article](#)

Putting CO2 away for good by turning it into stone

June 9, 2016 | [The Conversation](#) by Martin Stute, Professor of Environmental Science, Columbia University

We seriously need to do something about CO2 emissions. Besides shifting to renewable energy sources and increasing energy efficiency, we need to start putting some of the CO2 away before it reaches the atmosphere. Perhaps the impacts of human-induced climate change will be so ...

Can we assess the impact of research and policy?

Open Science



What is open science?

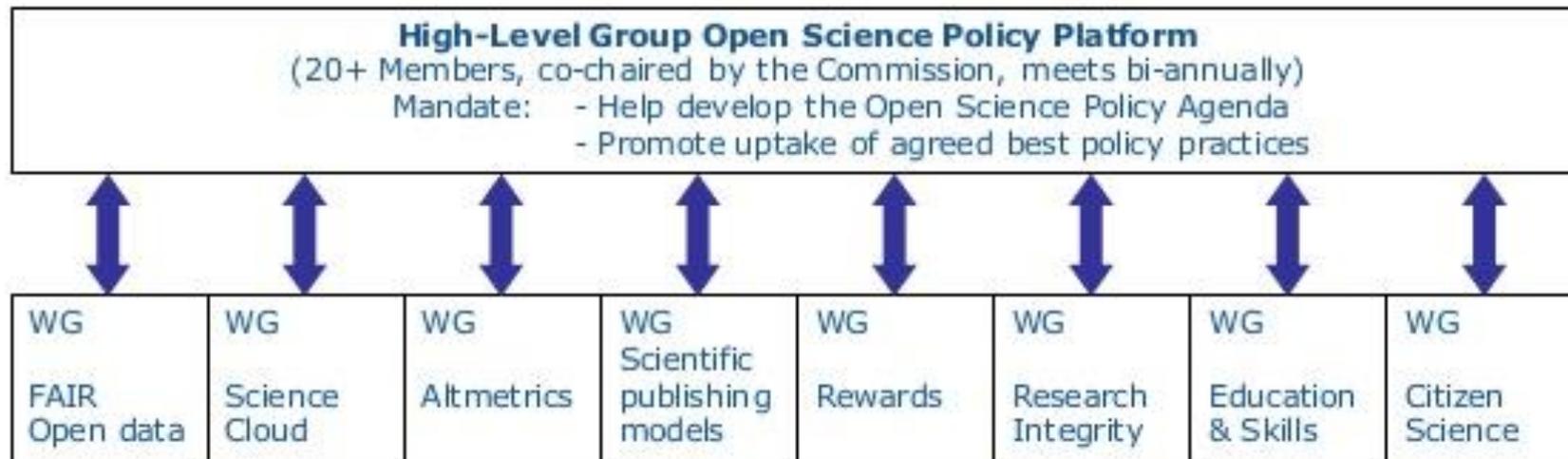
- Open Science describes a way of working which makes research more **inclusive**, more **collaborative** and more **transparent**.
- We believe open science can benefit research and society and drive research performance.
- Elsevier partners with the research community to enable open science.



Open Science – the European Commission’s perspective



Open Science Policy Platform



Open Science – OS-CAM



Evaluation of Research Careers fully acknowledging Open Science Practices

Rewards, incentives and/or recognition for researchers practicing Open Science

Written by the Working Group on Rewards under Open Science
July – 2017

Research and Innovation

Open Science Career Assessment Matrix (OS-CAM)	
Open Science activities	Possible evaluation criteria
RESEARCH OUTPUT	
Research activity	Academic standing
Publications	Peer review
Datasets and research results	Networking
Open source	RESEARCH IMPACT
Funding	Communication and Dissemination
RESEARCH PROCESS	
Stakeholder engagement / citizen science	IP (patents, licenses)
Collaboration and Interdisciplinarity	Societal impact
Research integrity	Knowledge exchange
Risk management	TEACHING AND SUPERVISION
SERVICE AND LEADERSHIP	
Leadership	Teaching
	Mentoring
	Supervision
	PROFESSIONAL EXPERIENCE
	Continuing professional development
	Project management
	Personal qualities

https://ec.europa.eu/research/openscience/pdf/os_rewards_wgreport_final.pdf



**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN
ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE
REGIONS**

**A renewed European Agenda for Research and Innovation - Europe's chance to shape
its future**

*The European Commission's contribution to the Informal EU Leaders' meeting on
innovation in Sofia on 16 May 2018*

The take up of open science practices at different stages of the researchers' careers can also stimulate attractive career environments for all, give more recognition and reward international and science-business mobility.⁵¹ The modernisation of universities and public research organisations should therefore also be supported with an **Open Science label**. Such a high-quality label could be awarded to individual universities and trans-national university partnerships, and would be recognised in future EU support for trans-national projects involving universities.⁵²

Key steps

- **Contribute to the modernisation of universities and public research organisations with an Open Science label.**



Open Science Monitor

Tracking trends for open access, collaborative and transparent research across countries and disciplines

Contacts

Project Coordinators:

david.osimo@lisboncouncil.net

katarzyna.jakimowicz@lisboncouncil.net





The Open Science Monitor **aims** to:

- provide data and insight to understand the development of open science in Europe
- gather the most relevant and timely indicators on the development of open science in Europe and other global partner countries

It will also support European Commission initiatives such as the Open Science Policy Platform and the European Open Science Cloud



Objectives

1. **Metrics** on the open science **trends** and their development
2. **Assessment of the drivers** (and barriers) to open science adoption
3. **Impacts** (both positive and negative) of open science
4. **Policy conclusions**



Scope

Trends

Categories	Trends
Open access to publications	Green and gold open access adoption (bibliometrics)
	Open access policies (funders and journals)
Open research data	Open data policies (funders and journals)
	Open data repositories
	Open data adoption and researchers' attitudes
Open collaboration	Open Science
	Next generation metrics
	Open hardware
	Citizen science

- Entire cycle of the scientific process
- All research disciplines
- Geographic coverage: 28 Member States and G8 countries
- Data presented at country level
- Different types of stakeholders



Indicators and data sources

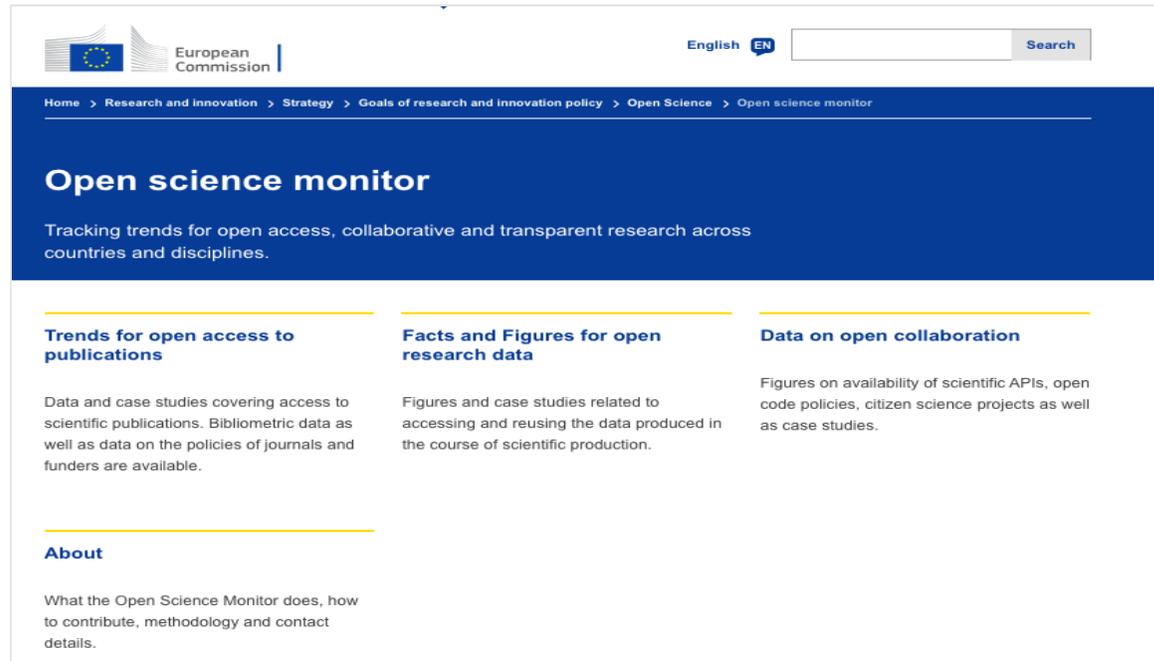
Wide variety of data sources used:

- **Bibliometrics:** for instance, open access to publications indicators, and partially for open data and next generation metrics
- **Online repositories**
- **Surveys**
- Ad hoc analysis in **scientific articles or reports**
- **Data from specific services:** open science services often offer data on their uptake, as for Sci-starter or Mendeley

Open Science Monitor

Updated indicators published on the EC website:

https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/open-science/open-science-monitor_en



The screenshot shows the top section of the Open Science Monitor website. At the top left is the European Commission logo. To its right is the text 'English EN' and a search bar with a 'Search' button. Below this is a blue navigation bar with the breadcrumb: 'Home > Research and Innovation > Strategy > Goals of research and innovation policy > Open Science > Open science monitor'. The main heading is 'Open science monitor' in white text on a dark blue background. Below the heading is a subtitle: 'Tracking trends for open access, collaborative and transparent research across countries and disciplines.' The page is divided into three columns, each with a yellow horizontal line above its title. The first column is titled 'Trends for open access to publications' and contains text about bibliometric data and journal policies. The second column is titled 'Facts and Figures for open research data' and contains text about data produced in scientific production. The third column is titled 'Data on open collaboration' and contains text about scientific APIs and citizen science projects. At the bottom left, there is an 'About' section with text describing the monitor's purpose and contact details.

Contribute to improving OSM indicators:

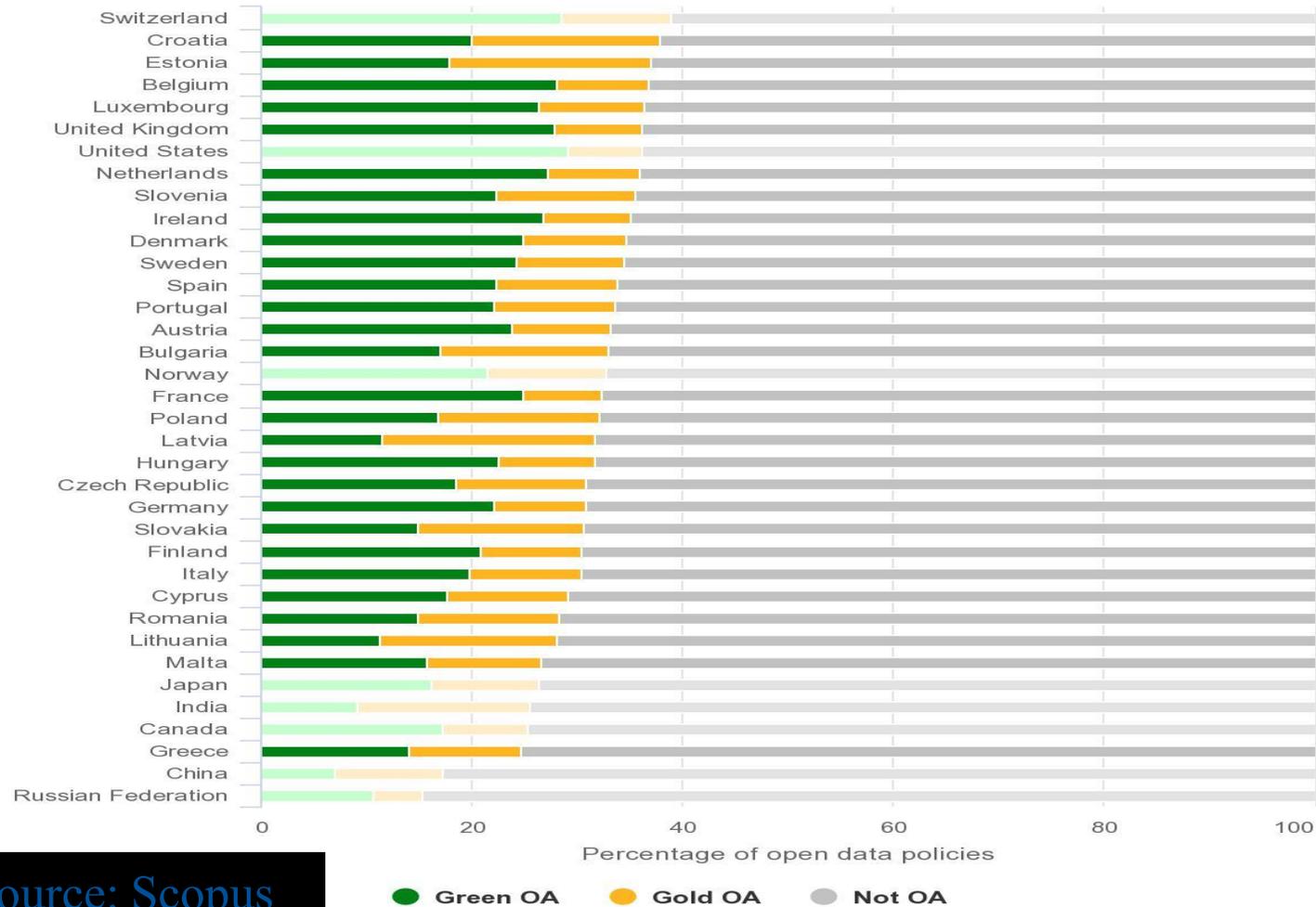
https://www.makingspeechstalk.com/ch/Open_Science_Monitor/



Example: Open Access to Publications

Percentage of open access publications (gold and green) by country

Source: Consortium's own analysis of Scopus database - Reference date: April 30th 2018



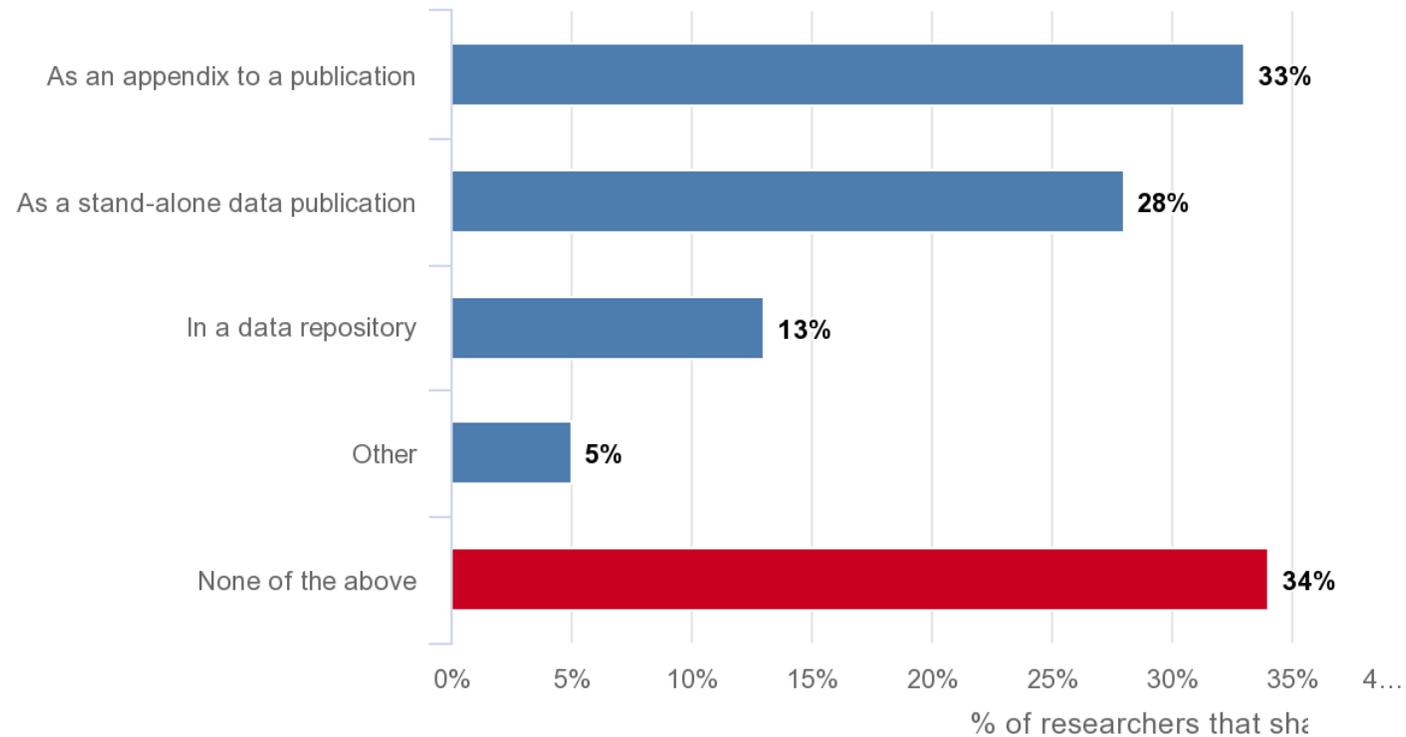
Source: Scopus



Example: Open Research Data

Attitudes of researchers: % of researchers that share data, by modality

Reference date: 2016



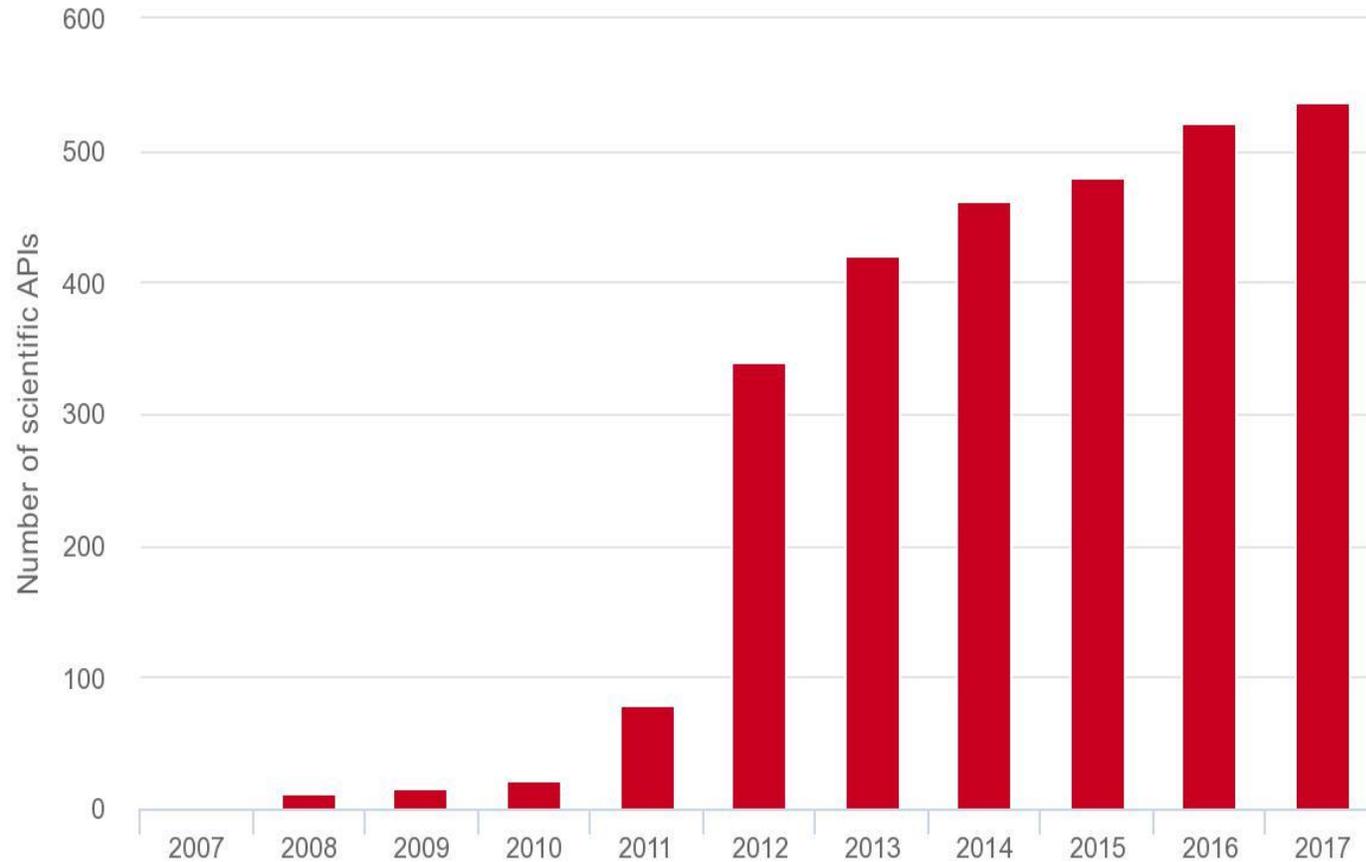
Source: *Open Data, a researcher perspective* (CWTS-Elsevier)



Example: Open Collaboration

Number of scientific APIs

Source: ProgrammableWeb - Reference date: April 20th 2018





Thank
you



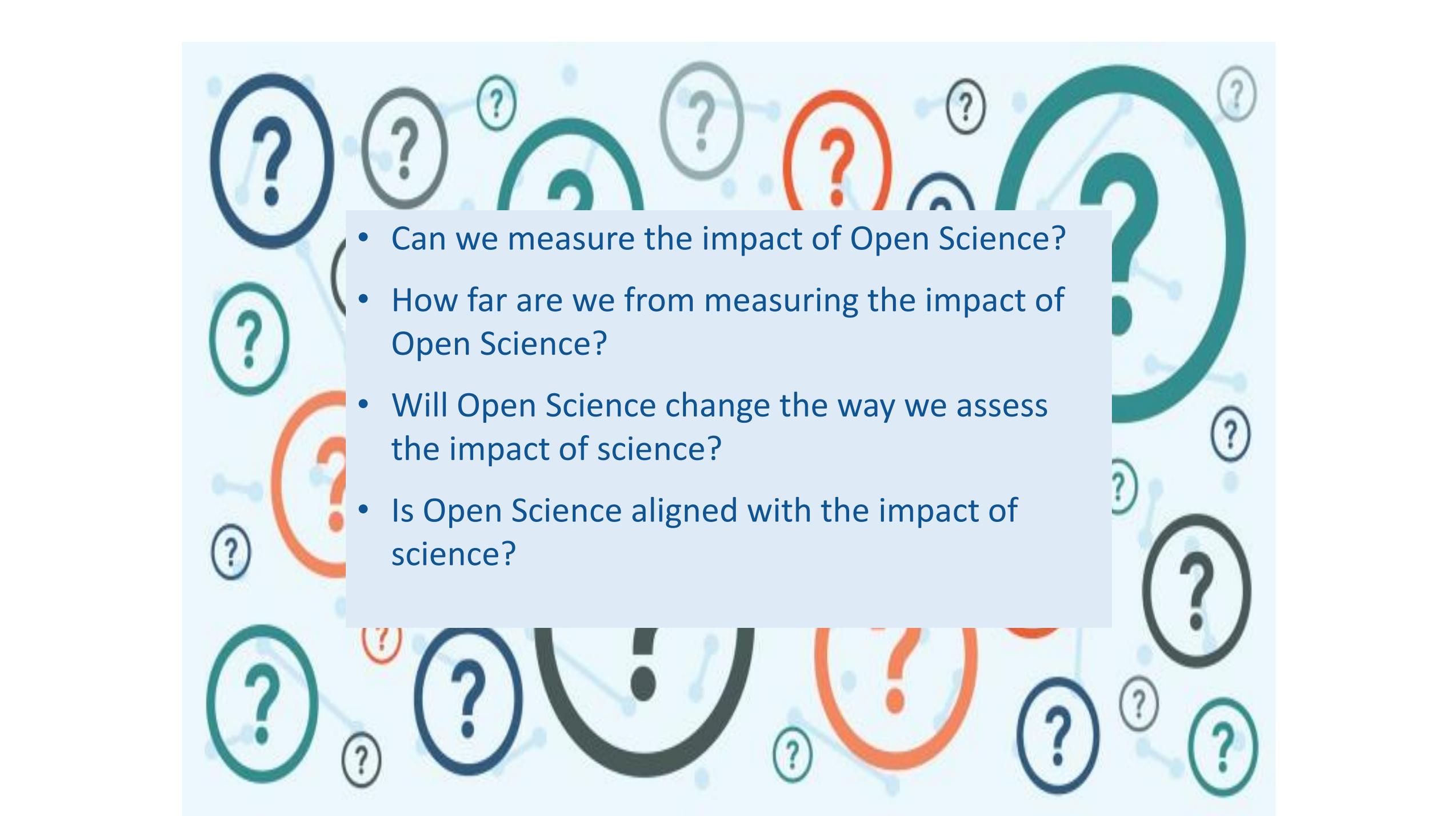
9-14 JULY 2018
SHARING SCIENCE:
TOWARDS NEW HORIZONS

Stephane Berghmans

Vice President, Academic & Research Relations, Elsevier
Governing Board Member, EuroScience

s.berghmans@elsevier.com

+32-471-781900

- 
- The background of the slide is a light blue color with a pattern of question marks and network nodes. The question marks are in various colors (dark blue, green, orange, black) and sizes, some enclosed in circles. The network nodes are small blue dots connected by thin lines, suggesting a complex or interconnected system.
- Can we measure the impact of Open Science?
 - How far are we from measuring the impact of Open Science?
 - Will Open Science change the way we assess the impact of science?
 - Is Open Science aligned with the impact of science?

Open Science – OS-CAM

Open Science Career Assessment Matrix (OS-CAM)	
<i>Open Science activities</i>	<i>Possible evaluation criteria</i>
RESEARCH OUTPUT	
Research activity	Pushing forward the boundaries of open science as a research topic
Publications	Publishing in open access journals Self-archiving in open access repositories
Datasets and research results	Using the FAIR data principles Adopting quality standards in open data management and open datasets Making use of open data from other researchers
Open source	Using open source software and other open tools Developing new software and tools that are open to other users
Funding	Securing funding for open science activities
RESEARCH PROCESS	
Stakeholder engagement / citizen science	Actively engaging society and research users in the research process Sharing provisional research results with stakeholders through open platforms (e.g. Arxiv, Figshare) Involving stakeholders in peer review processes
Collaboration and Interdisciplinarity	Widening participation in research through open collaborative projects Engaging in team science through diverse cross-disciplinary teams
Research integrity	Being aware of the ethical and legal issues relating to data sharing, confidentiality, attribution and environmental impact of open science activities Fully recognizing the contribution of others in research projects, including collaborators, co-authors, citizens, open data providers
Risk management	Taking account of the risks involved in open science
SERVICE AND LEADERSHIP	
Leadership	Developing a vision and strategy on how to integrate OS practices in the normal practice of doing research Driving policy and practice in open science

Open Science – OS-CAM

Academic standing	Developing an international or national profile for open science activities Contributing as editor or advisor for open science journals or bodies
Peer review	Contributing to open peer review processes Examining or assessing open research
Networking	Participating in national and international networks relating to open science
RESEARCH IMPACT	
Communication and Dissemination	Participating in public engagement activities Sharing research results through non-academic dissemination channels Translating research into a language suitable for public understanding
IP (patents, licenses)	Being knowledgeable on the legal and ethical issues relating to IPR Transferring IP to the wider economy
Societal impact	Evidence of use of research by societal groups Recognition from societal groups or for societal activities
Knowledge exchange	Engaging in open innovation with partners beyond academia
TEACHING AND SUPERVISION	
Teaching	Training other researchers in open science principles and methods Developing curricula and programs in open science methods, including open science data management Raising awareness and understanding in open science in undergraduate and masters' programs
Mentoring	Mentoring and encouraging others in developing their open science capabilities
Supervision	Supporting early stage researchers to adopt an open science approach
PROFESSIONAL EXPERIENCE	
Continuing professional development	Investing in own professional development to build open science capabilities
Project management	Successfully delivering open science projects involving diverse research teams
Personal qualities	Demonstrating the personal qualities to engage society and research users with open science

Recommendation

Measurement Tools Chris James

Fairmont

- COMMON QUESTION SET
- EASIER TO SHARE BEST PRACTICE
- MAKE IT FAST!

“STRUCTURED INSIGHTS REQUIRE STRUCTURED QUESTIONS, THAT CAN BE ANSWERED USING APPROPRIATE METRICS, AT THE APPROPRIATE LEVEL OF GRANULARITY, ALONG WITH EXPERT OPINION.”

- MORE THAN ONE!
- THINK MULTIDISCIPLINE
- AIM FOR A CULTURE OF ENGAGEMENT
- THINK “2 GOLDEN RULES”!

Recommendation

Internal evaluation policies

Robert Haché

Impact is more than assessment driven.

Recommendation

Assessment for funders

David Sweeney

Funding strategy are based on gender diverse people, on the funders and their success metric.

Recommendation

Indicators for SSH impact

Brent Herbert-Copley

Impacts are achieved through pathways that connect academia with broader society, and assessment of impacts must acknowledge complexity and diversity across disciplines.

Recommendation

Entrepreneurial knowledge transfer

Cynthia Goh

Students are an important vector for entrepreneurship. You need to provide them with the opportunity to know if it is right for them, surround them with good support and help them understand how to minimize their risks

Recommendation

Global challenges/issues

Jean Lebel

Climate change, sustainable development, global health, food and nutrition.

These challenges transcend borders and national interests.

Recommendation

Collaboration with industry

Yuko Harayama

Invest in industry and university relationships, also find common interests or problems to solve, then act together.

Recommendation

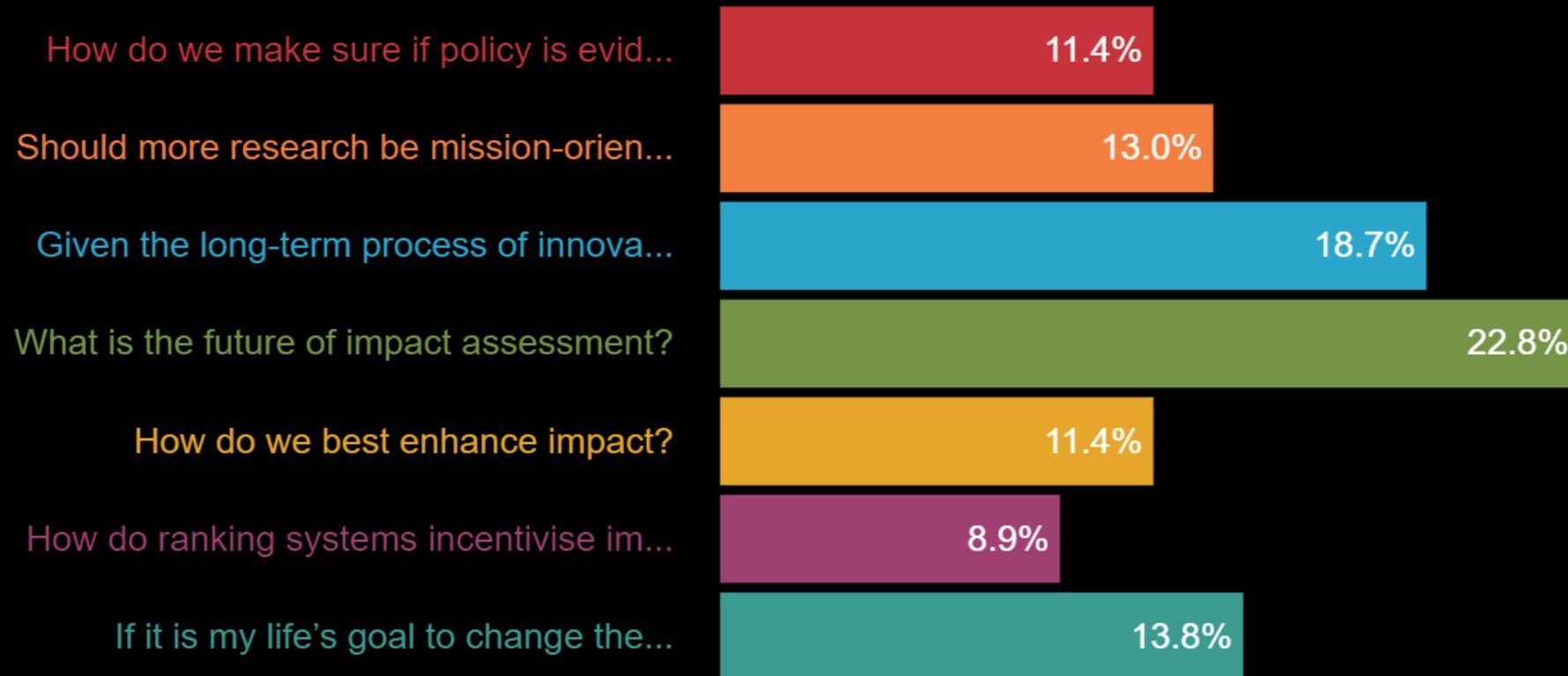
Community Engagement

Wendy Naus

University research does not hold monopoly on knowledge – co-creation/“ecology of knowledge”. Make scientific knowledge more accessible – common language, trust, humility.

Outcomes poll:

Which questions should be debated?



Drawing Room, 16.00-17.15

**Interactive debate: Conditions for integrating
impact in policies: shared and tailored approaches**

Moderator: *Martin Kirk*

Panel Members:

Alfred LeBlanc

David Sweeney

Wendy Naus