Guidelines to Support Smart OA

Smart OA: By Researchers and for Researchers.

Version: 1.0

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1.0	11 Sept. 2021	D. Baker published Version 1.0 Open Access (CC BY SA 2.0) by depositing to Zenodo and began circulating within the ODTÜ R&I Ecosystem for feedback and implementation.

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[1] https://creativecommons.org/licenses/by-sa/2.0/

Contents

Foreword to v1.0: Evolution of Smart OA from a Silo to a Systemic Approach

Just as European Funded research addressing Societal Challenges has evolved from silo to systemic research approaches (e.g. see the Green Deal), the ideas in these Smart OA Guidelines are expected to evolve from a silo "By Researchers. For Researchers." approach to OA to a more systemic approach. Specifically, the "By Researchers. For Researchers." approach to OA was driven by the idea that too often OA seemed to be pushed by funding institutions seeking to maximize societal and global scientific benefits from their funded research without sufficient consideration of how these OA policies impacted individual researchers executing and publishing their research (e.g. impacts on their opportunities for career advancement and ability to pursue their scientific ambitions). Thus this "By Researchers. For Researchers." OA approach was meant to be a counterweight to the dominant OA approach. While the "By Researchers. For Researchers." Smart OA approach shared and was designed to support the realization of Plan S, the approach being developed focused on routes to realize Plan S that resulted in clear and large benefits to individual researchers, and therefore to change the paradigm from too many individual researchers preferring not to pursue OA to having especially leading researchers prefer OA as OA would offer larger returns on investment at the individual researcher level than Closed Access (CA) publishing. However, after much work to develop the Smart OA concept as a "By Researchers. For Researchers." approach, it is becoming apparent that Smart OA could be most impactful if took a Systemic Approach that reflected the inputs and concerns of all key scientific stakeholders, and not just researchers, with a shared mission to produce Excellent Science that benefits society. Therefore, while Smart OA was conceived as a "By Researchers. For Researchers" approach and this is reflected in v1.0 of these Guidelines, it is hoped that Smart OA will increasingly evolve to become an OA approach that is "By all Key Scientific Stakeholders. For Society."

1.   Introduction and Nomenclature

This introduction to Open Access (OA) publishing is based on defining key OA terms, with later definitions often building on earlier definitions.

1.1   Basic OA Definitions

Closed Access (CA)   Research outputs (especially journal articles) that are locked behind a paywall and can only be accessed by paying a subscription fee. Historically most journal articles were published CA and subscription fees were paid at the institutional level to enable institutional access to all published articles. More recently, individual readers can often pay to access individual CA articles.

Open Access (OA)   Research outputs that can be downloaded by anybody for free. A more complete definition is given in Section ….

OA Transition   The transition from CA to OA publishing.

1.2   Definitions Unique to these Guidelines

OA Working Group (OAWG)   The OAWG is a self-forming group of researchers from the ODTÜ R&I ecosystem that includes METU and ODTÜ-GÜNAM who developed the Smart OA Concept, Guidelines, and Pledge.

Smart OA   Smart OA seeks OA routes that synergistically embody Plan S principles, support the authors' careers and professional ambitions, and maximize research impacts, while appropriately considering funding agency OA requirements and available OA funds. Smart OA was defined by the OAWG while elaborating these Guidelines, and based on a brief internet search this term is novel. The need for the OAWG to define Smart OA reflects that many OA routes are not considered to be sufficiently Smart by the OAWG, and this is impeding the OA Transition and realization of Plan S. The concept behind Smart OA underpins these Guidelines and is further elaborated in Section 4.

Blind OA   Blind OA is the opposite of Smart OA and involves blindly following the OA path of least resistance without considering opportunities to more fully benefit from OA by being Smart. Too often researchers are currently practicing Blind OA, this is leading to poor outcomes, and these poor outcomes are making researchers hesitant to publish OA. Thus Blind OA is seen as a major impediment to the OA Transition and the realization of Plan S. As for Smart OA, Blind OA was defined by the OAWG while elaborating these Guidelines, and based on a brief internet search this definition is novel.

FAIR   Publishing research data OA in a manner that is **F**indable, **A**ccessible, **I**nteroperable and **R**eusable.

Smart OA Pledge   Signatories to the Smart OA Pledge to seek Smart Open Access (OA) for all their journals articles and FAIR OA to the associated research data sets [Give a link to the Smart OA Pledge]. As a pledge that was developed "By Researchers. For Researchers.", the motivation for individual researchers to sign the pledge is based on the expectation that Smart OA will enhance their professional careers. The OAWG are the founding signatories to this Pledge.

1.3   Definitions relevant for the European Research Area (ERA)

Horizon 2020 (H2020)   The EU scientific funding program that ended in early 2021. Public research outputs resulting from H2020 projects must meet specific OA requirements,

and the Smart OA concept is based on meeting these OA requirements in a manner that provides the most benefits to individual researchers.

Horizon Europe (HE)   The EU scientific funding program that started in mid-2021. Successful HE proposals will need to convincingly describe how the proposed projects will support Open Science in general and OA publishing specifically, including in complying HE OA requirements. These Smart OA concepts were in-part developed to strengthen HE proposals.

European Commission (EC)   The European scientific agency funding the H2020 and HE programs.

cOAlition S   A group of national research funders, and European and international organizations and charitable foundations that includes the European Commission (EC) that created Plan S to drive the OA Transition.

Plan S   A plan created by cOAlition S with a stated goal of "Making full & immediate Open Access a reality"[2]. See Section 2 for more details.

1.4   Definitions of Main Methods to Publish OA

Repository   A server where research outputs are stored. Depending on copyrights, licenses, and confidentiality, these research outputs may be OA or CA. Both institutional and thematic (also called subject-based) repositories exist. Repositories are discussed further in Section 4.3.

Self-archiving   Depositing one's own work in a repository. Green OA is typically achieved by the authors *Self-Archiving* their work in a repository and making the work OA.

The two most commonly identified OA routes are:

Gold OA   OA delivered by journals;

Green OA   Making an appropriate version of a work self-archived in an institutional or thematic repository OA.

Additionally, while elaborating these Guidelines the new Green+ OA route was defined as an improvement to Green OA:

Green+ OA   Green+ OA is a Smart extension of Green OA that most importantly results in an appropriate version of a work being freely and easily accessible during the Embargo Period defined below. Green+ OA moves non-Plan S compliant Green OA closer to Plan S compliance, and therefore support the OA Transition and realization of Plan S. Green+ OA is defined and discussed more fully in Section 4.4.

To advance the OA Transition, on 24 March 2021 the European Commission (EC) launched the Open Research Europe publishing platform:

Open Research Europe (ORE)[3]   ORE is a peer-reviewed OA publishing service for disseminating research outputs from H2020 and Horizon Europe projects. ORE is free and Plan S Complaint. The EC created ORE to address weaknesses in the Gold and Green OA routes. Importantly, ORE is not a journal but a novel alternative to journals.

1.5   Additional terms relevant for Gold OA

Article Processing Charge (APC)   A fee paid to the journal for Gold OA.

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[2] https://www.coalition-s.org/
[3] https://open-research-europe.ec.europa.eu/

Open Access Journal (OAJ)	Journals in which all articles are published Gold OA and all authors pays APCs.
Hybrid Journals	Subscription-based journals that allow authors to publish their work Gold OA by paying an APC. Note articles by authors who do not pay the AJC are also published in Hybrid Journals and are locked behind a subscription paywall as CA articles.

1.6 Additional terms relevant for Green OA

Version of Record (VoR)	The final typeset published version of an article; i.e. the fully-formatted version supplied by the journal to their readers.
Author Accepted Manuscript (AAM)	The post-peer-reviewed manuscript that is submitted to the publisher for typesetting to create the VoR. The content of the VoR and AAM are the same, but the content in the AAM has not undergone typesetting (i.e. the journal has not added value to the manuscript by applying formatting to meet the journals formatting standards). Green OA in most cases involves making the AAM OA (and not the VoR) through self-archiving in a repository while the VoR remains locked behind the journal's paywall.
Embargo Period	The time period between when the VoR is published CA and when the work (typically the AAM) can be published Green OA. The length of the Embargo Period varies with the journal and is typically between 0 and 24 months. Most repositories allow authors to specify an Embargo Period, and during the embargo period the work is kept CA and after the embargo period ends the work automatically becomes OA; i.e., authors do not need to wait to deposit in a repository until the Embargo Period ends, they just need to specify the end-date of the embargo period while depositing. Note the Green+ OA method discussed in Section 4.4 combines Green OA with the ability to make some version of the work (typically AAM) openly and easily available for download from the internet during the embargo period.

1.7 Online Resources to Support Smart OA

These online resources facilitate collecting information related to funder's OA requirements and journals' OA policies to implement Smart OA.

Journal Checker Tool	A tool developed by cOAlition S to check a journal's compliance with Plan S. https://journalcheckertool.org/

Sherpa[4] is a suite of complementary online tools to support OA.

Sherpa Romeo	Sherpa Romeo is a core tool for Green OA and Green+ OA publishing as it provides summaries of copyright and OA policies for most major scientific journals, including embargo periods for different classes of repositories, which version of work can be published Green OA (typically AAM and not VoR), and whether some version of the work (typically AAM) can immediately be posted to the author's personal webpage, which is a key part of the Green+ OA method. https://v2.sherpa.ac.uk/romeo/
Sherpa Juliet	Sherpa Juliet provides funder-specific OA policies and requirements. https://v2.sherpa.ac.uk/juliet/

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[4] https://www.jisc.ac.uk/Sherpa

Sherpa Fact   Sherpa Fact provides information on whether a specific journal complies with a specifc funder's open access policies.

<div align="right">

https://v2.sherpa.ac.uk/fact/
</div>

Sherpa REF   Sherpa REF provides information on whether a journal complies with the OA requirements for the UK's Research Excellence Framework (REF). This Sherpa tool is not expected to be relevant for most researchers in the ODTÜ R&I ecosystem, but is included here for completeness.   https://ref.sherpa.ac.uk/

2.   Plan S

The initial motivation for devoting resources to develop these Smart OA Guidelines was to allow researchers in the ODTÜ R&I ecosystem to use Smart OA strategies to comply with H2020 OA requirements and submit HE proposals with strong OA content; i.e. the main motivation for these Guidelines is to make the EC happy in a Smart manner. The EC is a member of cOALition S that developed Plan S with the following target:

With effect from 2021[…], all scholarly publications on the results from research funded by public or private grants provided by national, regional and international research councils and funding bodies, must be published in Open Access Journals, on Open Access Platforms, or made immediately available through Open Access Repositories without embargo.

Or as stated in a Spark*Europe report[5], Plan S requires that

All publications resulting from funding from a cOAlition S member must be

- *openly available upon publication without any embargo period.*
- *published using a CC BY or CC BY-SA Creative Commons Attribution Licensing (note exceptions to this policy are possible but these details are outside the scope of this document).*

Plan S has 10 principles[6], and for brevity only the 5th Principle which is deemed the most relevant to the present Guidelines is presented and discussed:

5. The Funders do not support the 'hybrid' model of publishing. However, as a transitional pathway towards full Open Access within a clearly defined timeframe, and only as part of transformative arrangements, Funders may contribute to financially supporting such arrangements.

As context, currently Hybrid Journals earn revenue for CA articles only through subscription fees but earn revenue for Gold OA articles through both subscriptions fees and APCs, and funding agencies supporting Plan S want to end this practice of Hybrid Journals earning more from Gold OA articles than from CA articles. Therefore and importantly, while cOAlition S funders will pay for APCs, they will only do so for Open Access Journals and Hybrid Journals that are *Transformative*; i.e. under Plan S, cOAlition S funders (which includes the EC) will not pay for APCs for non-Transformative Hybrid Journals. Transformative journals are hybrid journals that are transforming to Open Access. A full definition of and details for Transformative Journals are given at[7], and this principle may be particularly relevant when framing and writing strong OA content in HE proposals.

Plan S is expected to force the rapid evolution of the scientific publishing landscape to become Plan S compliant; i.e. scientific journals that are not Plan S compliant are expected to become irrelevant. Within this context, many of the Smart OA ideas elaborated in these Guidelines are expected to become obsolete when Plan S is realized.

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[5] https://zenodo.org/record/4046624#.YSX4-44zbGY
[6] https://www.coalition-s.org/plan_s_principles/
[7] https://www.coalition-s.org/addendum-to-the-coalition-s-guidance-on-the-implementation-of-plan-s/

3.   Current barriers preventing individual researchers from preferring OA

The benefits of OA publishing to society and the global scientific community are well documented, such as by cOAlition S, and these are driving the push to OA. However, both from the OAWG's personal experiences and their research that resulted in the creation of the Smart OA concept, in too many cases the net benefits of OA to individual researchers are not sufficiently evident to motivate individual researchers to prefer OA. For example, a commonly cited OA benefit that resonates strongly with researchers is "Scientific research shows that publishing in open access, because of the worldwide visibility without barriers, demonstrably leads to more citations and more impact." [8] [9] [10]. However, in these 3 cases the source of this statement is not referenced, any important context for this statement is not given or easy to learn, and the veracity of this statement is not easy to assess. Thus, many if not most researchers would think this statement reads more like a marketing pitch than a rigorous scientific statement on which they should base scientific decisions, especially with respect to how to best allocate limited resources.. Specifically, most researchers would likely find it difficult to link this statement to the real trade-offs they typically face when considering various OA routes. For example, when publishing many researchers are trying to decide among the following:

1. Publishing CA in the best journal possible, which is free;
2. Publishing Gold OA in the best journal possible, which involves paying APCs;
3. Publishing Gold OA in a lower-impact journal with lower APCs, with a goal to publish OA at lower costs.

Most researchers would intuitively expect option 2 to result in more citations than option 1, but seriously question whether option 3 would yield more citations than option 1. In fact, this quote appears to come from[11] and this "scientific research" compares Gold OA versus CA articles published in the elite hybrid journalNature Communications (IF = ~15[12]) (i.e. the "scientific research" compares options 1 and 2) and does not compare options 1 and 3. Thus, this quote in not expected to be sufficiently Smart to guide OA decisions for most researchers.

Many of the OA challenges being faced in the ODTÜ R&I ecosystem are reflected in the contemporary article *The push for open access is making science less inclusive*[13] (31 Aug. 2021) with the subtitle "Researchers in developing countries could be frozen out by high article charges unless wider publishing reform is undertaken, say four Brazilian researchers." Open Access.nl[14] gives a more general list of Pros and Cons to publishing OA that aligns strongly with the views of the OAWG in that the Pros generally occur at the societal and global scientific levels while the Cons generally occur at the individual researcher level. The cons include

1. *In science, medicine, and economics especially, researchers are rated by their ability to publish in journals with a high impact factor….;*
2. *The number of high-quality, fully open access journals varies enormously across the different disciplines. Some disciplines have very few or not enough.*
3. *… most research institutes have not yet made provisions for the payment of Author Processing Charges (APCs). This therefore entails additional, often substantial, costs for researchers…*
4. *Researchers can be spammed by open access publishers of often dubious quality ("predatory journals"), which colours their perception of the open access publication model…..*
5. *Supplying publication data and the full text of publications to repositories means extra work for researchers.*
6. *It is often not clear whether the texts of publications in repositories can in fact be published in open access. There are sometimes copyright barriers. Researchers may wonder whether the additional effort will produce the desired result.*

[8] https://www.openaccess.nl/en/what-is-open-access/pros-and-cons
[9] https://www.editage.com/insights/how-can-academia-make-the-switch-to-open-access-journals?refer-type=qa
[10] https://libguides.msutexas.edu/c.php?g=1057974&p=7688809
[11] https://www.enago.com/academy/open-access-publications-get-cited-more-often/
[12] https://www.nature.com/nature-portfolio/about/journal-metrics
[13] https://www.timeshighereducation.com/opinion/push-open-access-making-science-less-inclusive
[14] https://www.openaccess.nl/en/what-is-open-access/pros-and-cons

These "cons" too often result in individual researchers not preferring OA, and thus the OA transition is too often lacking critical grassroots support from publishing researchers. A more complete discussion of major "cons" (or barriers) currently preventing many researchers from preferring OA is as follows:

3.1   General OA Barrier: OA too often not obviously supporting career paths and scientific ambitions

Historically number of publications in high-impact journals and number of citations have been two of the most widely accepted metrics to assess a researcher's performance, and these metrics are strongly tied to a researcher's scientific reputation and professional opportunities including hiring, retention, promotion, and tenure. For example, one of the quantitative requirements for hiring, promotion, and tenure at METU is based on number of publications in select high-impact journals, and this requirement is often the biggest barrier to be hired, promoted, and tenured at METU.

Therefore, most Excellent Researchers have been trained to value publishing in high-impact journals and not OA both as a goal in and of itself and to yield a large number of citations. The benefits to publishing in high-impact journals has been internalized by many Excellent Researchers to such an extent that this is one of their driving ambitions (which is not necessarily bad). Therefore, within today's scientific climate, especially at METU, any OA requirement that discourages researchers from publishing in high-impact journals may require these researchers to reduce their scientific ambitions and therefore their motivation. Furthermore, if these researchers ultimately decides to pursue lower-impact OA options over high-impact CA options their career opportunities and scientific reputation may be negatively impacted. Additionally, at least within the ODTÜ R&I ecosystem there is often deep suspicion of the quality of publications in OA Journals due to concerns over predatory journals, and at least unconsciously, articles in OA Journals may unfairly be assessed as being of lower quality when researchers are being evaluated for hiring, retention, promotion, and tenure. Thus, Blind OA does not support individual researchers, and therefore does not support Scientific Excellence. The aim for Smart OA is to simultaneously and synergistically enable OA while supporting career paths and scientific ambitions for individual researchers. Although outside the scope of these Guidelines, a Smart OA approach at the institutional level would be to better align institutional hiring, retention and promotion policies with OA principles.

3.2   Barrier to Gold OA: Lack of Funding to Pay APCs

The expert opinion of the OAWG is that most if not all researchers at METU and ODTÜ-GÜNAM would prefer to publish Gold OA if this did not impact their journal selection and it did not personally cost them; i.e., researchers do see benefits to OA publishing, but these benefits are not sufficient to justify using discretionary research funds to pay APCs. While some research institutes do have institutional funds and mechanisms to pay APCs, METU and ODTÜ-GÜNAM do not, and METU and ODTÜ-GÜNAM researchers have to pay APCs from their own project budgets. APCs can be as high as ~ €5000[15] and members of the OAWG often pay ~ €3500 for APCs. As a reference, a PhD student at METU or ODTÜ-GÜNAM may have a gross salary of ~ €1000/mo, in which case APCs for 1 Gold OA article is equivalent to ~3.5 months of a PhD salary. Specifically, all members of the OAWG share a common desire to maximize scientific and professional returns-on-investments, and in most cases when making discretionary decisions on how to invest limited financial resources, members of the OAWG would prefer to invest in offering globally competitive positions to attract, motivate, and retain excellent researchers, including PhD students, using these positions to create excellent scientific outputs and train PhD students, and to disseminate public research outcomes CA through the "best"[16] journal possible; i.e. to seek the large dissemination of research outputs possible at no-cost to the researchers.

3.3   Barrier 1 to Green OA: Time

Green OA typically requires authors to invest time to organize and combine the multiple files that constitute the AAM into a coherent single pdf file and then invest additional time to find, understand, and appropriately enter information while depositing the file into a repository (e.g. embargo period, version of the work that

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[15] https://www.openaccess.cam.ac.uk/publishing-open-access/how-much-do-publishers-charge-open-access

[16] High impact factor, being well respected within the global scientific community, and researchers at most major research institutions having access to this journal.

can be made Green OA, licenses, etc). While the actual time to self-archive is miniscule compared to the time already invested by the authors to publish an article, and researchers are accustomed to the tedious work of creating and uploading all the files that constitute the AAM and gathering and entering all the necessary information into a journal's website to have a manuscript published by a journal (author names, affiliations, funding agencies, etc), especially researchers who publish a lot have many other competing demands on their time and, without clear and large net benefits to Green OA, they would prefer to not spend their time to achieve Green OA. Specifically, if researchers saw a clear and large benefit to publishing Green OA, they would willing do this. But the fact that most researches in the ODTÜ R&I ecosystem are not publishing Green OA suggests that the large net benefits to Green OA are not sufficiently evident.

3.4 Barrier 2 to Green OA: Understanding and Complying with Copyright Laws

The Berlin Declaration defines Open Access as follows[17]:

1. *Open access contributions must satisfy two conditions: The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.*

2. *A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving.*

The first item suggests that experts with deep knowledge of IP law contributed to this definition with legal intentions that are very clear and well-defined for them, but may not be fully clear to researchers who are trying to publish OA. To this end, the Spark*Europe report *Open Access: An Analysis of Publisher Copyright and Licensing Policies in Europe, 2020*[18] published in September 2020 is an important and contemporary reference. For brevity, this report is subsequently referred to as the "Spark*Europe Report." According to the Spark* website[19], the Spark*Europe Report "… is a first – and offers new and valuable insights around what has been one of the most challenging barriers to advancing [Open Access]: copyright"; thus this statement confirms that understanding and complying with copyright laws is a major barrier to the OA transition and realizing Plan S. The Spark*Europe Report is published using a Creative Commons Attribution 4.0 International License (CC BY) defined as follows[20]

[Others] are free to:

Share — copy and redistribute the material in any medium or format

Adapt — remix, transform, and build upon the material for any purpose, even commercially.

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[17] https://openaccess.mpg.de/Berlin-Declaration

[18] Morrison, Chris, Secker, Jane, Vezina, Brigitte, Ignasi Labastida I Juan, & Proudman, Vanessa. (2020). Open Access: An Analysis of Publisher Copyright and Licensing Policies in Europe, 2020. Zenodo. https://doi.org/10.5281/zenodo.4046624.

[19] https://sparceurope.org/oacopyrightlook2020/

[20] https://creativecommons.org/licenses/by/4.0/

To demonstrate that the OAWG understands and is able to properly implement this license (which is particularly relevant since this is the barrier being addressed in this section), it is noted that appropriate credit to the original source is given above through a footnote. Within this section all subsequent text in quotes or in italic font are quotes from this report without further attribution for conciseness. More fully, the goal in this section is to reuse content from the Spark*Europe Report with clear attribution and not use OAWG resources to present the same ideas in an original manner.

The Spark*Europe Report is a 49-page report commissioned by Spark Europe. The fact that Spark Europe needed to commission this analysis and the resulting report is a 49-pages long and not, e.g. 5-pages long, suggests that European publisher copyright and licensing policies with respect to OA is a complex and multi-faceted problem. This conclusion is supported by the following content:

> (p. 13) *It was not always immediately self-evident and easily understandable as to what publisher positions were based on a reading of their publicly accessible policy information. It was for example observed that:*
>
> - *The number of different web pages that often exist on different parts of the website and the potential confusion that this might cause to authors and institutional research support staff looking for information on copyright policy*
> - *Confusing, and in some cases contradictory, statements in publisher policies on issues such as whether authors retain copyright or publishing rights in journal articles and whether Creative Commons Licences can be used. In some cases, this was due to the policy at the top level for the publisher differing from the journal title level policy (sometimes set by a learned society for example). The responses to the verification survey revealed that the research team's analysis of publisher policy positions based on publicly available information were in many cases not the same as those provided by the publishers (see sections 4.7 and 4.8).*
> - *There is a variation in terminology used by different publishers around OA publishing, e.g. use of the terms such as Author Accepted Manuscript (AAM), Author Manuscript (AM) and Author Original Manuscript (AOM) by different publishers, which can confuse authors due to a lack of alignment.*
>
> (p. 20) *… it was not clear from a number of publishers' websites whether authors retained copyright in Gold OA articles.*
>
> (p. 22) *This indicates that publisher policies on publishing rights for Gold OA are not clear.*
>
> (p. 33) *The analysis of publicly available publisher policy data demonstrates that copyright policy information is not yet consistently available in a form that allows funders, researchers and those in research institutions to assess alignment with Plan S principles.*

As a conclusion, if the OA experts elaborating this report are using the phrases "not always immediately self-evident and easily understandable", "Confusing, and in some cases contradictory", and "not clear", "information is not yet consistently available", the expert opinion of the OAWG is that it is reasonable to expect that publishing researchers will find it difficult to fully understand and properly implement a journal's OA policies.

Additionally, practicing Blind OA by paying APCs to OA journals or implementing Green OA with the expectation that the resulting OA publication will automatically be Plan S compliant seems misplaced. Specifically,

> p. 31: *Table 14 and Figure 8 show that of the DOAJ indexed journals, 2885 titles (40.6%) are Plan S compliant for copyright retention and licensing as the author holds copyright and the articles are licensed under CC BY or CC BY-SA. Meanwhile the data shows that 4221 titles (59.4%) are currently not Plan S ready according to data in DOAJ provided by the publisher unless that title applies a range of licences, including CC BY."* And p. 33 *"Less than half of European OA journals listed in DOAJ (40.6%) currently comply with the Plan S principles relating to copyright ownership and end user licensing.*

> p. 33 *Although it is possible to comply with Plan S principles via the Green OA route and all publishers currently allow authors to self-archive, only one of the 10 large publishers allows a zero month embargo across all titles, with another reporting this with some variation, 1 publisher has a 0 embargo for the HSS, and another mentioning this in a range of embargo from 0-18 months.*

As a major conclusion, the members of the OAWG agree that these ambiguities and inconsistencies in journals' OA policies and the difficulties in assessing the extent to which different publishing channels comply with Plan S and EC OA Requirements makes them professionally uncomfortable when publishing OA and is a barrier to preferring OA when given a choice between publishing OA or CA.

4. Smart OA as a Novel "For Researchers. By Researchers." Response

The emergence of Gold and Green OA routes, the ORE platform, and the large barriers resulting individual researchers too often not preferring OA are seen as symptoms that the scientific community currently does not have the capacities to achieve Plan S in a manner that sufficiently considers the needs of all key scientific stakeholders, including the needs of most individual researchers within the ODTÜ R&I ecosystem. Specifically and consistent with the motivation for elaborating these Guidelines, a fundamental barrier to the OA transition is that individual researchers will not consistently act in ways that are against their professional self-interests, and too often it is not sufficiently evident to most researchers that, when given a choice, publishing OA is inherently in their professional self-interests for the reasons give above.

Smart OA is a "By Researchers. For Researchers" OA approach based on the belief that the better articulation of the benefits of OA publishing to individual researchers and the definition of Smart paths to publish OA will lead individual researchers to prefer OA over CA publishing to the extent that they will willingly invest the resources to publish OA using routes that supports the OA transition and realization of Plan S. Specifically, Smart OA seeks OA routes that synergistically embody Plan S principles, support the authors' careers and professional ambitions, and maximize research impacts, while appropriately considering funding agency OA requirements and available OA funds. The primary expected professional benefits OA that initially motivated the OAWG to invest their discretionary time resources to develop the Smart OA Concept, Guidelines, and Pledge and that are expected to be relevant for a large number of researchers outside the OAWG are as follows:

- Individual researchers and research groups developing and implementing Smart OA publishing techniques will have competitive advantage when seeking EU and other prestigious funding;
- Graduate students who have mastered Smart OA techniques will have better professional opportunities;
- Smart OA facilitates compliance with funding agencies' OA requirements in a Smart manner, which importantly includes supporting the authors' careers and scientific ambitions and maximizing scientific returns on investment.

Smart OA does not approach OA as a silo step in the scientific process that would then enable Scientific Excellence to be sought by optimizing OA independently of the other steps in the scientific process. Rather, Smart OA takes a Systemic approach to where OA is optimized to maximize scientific returns on investment.

4.1 Smart OA Goal

The Goal of Smart OA is to identify and use OA routes that synergistically

- Embody Plan S principles;
- Results in large and high-quality research outputs;
- Trains new researchers (e.g. PhD students) not only in how to create valuable knowledge, but also in how to maximize the impact of this new knowledge through Smart OA and Smart[21] Exploitation.
- Reduces brain drain by offering research positions that are globally competitive both in terms of scientific opportunities and pay;

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[21] To the OAWG's knowledge, this is the first time the term Smart Exploitation has been used, and the OAWG envisions using a follow-up set of Guidelines and Pledge to develop and elaborate Smart Exploitation.

- Support the individual authors' careers and scientific ambitions;
- Leads to the largest sharing of non-confidential research outputs;
- Leads to the largest use of shared research outputs.

all while appropriately considering funding agency OA requirements and available OA funds.

Placing Smart OA within today's scientific environment, the OAWG's expert opinion for OA outcomes ranked from best to worst and emphasizing that Smart OA explicitly includes appropriate consideration of funding agency OA requirements is as follows:

1. Smart OA publishing that is fully Plan S Compliant;
2. Smart OA publishing that embodies the Plan S principles and supports realization of Plan S;
3. Blind OA publishing that is Plan S Compliant;
4. Blind OA publishing that is not Plan S Compliant;
5. Deciding not to publish research results because meeting the funding agency's OA requirements would result in an insufficient return on investment for the individual researchers.

4.2 Selecting a Smart OA Route

As a first step, the authors decide which OA route among ORE, Gold OA, Green OA, or Green+ OA most strongly aligns with the Goal of Smart OA while considering their unique conditions. The methods to publish Open Research Europe, Green OA, Gold OA are well documented and are not repeated here for brevity. Green+ OA is a novel OA route developed as a Smart Green OA route while developing these Guidelines and is defined below in Section ….. Based on the Goal of Smart OA, authors who select Green OA for a journal with an embargo period should consider advancing to Green+ OA as typically this will allow an appropriate version of the manuscript to be openly, freely, and legally be available for download during the embargo period, and in this case Green+ OA embodies Plan S principles more fully and therefore more strongly supports realization of Plan S than Green OA.

4.3 Choosing a Repository

Often journals only allow Green OA using thematic (subject-based) or institutional repositories. Two of the most recognized thematic repositories are RePEc[22] (economics) and arXiv[23] (physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering and systems science, and economics). However, the scope of RePEc and arXiv are not inclusive of the subject areas in which the Lead Author publishes, and therefore the Lead Author is leaving further investigation of these repositories to those who could potentially benefit from this information.

The two institutional repositories likely to be of most interest to researchers in the ODTÜ R&I communities are **OpenMETU**[24] and **Zenodo**[25]. A strength of OpenMETU is that it is curated by METU personnel appropriately trained in copyright issues related to OA publishing, and these curators will provide support in assuring that the works deposited in OpenMETU conform to copyright laws including embargo periods and licenses. However, OpenMETU does not assign DOI's, and while all journal articles should have a DOI assigned by the publisher, other research outputs such as Public Deliverables from EU projects will not. Additionally, OpenMETU can only be used by METU personnel, and thus, for example, within the context of multi-partner EU projects, research outputs from partners that do not include METU personnel cannot be deposited in OpenMETU.

Zenodo is an institutional repository[26] developed through the EU's OpenAIRE initiative specifically to support the EU's Open Access objectives, and therefore is strongly linked to the EC. OpenAIRE markets Zenodo as "Don't have an appropriate institutional or thematic repository? Use Zenodo!"[27], which suggests there may be reasons to prefer OpenMETU. However, two advantages of Zenodo over OpenMETU are that Zenodo will

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[22] http://repec.org/
[23] https://arxiv.org/
[24] https://open.metu.edu.tr/
[25] https://zenodo.org/
[26] https://v2.sherpa.ac.uk/id/repository/2659
[27] https://www.openaire.eu/zenodo-guide

assign DOIs to deposited documents without a DOI (e.g. EU Public Deliverables) and Zenodo can be used by researchers without an affiliation to METU (e.g. Zenodo can be used as a common repository for a multi-partner EU project). However, Zenodo does not provide professional curation support like OpenMETU does.

In conclusion, both OpenMETU and Zenodo have unique strengths and the "best" repository likely depends on the unique needs of the researchers.

4.4	**Green+ OA**

Green+ OA is a novel OA method developed to overcome Green OA's biggest barrier: embargo periods. Green+ OA

- Makes it not only easy but also desirable for METU and ODTÜ-GÜNAM researchers to publish OA by being logistically and financially practical while supporting their professional development including by strengthening their opportunities to be hired, retained, and promoted to globally competitive positions, and strengthening their scientific reputations at institutional, ERA and global levels;
- Maximizes the quality of the research outcomes being disseminated through rigorous peer review processes;
- Exploits existing scientific dissemination channels that are well-known, trusted, and have broad reach globally;
- Makes the research publications available OA using the Green OA model;
- Makes the research publications openly available for download from the internet immediately upon publication regardless of any embargo periods imposed by Green OA.

Green+ OA is intended to be an OA model that complements rather than replaces the Open Research Europe publishing platform and Gold and Green OA models, with the "most appropriate" OA method varying with the unique characteristics of the research outputs being published (e.g., funding agency, project budget, objectives, etc.). More fully, sophisticated researchers publishing OA are expected to appropriately use different OA methods under different conditions. The Green+ OA method was specifically developed in response to the internally assessed biggest weakness of the Green OA model, which is that when using Green OA for all journals surveyed the publications can only be made openly available after an embargo period defined by the publisher; more fully, making this publication openly available through a repository violates copyright laws. However, for the journals surveyed, the author can immediately make the Accepted Manuscript (AM) defined fully in Section 1.6 openly available from the author's personal webpage. Green+ OA combines Green OA with making the AM openly available for download from the author's personal webpage at least for the duration of the embargo period. More fully, in the short term the AM is made immediately and openly available for download from the author's webpage, and in the long term (i.e. after the embargo period ends) open access is assured through the OA repository.

The specific method to publish OA is as follows:

1. Ultimately Green+ OA is a Green OA method to make subscription-based publications OA with Green+ OA having one additional step to make the Green version of the work (herein assumed AAM for clarity) immediately and openly available on the internet. Thus, as for Green OA, the authors submit their manuscript to the most appropriate subscription-based (CA) journal.
2. After acceptance, the authors search on the journal in Sherpa Romea (link) to learn for the version of the work (typically AAM) that can deposited in an institutional repository and made (Green) OA, the embargo period, and the associated license, and confirm that an appropriate version of the work (typically AAM) that can immediately be placed on an author's webpage and the associated license.
3. The author's create a cover page to their AAM that includes at least a doi based link to the published article, instructions on how the article should be cited, and licensing information. Importantly, this citation should be to the published article and not the Green OA version.
4. The AAM with the cover page is deposited in an appropriate OA repository and embargoed according to the publisher's policies. With the completion of this step, Green OA has been achieved.

5. The AAM with the cover page is uploaded to an author's website… add instructions on how to do this using Horde.. and enter the publication in the Smart OA List of Publications table easily, freely, and openly available on the internet..

4.5   Smart OA Publications List

…. The article is added to a Green+ compliant Publications List that contains information about the article (e.g. citation), and links to the JoR, AAM in the repository, and AAM on an author's webpage. A Green+ compliant Publications List should combine ORE, Gold OA, Green OA, and Green+ OA publications, Public Project Deliverables, and other relevant research outputs in a coherent manner. One example is a table with the following four columns:

1. Publication: The citation information for the publication;
2. Published: In the case of ORE, a link to the ORE repository. In the case of Gold OA, Green OA, or Green+ OA, this is a link to the VoR on the publisher's website. For a Public Project Deliverable, the link is to CORDIS.
3. Institutional Repository: In all cases (ORE, Gold OA, Green+ OA, Green OA, Deliverables, etc), a link to the version deposited in the Institutional Repository. In the cases of ORE and Gold OA articles and Public Project Deliverables, this is the VoR version. For Green OA and Green+ OA articles, this is the AAM with the cover page.
4. Author's Webpage: For Green OA and Green+ OA publications, a link to the AAM with the cover page on the author's webpage. Since ORE and Gold OA publications and Public Project Deliverables are immediately made OA from both the publisher's or EC's webpage and the institutional repository, there is no need to make versions of these publications available for immediate download from the Author's webpage and this cell can just contain NA for Not Applicable to simplify the process.

An example of this table is as follows:

	Version		
Publication (IEEE citation format)	Published	Institutional Repository (Access subject to any publisher mandated embargo periods)	Author's Webpage (Only for publications with embargo periods; NA = Not Applicable).
Publication Citation Information	[VoR]	[AAM]	[AAM] or [NA]

Key characteristics of this Table are as follows:

1. Citation information is clearly presented;
2. A link to the Published Version is always provided;
3. A link to an appropriate version in the Institutional Repository is always provided;
4. In cases where immediate access is not available to the Published version and/or the version in the Institutional Repository, a link is provided to an appropriate version that can be immediately and openly downloaded and thereby by-pass any subscription (firewalls?) and/or embargo periods.

OA publications are considered to be Green+ OA if they embody the following characteristics:

1. Green OA with an embargo period;
2. During the embargo period, an appropriate version of the work is openly, freely, and legally available for download, such as from the author's personal webpage;
3. The publication is listed as part of a larger Green+ OA compliant Publications List that is easy to find and access from the internet, such on the project's webpage, the author's webpage, and/or an institutional webpage.

5. Conclusions

The OA transition is being driven top-down by major institutions including most importantly funding agencies based on benefits at societal and global scientific levels. However, at the individual researcher level too often the OA transition is not being strongly supported as the resulting outcomes are assessed as only marginally supporting career advancement at best, and is actually being resisted as the resulting outcomes are seen as hindering career advancement. Smart OA is a response to strengthen bottom-up "By Researchers. For Researchers." support for the OA transition and realization of Plan. Smart OA is based on better articulating to individual researchers how Smart OA publishing can support their career development and scientific ambition.

Broad conclusions are:

1. At the institutional level within the ODTÜ R&I ecosystem, there are currently no easy or silver-bullet solutions to fully comply with Plan S. This is consistent with the lead author's observations that even globally leading institutions with significantly more resources devoted to Open Science are not fully Plan S compliant

2. Presently there is no single OA route that is universally applicable to all research outputs with a specific focus on journal articles and supporting research data. Therefore, each researcher or group of researchers should make Smart OA (i.e. well-informed and appropriate) decisions on a case-by-case basis.

3. The backing of Plan S by major European scientific funding agencies is expected to force scientific publishers to comply with Plan S in the near future or risk becoming irrelevant.

Appendix A: Smart OA Pledge

The signatories agree to seek Smart[28] Open Access (OA) for all their journals articles and FAIR[29] OA to the associated research data sets[30]. This pledge is a bottom-up effort initiated by a self-forming OA Working Group (OAWG) consisting of researchers from the ODTÜ R&I ecosystem[31]. An important characteristic of Smart OA is that it is *"By researchers. For researchers."* Specifically, while the members of the OAWG recognize the institutional, scientific, and societal benefits to OA publishing, their primary motivation for pursing Smart OA is their expectation that this will enhance their professional careers. Specifically,

- Research groups developing and implementing Smart OA publishing techniques will have competitive advantage when seeking EU and other prestigious funding;
- Graduate students who have mastered Smart OA techniques will have better professional opportunities;
- Smart OA facilitates compliance with funding agencies' OA requirements in a Smart manner.

A secondary motivation is to strengthen the ODTÜ R&I ecosystem through the diffusion and uptake of Smart OA best-practices and lessons-learned, including by growing the number of signatories. The third motivation is more altruistic and is to make one's published work openly, easily, and freely accessible to anyone in the world with an internet connection without respect to their ability to pay. The desired conclusion is to make the need for this Pledge obsolete; i.e., to reach a state where all successful researchers in the ODTÜ R&I ecosystem are publishing Smart OA, and to be a successful researcher in the ODTÜ R&I ecosystem one must be publishing Smart OA.

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[28] Smart OA seeks OA routes that synergistically embody Plan S principles, support the authors' careers and professional ambitions, and maximize research impacts, while appropriately considering funding agency OA requirements and available OA funds.

[29] Findable, Accessible, Interoperable and Reusable.

[30] Most signatories are not expected to initially have experience and therefore skills to deposit research data sets in an appropriate OA repository under the FAIR principles, or to know which research data should be deposited. To develop these skills, initially the minimum goal is for each signatory to deposit at least one research data set per year.

[31] METU/ ODTÜ, ODTÜ-GÜNAM, etc…