

ANALYSIS

# An Analysis of Open Data and Open Science Policies in\* Europe \*

v3 | November 2018



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## 1. Introduction

The DCC maintains a watching brief on funder data policies, and since 2016 we have been collaborating with SPARC Europe to extend our coverage to make it more comprehensive at the European level, and to cover open research practice more generally. While some studies have been done in this area, all are either out of date or concentrate on Open Access publications or open government data rather than open research data. The most recent known analysis dates from 2013, and while this is a relatively short period the intervening period has been one of considerable change in research data policy.

This document presents an updated review of Open Data and Open Science policies in Europe as of November 2018. This analysis goes more into depth on the types of policy in place in Europe, their processes of creation, and some of their specifics. This updated version of the deeper analysis reflects changes that have been identified between January and November 2018. We concentrate on the twenty-eight EU member states, but we also consider relevant countries from the European Research Area, namely Iceland, Norway, Serbia and Switzerland.

As with the first version of this analysis, we once again reached out to the European research community and received extremely helpful comments and pointers, particularly where documents are not currently available in English or work in progress has not yet been publicised. We are particularly grateful to the OpenAIRE National Open Access Desks (NOADs) for their help in identifying relevant documents and initiatives. Specific acknowledgements are given at the end of the document.

To summarise changes since the first version, five new policies (CZ, ES, FR, RS,SI) have been added in the period between January and November 2018. Furthermore, new activity around national approaches to Open Data and Open Science has been noted in several additional countries, e.g., Czech Republic, Greece, Ireland, Luxembourg and Poland.

Summary of changes from v2:

- Austrian entry updated;
- Czech entry updated;
- French entry updated;
- Greece entry updated;
- Irish entry updated;
- Italian entry updated;
- Latvian entry added;
- Luxembourg entry added;
- Maltese entry added;
- Polish entry updated;
- Romanian entry added;
- Serbian entry updated;
- Slovakian entry added;

- Slovenian entry updated;
- Spanish entry updated;
- Swedish entry updated;
- Swiss entry updated;
- Overview tables updated;
- Analysis/comparison section updated.

## 2. Executive summary

It has long been accepted that national energies are generally dedicated to implementing Open Access to publications before attention turns to research data, not least because of the potential penalties for non-compliance with funder mandates, which are rare in the data realm. This study found that, in some countries, research data has had to wait in line behind public sector data, i.e. that produced by government departments (and often re-used by HE researchers) as opposed to data created or captured by researchers in the field or the laboratory.

The European Commission's Open Research Data Pilot for Horizon 2020 is cited in multiple policy documents as a driver and influencing force in the development of national approaches. At the same time, the importance of underpinning infrastructure is clear, and while significant efforts have been taken to develop a pan-EU research data management infrastructure via projects such as EUDAT, there is no consensus position shared within, less still across, the member states. The UK case exemplifies this, with a single set of overarching principles guiding the individual funders, but a wide diversity of approaches and levels of support at domain/disciplinary level. Some of the RCUK councils operate or sponsor dedicated data centres, while others leave this to the researchers and their institutions, or to the disciplinary community at large. This underscores the difficulty in producing a "one-size-fits-all" approach to research data management, whether at a policy level or at a practical/procedural level: the Danish and German policies, to name two, are quite explicit on this point.

Despite the difficulties inherent in attempting to make comparisons between quite different types of policy document, the analysis made some interesting findings. 13 of the 28 European Union member states have national, research data-related policies in place. In the European Research Area, three further non-EU members (Norway, Serbia and Switzerland) have active policies. The majority of the policies we looked at are owned by, or heavily involved, the national research funders, and consequently the type of policy that we see most often is the standard funder data policy, laying out expectations for grant recipients. Other types are available, ranging from national plans or roadmaps to codes of ethics, white papers, and even laws passed by national parliaments. The years in which the policies came into effect ranged from 2009 to 2018, with a pronounced tendency towards more recent implementation. Of the thirteen, there is roughly an even split between countries where research data is covered in the same policy as Open Access or Open Science and those where it is considered in isolation, and between countries with a 'hard' (imperative) and a 'soft' (encouraging) approach. Formal approaches to monitoring and compliance, and indeed fair mechanisms for

reward and recognition, seem relatively low on the priority list, although four of the thirteen policies do make reference to these.

Where policies had been in place for a reasonable period of time, our original intention was to say something about their levels of uptake and success. In practice, none of the policies we looked at were more than 7 or 8 years old. In some cases, the current policies stand as successors to previous policies; in others, they are the first time that anything like this has been attempted at a national level.

Another potential area for further study is in codes of research ethics. Numerous European countries have these in place, often serving as a form of community-derived *de facto* policy.<sup>1</sup> It may be worth future effort to look at these in more detail, particularly as carrying out comparisons between them will be comparing like with like. On the other hand, whilst coverage may vary between them, it seems unlikely that their positions on specific issues would vary greatly from country to country, given the general scientific consensus about the benefits of openness. What divides opinion now is less whether or not openness is a good thing, but rather how best to implement it, whose responsibility it should be, and who will pay.

### 3. Overview

By policy here we mean “a set of ideas or a plan of what to do in particular situations that has been agreed to officially by a group of people, or an organisation” (lightly adapted from the Cambridge dictionary definition). Specifically, this means Laws passed by Parliament, national Funder Policies and Research Plans/Roadmaps, Concordats/Agreements between multiple influential parties, and Codes of Research Practice/ Integrity/ Ethics, etc. Many of the documents examined in the course of this study are pitched at a high level, with detail about issues such as scope and compliance devolved to individual institutions or funding bodies, or to supporting documents such as FAQs. Just as there is no “one-size-fits-all” solution for research data management (the needs of a small, specialist Art college, for example, will be quite different from those of a large, research-intensive university) there is no single shape and size of “a European national RDM policy document”. How these are arranged, and the level at which they are pitched, depends to a considerable degree on several factors, such as existing national infrastructure, number of public research funders, number of research organisations, and the national culture – which can be difficult for an outsider to grasp. In some cases the documents are not yet available in English, so we have used our local contacts to better understand the process of developing the policies, their current level of maturity or engagement, and their position within the larger national and European picture(s).

We have sought to identify where national Open Data policies are linked to other agendas, such as Open Access or Open Science more broadly. Naturally, in addition to addressing the benefits of openness, it should be said that many of these policies are also explicit about

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<sup>1</sup> See for example <http://www.enrio.eu/>

situations where data should not be shared, for ethical, commercial or security-related reasons.

Overview table: Status of national policies

MEMBER STATE / COUNTRY	EXISTING POLICY? (Y/N) <sup>2</sup>	IF NO EXISTING POLICY, IS THERE WORK AFOOT?	WHAT SORT OF WORK?
<b>EUROPEAN UNION</b>			
AT	N	Y	Pilot programme on Open Data, FWF is working on implementing Open Data guidelines into all their programmes.
BE	Y	-	-
BG	N	Y	Academic team working on a policy for Open Science and Open Research Data
HR	N	Y	Research and Innovation Infrastructures Roadmap (under the auspices of the Ministry of Science, Education and Sports)
CY	Y	-	-
CZ	Y	-	-
DK	Y	-	-
EE	N	Y	Recommendations for the development of a national policy
FI	Y	-	-
FR	Y	-	-
DE	Y	-	-
EL	N	Y	- A proposal for the re-formulation of a National Open Science High Level Task Force under the auspices of the General Secretariat of Research and Technology (GSRT) was made in November 2018.
HU	N	Y	Joint committee on Open Science, bringing together representatives of various stakeholder groups
IE	N	Y	The National Open Research Forum (NORF) released a National Statement on the Transition to an Open Research Environment. The implementation of this policy will be detailed in a national action plan which will be 2019.
IT	N	Y	New Working group ICDI (Italian Computing and Data Infrastructure) was recently created by representatives of some of the main Italian Research Infrastructures and Infrastructures with the aim of promoting synergies to optimize Italian participation in e.g., EOSC, EDI and HPC.
LV	N	N	-
LT	Y	-	-
LU	N	Y	A working group has been set up to define a Luxembourg wide national open access to science plan for 2020.

<sup>2</sup> Links to the national policies are given in this document's predecessor, our [Snapshot of Open Data and Open Science Policies](#)

MEMBER STATE / COUNTRY	EXISTING POLICY? (Y/N) <sup>2</sup>	IF NO EXISTING POLICY, IS THERE WORK AFOOT?	WHAT SORT OF WORK?
MT	N	Y	Collaboration between the Ministry and UM who are working towards an Open Access/Open Science policy for Malta.
NL	Y	-	-
PL	N	Y	Ministry has declared that a new OA policy will be published soon
PT	Y	-	-
RO	N	N	-
SK	N	N	-
SI	Y	-	-
ES	Y		
SE	N	Y	The Swedish Research Council is coordinating a national open research data initiative, in conjunction with the National Library and National Archive, at the behest of the Swedish government.
UK	Y	-	-
<b>NON-EU</b>			
IS	N	Y	Addressed within the Ministry of Education, Science and Culture's plan for Icelandic HE (2017-2012)
NO	Y	-	-
RS	Y	-	-
CH	Y	-	-

**Table 1 – Status of national policies**

## 4. State by state

### 4.1 Summary

Overview table: countries with national policies in place

MEMBER STATE / COUNTRY	TYPE OF POLICY (STATUTE, GOVERNMENT MINISTRY, FUNDER POLICY)	YEAR POLICY CAME INTO EFFECT	SPONSORING ORGANISATION (MINISTRY, FUNDER, ETC)	SCOPE / COVERAGE BEYOND DATA	LINKED TO OA / OPEN SCIENCE POLICY?	SOFT/HARD <sup>3</sup>	COVERAGE OF SKILLS OR TRAINING?	MONITORING AND/OR COMPLIANCE <sup>4</sup>
<b>EU</b>								
BE	Code of Ethics	2009	Learned Societies, supported by Federal Government	Protocols	No	Hard	No	No
CY	Joint policy of Government and Funder	2016	Working group involving government ministry, funder and universities	Publications	Yes	Soft	No	No
CZ	National Strategy	2017	Ministry of Science, Research and Innovation	Publications	Yes	Soft	Yes	No
DK	National Plan	2015	Steering group involving universities, libraries and national ICT infrastructure provider	Software, protocols	No	Hard	Yes	No

<sup>3</sup> Here we define a ‘hard’ policy as one that employs language such as “must” or “should”, as opposed to soft policies which more gently advise or encourage.

<sup>4</sup> In this column, a “No” entry means either that compliance is not addressed explicitly, or is devolved to a lower level.



MEMBER STATE / COUNTRY	TYPE OF POLICY (STATUTE, GOVERNMENT MINISTRY, FUNDER POLICY)	YEAR POLICY CAME INTO EFFECT	SPONSORING ORGANISATION (MINISTRY, FUNDER, ETC)	SCOPE / COVERAGE BEYOND DATA	LINKED TO OA / OPEN SCIENCE POLICY?	SOFT/HARD <sup>3</sup>	COVERAGE OF SKILLS OR TRAINING?	MONITORING AND/OR COMPLIANCE <sup>4</sup>
ES	State Plan	2018	Ministry	Covers data alongside many other RDI related issues, including OA	Yes	Soft	Yes	No
FI	National Plan	2014	Ministry	Publications, tools, methodologies	Yes	Hard	Yes	Yes
FR	Law/National Plan	2016/2018	Parliament/Ministry	Covers data alongside many other ICT related issues, including OA	Yes	Hard	No/Yes	No/Yes
DE	Funder Policy	2010	Research Council	Software, methods	No	Hard	No	No
LT	Law / Funder Policy	2016	Research Council / Parliament	Publications	Yes	Hard	No	Yes
NL	National Plan / Concordat	2017	Ministry	Publications	Yes	Soft	Yes	Yes
PT	Funder Policy	2014	Research Council	Samples, software, models	No	Soft	No	No
SI	National Policy	2017	Government	Publications	No	Hard	No	Yes
UK	Funder Policy / Concordat	2015/2016	Funding Council, Research Councils, Universities, Private Funder	Software (in the FAQs and Concordat)	No	Hard	Yes	No
<b>NON-EU</b>								
NO	Funder Policy	2014	Research Council	Only data	No	Soft	Yes	No

MEMBER STATE / COUNTRY	TYPE OF POLICY (STATUTE, GOVERNMENT MINISTRY, FUNDER POLICY)	YEAR POLICY CAME INTO EFFECT	SPONSORING ORGANISATION (MINISTRY, FUNDER, ETC)	SCOPE / COVERAGE BEYOND DATA	LINKED TO OA / OPEN SCIENCE POLICY?	SOFT/HARD <sup>3</sup>	COVERAGE OF SKILLS OR TRAINING?	MONITORING AND/ OR COMPLIANCE <sup>4</sup>
CH	White Paper (1) / Funder Policy (2)	2014 (1) / 2017 (2)	Universities (1) / National Funder (2)	Covers data alongside many other ICT related issues, including OA (1)	Yes (1) / No (2)	Hard (both)	Yes (1) / No (2)	Yes (both)
RS	National policy	2018	Ministry	Open Science	Yes	Soft	Yes	Yes

**Table 2 – Countries with national policies in place**

## 4.2 Member states with existing national policies (13/28)

### BELGIUM (BE)

#### *Policy specifics*

Preserving and providing access to data to allow verification of published research is addressed within the “[Code of Ethics for Scientific Research in Belgium](#)”, which states that “the primary data of a research project and the protocols must be kept and made accessible during a determined and sufficient period of time. When publications, especially review and summary articles, do not contain all the necessary data for verification, the data should nevertheless be available.” (p8.) The rationale for RDM stems from the need for verifiability of research results.

The Belgian approach, which is similar in some ways to Estonia’s Statement of Principles, was led by the Learned Societies of Belgium, with the support of the Federal Government, and covers both primary data and the protocols and methods required to replicate scholarly findings. The document draws legitimacy from its origins within the Belgian learned societies, claiming that: “A code of ethics offers advantages in relation to legal or statutory standards. Indeed, it is impossible to elaborate precise rules covering all cases and circumstances. Furthermore, a code, which is based on the values shared by researchers, has a greater moral legitimacy than the rules imposed top down.”

It is noteworthy for being the longest-lived of the policies considered in this report. While this is a ‘hard’ policy in terms of its language, the policy appeals more to the scholar’s sense of being part of a community sharing high standards than some other ‘carrot-and-stick’ types approaches. This is demonstrated by the process of its creation, via the Learned Societies. Skills and training are addressed only in very general terms, in that researchers must become skilled in all techniques necessary to conduct their research, data management being but one of these.

#### *Additional information*

In addition to the Code of Ethics, “[The Brussels Declaration on Open Access](#)” of 2012 (signed by the federal, Flemish and Brussels-Wallonia Science Ministers), commits the signatories to “investigating possibilities and new opportunities in the broad Open Access field, all in frequent collaboration with relevant stakeholders, considering Open Access to scientific publications a forerunner of new initiatives in the ‘Open Data’ and ‘Open Science’ areas”.

At a sub-national level, the Flemish research council (FWO) has introduced “[Research Integrity Profiles](#)” which outline the rights and duties of researchers, supervisors and their institutions, including a responsibility to “securely and durably store” research data. The FWO is currently understood to be considering introducing a DMP requirement in line with other research councils in Europe, which may form part of a broader RDM policy. Furthermore, in the absence of higher-level research data policies, individual research institutions have already started adopting or developing their own RDM and data sharing policies.

#### CYPRUS (CY)

The Cypriot [national policy for Open Access](#) was developed via a working group including government, national funder and universities, and approved at Government level in 2016, although – as with the Portuguese and Norwegian policies – it is important to note that the Cypriot policy encourages without mandating; the Horizon 2020 Open Data Pilot is currently the only ‘hard’ mandate governing HE research in Cyprus. The national policy has also been adopted by the national funder, the Research Promotion Foundation (RPF), and universities are expected to follow the national policy, but are also free to create their own institutional policies which align with it. The policy covers both data and Open Access publications. Having recently come into effect, the policy’s efficacy has not received any formal monitoring, although this is expected to begin when the first batch of funded projects begin to complete, although the OpenAIRE NOAD in the country has already reported contact from researchers asking for help in meeting the policy expectations: an encouraging sign, although obviously for a larger country (Cyprus has a population of 1.1M) such an approach would not scale.<sup>5</sup>

#### CZECH REPUBLIC (CZ)

A National Strategy on Open Access To Scientific Information (2017-2020) was approved by the Government in 2017, which covers both research publications and research data. This document originates from the office of the Deputy Prime Minister and is pitched at quite a high level. The next step is expected to be a more detailed Action Plan, of which a draft is ready but it is not publicly available yet.

#### DENMARK (DK)

The Danish Government’s 2012 paper “[Denmark – a nation of solutions, Enhanced cooperation and improved frameworks for innovation in enterprises. Ministry of Science, Innovation and Higher Education](#)” provides the context for recent ICT innovations in Danish HE. Following this, a group comprising the Danish Rectors’ College, the Danish e-Infrastructure Cooperation (DeIC) and Denmark’s Electronic Research Library established a Steering Group for National Data Management, which presented a [strategy on data management](#) in 2015 (in Danish.) This advocates a structured, holistic approach to data management, data preservation and data infrastructures, with a bottom-up process based on stakeholder collaboration. (Source: NordForsk (2016), “Open Access to Research Data – Status, Issues and Outlook”). A [National Forum for Data Management](#) (Danish language) was formed in 2015, with representatives from the Danish universities and national libraries and a secretariat from DeIC. Its vision is “to promote academic and research initiatives in research data management within universities, and link them in a national and international cooperation.”

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<sup>5</sup> The policy is currently available only in Greek, although colleagues in Cyprus have offered to produce an English translation as a result of this study’s interest in the Cypriot national approach.

The Danish policy employs terms such as “should” and “shall”, although practical implementation and monitoring are devolved to individual research organisations via their own policies and procedures. The strategy, being a national one, is quite wide-ranging, covering both data and the software/protocols necessary to re-run experiments (although not publications, which are mentioned only in passing), noting also the need to foster research data management skills. The strategy is clearly the product of considerable liaison across and between stakeholder groups, and is sensitive to the differences between academic disciplines in terms of how research data management should be organised in practice.

Finally, the strategy notes the relatedness of policy and supporting infrastructure, as well as giving an insight into some of the benchmarking carried out in its production:

The Swedish experience that a national top-down policy without the provision of infrastructure and support functions and without adaptation to and involvement of research communities are actually ineffective. On the other hand, the Australian experience shows that a parallel and gradual building of local and national policies, infrastructures and support functions coupled with strong cooperation-organization and significant national financial support - are extremely effective. (Via Google Translate)

#### FINLAND (FI)

The development of Finland’s [“Open Science and Research Roadmap 2014–2017”](#) was led by the government’s Ministry of Education and Culture, and sets out the policy framework for a national approach. The document is both ambitious – its aim is “to make Finland the leading country for openness in science and research by 2017, and for the opportunities afforded by Open Science to be extensively harnessed in Finnish society” – and it is consequently broad in scope, covering publications, data, methods and tools. It is linked to the national Open Access strategy, and is complemented by an Open Science Handbook and a Data Management Guide for Finnish researchers.

The language used is relatively hard, using terms such as “will” rather than “should”. Monitoring and compliance responsibilities are divided amongst stakeholder groups, and responsibility for skills and training is delegated to the Doctoral Training Centres, placing it firmly within the academic domain, and putting the emphasis on shared best practice as opposed to a top-down mandate. The Roadmap refers to a forthcoming Certificate of Open Research, due in 2017.

#### FRANCE (FR)

The French approach is, together with Lithuania, the most high level of all: the [“Law for a Digital Republic”](#) (Loi n°2016-1321 pour une République numérique,) passed by the French Senate in 2016. Designed by the French government as a framework for the development of the entire national digital economy, this is also the most wide-ranging of all the policies examined in this study, covering a multitude of digital issues, including both Open Access

publications and research data. Article 30 ensures the re-usability of open data deriving from public funding:

When data result from a research activity funded for at least half by the State, local authorities or public institutions, by national agencies or by European Union grant are not protected by a specific right or a particular regulation and have been made public by the researcher, the institution or the research agency, their reuse is free. The publisher of a scientific publication [...] cannot limit the reuse of the research data made public in the publication.<sup>6</sup>

The French law is unlike most of the other policies in that it focuses on rights, rather than obligations, such as the right to access research data and the right to deposit publications in an Open Access repository. In practical terms, it seems somewhat obvious to say that implementation and monitoring will not be the duty of the French parliament but rather devolved to individual research organisations and publishers, although the ultimate arbiter of any disputes will be the French legal system. Being a law, it is very much a hard policy. Training is addressed in a sense, although as such a wide-ranging document this is not specifically in the context of data, but rather about the role of trade organisations in developing skills, which could conceivably be extrapolated to a Learned Societies/HE context.

In July 2018, The Ministry of Higher Education, Research and Innovation adopted the ambitious [National Plan for Open Science](#). The plan presents three broad commitments under the headings:

- *‘Generalising Open Access to Publications’*
- *‘Structuring Research Data and Making it Available through Open Access’*
- *‘Be part of a sustainable European and international open science dynamic’*

Each commitment is accompanied by a short Roadmap section, which outlines the stepping stones to meeting each commitment. The section on Open Data can be summarised in the following quote:

*“Our ambition is to make sure that the data produced by French public research are gradually structured in accordance with FAIR principles (Easy to find, Accessible, Interoperable, Reusable), preserved and, when this is possible, open.”<sup>7</sup>*

The Plan references the "[Artificial Intelligence Strategy](#)" which was launched in March 29, 2018, where the President announced the establishment of openness principles by default for all data published by projects funded by public funds. The plan furthermore

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<sup>6</sup>OpenAIRE blog, *New French Digital Republic Law boosts support for OA and TDM*, 29.11.2016. <https://blogs.openaire.eu/?p=1602>

<sup>7</sup> National Plan for Open Science (2018) p.6. [http://cache.media.enseignementsup-recherche.gouv.fr/file/Recherche/50/1/SO\\_A4\\_2018\\_EN\\_01\\_leger\\_982501.pdf](http://cache.media.enseignementsup-recherche.gouv.fr/file/Recherche/50/1/SO_A4_2018_EN_01_leger_982501.pdf)

recognizes the limitations placed on some data by law, professional secrecy, commercial limitations and IPR issues etc. Data processing will now be an eligible research expense in funded projects and researchers will be invited to submit their data to certified data repositories. The plan also states that Data Management Plans will be generalized; a prize for research data will be set up to reward and highlight research teams who are excelling in this area. The plan pledges the support of France to the RDA and software and technical solution development in this field.

#### *Additional information*

As a member of the G8, together with Germany, Italy and the UK, France is party to the G8 science ministers statement, made in London on 12 June 2013.<sup>8</sup> This statement “proposes to the G8 for consideration new areas for collaboration and agreement on global challenges, global research infrastructure, open scientific research data, and increasing access to the peer-reviewed, published results of scientific research.”

#### GERMANY (DE)

##### *Policy specifics*

DFG (the main German research funder) has “[Guidelines on the Handling of Research Data](#),” which also point towards a set of “[Principles for the Handling of Research Data](#),” developed in partnership between a number of high profile German research organisations and adopted by the Alliance of German Science Organisations in June 2010. The DFG policy focuses on research data, although it also addresses the software and methods necessary for validation and/or replication. It is a hard policy, and does not explicitly address skills or training, but does make reference to the necessity of national infrastructure funding, which could be seen to cover human as well as technical infrastructure. (The accompanying Principles document, an analogue of which the UK also uses in its FAQs, does address skills explicitly.)

As with the Dutch approach, the German policy emphasises the need to formally recognise the effort and time required for data management:

The commitment and efforts of researchers to make research data available, for example the subject-specific further development of the discussion process or the technical possibilities of archiving, evaluating and networking research data should be given greater emphasis in the appraisal of scientific qualifications and achievements.

#### *Additional information*

In 2016 the Helmholtz Association, a union of 18 German scientific-technical and biological-medical research Centres, adopted a [position paper on the management of research data](#). This includes a commitment to “store research data from the Centres within suitable data

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<sup>8</sup> G8 Science Ministers Statement (2013), URL: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/206801/G8\\_Science\\_Meeting\\_Statement\\_12\\_June\\_2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/206801/G8_Science_Meeting_Statement_12_June_2013.pdf)

infrastructures and make them available openly and free of charge for subsequent use by science and society.”<sup>9</sup>

As a member of the G8, together with France, Italy and the UK, Germany is party to the G8 science ministers statement, made in London on 12 June 2013.<sup>10</sup> This statement “proposes to the G8 for consideration new areas for collaboration and agreement on global challenges, global research infrastructure, open scientific research data, and increasing access to the peer-reviewed, published results of scientific research.”

#### LITHUANIA (LT)

##### *Policy specifics*

Although Lithuania has a [Law on Higher Education and Research](#) (2009, revised 2015 and 2016) which covers Open Access and research data, stipulating that “the results of all research works carried out in state higher education and research institutions must be communicated to the public,” in practice the more relevant policy document is the Research Council of Lithuania’s “[Guidelines on Open Access to Scientific Publications and Data](#)” (2016). These guidelines likewise cover both publications and data. Skills are not addressed, but responsibilities for various aspects of Open Access and Open Data are covered in detail, indeed in more explicit detail than most of the other national policies. As with France, the only other EU country known to have enshrined OA and research data in law, the focus is more on rights than on obligations, and the inference is that universities will be responsible for developing their own policies, procedures, guidance and monitoring systems.

##### *Additional information*

Some research institutions in Lithuania, including Kaunas University of Technology Lithuanian University of Health Sciences, Mykolas Romeris University, Vytautas Magnus University, Lithuanian University of Educational Sciences and Vilnius Gediminas Technical University are understood to have adopted institutional policies aligned with the Research Council guidelines, the Horizon 2020 Open Access Mandate and Open Research Data Pilot, and the Guidelines on Data Management in Horizon 2020.<sup>11</sup>

#### NETHERLANDS (NL)

Open Data is addressed within the “[Nationaal Plan Open Science](#)” which deals with data as well as other research outputs. There is also a [National Coordination Point for Research Data Management](#). The National Plan is sponsored by the government’s Ministry of Education, Culture and Science, and covers OA publications and data in detail. Mention is also made of

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<sup>9</sup> This article describes the current state of play and the need for national initiatives: <https://www.hrk.de/themen/forschung/forschungsdaten-management/> (in German)

<sup>10</sup> G8 Science Ministers Statement (2013), *op. cit.*

<sup>11</sup> Further information is available in the blog post at <http://eifl.net/eifl-in-action/open-access-lithuania>



other “Open” components, such as software and methods, but these are deferred/devolved to the National Platform for Open Science.) This is a relatively soft policy, speaking of ambitions rather than requirements, and addresses both the need for evaluation/ monitoring approaches, and also – encouragingly – incentives and rewards for engagement and effort.

#### PORTUGAL (PT)

##### *Policy specifics*

FCT (the national research funder) has a [policy on management and sharing of data and other results arising from FCT-funded research](#), but in practice this is a general, aspirational call for researchers to share their data, and not a mandatory policy. The policy document is brief, at under two pages in length, and very much on the soft (suggest and encourage) end of the scale. It “encourages researchers to make available the data resulting from R&D projects it finances in appropriate Open Access databases, where possible,” with scope for opting out if the nature of the data does not lend itself to open sharing. The focus is on sharing data (and other research outputs, such as samples and software models) “*with other researchers.*” [our italics]

The policy suggests that a data management plan should be produced, proposing a basic template/table of contents, and that best practice be followed for whichever scientific discipline the research sits closest to. The only mandatory element of the policy is that FCT must be credited as a funder of any dataset made openly available. Skills are not addressed in the document, and – given the soft, aspirational approach – compliance is not covered either, but the document is clear that the policy will continue to be developed in order to “converge with international best practices, in particular with the initiatives of this domain that may be established within the European Union.”

##### *Additional information*

The Portuguese Ministry of Science has established an Expert Group on national Open Science Policy. The group is producing recommendations that will include recommendations on open research data policies. At the same time there are discussions underway for concrete national initiatives, both at the infrastructure level and at capacity building and training levels. Furthermore, a consortium of the University of Minho, the Ministry of Science and FCT have organised periodic Research Data Management Forum events to help improve communication and understanding between research and government.

#### SLOVENIA (SI)

The Slovenian government has an [official policy on Open Access](#), which contains a chapter on an Open Data pilot, more or less in line with the EU H2020 pilot. It contains a requirement for Open Access by default, the production of a data management plan, and recommendations about where to store data for the long term. The government strategy is accompanied by an [action plan](#) which was implemented in 2017 wherein the national research agency will adapt the regulation and specify the scope and details of an Open Data pilot. It is expected that the

coverage of the infrastructure will be broadened to include preservation and access as well as data storage and archiving.

#### SPAIN (ES)

The Spanish Government published the [State Plan for Research, Development and Innovation 2017-2020 in January 2018](#). The plan includes a new focus on Open Access to scientific publications and research data<sup>12</sup>. The State Plan is the main instrument of the State Government for developing and achieving those objectives set at the Spanish Strategy for Science and Technology and Innovation 2013-2020, and at the Europe 2020 Strategy. The state plan presents a new focus on research data with a voluntary mandate that data from research funded by public funds should be stored and made available through Open Access for purposes of replication and reproduction of research and analysis.

The plan outlines how funded research projects may include, as an option, a plan for the management of research data that will be deposited in national/institutional/international repositories after the end of the project. The plan also recognises that data must be protected and some may not be amenable to openness for reasons of security, confidentiality or commercial reasons. The plan recommends that evaluation of researchers should take into account work published in open repositories and this regards both publications as well as research data.

Furthermore, two HE consortia (“Consortio Madroño” in Madrid and CSUC in Catalonia) have developed RDM services to support their researchers. Work is currently underway to create guidance and policies for member institutions based on the LEARN model policy.<sup>13</sup>

#### UNITED KINGDOM (UK)<sup>14</sup>

##### *Policy specifics*

The UK approach is multilevel, comprising a concordat, a set of common principles, and individual research funder policies. The highest level of these, the “[Concordat on Open Research Data](#)” (2016) is signed by the (non-research) HE funding council (HEFCE), the umbrella group representing the seven national research funders (RCUK), the umbrella group representing c. 135 of the c. 1964 UK universities (Universities UK), and one large and influential private funder (the Wellcome Trust).

The “[RCUK Common Principles on Data Policy](#)”, published in 2011 and last revised in 2015, apply to the seven domain-aligned public research councils, and serves as a foundation for their individual approaches, which vary considerably in terms of implementation and supporting infrastructure. The documents’ coverage is largely focused on research data,

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<sup>12</sup> 2017-2020 Plan Estatal de Investigación Científica y Técnica y de Innovación (pages 30-31)

<sup>13</sup> LEARN, *Highlights of the Fifth LEARN Workshop in Barcelona*, 09.02.2017. <http://learn-rdm.eu/en/highlights-of-the-fifth-learn-workshop-in-barcelona/>

<sup>14</sup> The United Kingdom is expected to leave the European Union in March 2019.

although the FAQs which accompany the common principles do also mention software. Neither the concordat nor the common principles makes an explicit link between open access to publications and data, although the introduction to the Concordat situates data as “the next step [following OA] in achieving the UK’s open science ambitions.”

#### *Additional information*

As a member of the G8, together with France, Germany and Italy, the UK is party to the G8 science ministers statement, made in London on 12 June 2013.<sup>15</sup> This statement “proposes to the G8 for consideration new areas for collaboration and agreement on global challenges, global research infrastructure, open scientific research data, and increasing access to the peer-reviewed, published results of scientific research.”

#### 4.3 Member states with no national policy but which are active in this space (12/28)

Thirteen further EU states do not yet have active policies in place, but are known to be developing national approaches.

##### AUSTRIA (AT)

Austria has no national policies at present, but the Austrian Science Fund (FWF) includes Open Data on its roadmap of Open Science policies. In January 2016, the FWF invited an expression of interest for the pilot programme Open Research Data (ORD) and received 48 responses of which 47 were invited for a full proposal. After an international peer review, 12 projects could be funded for the pilot programme. Furthermore, on this basis the FWF will implement guidelines in all of their programmes to increase the openness of research data.

##### BULGARIA (BG)

According to the Ministry of Education and Science of Bulgaria, an academic team is working on a policy for Open Science and open research data, and events have been held to formulate a national approach (e.g. at Sofia Tech park in 2015, and one in the Bulgarian Academy of Sciences in 2016), but there are at present no active national policies governing research data in Bulgaria, information is available on the [website](#) of the Ministry of Education and Science regarding the work that is in progress.

##### CROATIA (HR)

No national policy is yet in place, but there is much on-going work in this area. National policies on access and preservation of scientific information (both publications and data) are under the responsibility of the Ministry of Science, Education and Sports. The Ministry strongly supports open access to scientific information to provide maximum impact from the research they support. The Croatian “[Research and Innovation Infrastructures Roadmap](#)

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<sup>15</sup> G8 Science Ministers Statement (2013), *op. cit.*

[2014-2020](#)” addresses the promotion of open access to research data, “especially data funded from public sources.” (See p.8, paragraphs g to j.

#### ESTONIA (EE)

Responsibility for research data lies with the Estonian Research Council, who host a webpage dedicated to it (in [English](#)). Their report “Open Science in Estonia - Open Science Expert Group of the Estonian Research Council, Principles and Recommendations for Developing National Policy” outlines the current state of play. The expert committee behind this report comprise representatives of government ministries, Estonian universities and the national library, so here again we see an example of a collaborative, consultative and collegiate approach.

The document is wide-ranging in terms of its scope, covering publications, data, code and methodologies, and addresses the relationship between data and OA publications. It is not a mandate as such, but rather lays out a series of (fairly strongly worded) recommendations for a national policy. Skills are explicitly addressed, with responsibility for developing researcher abilities and understanding placed at the door of the research libraries. As in the Danish case, monitoring and compliance are expected to be devolved to individual institutions’ policy documents. In practical terms, RDM in Estonia remains a work in progress. Most research projects will deposit their output, including data, with international publishers and third-party service providers. University libraries – such as Tartu and Tallinn - have joined the DataCite consortium and offer data archiving services. Some research centres are also members of CLARIN and DARIAH, and the national data archive for social science data (ESTA) is a CESSDA member.

#### GREECE (EL)

Law 4310/2014 supports open access to publicly funded research, however Greece does not have a national Open Access/Open Science policy as of yet. On 29 and 30 November 2018, OpenAIRE organised a [Greek Open Science Symposium, the aim of which was to](#) understand the current research ecosystem and prioritise actions towards the development of a National Open Science Strategy. Drawn from discussions during the 1st day, a proposal for the re-formulation of a National Open Science High Level Task Force under the auspices of the General Secretariat of Research and Technology (GSRT) was made.

#### HUNGARY (HU)

No policy is yet in place, but first steps are being taken in Autumn 2017, with the formation of a joint committee on Open Science. The committee has produced a policy draft which is currently being discussed.

#### IRELAND (IE)

In November 2018 the National Open Research Forum (NORF) released a [National Statement on the Transition to an Open Research Environment](#). The statements lists principles that

support access to publicly funded research. This work draws on national and international open research policies, and will be implemented between 2018 and 2020. The implementation of this policy will be detailed in a national action plan which will be prepared with all relevant stakeholders in 2019. The statement includes a confirmation and support on research data management principles i.e., FAIR principles, openness, interoperability and citation mechanisms. The principles stipulate that data management plans be standard practice from an early stage in the research process and that data is made identifiable through the use of standardised persistent identifiers. Openness of data should be the the aim, all the while respecting any legal, ethical and security restrictions which may be present. The principles furthermore state that ‘funders and institutions will include their requirements for data management plans and for data sharing, together with details of their mechanisms for monitoring compliance, in grant terms and conditions.’ (point 18, page 4)

Until now, the EPA (Environmental Protection Agency) was the sole Irish funder requiring data deposit from projects which they fund. “All significant datasets produced during the research project must be submitted to the EPA at the end of the project for archiving in the EPA Research Data Archive. Some other funders’ OA publications policies also mention archiving data where possible, and a few HEIs, including Trinity College Dublin and University College Cork, have introduced RDM policies.<sup>16</sup>

#### ITALY (IT)

There is no known national policy as yet, but there have been announcements about a national policy on Open Science and research data from the Ministry of Research and Education. [A recent report](#) from the Ministry (June 2016) makes reference to it:

The current Italian National Research Program aims to encourage the development and dissemination of Open Science and Big Data [.] The plan is to adopt a national policy on the deposit, open access and the reuse of products and research data, in consideration also of big data. In this regard, a working group will be set up to define and propose short strategies, guidelines, implementation plans and shared tools at inter-institutional level, European and international level[.] (Translated from p. 74.)

The Conference of Rectors of Italian Universities, CRUI, has a Working Group on Open Access, which is planning to take action in this area. At the same time, several individual universities and research centres are creating their own policies to manage research data and provide support to researchers; some research centres have consolidated experience in research data

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<sup>16</sup> In a distant but still noteworthy initiative, the Irish government’s Government Reform Unit has recently published its “Open Data Strategy 2017 – 2022” which notes an intention to “Explore the possibility to broaden the initiative to include Open Research Data, in line with the requirements of the Horizon 2020 research programmes, and with emerging policy in Irish research funding bodies. Where research is publicly-funded, make the research findings available in Open Data formats.” This exploratory work is anticipated to begin in 2021.

management in their own specific domains. A small working group (comprising IT, librarians and research administrators from five Italian universities) has produced templates for institutional research data policy, together with implementation guidelines. In recent years several RDM workshops have been organised under the auspices of OpenAIRE, RDA and the Italian Association for the Promotion of Open Science, but the lack of a single, central body to coordinate these efforts has been noted.

A newly formed working group ICDI (Italian Computing and Data Infrastructure) was recently created by representatives of some of the main Italian Research Infrastructures and Infrastructures with the aim of promoting synergies at national level in order to optimize Italian participation in current European challenges in this sector, including the European Open Science Cloud (EOSC), the European Data Infrastructure (EDI) and HPC. Due to its recent formation, it is as of yet unclear what activities on open research data will be carried out and what its role will be within the Italian research landscape.

Furthermore, as a member of the G8, together with France, Germany and the UK, Italy is party to the G8 science ministers statement made in London on 12 June 2013.<sup>17</sup> This statement “proposes to the G8 for consideration new areas for collaboration and agreement on global challenges, global research infrastructure, open scientific research data, and increasing access to the peer-reviewed, published results of scientific research.”

#### LUXEMBOURG (LU)

Luxembourg has had a [National Policy on Open Access](#) since 2015, which focuses on open access to publications. The national research funder (FNR) is a strong supporter of OA and led the policy’s adoption. The Open Science Forum was held by OpenAIRE in Luxembourg in November 2018 and ahead of the event a working group consisting of stakeholders including CEOs from Luxembourg research institutions, as well as researchers and representatives from OpenAIRE, gathered to discuss a Luxembourg National Plan for Open Science. This working group will define a Luxembourg-wide plan for open access to science, with a goal to implement the plan by 2020. Five principles, including publications in Open Access journals, making data openly available, developing infrastructure, as well as making adjustments to how researchers and proposals are evaluated with a focus on Open Science practice, will be at the heart of the Open Science plan for Luxembourg.

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<sup>17</sup> G8 Science Ministers Statement (2013), *op. cit.*

#### MALTA (MT)

Malta does not have a national Open Access/Open Science policy. Open Access to publicly funded research is anchored within Malta's National Research and Innovation Strategy 2020. There is work underway to compile a National Open Science Policy for Malta, which is currently being undertaken by The University of Malta (UM) Library and MCST and other national stakeholders. Malta has submitted an application for support under the H2020 Policy Support Facility so as to implement a National Open Access Policy. The University of Malta adopted an [Open Access Policy](#) which was approved by the Senate on 20 September, 2017, but this focuses solely on open access to publications.

#### POLAND (PL)

The national Open Access policy in Poland, "[Directions of the development of open access to research publications and research results in Poland](#)" (2015), addresses data briefly, in a single paragraph stating that, in line with EC recommendations, Open Access should also be extended to research data, and recommends that research institutions and individual researchers should open research data taking into consideration world trends and best practices. These recommendations are non-binding.

In parallel, the Polish Ministry of Science and Higher Education has also undertaken to:

- Analyse how data are processed, preserved, curated and shared in the Polish research environment;
- Identify best practices, strategies and policies for Open Data worldwide;
- Consult with key stakeholders to identify noteworthy differences between specific disciplines.<sup>18</sup>

In April 2018, '*Report on Open Access Policy in Poland*' along with guidelines and [education materials](#) on Open Access (in Polish) was published by the Ministry, summarising OA efforts for the last two years, which have been hindered by a number of barriers such as lack of both resources and a systematic approach. The Ministry has declared that a new Open Access policy will be published.

#### SWEDEN (SE)

While no policies are yet in place, the Swedish Research Council (Vetenskapsrådet, VR) proposed a set of national guidelines for open access to scientific information in January 2015. This proposal includes a section on Guidelines for Open Access to Publications, and a description of a process towards providing Open Access also to research data. The intention is that all research data, produced in whole or in part through public funding, should be made openly available as soon as possible, with the default responsibility for archiving and preservation of data falling on the shoulders of the Swedish HEIs, with pathfinder work

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<sup>18</sup> Further information is available in the blog post at <https://blogs.openaire.eu/?p=877>

currently underway coordinated by the Swedish Research Council (in a similar way to the National Library's coordination of Open Access implementation. (Source: NordForsk (2016), op. cit.)

In 2017 VR received the Swedish government's assignment to coordinate the national implementation of open access to research data. This will be carried out in conjunction with the National Library of Sweden and the National Archive of Sweden. VR intends to be a driving actor for policies regarding open access to research data, particularly with regard to developing guidelines and generating incentives for researchers to make their research data open.

In 2018 VR received the assignment from the Swedish Government to develop criteria assessing the extent to which research data, partly or fully resulting from public funding, complies with the so-called FAIR principles. The results shall be reported to the Ministry of Education no later than 28 February, 2019.

#### 4.4 Member states with no policy or activity (3/28)

Those EU member states which are not covered above are understood to have no national Open Science or Open Data policies in place, nor any national activities underway, although there are individual research organisations in these countries which are leading the way by setting up institutional level working groups, and by organising and hosting symposia.

##### LATVIA (LV)

Latvia does not have a national Open Access/Open Science policy yet. However, in 2016 the Ministry of Education and Science released the "[Latvian European Research Area Roadmap 2016-2020](#)", listing the promotion of Open Access as a top priority.

##### ROMANIA (RO)

Romania does not implemented a national Open Access/Open Science policy yet. Open Access is however mentioned in [The National Plan for Research and Innovation 2015-2020](#).

##### SLOVAKIA (SK)

Currently there are no national Open Data or Open Science polices in Slovakia. Some organizations such as the Slovak Research and Development Agency recommend OA for publications and Ministry of Education recommends CC license in KEGA projects. In 2017 the "[Open Government Partnership National Action Plan of the Slovak Republic 2017 – 2019](#)" was approved; it advocates Open Information and Open Access to the results of research and development. There are no special policies for Open Research Data. Open Data is referenced in the aforementioned document „Open government partnership“, but it's mainly a document about Open Data portal in Slovakia – data.gov.sk. Ministry of Education published



an Open Data standard proposal in 2015, it is however a general document, which presents basic information about what Open Access and Open Data are.

#### 4.5 Selected non-EU countries

##### ICELAND (IS)

Discussions on Open Access to research data have recently been initiated both within the Ministry of Education, Science and Culture and at the National and University Library, and awareness of the importance of issues relating to open access to digital research results, especially for smaller countries, is growing. The Ministry is currently drawing up a plan for Icelandic higher education and research for the years 2017–2021, and the importance of structured data management and open access to research data is likely to be included there. Currently, no requirements on (e.g.) providing a data management plan are imposed when applying for a grant from public competitive funds. (Source: NordForsk (2016), op. cit.)

##### NORWAY (NO)

The Research Council of Norway released a policy on [Open Access to Research Data](#) in 2014. This focuses solely on research data, and – like the Portuguese policy – it is explicit that it constitutes a series of recommendations, rather than requirements. The responsibility for skills and training is accepted by the research funder itself, and – in keeping with the soft approach – issues of monitoring and compliance are not covered.

##### SERBIA (RS)

Serbia adopted a national science policy called ‘Open Science Platform’ in July 2018. The Ministry of Education, Science and Technological Development (MESTD), which is also the main research funder in Serbia, developed and published the policy, which is the national OA policy. The PASTEUR4OA and OpenAIRE projects contributed during the drafting phase. The policy sets out the basic requirements for depositing procedures, responsibilities for training, administration, monitoring the efficiency of OA policies, etc., but details will be set out in institutional policies. According to the policy, universities and research institutes should define and adopt their Open Science platforms within six months. Progress and compliance will be monitored by the Ministry. The overall focus of the policy is on OA publications resulting from MESTD research funding, which should now be mandatory (Green OA). Open research data is not mandated but recommended. The policy furthermore specifies instances where data should not be shared.

##### SWITZERLAND (CH)

The programme “Scientific information: access, processing and safeguarding,” initiated by the Rectors’ Conference of Swiss Universities (Program SUC 2013-2016 P-2), addresses research data in its [“White Paper for a Swiss Information Provisioning and Processing Infrastructure](#)

[2020](#)". The Swiss approach is the least "policy-like" of the documents examined, and the most like a project plan. Labelled as a white paper, and led by the umbrella group representing the heads of the Swiss universities, the document is wide-ranging in scope, addressing data amongst a number of other ICT infrastructure issues, including Open Access publications. It is difficult to categorise this document as hard or soft, as it is more of a project plan, setting out what will be done. Non-compliance does not seem to be a likelihood, although reference is made to a potential future monitoring role for the Swiss National Science Foundation (SNSF). Further to this, in 2017 the SNSF released its [Research Policy on Open Research Data](#), in which it states that the SNSF expects all researchers to store their research data, to share the research data (unless there are ethical or legal reasons not to do so) and to deposit their data and metadata into repositories in re-usable formats, where they are open and easily findable.

## 5. Analysis/comparison of existing policies

This section looks in more detail at the 10 EU member states with national Open Data policies in place, as well as two non-EU ERA members (Norway and Switzerland), hence 12 countries in total.

### Types of policy / lead or sponsoring organisation

The documents considered here do not readily lend themselves to classification, but nonetheless we have attempted to do so. See the previous tables for the full overview. Across the thirteen countries with existing policies in place, we identified:

- Seven funder policies (CY, DE, LT, PT, UK, NO, CH)
- Seven national plans or roadmaps (DK, FI, NL, FR, RS, ES, SI)
- Two concordat-type documents (NL, UK)
- Two laws (FR, LT)
- One code of ethics (BE)
- One white paper (CH)

Similarly, identifying the lead, ranking or otherwise 'sponsoring' organisation was not always straightforward; at other times the documents were co-signed by multiple organisations on an equal footing:

- Seven were led by (or otherwise involved) national public research funders (CY, DE, LT, PT, UK, CH, NO)
- Four involved university representative bodies (such as Universities UK) (CH, CY, DK, UK)
- Eight were led by, or had the explicit support of, government ministries (BE, CY, ES, FI, NL, FR, RS, , SI)
- Two were laws passed by the national parliament (FR, LT)
- Two approaches were led by the academic community (Rectors and Learned Societies) (BE, CH)

The following were also involved (as a signatory, or as part of one or more working groups): national library, national ICT infrastructure provider, national (non research) HE funder, and private research funder.

The years in which the policies came into effect ranged from 2009 to 2018, with a heavy tendency towards more recent years: only two policies (BE and DE) predate 2014, although many have their roots in earlier documents, not always originating from precisely the same organisation as the current policy does.

### **Scope/coverage/relationship with Open Access / Open Science**

By definition, all of the policies address research data. Seven of the thirteen countries have policies which also address Open Access publications explicitly. Six address software, code, tools or models. Five address methods, workflows or protocols, and one addresses physical (non-digital) samples. The split between countries with policies which address Open Research Data issues in isolation is (7), and those which deal with data under a broader umbrella such as “Open Science” or “Open Access” (8).<sup>19</sup>

### **‘Soft’ vs ‘Hard’ / Monitoring and compliance**

Seven of the national approaches can be considered ‘soft’, in that they are explicitly recommendations, and do not mandate compliance (CY, CZ, NL, PT, NO, FR, ES). Of the remainder, i.e. those that can be considered ‘hard’ policies, five make reference to monitoring compliance, or raise the question of sanctions for non-compliance (FI, LT, NL, CH, RS). This is perhaps unsurprising given the youth of many of the policies, the development of which tends to follow a pattern such as: Encourage > Expect > Require > Mandate. It is also encouraging to see a couple of national policies (DE, FR and NE) which not only address the potential of penalties for non-compliance, but also reward and recognition for work well done.

### **Skills and training**

The split between countries with policies which refer to the need to develop skills and training is (9), and those which do not (8). This may well be considered to be more of a procedural issue than a policy one, and as such it may be more appropriate to address training and skills in subsidiary documents, such as implementation plans, FAQs and further information.

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<sup>19</sup> See Table 2, Overview Table: Countries with national policies

## 6. Acknowledgements

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The information held within this report is accurate to the best of DCC's knowledge as of November 2018. We will continue to investigate the Open Data policy landscape across Europe, updating this document periodically. It is a living document. If you are aware of existing policies or relevant national initiatives, or have corrections to share, please get in touch: [info@dcc.ac.uk](mailto:info@dcc.ac.uk)

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