

# BUILDING TOGETHER THE OPEN SCIENCE MONITOR

Authors: David Osimo, Jon Switters (Lisbon Council); Laia Pujol, Jonathan Wareham (ESADE); Stephane Berghmans (Elsevier); Rodrigo Costas, Ingeborg Mejer, Ziga Turk, Thed Van Leeuwen (CWTS)

Launched in 2013 by the European Commission, the Open Science Monitor gathers data about open science trends in Europe to support open science policies. Below, is a selection of the data.

## OPEN SCIENCE TRENDS

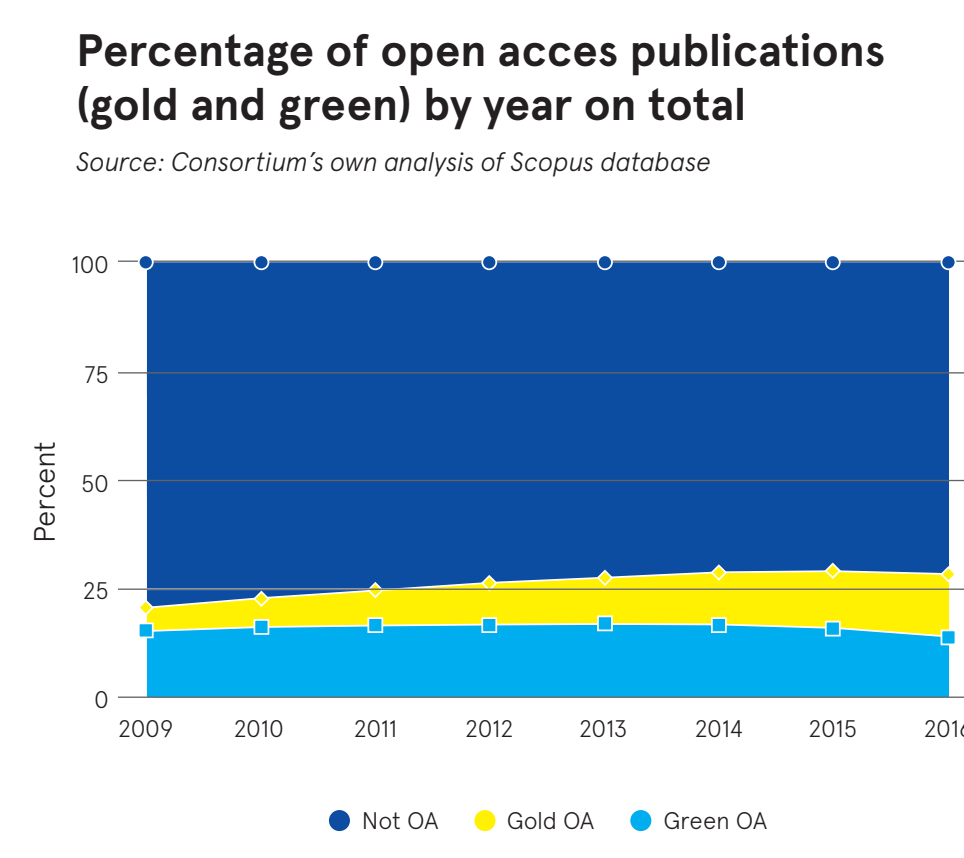
The Open Science Monitor helps to track trends for open access, collaborative and transparent research across countries and disciplines.

### Open Access to Publications

Open access to publications refers to freely, legally and sustainably accessing research publications. These are divided into:

- Gold/Hybrid Open Access:** research outputs that are made open access (OA) by the publisher; journal publications are freely available on the journal website; the cost of the publishing is recovered upfront typically as an Article Publishing Charge (APC). In gold, the whole journal is OA; in hybrid, a single publication is OA in a non-OA background.
- Green Open Access:** research outputs that are made open access by the author independently in an OA repository and in a version of the subscription article; there is no Article Publishing Charge (APC).

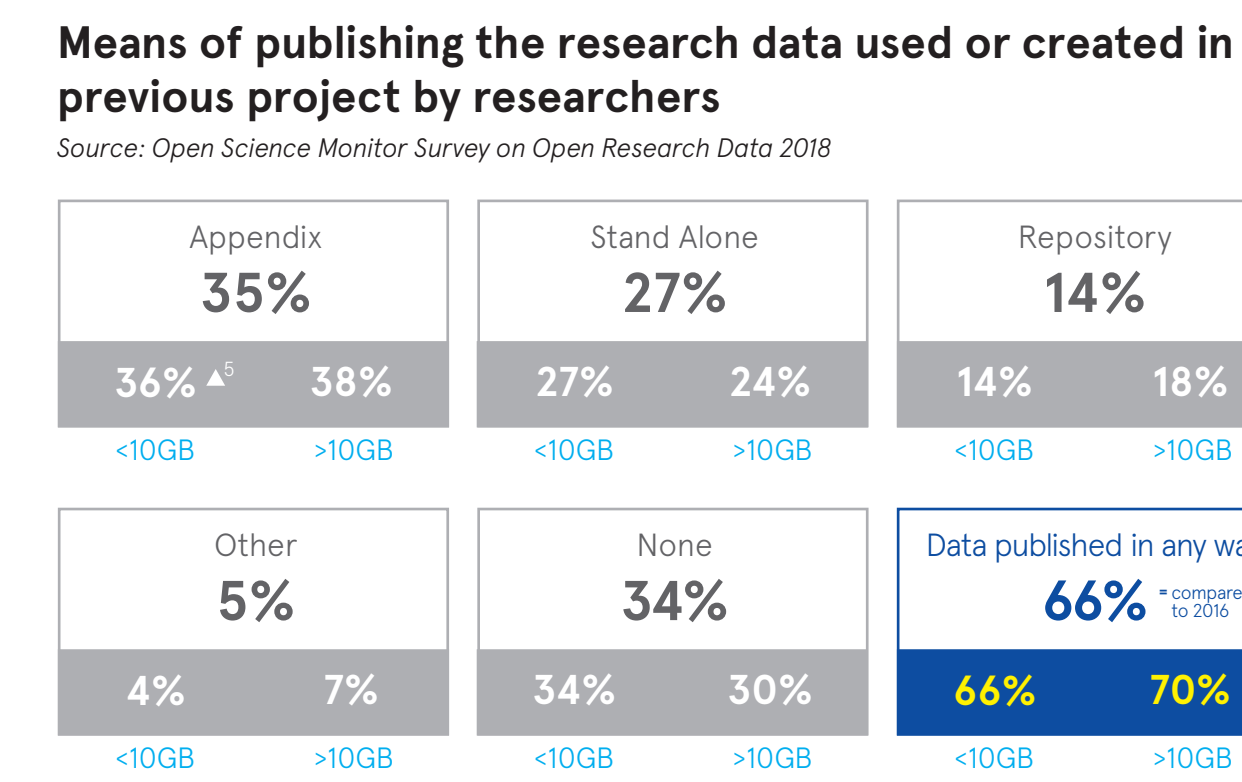
This data, based on the analysis of Scopus and Unpaywall data, shows the percentage of open access publications available.



### Open Research Data

Open research data refers to the data underpinning scientific research results that has no restrictions on its access, enabling anyone to access it.

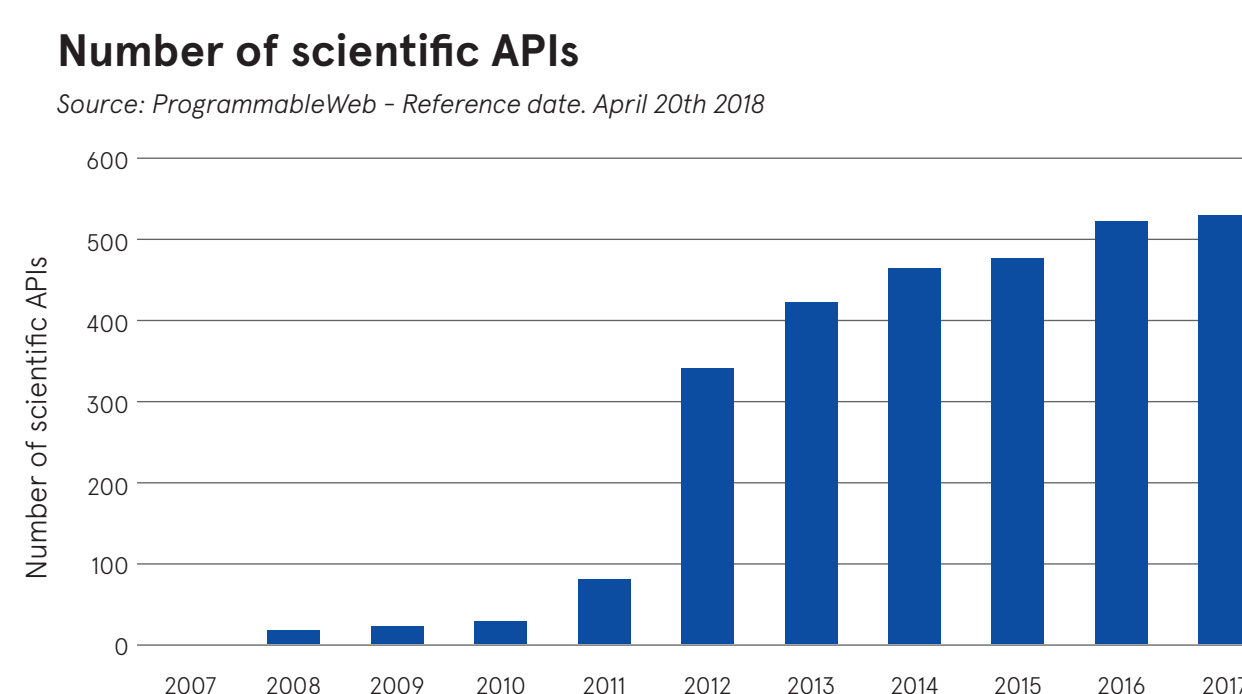
- The no. of researchers sharing data in their last project has remained stable with no growth shown over the past two years.
- 42% of researchers declare that they rely on data from other researchers and 74% declare they would benefit from access to others' research data.
- The majority of researchers do take steps to manage their research data for potential future reuse (89%).



### Open Collaboration

Open scientific collaboration refers to the forms of collaboration in the course of the scientific process that do not fit under open data and open publications.

This indicator shows the number of Application Programming Interfaces (API) in the science category of the largest API repository ProgrammableWeb



## Objectives of the open science monitor

- To deliver a monitoring system (for Europe) and (global) observatory for trends in Open Science;
- To set up a global reference point for the Open Science community to interact with;
- To determine the impacts of Open Science in the scientific domain;
- To provide structured analysis of policy-relevant trends in Open Science.

## An open and collaborative process

- Methodology presented in draft, publicly commentable format. 300 comments received and discussed at expert workshop: [https://www.makingspeechestalk.com/ch/Open\\_Science\\_Monitor/](https://www.makingspeechestalk.com/ch/Open_Science_Monitor/).
- Revised methodology published, with answer to each comment.

### Main changes:

- Integration of Unpaywall data alongside Scopus.
- Double checking of results using different sources (e.g. WoS).
- Scopus data accessible to researchers to replicate methodology.
- Advisory board and LinkedIn group established.

## DRIVERS BEHIND OPEN SCIENCE

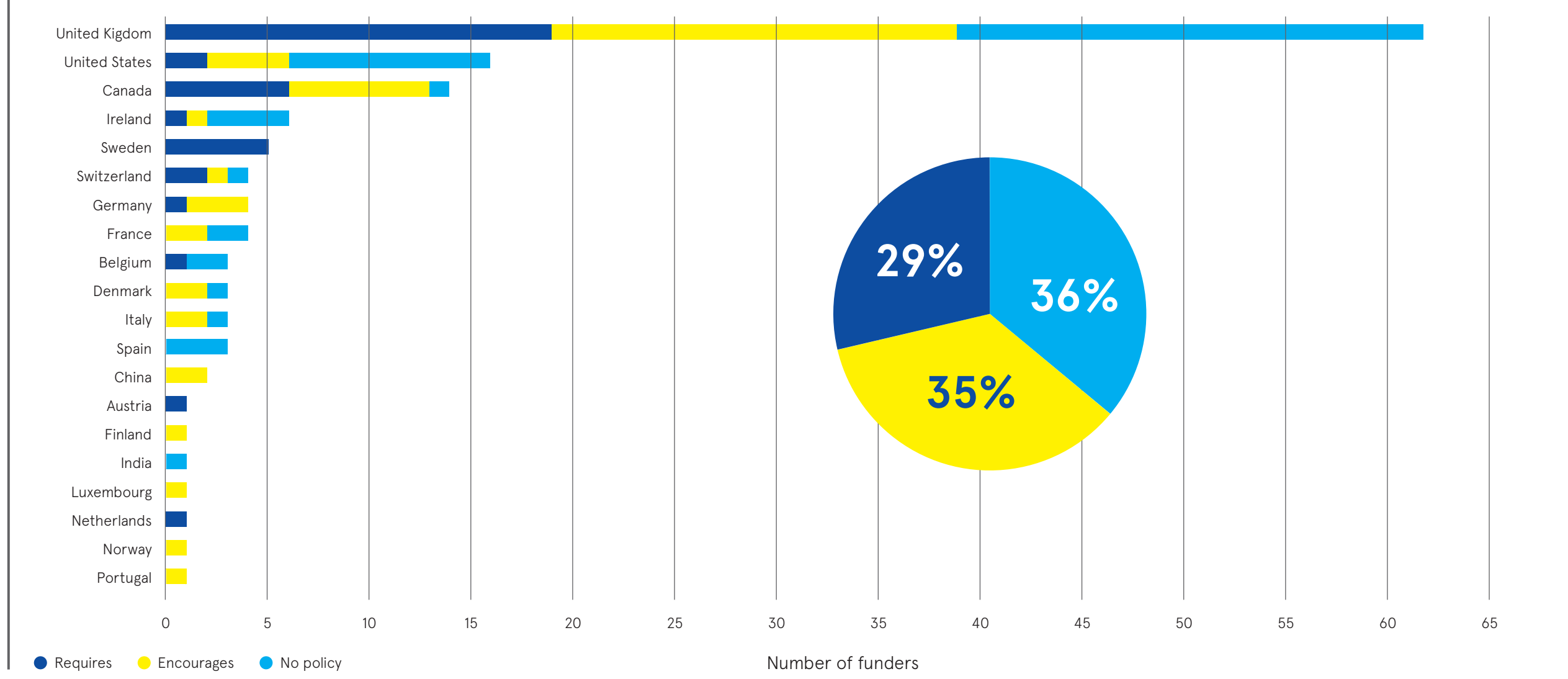
There are many different drivers at play which can facilitate the adoption of open science. Journal and funders' policies are increasingly in place.

### Driver 1. Funder mandates on Open Access.

### Driver 2. Research journal mandates on Open Access.

#### Number of funders with policies on open access - publishing, by type of mandate and country

Source: Sherpa-Juliet - Reference date: April 19th 2018

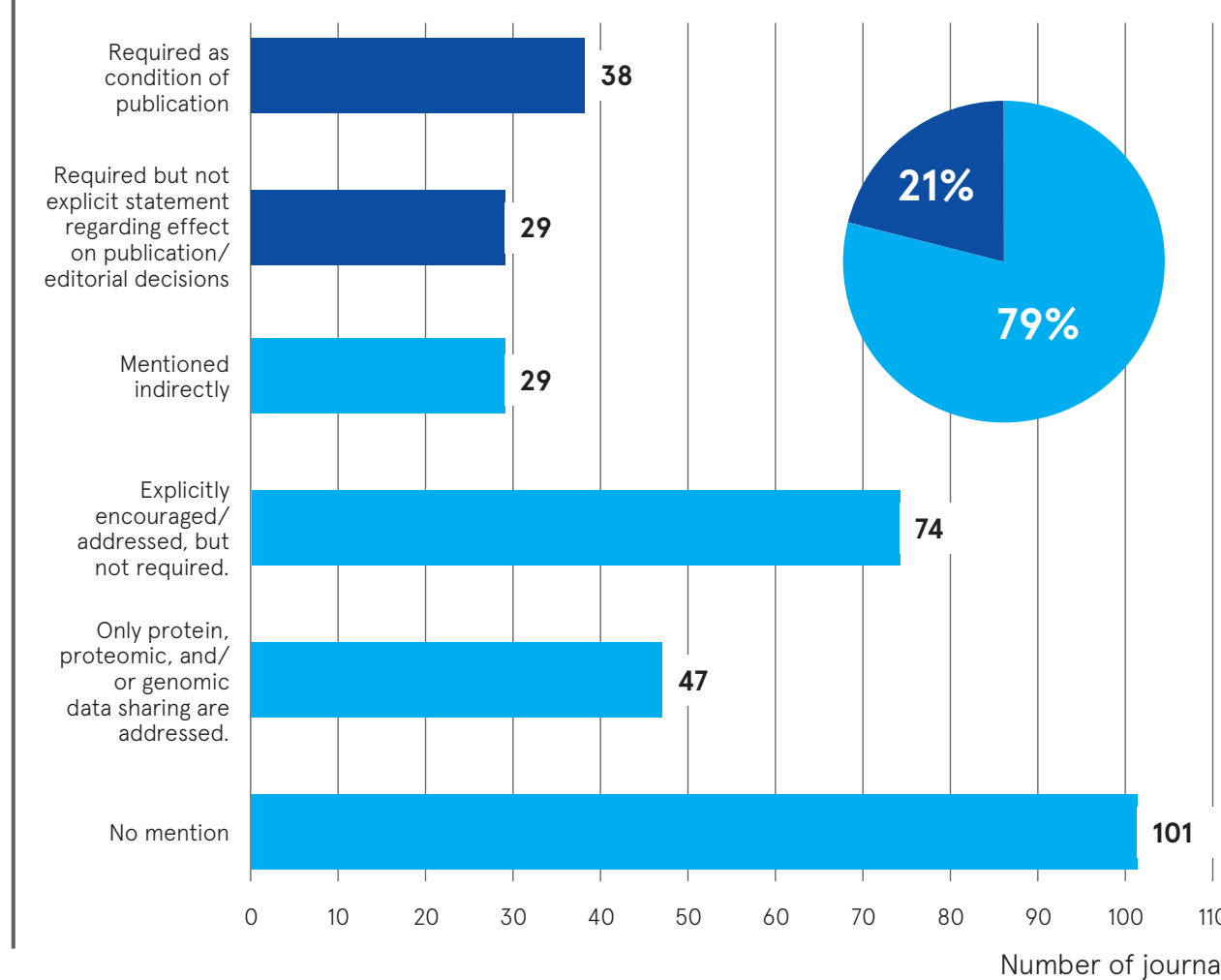


### Driver 3. Funder mandates on data archiving.

### Driver 4. Journal policies on Open Data.

#### Number of journals by data sharing modality

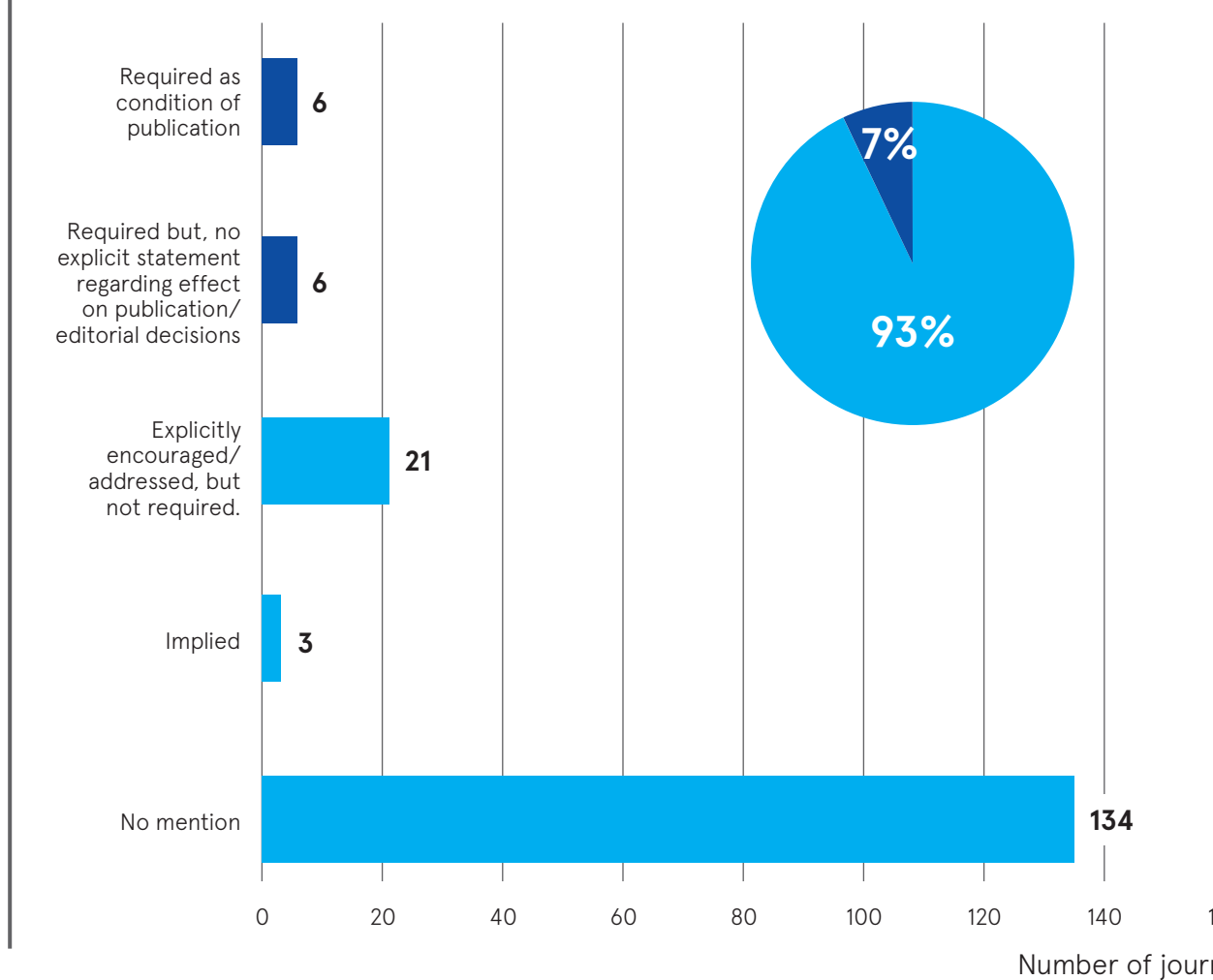
Source: Vasilievsky, Nicole A., Jessica Minnier, Melissa A. Hoandel, and Robin E. Champieux. "Reproducible and Reusable Research: Are Journal Data Sharing Policies Meeting the Mark?" PeerJ 5 (April 25, 2017): e3208. doi:10.7717/peerj.3208.



### Driver 5. Journal policies with regards to Open Code.

#### Number of journals per code sharing modality

Source: Stodden, V., Guo, P. and Ma, Z. (2015), "Toward reproducible computational research: an empirical analysis of data and code policy adoption", PLoS One, Vol. 8 No. 6, p. e67111. doi: 10.1371/journal.pone.0167111.



## THE OSM WILL DELIVER 30 CASE STUDIES

OSM delivers 30 case studies on the drivers and barriers encountered regarding open science and the direct impact on three main areas: science, industry and society.

### Open Data

**Open Targets** is an innovative, large-scale, public-private collaboration on pre-competitive research that provides comprehensive and up to date data for drug target identification and prioritisation.

Open Targets integrates publicly available information and data relevant to targets and diseases in the Open Targets Platform; and performs high throughput experimental projects that generate target-centred data in physiologically relevant systems to understand causal relationships between targets and diseases.

A cornerstone of this public-private collaboration is an agreement among the organisations that all data and resources generated within Open Targets should be made available rapidly in the public domain to the entire scientific community.

### Open Collaboration

**White Rabbit** is an open source scientific hardware developed at CERN in collaboration with a wide range of organizations worldwide and companies. White Rabbit has already shown its innovation potential by being commercialized and deployed in different industries.

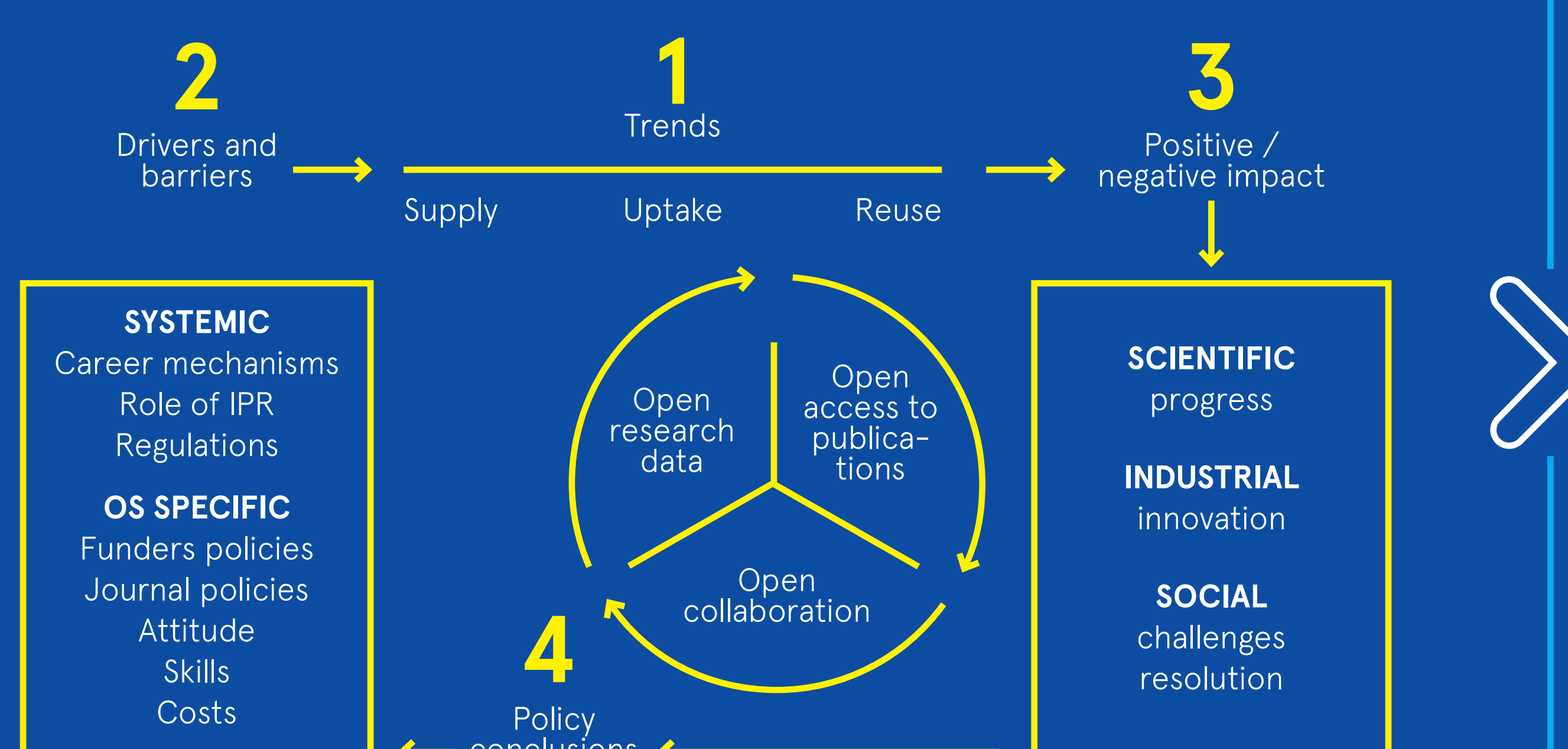
White Rabbit offers an example of how CERN managed to transform the open source software model to capital intensive innovations; that is, motivating self-interested actors to freely reveal innovations developed with private resources without compensation guarantees.

### Open Access

The **Netherlands Plan for Open Science (NPOS)** serves to improve accessibility to and increase the impact and social relevance of scientific research. During the development of the plan, a multi-actor approach was adopted including scientists, researchers, educational research institutions, government bodies, funders and science platforms in a joint and coordinated effort towards open science.

The NPOS has three key ambitions for open science: (1) 100% open access to publications, (2) making research data optimally suitable for reuse and (3) corresponding evaluation and valuation systems to recognise and reward researchers.

## Steps to building an open science monitor



## Proprietary vs. Open Data

The project uses the widest possible range of data. In some cases, proprietary data are still necessary (e.g. Scopus) because of the accuracy and richness of metadata. Hopefully, once the European Open Science Cloud is fully deployed, indicators will be automatically produced from open data sources.

Key bibliographic information	Additional bibliographic information
First author, incl. initials	Journal name
Journal name	Subject classification
Title of publication	Higher-level field labels
Publication year	
Volume	
Page numbers	
DOI	Address information
PMD	· Country
EID (Scopus)	· Institution
UT (WoS)	

Field labels created by CWTS

Address cleaning by CWTS

- This data is organised in relational databases.
- Meta data are either WoS or Scopus.
- Proprietary data, as maintenance is quite laborious, and thus not for free.
- Currently, no open meta data exist on such level, containing the required information to conduct the study.