



# A national strategy for open access

Briefing paper

Office of the Chief Scientist

30 September 2022



Building a better  
working world

## Release Notice

Ernst & Young ("EY") was engaged on the instructions of the Department of Industry, Science and Resources ("Client") to develop a briefing paper for a national open access scheme that provides expanded community-wide access to academic journals ("Project"), in accordance with the contract dated 16 March 2022.

The results of EY's work, including the assumptions and qualifications made in preparing the report, are set out in EY's report dated 30 September 2022 ("Report"). The Report should be read in its entirety including this release notice, the applicable scope of the work and any limitations. A reference to the Report includes any part of the Report.

EY has prepared the Report for the benefit of the Client and has considered only the interest of the Client. EY has not been engaged to act, and has not acted, as advisor to any other party. Accordingly, EY makes no representations as to the appropriateness, accuracy or completeness of the Report for any other party's purposes.

Our work commenced on 16 March 2022 and was completed on 30 September 2022. Therefore, our Report does not take account of events or circumstances arising after 30 September 2022 and we have no responsibility to update the Report for such events or circumstances arising after that date.

No reliance may be placed upon the Report or any of its contents by any party other than the Client ("Third Parties" or "you"). Any Third Parties receiving a copy of the Report must make and rely on their own enquiries in relation to the issues to which the Report relates, the contents of the Report and all matters arising from or relating to or in any way connected with the Report or its contents. EY disclaims all responsibility to any Third Parties for any loss or liability that the Third Parties may suffer or incur arising from or relating to or in any way connected with the contents of the Report, the provision of the Report to the Third Parties or the reliance upon the Report by the Third Parties.

No claim or demand or any actions or proceedings may be brought against EY arising from or connected with the contents of the Report or the provision of the Report to the Third Parties. EY will be released and forever discharged from any such claims, demands, actions or proceedings. In preparing this Report EY has considered and relied upon information provided to us by the Client and other stakeholders engaged in the process and other sources believed to be reliable and accurate. EY has not been informed that any information supplied to it, or obtained from public sources, was false or that any material information has been withheld from it. EY does not imply, and it should not be construed that EY has performed an audit, verification or due diligence procedures on any of the information provided to us. EY has not independently verified, nor accept any responsibility or liability for independently verifying, any such information nor does EY make any representation as to the accuracy or completeness of the information. Neither EY nor any member or employee thereof undertakes responsibility in any way whatsoever or liability for any loss or damage to any person in respect of errors in this Report arising from incorrect information provided to EY.

Modelling work performed as part of our scope inherently requires assumptions about future behaviours and market interactions, which may result in forecasts that deviate from future conditions. There will usually be differences between estimated and actual outcomes, because events and circumstances frequently do not occur as expected, and those differences may be material. EY takes no responsibility that the projected outcomes will be achieved. EY highlights that the analysis included in this Report does not constitute investment advice or a recommendation to you on a future course of action. EY provides no assurance that the scenarios that have been modelled will be accepted by any relevant authority or third party.

EY has consented to the Report being published electronically on the Client's websites for informational purposes only. EY has not consented to distribution or disclosure beyond this. The material contained in the Report, including the EY logo, is copyright. The copyright in the material contained in the Report itself, excluding EY logo, vests in the Client. The Report, including the EY logo, cannot be altered without prior written permission from EY.

Readers are advised that the outcomes provided are based on many detailed assumptions underpinning the scenarios, and the key assumptions are described in the Report. These assumptions were selected by the Client. The modelled scenarios represent two possible future options for the open access scheme, and it must be acknowledged that many alternative futures exist. Alternative futures beyond those presented have not been evaluated as part of this Report.

EY's liability is limited by a scheme approved under Professional Standards Legislation.

## Contents

Glossary and acronyms .....	iii
At a glance .....	4
Executive summary .....	5
1. Introduction .....	13
2. Academic publishing .....	15
2.1 The academic publishing process .....	15
2.2 The academic publishing landscape .....	16
2.3 Access costs.....	18
3. An open access scheme for Australia .....	20
3.1 The movement towards open access .....	20
3.2 The international experience.....	22
3.3 Options for Australia's open access scheme .....	24
3.4 Governing principles for a scheme .....	25
4. The potential economic and social benefits of open access .....	27
4.1 The economic rationale for open access.....	27
4.2 The potential economic impacts of open access .....	32
4.3 Social benefits of open access.....	35
5. A preferred model for an Australian open access scheme .....	38
5.1 Central implementation body .....	38
5.2 National agreements between publishers and central implementation body .....	41
6. Design and deliverability .....	42
6.1 Stakeholder engagement.....	42
6.2 Governance.....	45
6.3 Supporting IT infrastructure .....	46
6.4 Timing and delivery.....	49
7. Costs and risks .....	53
7.1 Costing a national open access scheme.....	53
7.2 Risks to the successful delivery of an open access scheme .....	59
8. Alternative open access models .....	61
8.1 Funding mandates .....	61
8.2 Repository-based open access .....	63
9. Conclusion .....	66
Appendix A Multi-criteria analysis .....	67
Appendix B Stakeholder engagement list .....	73



## Glossary and acronyms

ACCC	Australian Competition and Consumer Commission
APC	Article Processing Charge is a fee charged for articles to be published open access in gold or hybrid journals.
Australian-led	An article with a corresponding author whose primary affiliation is with an Australian institution.
Author-submitted	An edition of a journal article prior to undergoing a peer review process. Author-submitted articles may be available to view prior to the publication of the peer-reviewed edition in a journal in pre-print services such as ArXiv, SocArXiv, and bioRxiv.
Author-accepted	An edition of a journal article that has undergone the peer review process but has not been typeset and formatted by the journal.
Biodiversity	The diversity of journals and publishers, services and platforms, funding mechanisms, and evaluation measures in scientific publishing and academic communications.
CAUL	Council of Australian University Librarians
Learned society	An organisation dedicated to scholarship and research, often focused on a particular discipline. Most societies are funded through membership fees, event registration fees, revenue from publications, and donations and have restricted membership, with government support.
Open access	Literature that is freely available on the public internet, where any user is permitted to read, download, copy, distribute, print, search or link to the full texts of these articles, pass them as data to software, crawl them for indexing or use them for any other lawful purpose.
Open data	Freely available, anonymous, and easily discoverable information that anyone can assess, explore, and reuse. The data must be provided under licensing terms that allow reuse and redistribution.
Peer review	The process in which articles submitted for publication are reviewed by independent members of the research community to assess their quality, validity, and originality. Peer reviews are organised by journal editors with publishers owning the business and managing the entire process. Peer reviewers are often not paid for these services.
Publish-and-read agreements	Agreements in which a publisher is paid a fee per published open access article that includes a premium for read access to their catalogue of journals. This agreement places greater emphasis on open access publishing, compared to read-and-publish agreements. This is also a type of transformative agreement.
Read-and-publish agreements	Agreements in which an institution pays a publisher for the rights to access journal content and to publish open access articles in their journals under a single payment. This agreement places particular focus on access to publisher content compared to publish-and-read agreements. This is also a type of transformative agreement.
Repository	An archive in which research outputs are stored (including but not limited to journal articles). Repositories are commonly administered by research institutions, publishers, and other organisations. Institutional repositories may also contain an institution's intellectual property and other assets.
Transformative agreement	An agreement between publishers and subscribing institutions that aims to help subscription-based journals transition to an open access model. Transformative agreements typically allow the participating university or consortium to read all articles in the journal and to publish articles as open access in the journal.

## At a glance

- ▶ A skilled, educated and technologically astute workforce will be increasingly important as Australia's economy becomes more knowledge intensive and dynamic. Most Australians and businesses outside of the research sector are unable to access academic papers due to paywalls. Locking so much research behind paywalls may limit the ability of industry and government to innovate, as well as holding back broader community inquiry.
- ▶ A national open access scheme would reform a major plank of Australia's knowledge and innovation system by breaking down subscription-based access barriers to world-class science and academic journals. It would provide access to academic journals for all Australians, businesses, and government agencies. The scheme could:
  - Promote access to cutting-edge research allowing businesses to stay ahead of new developments and remain competitive.
  - Help build the nation's knowledge base and support researchers, businesses and citizens translate this knowledge into new ideas and innovations.
  - Support evidence-based policymaking to meet the country's challenges, especially in science and technology-intensive areas like public health, climate change, agriculture and energy.
  - Develop a more engaged, inquiring and informed community by enabling access to world-class, peer-reviewed research.
- ▶ Analysis suggests that the economic dividend from a national open access scheme could be large – potentially in the order of \$36 billion over the next few decades, as new economic and social opportunities for local industry and citizens are expanded.
- ▶ A national open access scheme for Australia consolidates many functions and expenditures currently undertaken within Australia's research sector to procure and manage access to academic journals. Under a proposed open access model, a central implementation body would enter new national-level commercial arrangements with publishers, covering the research community and broader community.
- ▶ Implementing a national open access scheme would involve costs for the Australian Government, predominantly to establish a body to administer the scheme, as well as the costs of striking new commercial access arrangements with publishers.
  - High level estimates of the potential cost of the scheme are in the order of \$420 million per year.
  - However, there is significant potential to offset much of these costs through savings in current spending on journal subscriptions by universities as well as operational efficiencies in centralising administration of the scheme.
- ▶ The scheme could be established in around 18 months, with an ongoing phasing in period. A range of implementation issues would require consideration by government, including operational and governance structures for the administering entity and managing the transition of existing journal access arrangements into the new system.

## Executive summary

Academic research – and the progress it underpins – is crucial to building national prosperity and tackling Australia’s major challenges. The Australian Government currently provides significant funding for academic research to promote a range of economic, scientific, and social objectives. Direct investment into the research sector was more than \$12.1 billion in 2020-21, with \$4.7 billion channelled through the higher education sector and almost \$3 billion for industry-led research.<sup>1</sup>

Most academic research is published in academic journals. The academic publishing industry, which is dominated by five global publishers (Elsevier, Springer Nature, Wiley, Taylor & Francis and Sage), charges subscription fees to access their journals. Subscription fees are a major cost for universities and research institutions, often comprising around 30-40% of library budgets.

While most research is funded by taxpayers either directly through grants or indirectly through university funding, the public is unable to access vast quantities of academic literature due to paywalls. Locking so much research behind paywalls may limit the ability of industry and government to innovate, as well as holding back broader community inquiry.

A national open access scheme would reform a major plank of Australia’s knowledge and innovation system by breaking down subscription-based access barriers to world-class science and scholarly journals. It would provide access to academic journals for all Australians, businesses, and government agencies, and support the distribution of Australian-led research through open access publishing.

### Why an open access scheme for Australia?

A national open access scheme would help position the country to better face future challenges. It would enable research to reach the widest audience and have the most impact to improve our understanding of the world as quickly as possible.

And why do this now?

- ▶ Science and academic research can accomplish much more, much faster, in an environment of frictionless collaboration. More governments, institutions and funders are now requiring that the research they fund be made freely available through open access, immediately upon publication.
- ▶ The global transition to open access is progressing, but gradually and unevenly. Australia can learn from international experience and get in front of the pack through a national open access scheme. This would signal Australia’s science, technology and innovation agenda and help build a more robust knowledge economy.
- ▶ As a relatively small (about 4% of global research publications) but important member of the international research community, Australia is in an ideal position to make the transition to open access manageable and truly national.

---

<sup>1</sup> Australian Government Department of Industry, Science, and Innovation SRI

## An open access scheme could generate broad-based economic gains for the country

By making science and research more transparent and accessible to all, not just academics and researchers, the scheme could provide a range of new economic and social opportunities for the country:

- ▶ **Enhancing productivity** – Australia’s productivity performance, which is critical to long-term living standards, has been growing more slowly than in decades prior. Increasing access to academic research for all Australian businesses, especially SMEs and innovation-intensive enterprises, can help drive greater research and development, and support businesses to find faster, less costly and less resource-intensive ways of doing things. Access to cutting-edge research allows businesses to stay ahead of new developments and remain competitive.
- ▶ **Driving our knowledge economy** – Australia’s economy, like much of the world, is becoming more knowledge-intensive. The ability to create, absorb and apply new knowledge is an increasingly important driver of business success and broader economic dynamism. An open access scheme would build the nation’s knowledge base and support researchers, businesses and citizens translate this knowledge into new ideas and innovations.
- ▶ **Building capabilities for policymakers** – All levels of government typically face constraints accessing academic papers and the underlying research and data. A national open access scheme would support evidence-based policymaking to meet the country’s challenges in areas such as public health, climate change, agriculture, energy and social inclusion, many of which were highlighted in the CSIRO’s 2022 megatrends analysis. Moreover, access to academic journals is critical for Australia’s defence intelligence, with current horizon scanning of critical technologies and research reliant on meta-analysis of the world’s academic journals.
- ▶ **Empowering citizens** – Improving citizens’ access to quality research can lead to important social gains. It can help develop a more engaged, inquiring and informed community. For example, a national open access scheme can foster new areas of citizen science such as environmental observation and criminology. By providing access to peer-reviewed research, the scheme can also help address the growing problem of community misinformation which is often transmitted through social media. A survey from Science and Technology Australia indicates that Australians overwhelmingly value and trust science and there is a clear need for credible, accurate and verifiable sources of scientific information.<sup>2</sup>

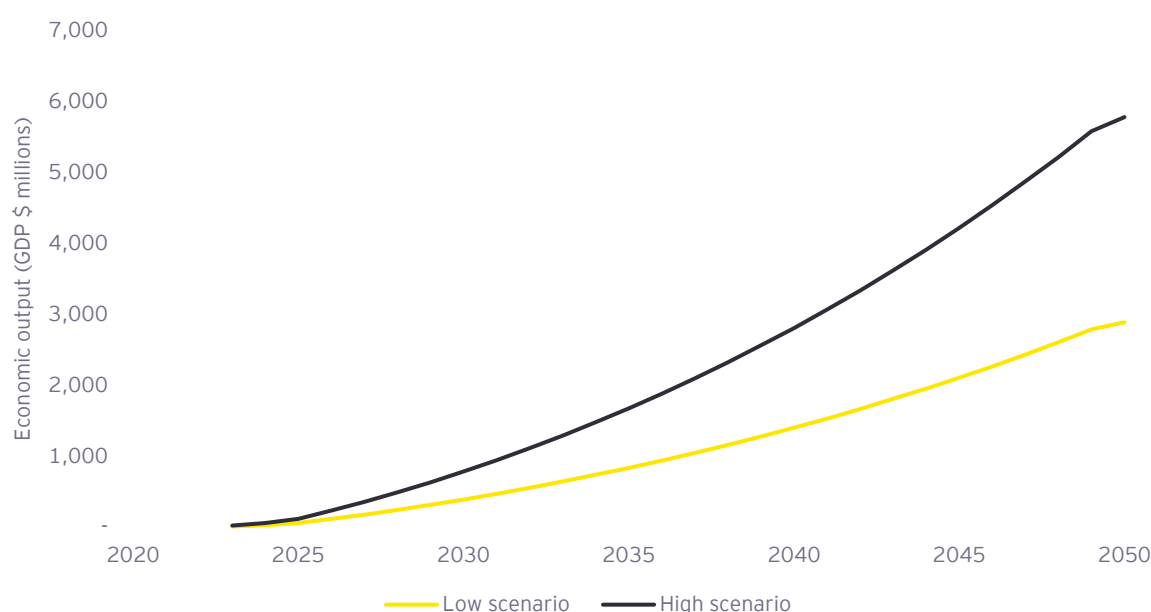
High-level estimates of the preferred national open access model suggest the initiative could deliver an economic dividend for the nation. Over the longer term, once the scheme is fully embedded as a national resource, it is estimated that national economic output could increase between \$18 billion and \$36 billion by 2050 (see Figure 1). Further, open access could stimulate new investment and employment opportunities across all sectors.

Table 1 shows the potential gains to investment, employment and GDP over the next 30 years. The economic benefits from the scheme are likely to increase over time as businesses and individuals fully capitalise on their access to leading academic research.

---

<sup>2</sup> Science and Technology Australia, <https://scienceandtechnologyaustralia.org.au/australians-overwhelmingly-trust-in-science/>.

Figure 1: Potential increases in economic output gains from open access



Source: EY analysis

Table 1: Potential economic benefits from a national open access scheme

Year	GDP (\$ millions)	Investment (\$ million)	Employment (FTE)
2030	\$1,100 - \$2,300	\$700 - \$1,400	520 - 1,030
2040	\$7,000 - \$14,000	\$3,100 - \$6,200	1,450 - 2,900
2050	\$18,000 - \$36,000	\$6,500 - \$12,900	2,650 - 5,300

Note: Dollar values reported in net present terms using a 3% discount rate. Employment reported as maximum expected FTE for the period 2022-2030, 2022-2040 and 2022-2050.

Source: EY analysis

The potential economic dividends from a national open access scheme include:

- ▶ Science and academic research can accomplish much more, much faster, in an environment of frictionless collaboration. More governments, institutions and funders are now requiring that the research they fund be made freely available through open access, immediately upon publication.
- ▶ The global transition to open access is progressing, but gradually and unevenly. Australia can learn from international experience and get in front of the pack through a national open access scheme. This would signal Australia's science, technology and innovation agenda and help build a more robust knowledge economy.
- ▶ As a relatively small (about 4% of global research publications) but important member of the international research community, Australia is in an ideal position to make the transition to open access manageable and truly national.



## What could an Australian open access scheme look like?

A national open access scheme could be implemented using different models, including funding mandates, repository based open access and a central implementation body. These key models were assessed based on their ability to meet the needs of Australian researchers, industry, and the broader community, as well as their deliverability and costs (a summary table is shown at the end).

A national open access scheme delivered through a central implementation body (see Figure 2) has some major advantages:

- ▶ Through national read-and-publish agreements with publishers, Australia would be able to access the world's academic journals and increase the number of Australian-led peer-reviewed articles published in open access journals.
- ▶ It consolidates many current functions and expenditures within Australia's research sector to procure and manage access to academic journals. Combining current agreements with publishers under a single purchasing body has the potential to drive cost efficiencies which can benefit taxpayers and the research sector.
- ▶ It strongly aligns with a global movement toward open access.
- ▶ By increasing access to the world's academic literature, it provides the highest potential for economic and productivity uplift, driving innovation and research across Australian industry, and generating key benefits for the community.

Figure 2: Proposed Australian model for open access



## Implementing the scheme

Education, industry, and research stakeholders strongly support a national open access scheme and consider that the challenges for government in delivering it are manageable and unlikely to involve excessive costs and risks.

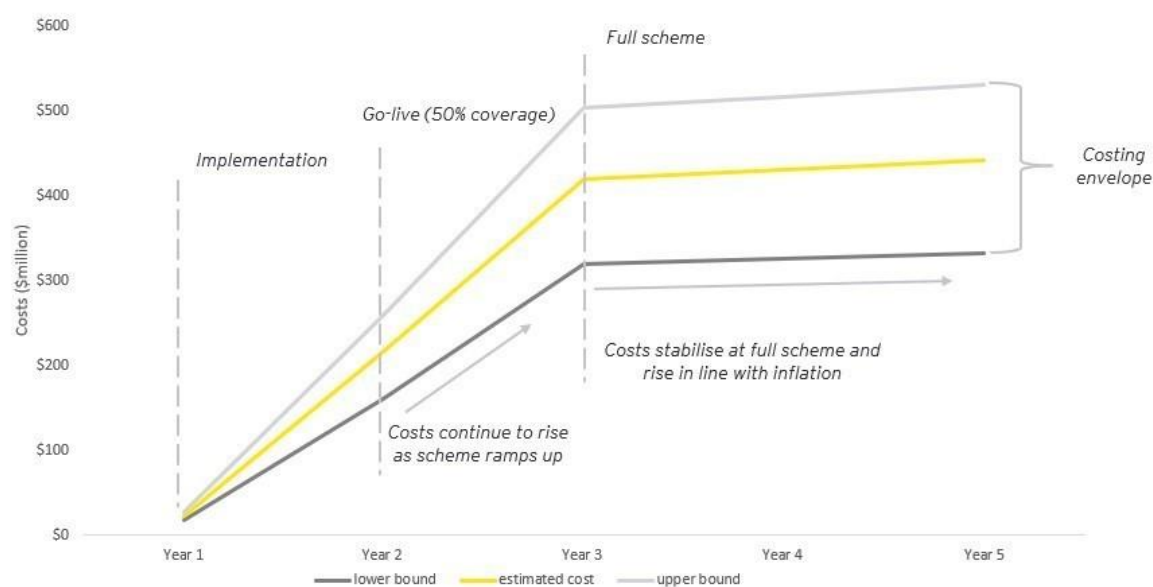
A major advantage of an Australian open access scheme is that it could be implemented using off-the-shelf technology platforms such as commercial academic literature aggregators and search engines. However, there are some important challenges in designing the scheme, including:

- ▶ Agreements with publishers will need to be negotiated as existing university-led agreements expire. This is a major commercial endeavour, and the central implementation body will require access to specialist resources to execute these agreements, especially with major publishers.
- ▶ The community-wide expansion of users under a national open access scheme needs to be supported by a robust central authentication system which restricts use to Australians and local businesses. This is a key issue for publishers which have noted their concern about the potential for 'leakage' of academic journal material to unauthorised users outside of Australia.
- ▶ While universities welcome the scheme, they emphasised their concern about the loss of public funding and how this might be drawn down to fund a national open access scheme.

## Preliminary estimates of the costs of a national open access scheme

A preliminary assessment of the scheme's costs was undertaken using a building block methodology. The approach, which was based on current spending on journal access and subscription management, adopted industry-tested assumptions related to providing national access to journals, the potential for volume discounts, and the availability of cost savings as access arrangements are centralised.

Figure 3: Estimated costs of Australia's open access scheme



Source: EY analysis

The costs of the scheme, once fully established, are estimated at approximately \$420 million per year. The estimates cover costs for read-and-publish agreements and operating expenses for the central implementation body and supporting IT infrastructure (see Figure 3).

- ▶ To manage continuity of access for core research and education users, the costs of the scheme are likely to ramp up over three years as existing commercial agreements roll off. Once the scheme is fully implemented, its costs are expected to stabilise and increase broadly in line with inflation.
- ▶ A review of international experience and industry consultations indicate that publishers typically negotiate transformative agreements on a cost-neutral basis, in which the value of individual contracts is based on the sum of existing expenditure. This would suggest the cost of the open access scheme would be, at a minimum, in the order of \$320 million per year.<sup>3</sup> This represents the lower bound of the cost estimate.
- ▶ The scheme's costs are also likely to be influenced by increasing access to academic journals on a national scale, including to individuals and businesses that do not currently have access. While publishers indicated that the future price of agreements would need to reflect community-level expansion, the value of additional users outside the research sector is highly uncertain. Prevailing costs likely to depend on the ability of the central implementation body to minimise additional costs of access to users which have little commercial value to publishers, as well as to recognise the in-kind contributions made by the research community to publishers for peer review (which are conservatively estimated at around \$32 million per year).<sup>4</sup>

In highlighting the potential costs of a national access scheme for the Australian Government, it is important to note there will also be significant opportunities for cost offsets. Predominantly, research institutions will no longer need to negotiate and subscribe to academic journals and could reduce the need to invest in repositories. The potential for cost offsets would need to be considered as part of broader institutional funding arrangements.

## A sequenced approach to implementation

Developing a national open access scheme would require a lead time of around two years.

Under a potential implementation timeline (see Figure 4), the first journals could become available after 18 months, with another 18 months to build out and incorporate all journals.

Figure 4: Potential timeline



Delivery of the open access scheme could occur over three phases:

1. **Implementation planning, funding approvals and setup (18 months)** – This phase builds on the foundation of this paper and progresses to detailed design of the open access scheme. This includes structuring read-and-publish agreements, developing a negotiation strategy and transition planning. This phase also involves securing funding approvals, implementing a preferred governance structure, and acquiring IT solutions.

<sup>3</sup> Estimate based on a recent survey of Australian stakeholder's expenditure on access and publishing in academic journals, and CAUL published aggregate data.

<sup>4</sup> Based on the number of published papers and average hourly costs of academic peer reviewers.

2. **Build out journal coverage (18 months)** – This phase involves the scheme going live, enabling Australian stakeholders to access and publish journal articles under a centralised system. This phase will also expand journal coverage through continuous onboarding of publishers and transitioning Australian stakeholders from existing arrangements.
3. **Full scheme (continuing)** – At this stage, all Australian stakeholders will have transitioned from existing arrangements and would continue access and publish journal articles through the central implementation body.

There are major economic and social dividends as access to academic journals is expanded beyond core research and educational activities to businesses and citizens. These economic gains are likely to be significantly higher than the direct costs of the scheme and represent a significant social return on investment.

## Summary of key open access models for Australia

	Central implementation body	Repository based open access	Funding mandates
<b>Key features</b>	National read-and-publish agreements. Single body represents the entire Australian community in agreements with publishers.	The Australian Government establishes a central (or virtually linked) repository of existing Australian academic repositories. Enables individuals to access author-submitted versions of academic journal articles.	All publicly funded research (e.g. ARC, NHMRC) to be published on an open access platform.
<b>Level of open access</b>	All individuals and organisations in Australia can access paywalled articles. Supports gold, hybrid and platinum open access publishing.	Individuals can access articles deposited in Australian repositories. Supports green open access publishing.	Individuals and businesses can access Australian authored journal articles. Supports gold, platinum, hybrid, and green open access publishing.
<b>Comparative cost</b>	\$420 million per year Substantial potential for cost offsets from current spending on academic journals.	\$50 million in up-front establishment costs, with relatively low operational costs (approx. \$1 million per year). Minimal potential for cost offsets from current spending on academic journals.	Negligible additional funding requirements, \$0.5 million. No potential for cost offsets from current spending on academic journals.
<b>Scale of economic uplift</b>	Could deliver nearly \$3.3 billion to the Australian economy over the next 30 years.	As the model provides a much lower level of access, the economic uplift is limited. The model could provide economic benefits of around \$400 million over the next 20 years.	Model is restricted to new Australian-led research. It does not cover paywalled articles by international researchers. Limited economic gains, potentially in the order of \$300 million over the next few decades.
<b>Delivery and risk</b>	Delivering this model could be completed over three years with an initial go live stage within 18 months. Involves some major delivery challenges due to the substantial shift in access arrangements and standing up a new body.	Delivering a virtually linked repository could take around two years. There will be delivery challenges in migrating and consolidating many Australian university repositories.	Funding mandates could be implemented in less than a year. Low delivery risk with research funders already starting to deliver this model.
<b>Conclusion</b>	An open access scheme delivered through a central implementation body involves greater cost and delivery challenges than other models. However, this model delivers a greater level of access to both international and Australian-led research. It provides a single system that would fulfill the needs of the research sector, as well as extending access to the entire community. The potential economic dividend from this model is broad-ranging and could help elevate the national science and innovation agenda and promote Australia's knowledge economy.		



# 1. Introduction

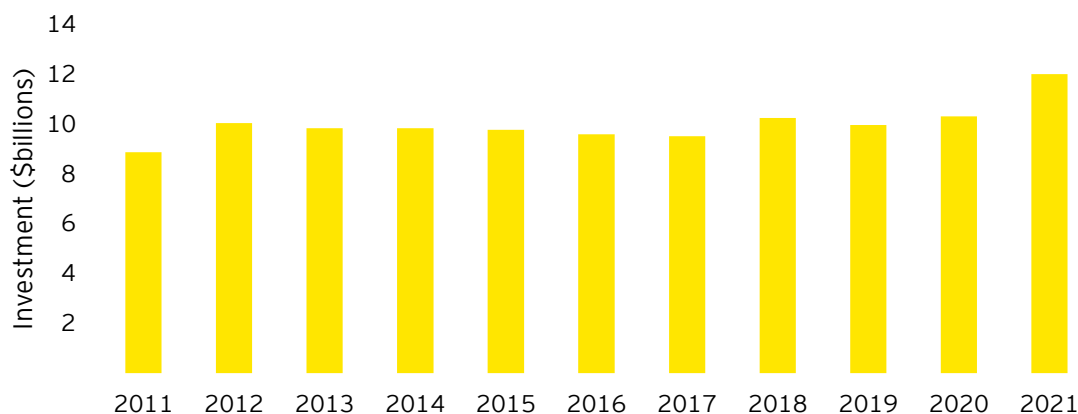
Open access is defined as academic literature or publications that are freely available on the internet, where users are permitted to read, download, distribute, or reference the full text of these works. For example, publisher Springer Nature defines open access as referring to the 'free, immediate, online available of research outputs such as journal articles or books, combined with the rights to use these outputs fully in the digital environment.'<sup>5</sup>

There is broad consensus about the intellectual and societal benefits of making research open access, and a trend towards institutions and publishers making more research open access.

## Too much academic literature sits behind paywalls

The Australian Government provides a range of support for the research sector. Investment in research totalled more than \$12.1 billion in 2020-21, with \$4.7 billion channelled through the higher education sector and almost \$3 billion in direct funding to industry (see Figure 5).

Figure 5: Australian Government investment in R&D



Source: Australian Government Department of Industry, Science, and Innovation SRI

Given the scale of government involvement in research funding, there are crucial issues about the extent to which this research should be accessible and promote broader science innovation and community inquiry. Currently, around 60% of academic journal articles published in Australia sits behind paywalls, limiting industry, university, government, and public access to academic research.<sup>6</sup>

Open access is becoming an increasing priority around the world and within Australia's research and scientific community. The open access approach outlined in this paper aims to provide access to academic journal articles for all individuals and organisations within Australia while simultaneously increasing open access publishing of Australian-led research. The strategy aligns with the global movement toward open science, open data, and open scholarship.

Importantly, a national open access scheme could strengthen the alignment between Australian research and the Government's broader policy agenda, driving new economic opportunities, unlocking social benefits, and helping build a more robust knowledge economy.

<sup>5</sup> Springer Nature, *Open Research*, Accessed June 2022, <https://www.springernature.com/gp/open-research/about/the-fundamentals-of-open-access-and-open-research>.

<sup>6</sup> Curtin open Knowledge Initiative, *COKI: Australia*, Access June 2022, <https://open.coki.ac/country/AUS/>.

## A briefing paper to support Australia's open access strategy

The Office of the Chief Scientist (OCS) commissioned EY to develop a briefing paper for a national open access scheme that provides access to academic journals for all individuals and businesses in Australia. The briefing paper assesses the workability of proposed open access models and funding arrangements, assesses the economic and social benefits of increasing access to academic literature, and considers high-level implementation issues.

The briefing paper has been informed by a range of consultations, including with publishers of academic journals, universities, industry, and government agencies.

The briefing paper is structured in the following chapters:

- ▶ **Chapter 2 Academic publishing** provides an overview of the research and publishing landscape, including the process for creating and publishing academic journals, the structure of the academic publishing industry and its cost dynamics, and the global movement towards open access.
- ▶ **Chapter 3 An open access scheme for Australia** sets out the vision, objectives, and strategic context for establishing a national open access scheme. It defines and analyses the core policy problems that a national open access scheme is seeking to address, drawing on international experience.
- ▶ **Chapter 4 The potential economic and social benefits of open access** examines the potential social and economic benefits from increasing access to academic research. It showcases the economic rationale for open access and assesses which Australian sectors could benefit the most, how better access to research could uplift R&D and drive new commercial opportunities, and the timeframes in which economic gains could materialise.
- ▶ Based on assessment, **Chapter 5 A preferred model for an Australian open access scheme** outlines a preferred model for a national open access scheme. Drawing on international examples, it highlights the model's core elements, how Australia could access academic research moving forward, and how the proposed model could work.
- ▶ **Chapter 6 Design and deliverability** discusses the potential design of the open access scheme, including IT infrastructure, delivery timelines, key governance structures and insights from stakeholder consultation.
- ▶ Establishing a national open access scheme will involve costs to government, much of which can be potentially offset by shifting current expenditures directed at journal subscriptions. **Chapter 7 Costs and risks** highlights the costs and implementation risks for the scheme and how these are best managed in the future. It also outlines important issues raised by stakeholders, including considerations for scheme design and the transition from a traditional subscriber model to open access.
- ▶ **Chapter 8 Alternative open access models** highlights some alternative models for a national open access scheme and their merits and drawbacks.
- ▶ Finally, **Chapter 9 Conclusion** provides some concluding messages.
- ▶ Some technical and background material supporting the briefing paper is provided in the appendices.

## 2. Academic publishing

Academic journals play a crucial role in building the world's knowledge base. But much of this content sits behind paywalls, limiting Australia's access to leading research. Open access is an alternative to traditional publishing models that continues to grow both in Australia and internationally.

### 2.1 The academic publishing process

Academic journals play a crucial role within academia and research, providing periodic articles relating to a specific discipline or across disciplines within a common field or focus. Published articles within a journal go through a peer review process with experts in the same field refereeing and reviewing submissions. Simply, the peer review process enables experts to test the validity and accuracy of individual research papers, providing comments for improvement or rejecting papers which do not meet required publications standards.

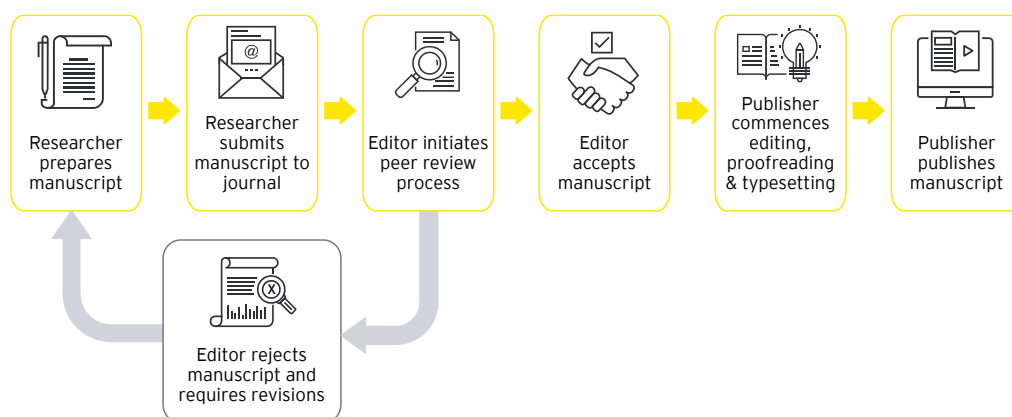
The peer review process creates an important assurance mechanism for academic research. Papers which do not meet the required publication standard or may be outside the journal's scope are not published. Thus, journals act as a 'seal of approval' for academic content and are a key source of information for other academics, educational activities, and evidence-based decision making.

Beyond coordinating the peer review process, publishers provide various editorial and metadata services to transform original submissions into a final published product. Publishing services include peer-review, copyediting, typesetting, metadata tagging, and archiving. These services support the readability, presentation, and mapping of research, with publishers also managing comments, corrigenda, retractions, and misconduct.

Further, publishers advocate for and disseminate research by launching new journals in existing and emerging academic fields, marketing journals to the public audience, and providing the IT infrastructure to support individuals to access academic research online.

The broad process of academic publishing is shown in Figure 6.

Figure 6: A typical process for academic publishing



## Different types of journal publishers

A range of entities publish academic journals, including:

- ▶ **Commercial publishers** – Commercial publishers are not affiliated with academic institutions and have a for-profit business model. The five largest global publishers are Elsevier, Springer Nature, Wiley, Taylor & Francis, and Sage.
- ▶ **University presses** – Are attached to a specific university, with the university providing financial support and the publisher redistributing any profits back into the university. Examples include the Cambridge University Press, the Oxford University Press, and Melbourne University Publishing.
- ▶ **Learned societies** – Are ordinarily not-for-profit organisations or professional associations. Profits from learned societies support member activities, including conferences and further research. Examples include the Association for the Study of Australian Literature, the Australian Council of Engineering Deans, and the Society for Reproductive Biology.

There has been major consolidation in the publishing market, with commercial publishers now the dominant provider of peer-reviewed academic literature. Several factors have driven consolidation, including increasing economies of scale, the ability to share costs across a portfolio of journals, and the influence of digital publishing on profit margins.

## 2.2 The academic publishing landscape

The academic publishing landscape is diverse, with approximately 26,000 journals stretching over 200 disciplines, publishing approximately 2 million journal articles each year.<sup>7</sup> The global publishing market is heavily concentrated, with the top five publishers (Elsevier, Springer Nature, Wiley, Taylor & Francis, and Sage) publishing over 50% of all peer-reviewed articles since 2015.<sup>8</sup> The other 50% has a long tail distribution, with approximately 5,000 publishers publishing 10% of the world's academic journal articles.

Approximately 770 journals are published in Australia. Consistent with the global picture, Australian led research is also heavily concentrated within the large global publishers, which published nearly 60% of Australia's journal articles over the last seven years. The average Australian journal comprises 17 articles, with over 6,000 journals publishing an Australian-led article since 2015.

Approximately 90% of publishers include Australian research, with the smallest 2,000 publishers releasing just 4% of all articles.<sup>9</sup> Again, this demonstrates a long-tailed distribution of publishers covering Australian research. Since 2015, Australian authors have published over 400,000 journal articles with more than 4.7 million citations. The level of citations is highly correlated with the volume of journal publications, with 97% of citations originating from large journals.

A graphical summary of the publishing landscape is shown in Figure 7.

---

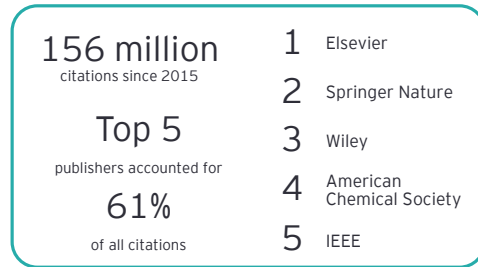
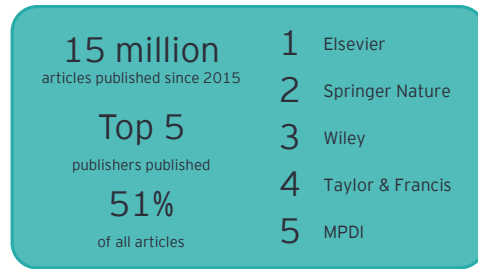
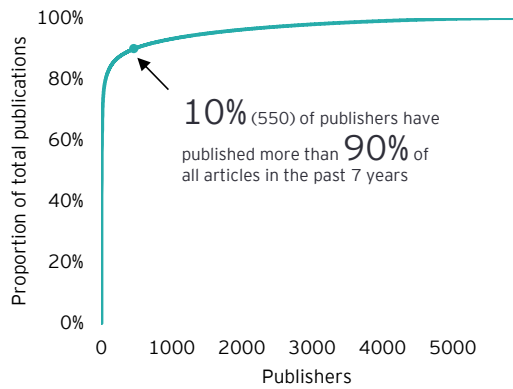
<sup>7</sup> Australian Research Council, *ERA 2023*, Accessed June 2022, <https://www.arc.gov.au/evaluating-research/excellence-research-australia/era-2023>.

<sup>8</sup> Clarivate Web of Science Database.

<sup>9</sup> Clarivate Web of Science Database.

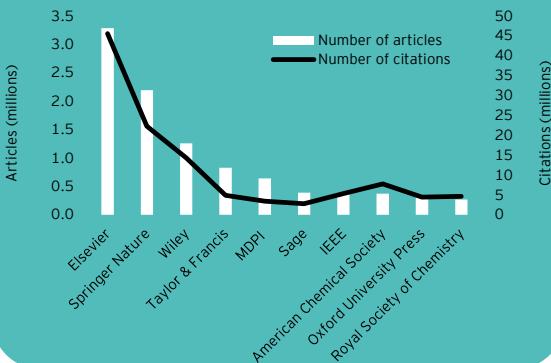
Figure 7: A snapshot of the academic publishing landscape

### Top publishers dominate the worldwide academic publishing scene

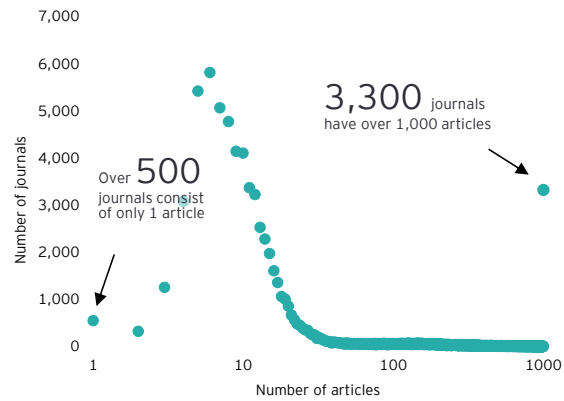


**98%** of citations a journal has can be explained by the number of articles it has

#### Publishers with more articles are cited more often



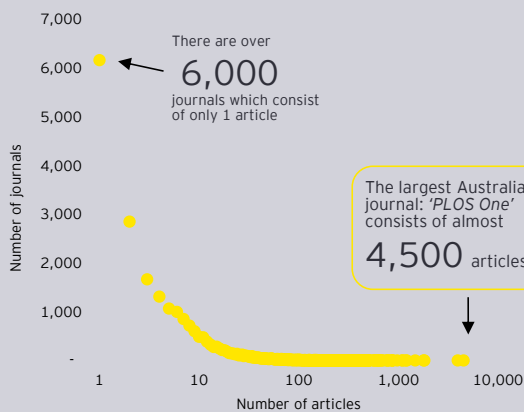
#### The size of journals vary



### Australia's academic publishing scene follows similar trends to the rest of the world

**96%** of all Australian articles were published by the top 10% of publishers

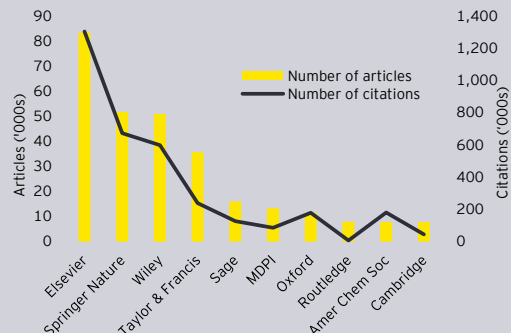
#### Australia's journals vary in size



#### Australian academic publishing since 2015



#### Australian publishers with more articles are cited more often





## 2.3 Access costs

Around 60% of academic journal publications in Australia sit behind publisher paywalls through the pay-to-read or traditional publishing model.<sup>10</sup> Under the traditional publishing model, authors typically transfer the copyright of accepted articles to publishers. Publishers can then sell access to journal publications through access charges which allow readers limited re-use rights depending on the level of access.

Under the traditional publishing model, there are two main access charges: one-off fees and subscription agreements. A one-off fee provides access to a single journal article, with access charges typically ranging between \$50 and \$200 per article.

Universities have subscription agreements with publishers to access a range of academic journals via an online portal which they typically host and maintain. Universities can either nominally subscribe to an individual journal or enter so called 'big deals' or bundling. Big deals, which represent a growing trend, wrap part or an entire publisher collection under one licensing agreement.<sup>11</sup>

Big deals are often standardised products which can restrict an organisation's scope to mix and match journals to maximise value. They often include lower impact journals which the organisation would not normally subscribe to in the absence of bundling.<sup>12</sup> Further, big deals offer bulk discounts across a range of journals, thereby increasing subscription costs by including journals that are not widely used.

A survey of research users which included state and federal government libraries and research departments, key industry stakeholders, and the university sector, found that Australia is spending approximately \$320 million on accessing academic journals each year.<sup>13</sup> This figure likely represents the lower bound of subscription expenditure as it does not include spending outside of these stakeholders including other government use, the private sector, other industry use, or one-off access charges.

The Council of Australia Universities Librarians (CAUL) collects subscription expenditure data from Australian universities, including total library expenditure. CAUL data shows that expenditure on journal subscriptions has been increasing significant in recent years, as seen in Figure 8. Journal expenditure has also risen significantly over the past three years as a proportion of total library expenditure.

---

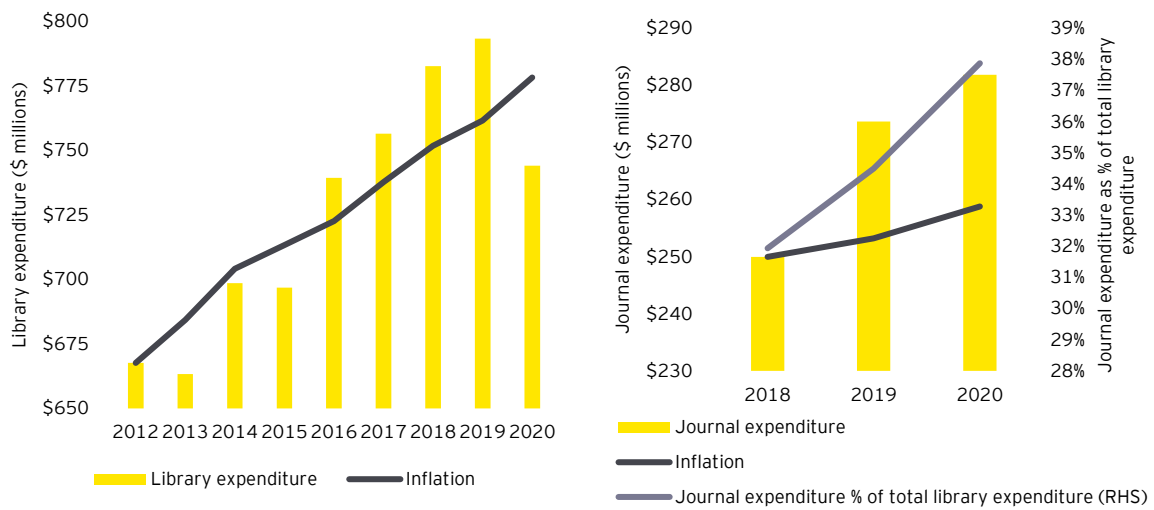
<sup>10</sup> Curtin Open Knowledge Initiative, *COKI: Australia*, Access June 2022, <https://open.coki.ac/country/AUS/>.

<sup>11</sup> Frazier, K. 2005, *What's the Big Deal?* The Serials Librarian.

<sup>12</sup> Berstrom, T, Courant, P, McAfee, R, & Williams, M. 2014, *Evaluating big deal journal bundles*, PNAS.

<sup>13</sup> Foley, C. 2021, *Unlocking the academic library: Open Access*, Australian Office of Chief Scientist.

Figure 8: Australian university expenditure on journal subscriptions



Note: Library expenditure for 2020 fell significantly due to COVID-19.  
 Source: CAUL

### 3. An open access scheme for Australia

The growing movement toward open access publishing and read-and-publish agreements is challenging traditional publishing models. Open access publishing shifts the costs of publishing services from readers to authors or third parties such as research institutions. Australia is well positioned to implement a new open access scheme which draws from international experience.

Academic journals provide a major avenue for building and sharing cutting-edge research, underpinned by robust peer review processes. However, most journal publications currently sit behind paywalls, limiting the impact of existing, current, and future research.

Open access removes barriers to academic information, enabling individuals to read publications freely. The open access movement continues to grow internationally, with government and organisations implementing new policies, forming consortiums to negotiate new deals with publishers, and continuing investment into repositories to advance an open access agenda.

Reducing paywalls and increasing access to academic journals could provide a range of new growth opportunities. As detailed in Chapter 4, open access could facilitate new productivity growth and commercial innovation, increase social capital, address a growing problem of community misinformation, and reduce inequities across the research system. Indeed, the academic publishing industry is approaching a turning point as the open access movement and digital technologies are challenging traditional publishing models.

Australia is a relatively small (representing 4% of total research publications) but important member of the international research community.<sup>14</sup> This creates substantial advantages in moving towards open access because Australia's scheme is unlikely to negatively disrupt the global research community. Moreover, Australia is in a strong position to learn from international experience in moving towards open access.

#### 3.1 The movement towards open access

Open access publishing in Australia, consistent with global trends, has expanded substantially over the last 20 years since the first open access university repository was established. With over 110,000 articles published in 2021, total articles published as open access in Australia has grown four-fold. In parallel, open access publishing in Australia is more than 11 times bigger than 20 years ago, with open access publications accounting for 50% of all articles published in 2020 in Australia.<sup>15</sup>

Year-on-year publishing growth has been consistent, at around 8% over the past 20 years. Looking at the next 10 years, this trend is likely to continue, with more authors looking to publish their articles to open access journals and repositories. In 2032, 66% of total publishing is expected to be published as open access, with a particular focus on articles published both in an open access journal or made accessible in a subscription journal online.<sup>16</sup>

The graph below shows the past performance of publishing in Australia, as well as the expected trajectory of publishing over the next 10 years. While Australia's open access publishing numbers are encouraging, Australia still has a long way to go to keep pace with other nations in removing paywalls to academic literature.

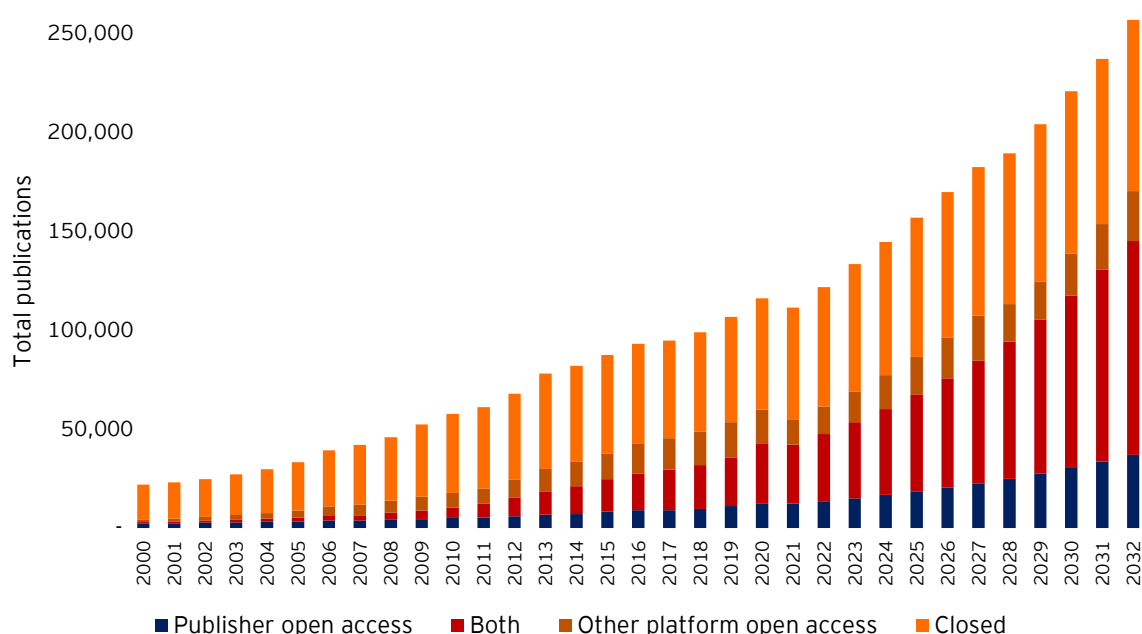
---

<sup>14</sup> Clarivate Web of Science data.

<sup>15</sup> Curtin open Knowledge Initiative, *COKI: Australia*, Accessed June 2022, <https://open.coki.ac/country/AUS/>.

<sup>16</sup> Based on an historical growth rate from COKI data.

Figure 9: Volume of open access publications in Australia over time



Source: Curtin Open Knowledge Initiative (COKI) data, EY analysis

In Australia, there is currently no national approach to open access. However, there are two key movements within Australia towards open access the Council of Australian Libraries (CAUL) negotiating read-and-publish head agreements with different publishers and major funders of research, the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC), implementing open access policies.

CAUL has successfully negotiated 17 different head agreements member institutions can participate in.<sup>17</sup> Examples include:

- ▶ **Cambridge University Press** – Enables authors from participating organisations to publish in gold and hybrid journals at no extra cost. Members of participating organisations are also able to read Cambridge University Press journal content.<sup>18</sup>
- ▶ **CSIRO Publishing** – Enables unlimited publishing in all journals listed in the included titles of the agreement. In addition, each participating member will receive read access to all the CSIRO journal titles.<sup>19</sup>
- ▶ **Wiley** – Enables authors from participating institutions to publish open access into most Wiley journals, without paying an APC fee, as well as giving researchers access to all hybrid and subscription journals.<sup>20</sup>

The ARC implemented its Open Access policy in 2013. The policy mandates all research outputs that come from ARC funded research, and their metadata, must be made openly accessible within 12 months of publication. Research outputs can be made open through either an institutional repository (green open access), through the publisher’s website, or through an open accessible digital archive as soon as the publication is made open.<sup>21</sup>

<sup>17</sup> CAUL, *Read and publish agreements negotiated by CAUL-Elsevier*.

<sup>18</sup> <https://www.cambridge.org/core/services/open-access-policies/read-and-publish-agreements/oa-agreement-caul>

<sup>19</sup> CAUL, *Read and publish agreements negotiated by CAUL-CSIRO Publishing*.

<sup>20</sup> CAUL, *Read and publish agreements negotiated by CAUL-Wiley*.

<sup>21</sup> Australian Research Council, *Open Access Policy*, 2013, Australian Research Council.

The NHMRC also has an open access policy which aligns with the ARC. The policy mandates that any peer-reviewed publication arising from NHMRC supported research must be made openly accessible in an institutional repository or other acceptable location (publisher’s website, subject repository) within 12 months of publication. The NHMRC is currently proposing to amend open access policies to facilitate the immediate access of publications funded by their grants, with a priority on implementing this from the start of 2023.

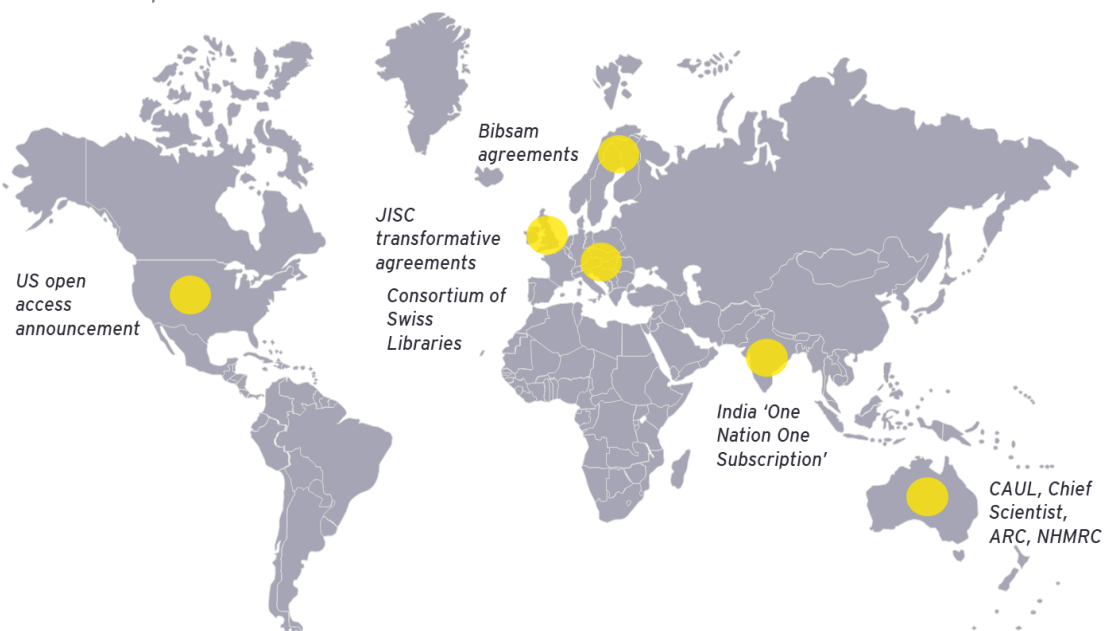
Approaches from CAUL, the NHMRC and ARC continue to drive higher levels of open access publishing in Australia and reduce the cost of subscription agreements. However, these approaches only get Australia part of the way there and limit access to the university sector or Australian-led research (which accounts for about 4% of global journal articles). Increasing access to the broader Australian community through national agreements provides a strong pathway forward and follows other international movements to reduce paywalls to academic literature.

### 3.2 The international experience

Many countries are promoting open access (see Figure 10). While arrangements vary, they tend to involve funders agreements to promote open access for publicly funded research, as well as transformative agreements to access publishers’ back catalogues.

Australia is not the only country moving in this direction and can learn from this international experience. This includes ensuring safeguards on perpetual access. The UK has been highly successful in pursuing an open access agenda but does not include the public or industry which will be a key feature of an Australian model.

Figure 10: Global open access movements



Source: EY analysis

A summary table is shown below.



Table 2: Key international open access systems

Country	Main features	Coverage
United States <sup>22</sup>	<ul style="list-style-type: none"> <li>▶ Government led mandate for all publicly funded research be free to read immediately after publication<sup>23</sup></li> <li>▶ Immediate open access publishing</li> <li>▶ Repository based open access</li> </ul>	<ul style="list-style-type: none"> <li>▶ Publicly funded research</li> </ul>
United Kingdom <sup>24</sup>	<ul style="list-style-type: none"> <li>▶ Transformative agreements with individual publishers</li> <li>▶ Agreements negotiated by JISC Collections</li> <li>▶ Immediate open access publishing</li> <li>▶ Read access for licensed publications</li> </ul>	<ul style="list-style-type: none"> <li>▶ Participating universities</li> <li>▶ Agreements include, Wiley, SAGE, Cambridge University Press, IOP Publishing</li> </ul>
Sweden <sup>25</sup>	<ul style="list-style-type: none"> <li>▶ Read-and-publish agreements with individual publishers</li> <li>▶ Agreements negotiated by the Swedish library consortium (Bibsam)</li> <li>▶ Immediate open access publishing</li> <li>▶ Read access for paywalled publications</li> </ul>	<ul style="list-style-type: none"> <li>▶ Participating universities</li> <li>▶ Agreements include, Elsevier, Wiley, Sage, the American Chemical Society</li> </ul>
Switzerland <sup>26</sup>	<ul style="list-style-type: none"> <li>▶ Read-and-publish agreements with individual publishers</li> <li>▶ Agreements negotiated by the Consortium of Swiss Academic Libraries and other key representative across the academic and government sector</li> <li>▶ Costs of open access publishing covered by agreements</li> <li>▶ Read access for licensed publications</li> </ul>	<ul style="list-style-type: none"> <li>▶ Participating universities</li> <li>▶ Agreements include a Memorandum of understanding with Elsevier, and a read-and-publish agreement with Springer Nature</li> </ul>
India <sup>27</sup>	<ul style="list-style-type: none"> <li>▶ 'One nation, one subscription' where the government would subscribe to scientific journals for all individuals in India to access</li> <li>▶ Government negotiates subscription deals with individual publishers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Read access to all scientific papers for all individuals in India</li> </ul>

Australia is a relatively small but significant player within the international research community. This well positions Australia to implement a new national strategy without significantly impacting the sector. Moreover, as other countries have moved toward open access over the last five years, Australia can draw on this significant international experience to design and deliver the new scheme.

There are several international approaches for open access, with universities forming consortiums to negotiate transformative agreements with publishers, new open access policies, and investment

<sup>22</sup> Nature 2022, *US Government reveals big changes to open-access policy*, viewed September 2022.

<sup>23</sup> There are other open access models in the United States, including individual universities negotiating transformative agreements with publishers.

<sup>24</sup> Natalia, N, Rycko, N, Seiwicz, K & Szprot, J 2021, *Transformative Agreement: Overview, Case Studies, and Legal Analysis*, Wydawnictwa ICM Warszawa.

<sup>25</sup> Open Access, *National open access strategy*, viewed June 2022, Swiss National Science Foundation.

<sup>26</sup> Natalia, N, Rycko, N, Seiwicz, K & Szprot, J 2021, *Transformative Agreement: Overview, Case Studies, and Legal Analysis*, Wydawnictwa ICM Warszawa.

<sup>27</sup> Nature 2020, *India pushes bold 'one nation, one subscription' journal-access plan*, viewed September 2020.

into repositories. The movement toward open access is especially prominent throughout Europe as seen in the case studies outlined below.

There are multiple forms and avenues for open access outlined in Table 3.

Table 3: Forms of open access and their features

Open access pathway	Features
Gold	<ul style="list-style-type: none"> <li>▶ Articles in a gold open access journal are freely available to readers without an additional fee.</li> <li>▶ The author pays an Article Processing Charge (APC) to a publisher which can be up to \$17,000 per paper for a high impact factor journal.</li> <li>▶ The publisher is responsible for publishing activities and maintaining online infrastructure.</li> </ul>
Platinum	<ul style="list-style-type: none"> <li>▶ Platinum open access is similar to gold open access, with all articles contained in the journal freely available to readers without an additional fee.</li> <li>▶ A sponsoring institution, or funder may pay the APC publication costs of the journal to publish open access</li> <li>▶ The publishers are responsible for publishing activities and maintaining online infrastructure.</li> </ul>
Hybrid	<ul style="list-style-type: none"> <li>▶ Hybrid journals contain both free-to-read and paywalled journal articles.</li> <li>▶ Authors can pay an optional APC to publish their article as open access.</li> <li>▶ The publisher is responsible for publishing activities and maintaining online infrastructure.</li> </ul>
Green or repository based open access	<ul style="list-style-type: none"> <li>▶ Commonly, freely accessible repositories contain either author-submitted, author-accepted, or published versions of articles.</li> <li>▶ The host institutions maintain each repository.</li> </ul>

### 3.3 Options for Australia’s open access scheme

As outlined above, there are multiple different approaches to open access both here in Australia and across the world. Generally, each approach aims to ensure publicly funded research is openly accessible and to reduce the cost of accessing academic journals. While policies vary, looking at international models, there are three potential ‘best of breed’ approaches for Australia’s open access strategy.

- ▶ **A single central implementation body** – Negotiating new agreements with publishers, which enable all participating users to read all the publisher journals and publish all Australian-led journal articles as open access.
- ▶ **Repository-based open access** – Australia invests into a centralised repository, or by virtually linking all Australian institutional repositories.
- ▶ **Funding mandates** – Similar but slightly different to current ARC and NHMRC open access polices, the Australian government would mandate that as a condition of funding, that all research outputs funded with taxpayer funding would be made openly accessible immediately after publication.

Table 4 provides greater detail on the different options.

Table 4: Potential open access options

	Repository based open access	Central implementation body	Funding mandates
Functionality	Government supports a central repository or virtual repository which enables access to author-submitted versions of academic journal articles.	Relevant stakeholders form a central implementing consortium to negotiate agreements with individual publishers.	Research funders mandate as a condition of funding, all research produced as a result must be published as open access.
Read access	All individuals can read and download the articles archived within the repository. Read access is limited to articles deposited within the repository.	Central implementation body provides read access to paywalled journal articles for researchers and affiliated organisations.	Provides read access to Australian publicly funded research. Does not facilitate access to paywalled non-Australian journal articles.
APC funding	Not applicable	Central implementation body covers all costs (APCs) associated with open access publishing for Australian-led research	In some cases, APCs may be paid by institutional or grant funding
Open access publishing	Green open access	Supports gold, hybrid and platinum open access publishing	Supports all routes for open access publishing
Examples	Core UK	UK, Sweden, Germany, Norway, Finland, Austria (note these examples only provide read access to pay-walled articles for affiliated organisations)	Plan S, National Health and Medical Research Council, Australian Research Council

Under one national approach, each of these models could be implemented in parallel. This briefing paper explores and assess each of these options through a Multi-criteria Assessment (MCA) in Appendix A to determine the optimal model for Australia.

### 3.4 Governing principles for a scheme

Australia's Chief Scientist is championing one nationally coordinated approach towards open access called the 'open access scheme'. Under a national scheme, individuals residing in Australia would be able to freely access all peer-reviewed academic journal articles and encourage Australian-led journal articles to be published as open access.

To this end, the following principles have been developed to guide delivery of the scheme:

1. Use, and increase benefits from, Australia's existing expenditure on academic subscriptions and publishing.
2. Allow people residing in Australia to have read access to all peer-reviewed journal articles from the date of publication.

3. Ensure Australian-led peer-reviewed journal articles in all disciplines are published as open access and are accessible internationally from the date of publication.
4. Support research integrity by facilitating the provision of quality meta-data, keeping versions of records, and assisting in discoverability.
5. Preserve bibliodiversity and author autonomy regarding where to publish.
6. Recognise the role of publishers in the system and ensure the sustainability of their businesses.
7. Use infrastructure that is user-friendly, internationally interoperable and designed for future developments in publishing and open research.

## 4. The potential economic and social benefits of open access

Greater access to academic research can drive job creation and technological advancement while supporting Australia's knowledge economy. Modelling shows a national model of open access could generate substantial benefits to the national economy. Over the period to 2050, an open access model has the potential to increase economic output by between \$18 billion and \$36 billion and generate 5,300 jobs.

Over the last decade or so, Australia has gradually expanded its agenda of open research, reflecting significant public investment in the academic research sector and the positive impacts which can accrue to the community. This undertaking has been underpinned by various open access initiatives including by Australian universities and Australian research funders for example the ARC and NHMRC.

While significant progress has been made to promote access, much academic research still resides behind publisher paywalls which limits industry, universities, government, and the community from fully harnessing the value of academic research.

Implementing a national system of open access for academic journals, and requiring publicly funded Australian research to be made open access to the world, can help drive impact from Australian research and develop a stronger system of national R&D.

This briefing paper has evaluated the benefits potentially available from a national system of open access. The analysis is intended to help government better understand the potential scale and distribution of the proposed initiative's economic impacts.

There are alternative models for establishing a national scheme of open access (see Chapter 6). While the models differ in terms of the mechanics of providing access and the 'depth' of access for specific user groups, they each provide community and industry-wide access to Australian academic journals at no cost to users. This fundamental service, consistent with the established objectives of a national open access scheme (see Chapter 3), has been the focus of the modelling. The analysis should therefore be viewed as showing the broader benefits of a national open scheme which facilitates compete access to Australia's academic journals rather than the specifics of a particular access model.

### 4.1 The economic rationale for open access

A national open access regime will be a major investment into Australia's broader research system, helping to create and disseminate new knowledge, enhance economic and social opportunities for citizens, and build the practical and intellectual capacity to meet our current and future challenges.

Harnessing the benefits of Australia's research sector, and supporting deeper community and industry engagement with world-class academic journals, can support the economy through three major channels:

- ▶ Encouraging greater collaboration with industry to stimulate more R&D, innovation, and commercial translation activities across the economy.
- ▶ Promoting broad-based productivity increases through supporting Australia's ongoing transition to a more knowledge intensive economy.
- ▶ Supporting the Australian research sector to produce high-quality and impactful research.

These economic benefits are discussed further below.

## Economic uplift for industry

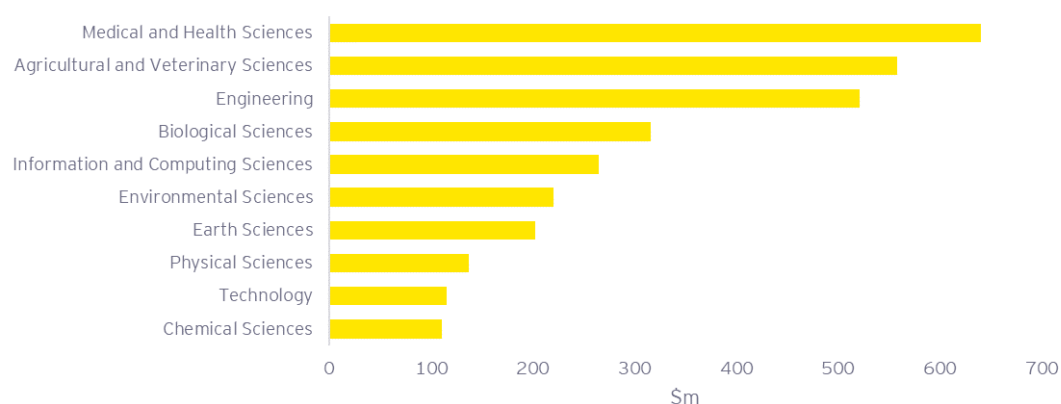
The fundamental motivation for business innovation is commercial; and consequently, happens inside firms. Businesses are the focal point where new value is generated from innovative activities. It is through the adoption of newer, more advanced practices and technologies that firms, and industries can increase their production capabilities, improve productivity, and expand lines of new products and services.

A standard innovation pathway may commence with an enterprise undertaking its own formal and informal R&D. Following this, some research or knowledge outputs may be encoded into registered Intellectual Property, integrated into business secrets, or embodied in tacit organisational knowledge. This may then evolve into new products or production technologies with effective managerial application and a measure of good fortune.

Australia's approach to open access will support all sectors of the economy by providing greater access to academic resources and information to make strategic and research decisions. However, open access will likely have the greatest impact on sectors which have the following attributes:

- ▶ **Research and innovation intensive** – Sectors in which there is high levels of investment in research and innovation may undertake more R&D as a result of open access.
- ▶ **Knowledge intensive** – Firms that depend on knowledge for operation are expected to benefit from more research being available.
- ▶ **Barriers to accessing research** – Sectors in which there are a high proportion of SMEs, start-ups or non-for-profits, means it is relatively harder for enterprises to access research due to tighter resource constraints. They would be expected to gain more from increased access to research.
- ▶ **Significant opportunities to apply research** – Sectors which are likely to be of greater importance in the future are likely to benefit from increased access to research. For example, there is a need for more R&D in climate change solutions and energy transitions as countries decarbonise.

Figure 11: Australian Government R&D expenditure by field of study, top 10, 2018-19



Source: ABS, Research and Experimental Development, Government and Private Non-Profit Organisations, Australia

Figure 12: Business R&D expenditure by industry, top 10, 2019-20



Source: ABS, Research and Experimental Development, Business, Australia

Based on the above attributes and industry consultations, potential productivity improvements from open access arrangements are likely to be concentrated in the following sectors:

- ▶ industrial (including manufacturing, mining, and engineering)
- ▶ medical
- ▶ agriculture
- ▶ energy
- ▶ government services.

An example of how open access can support policymaking, including in the Department of Defence is shown below.

### Horizon scanning using open access resources in the Department of Defence

Open access can assist industry and government by unlocking bibliometric data which can be processed and analysed. Bibliometric data involves the analysis of citation counts, publication counts, patents, technology transfers, and a range of metrics related to research outputs.

Bibliometric data analysis typically informs decisions on new and emerging technologies in fields of medicine, sciences, and defence. Through an open access model, Australian industry and governments will have access to a larger pool of bibliometric data to enhance evidence-based decision-making.

#### *Using bibliometric data to inform defence capabilities*

Australia's Department of Defence utilises bibliometric data analysis to inform decisions around Australia's defence capabilities and national security. To oversight technological advancements made in defence and national security, the Department engages in frequent 'horizon scanning' using bibliometric data.

- ▶ Horizon scanning utilises bibliometric data to monitor R&D activity to identify leading-edge technologies that have either not been previously known by Defence, or have substantially changed since Defence's last horizon scan.
- ▶ Once these technologies have been identified using bibliometric data analysis, Defence assesses these technologies for their relevance, readiness, and potential impact on Australia's economic, social, and security interests.

Access to large bibliometric datasets is critical to Defence's horizon scanning. Technological advancements typically appear in bibliometric data first before appearing in patent or venture capital data. Thus, an open access model would unlock the bibliometric data required to support Defence's scanning for potentially significant technological advancements.

Source: Department of Defence

## Building a more productive, innovative, and knowledge-based economy

Productivity is fundamental to sustaining and raising a country's overall standard of living. With growth in productivity, an economy can produce and consume increasingly more goods and services for the same amount of work. For this reason, the rate of productivity growth receives great attention from policymakers.

Importantly, innovation is widely regarded as the most important source of productivity growth over the long term. Innovation, involving the diffusion of better production methods, new-to-world innovation technologies and the introduction of new products and services, is a core driver of productivity growth. That is, it allows for more and higher-value outputs to be yielded from any level of inputs.

Supporting these growth tenets, a key benefit of open access centres on the fundamental impacts that greater access to research could have on broader innovation and productivity. Government, business, and higher education institutions invest heavily in research, developing new solutions and increasing the country's knowledge base – which ultimately raise productivity. However, the impact of research is limited by access. As such, increasing access to research could ultimately support better productivity outcomes.

Currently, academic research is mostly inaccessible to many stakeholders, including policymakers, citizens, and firms, due to journal paywalls. This means that neither Australian or international research is being fully utilised, limiting the spread of ideas and the adoption of new innovations. Open access will remove the paywall barrier and allow everyone access to the academic stock of knowledge, boosting R&D which drives productivity.

Implementing open access will allow Australia to tap into the world's research resources. If the preferred model is used, it could see the following impacts:

- ▶ **Access to more research** – Implementing open access will allow new users to access research and allow existing users to access a broader range of research. This could generate more R&D and subsequent breakthroughs. If more people can read the research, more people can build on it.
- ▶ **Faster access to research** – Open access could save users who cannot pay for research time searching for free-accessible research as all research would be freely available. The time saved searching could be put towards other productive uses, and faster access to research may bring forward the dissemination of knowledge.
- ▶ **Access to full information** – Open access would allow access to a range of academic articles rather than alternatives that are currently free, including news sources that may be biased, or other information sources that are not complete or peer-reviewed. This could lead to more effective research and decrease the chances of using misleading information.
- ▶ **Cost savings from subscription fees** – Businesses that currently purchase paywalled articles will realise cost-savings from an open access model because they will no longer have to pay these fees to receive access to the articles. The savings will be much higher for research-intensive industries, which spend large sums of money to obtain research.

Increased access to research has never been more important as Australia continues its transition to a service and knowledge-based high-tech economy. Open access will increase the stock of knowledge within Australia, potentially increasing the creation and adoption of innovations and raising Australia's productivity.

A case example of the potential for open access collaboration is shown below.



## Using open access to treat and prevent malaria

The Open Source Malaria (OSM) Consortium is an open access database of pharmaceutical compounds and medical research into treating and preventing malaria.

- ▶ Founded in 2011 by Sydney University Associate Professor Matthew Todd, the OSM Consortium aims to enable researchers, universities, and students to better research approaches to fighting malaria without costly barriers to accessing previous and current research. The project now involves over 50 researchers across nine countries.
- ▶ The OSM database was used in 2016 by a group of high school students from Sydney Grammar School to recreate a low-cost version of the malaria drug Daraprim, a drug that escalated in price from \$13.5 to \$750 a dose in the United States.
- ▶ The students relied on the open access research provided by the OSM to create their project, and their results helped motivate price reform in the United States and pioneered a different drug compounding approach that could be used to make cheaper generic versions.

In 2020, Optibrium, a software company that provides drug discovery modelling capabilities, and Intellegens, an AI toolset company, contributed a generative model to the OSM project.

- ▶ Data mining the research into different pharmaceutical compounds for treating malaria, their program has designed multiple different novel malaria compounds.
- ▶ As their results are open access, other researchers have begun to formulate and test these novel compounds, with results showing promising signs of effective treatment, people outside of academic institutions are benefitting from access to academic research.
- ▶ Beyond accessing research for self-learning, professionals across industries such as healthcare and public policy development are using research to inform their work.

Source: <http://opensourcemalarial.org/>

## Strengthening the Australian research system

Research is important in increasing the stock of knowledge in Australia. It enables discovery of solutions such as new technologies to address climate change challenges, new medical treatments, and new ways of farming to increase efficiency. The COVID-19 pandemic is a recent reminder of the vital importance of research. Research communities around the globe collaborated to devise vaccines and provide evidence on processes and strategies for public health management.

Research is also used to find faster, less costly and less resource-intensive ways of doing things. It allows businesses to stay ahead of new developments and, at the least, remain competitive with the rest of the world. Many businesses undertake their own R&D for this reason.

Access to research can also improve Government decision-making and lead to more effective policy development. For citizens, gaining access to the latest findings can translate to more informed and scientifically engaged decision making and thinking.

Access to academic research is a key part of the education process from school age student through to working academics. Open access can reduce inequality in this learning process between institutions with unequal access to academic journals behind paywalls, and further enable education and skills development.

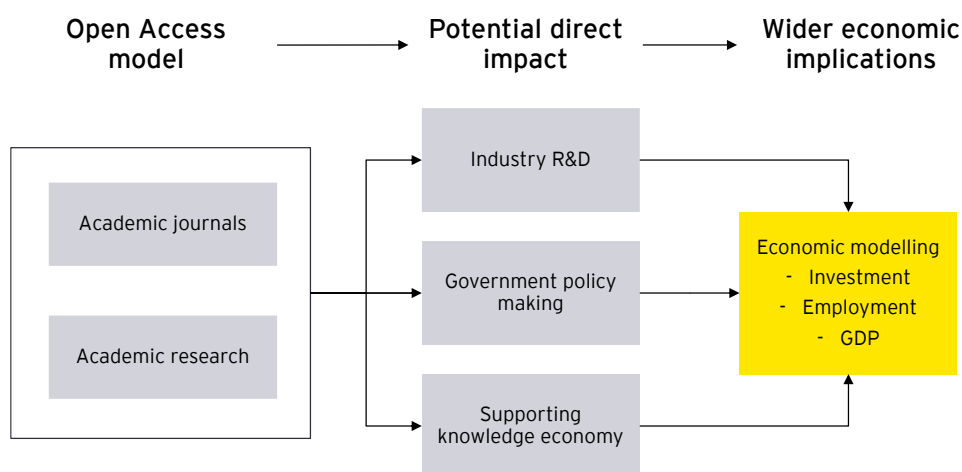
## 4.2 The potential economic impacts of open access

### The analytical approach for examining the economic potential

The economic impact of the proposed open access scheme is assessed using EY-GEM, EY's in-house computable general equilibrium (CGE) model of the Australian economy. CGE models are used extensively by the Australian Government to assess the economy-wide impacts of major policy changes and investments.

The core economic impact of a national open access regime is the productivity dividend associated with the increase in R&D investment, better policy making and the broader dissemination of quality academic research into the community and business sector (see Figure 13).

Figure 13: Analytical framework



Source: EY analysis

#### Key modelling channels and assumptions

1. Businesses may increase R&D, boosting industry productivity. Highly innovative industries will increase R&D where there is currently a knowledge barrier to innovation. This leads to an increase in productivity.
2. There may be a broader economy-wide increase in productivity, reflecting several channels.
  - i. There may be an increase in R&D for Government services, enhancing policy making and boosting productivity across the whole economy.
  - ii. There may be an increase in the efficiency with which venture capital is allocated, so that it goes to the highest value areas, improving the productivity of the economy.
  - iii. There may be increased R&D from businesses in sectors other than those specifically modelled in step 1.

The economic impacts are based on some key assumptions.

- ▶ Each industry increases R&D by the proportion of firms for which access constraints to academic journals form a barrier to innovation, in line with ABS data.
- ▶ The increase in R&D is in line with the average R&D expenditure for each industry. This is based on ABS data on R&D.

- ▶ For every 1% increase in R&D, the increase in productivity is assumed to be 0.07% for industry and 0.28% for government. This is in line with studies conducted by the OECD and the Productivity Commission.
- ▶ The productivity improvements from increased access to research will increase gradually as industry slowly becomes aware of the research and adopts it into new technologies or practices.

Recognising the uncertainty of the pace and intensity of the sectoral and broad-based productivity impacts, two adoption pathways of open access (a low and a high scenario) have been modelled:

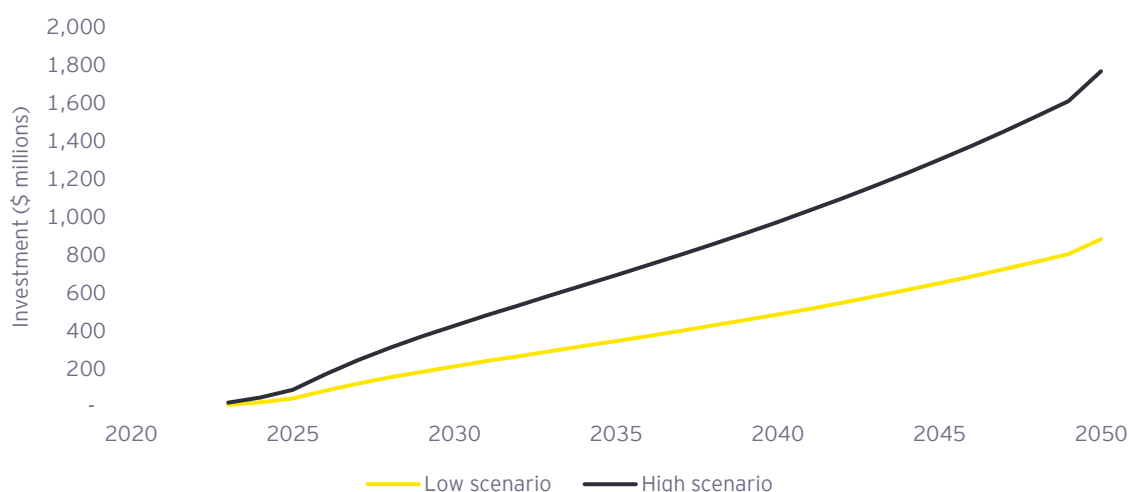
- ▶ **High scenario** – The first pathway assumes constant compounding of the productivity dividend, meaning that the initial growth of productivity benefits of open access remains constant over time.
- ▶ **Low scenario** – The second pathway assumes a linear decay in the productivity improvements, meaning that the productivity benefits of open access see no further increases over time, however the benefits are still retained compared with the starting point.

## The potential economic impacts

Open access has the potential to stimulate more R&D activity across our economy. This is a critical driver of productivity which, over time, can enable Australian businesses and governments to operate more efficiently and boost the productive capacity of the economy.

An open access model would likely reduce the cost of undertaking R&D, generating greater productivity returns on investments into research. These greater returns attract more business investment, particularly in non-mining activities, which could increase investment in 2030 by \$428 million and increase net investment over the next 28 years by over \$12.9 billion under the high scenario (Figure 14).

Figure 14: Investment impacts



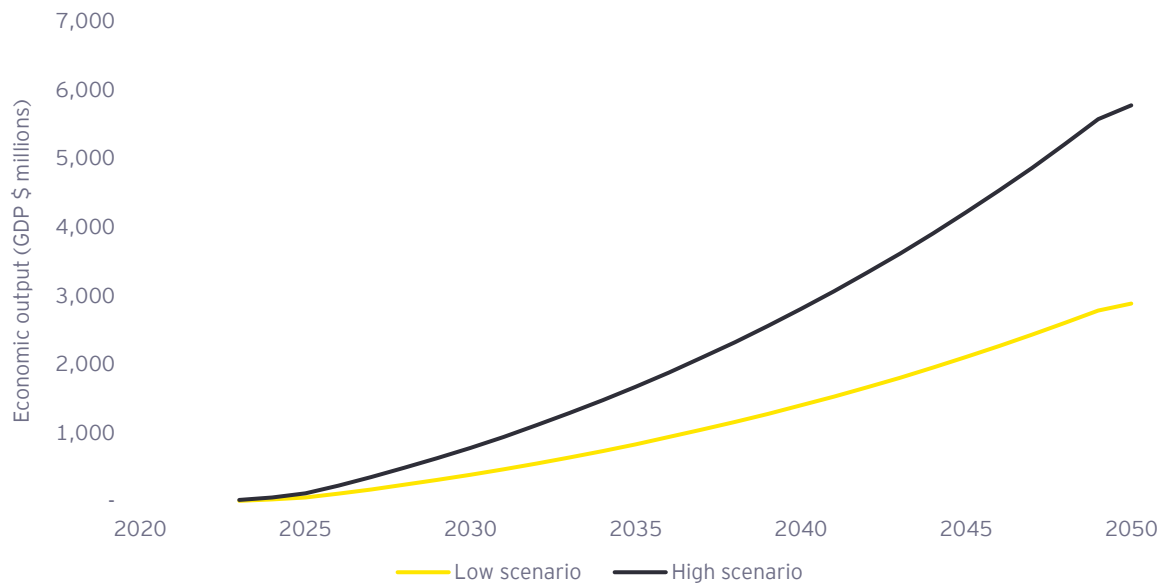
Source: EY analysis

Importantly, the increase in investment will drive increased economic activity through improved productivity, leading to higher economic output and employment.

The increase in the productive capacity from the open access scheme, through increased investment, will significantly boost Australia's GDP. GDP is modelled to increase slowly over the next decade in the high scenario, to be \$790 million above the baseline in 2030.

After 2030, the full benefits of national open access are realised, as new technologies and operations are adopted throughout the economy. Scenario modelling suggests that the economic payoff from open access could see GDP increase by between \$2.9 billion (low scenario) and \$5.8 billion (high scenario) in 2050 (Figure 15).

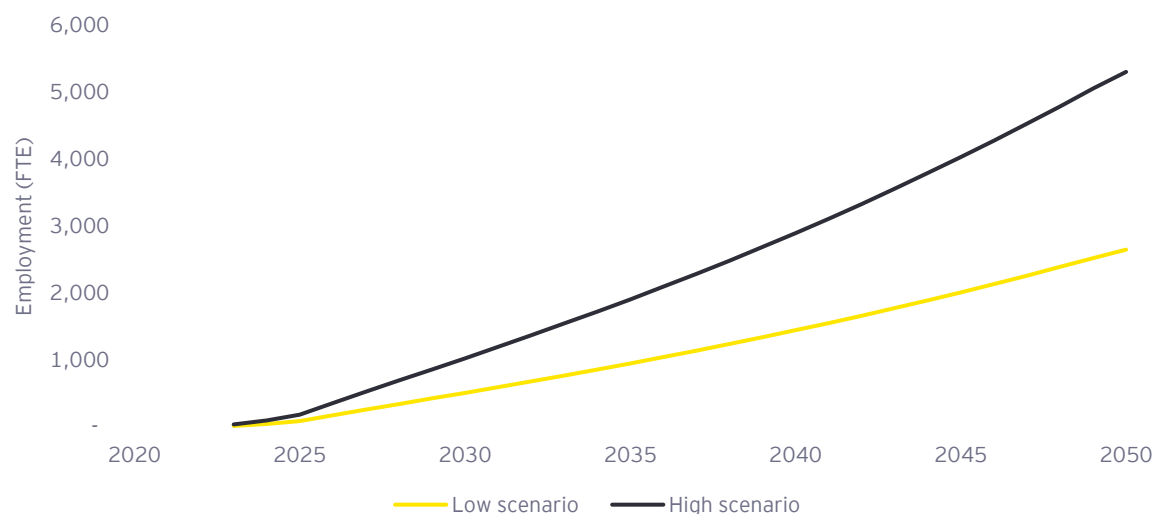
Figure 15: Impact on economic output



Source: EY analysis

Innovation intensive industries tend to also be labour intensive. By increasing investment and productivity into these industries, this increased economic activity leads to growth in employment over the next three decades. In 2030, employment is expected to be 1,030 jobs higher. This increase in employment is forecast to reach over 5,300 FTE jobs above the baseline over the next 28 years in the high scenario (Figure 16).

Figure 16: Employment impacts



Source: EY analysis

Increased R&D is likely to drive growth in output across all economic sectors, however innovation intensive industries have the greatest potential for benefits from an open access system.

The modelling suggests that the manufacturing sector will see the largest increase in output as the sector becomes more competitive internationally. In the high scenario there could be an uplift in manufacturing output of \$8 billion by 2050. The increase in the knowledge base also improves the quality of Australian professional services, lifting industry output in the high scenario by \$7.5 billion over this time.

Additionally, the increase in output in the innovation intensive sectors flows through to the performance of Australia’s trade industry. Under the high scenario, trade output could increase by around \$6.8 billion over the next three decades.

Table 5 provides a summary of the key short- and long-term economic impacts of a national open access scheme.

Table 5: Potential economic impacts of a national open access scheme

	NPV/Annual average	2030	2040	2050
<b>Low scenario</b>				
GDP (\$m)	18,000	400	1,400	2,900
Employment (FTEs)	1,176	520	1,450	2,650
Investment (\$m)	6,500	210	490	880
<b>High scenario</b>				
GDP (\$m)	35,900	790	2,800	5,800
Employment (FTEs)	2,350	1,030	2,900	5,300
Investment (\$m)	12,900	430	975	1,770

Source: EY analysis

### 4.3 Social benefits of open access

Open access under the proposed approach facilitates access to academic literature across a range of disciplines by all individuals and organisations within Australia with wide social benefits.

Access to information supports social cohesion, informs public debate and decision making, and provides better resources to educational facilitates across Australia. In effect, open access shifts academic literature from being a private commodity (behind a paywall) to a public good.

Some key social benefits are noted in the box below.

### Key social benefits from open access

- ▶ Reduces the informational asymmetry between the public and academic institutions and promotes the role of citizen scientists
- ▶ Promotes greater public engagement with academic research
- ▶ Supports more informed public debate by elevating countering misinformation
- ▶ Provides greater academic resources to educational facilities
- ▶ Creates the opportunity for multi-disciplinary engagement and foster further research
- ▶ Improves the reach of Australian authors both domestically internationally
- ▶ Enables taxpayers to access to government funded research
- ▶ Gives decision makers better access to critical information influencing public debate
- ▶ Prevents the need for research duplication by reducing barriers to accessing research

### Informational asymmetry and citizen scientists

Currently, access to papers and informed research is concentrated within universities, some industry players, and other subscribing organisations. This creates an information asymmetry between different groups in society. Open access reduces this access asymmetry by enabling individuals to access the same content, driving a more inclusive society in academic engagement.<sup>28</sup>

Citizen science is a growing phenomenon, with individuals across society contributing to data collection and observations propelling scientific advancement.<sup>29</sup> For example, the public contributed significantly to our understanding of the effects of climate change on migratory birds. Open access will propel citizen science forward, with greater access to academic literature and opportunity for the public to contribute to different fields.

Some evidence on the dissemination and value of open access publishing is provided in the box below.

---

<sup>28</sup> While open access enables individuals to access information, it does not support individuals to comprehend academic literature to the same level.

<sup>29</sup> Citizen science is the practice of public participation and collaboration in the scientific research to increase scientific knowledge.

### **NASEM finds widespread use of open access in the public domain**

A recent study highlights the potential for access to high-quality science to provide long lasting dividends to society, broadly and at the local level. Analysis of the American National Academies of Science, Engineering, and Medicine (NASEM) consensus reports indicates their impact extends far beyond the research community.

NASEM's consensus study reports have served as headland scientific evidence for policymakers. The most downloaded reports are built on social science expertise in education and policy, in addition to medical knowledge. All consensus reports were made open access in 2011.

This study provided empirical evidence for the wider impact of open access research, and that people outside of academic institutions are benefitting from access to academic research. The study used machine learning to analyse over 1.6 million comments on research use of NASEM studies.

- ▶ Half of all report downloads are used for non-academic purposes, including to improve the provision of services by medical professionals, local and regional planners, public health workers, and veterans' advocates.
- ▶ Heavy use is made of Academies reports on STEM education and how people learn by teachers, school administrators and teachers' coaches.
- ▶ The analysis also detects signals of 'serious leisure', a sociological concept used to describe unpaid activities by individuals who engage in a systematic, self-directed pursuit of knowledge.

The research indicates an identifiable payoff to society for taxpayer investments into people, technology and design to support open access publishing.

Source: Hicks, D. Zullo, M. Doshi, A. & Asensio, O. 2022, Widespread use of National Academies consensus reports by the American public, Proceedings of the National Academies

### **Supports a more informed public debate and social cohesion**

Open access increases the opportunity for more informed public debate by enabling access to academic literature and primary sources of information. Increasing access to peer reviewed research supports citizens to engage in published literature and public debate from a more informed position, and filter information which may not be accurate. Better informed public debate supports a more democratic society and better decision making in public policy.

Open access supports greater social cohesion across Australia, with knowledge networks and information asymmetry influencing how individuals interact with each other. Greater social cohesion leads to a more cooperative society, and better health, and economic outcomes across the nation.<sup>30</sup>

Misinformation is a serious issue facing countries across the globe. Open access combats misinformation by enabling individuals to access primary sources of information and facilitates understanding of key issues.

---

<sup>30</sup> The Strategist, *What does social cohesion mean in Australia?* September 2021, Australian Strategic Policy Institute.

## 5. A preferred model for an Australian open access scheme

Based on multi-criteria assessment, a central implementation body that negotiates and manages transformative agreements with publishers best meets the objectives of Australia's open access strategy.

A multi-criteria assessment examined three different 'best of breed' open access models. From this assessment, a government-supported central implementation body negotiating new national agreements with publishers is likely to be the best model for Australia.

This chapter details the role of the central implementation body, including types of agreements, issues around copyright of articles, and Australia's level of access.

### 5.1 Central implementation body

Under this model of open access, a government supported central implementation body would negotiate new national read-and-publish agreements on behalf of all Australian stakeholders. Broadly, the agreements would cover read access for individuals and organisations residing in Australia, and the costs associated with publishing Australian-led journal articles as open access.

The functions of the central implementation body model of open access are outlined in Figure 17.

Figure 17: Proposed Australian model



Table 6 summarises the benefits which could be delivered through the central implementation body model.



Table 6: Expected benefits for each stakeholder group

Stakeholder Group	Intended benefits
Universities and research institutions	<ul style="list-style-type: none"> <li>▶ Improve access to a broader range of research</li> <li>▶ Simplification of academic publishing and access costs</li> <li>▶ A level playing-field for citation-based metrics</li> <li>▶ Easier compliance with funder policies</li> <li>▶ Improved open access publication rates and elimination of individual APCs</li> </ul>
Libraries	<ul style="list-style-type: none"> <li>▶ Reduced cost and workload associated with managing journal subscriptions</li> <li>▶ Potentially reduced cost and workload associated within managing institutional repositories</li> </ul>
Publishers	<ul style="list-style-type: none"> <li>▶ Streamlined, sustainable revenue streams</li> <li>▶ Reduced transaction and negotiation costs due to fewer contracts to negotiate</li> </ul>
Industry	<ul style="list-style-type: none"> <li>▶ Improve access to peer reviewed journal articles</li> <li>▶ Productivity lifts across the workforce</li> </ul>
Government	<ul style="list-style-type: none"> <li>▶ Maximises impact of publicly funded research</li> <li>▶ Better informed public debate, and social cohesion</li> <li>▶ Access to research literature to inform policy making</li> </ul>
Australian community	<ul style="list-style-type: none"> <li>▶ Increase access to academic and scientific papers</li> <li>▶ Enables greater opportunities for citizen science</li> <li>▶ Supports the breakdown of misinformation</li> </ul>

The following sections provide additional details related to the proposed agreement structure and funding approach. Further design, implementation, costs, and risk issues are discussed in Chapter 6 and 7.

### 5.1.1 Read-and-publish agreements

Read-and-publish agreements are a subset of other transformative arrangements and utilise current subscription expenditures to meet the costs of open access publishing. The intention of these agreements is to gradually transition agreement costs from subscriptions and towards APCs payments.

Under the preferred model, the central implementation body would negotiate new national read-and-publish agreements with individual publishers. These agreements would cover both read access to paywalled articles for prescribed users and the APC costs associated with publishing Australian-led journal articles in open access journals.

#### Read access covers all individual users and is the lowest cost option

Permissions and copyright are directly tied to different licensing conditions. Licensing agreements give individual and institutional users permission to distribute and re-use paywalled journal articles for either educational or commercial purposes. The intended use of a journal article and how it is to be distributed typically determines the price of the individual licensing agreement. For example, copying a journal article for distribution in a classroom typically carries a higher cost than read access.

Individuals and institutions often require differing access levels depending on the purpose, the reason for access and any resulting re-use of article content in further research or commercial application.

Figure 18 provides a matrix of user profiles and reasons for use.

Figure 18: User profiles and journal use

Use/stakeholder	General public	Citizen scientist	Professionals	School teachers	Policy makers	Industry	Teaching academics	Researchers
Read	Expected user	Expected user	Expected user	Expected user	Expected user	Expected user	Expected user	Expected user
Copy for further reading and reference			This may not be needed if there is always accessible references	This may not be needed if there is always accessible references	This may not be needed if there is always accessible references	This may not be needed if there is always accessible references	This may not be needed if there is always accessible references	This may not be needed if there is always accessible references
Copy for teaching materials				Expected user			Expected user	
Reuse diagrams or data for publication purpose in another paper						Expected user		Expected user
Copy into a repository								This may not be needed if there is always accessible references
Use ML searching for autonomous science								Expected user
Simple search	Expected user	Expected user	Expected user	Expected user				
Complex search					Expected user	Expected user	Expected user	Expected user

Expected user  
 This may not be needed if there is always accessible references

To manage costs and meet the needs of a national open access scheme, the preferred approach would negotiate read access to paywalled journal articles. Read access provides a baseline level of access and covers all prescribed users under the central implementation body. Users who require a higher level of access than provided under the standard model, could elect to increase their level of access by negotiating individual agreements or continue accessing journal articles under other licensing arrangements like the education copy scheme (Statutory Education License).

A read access focused model, as proposed, provides a base level of access while limiting potential risks of copyright infringement.

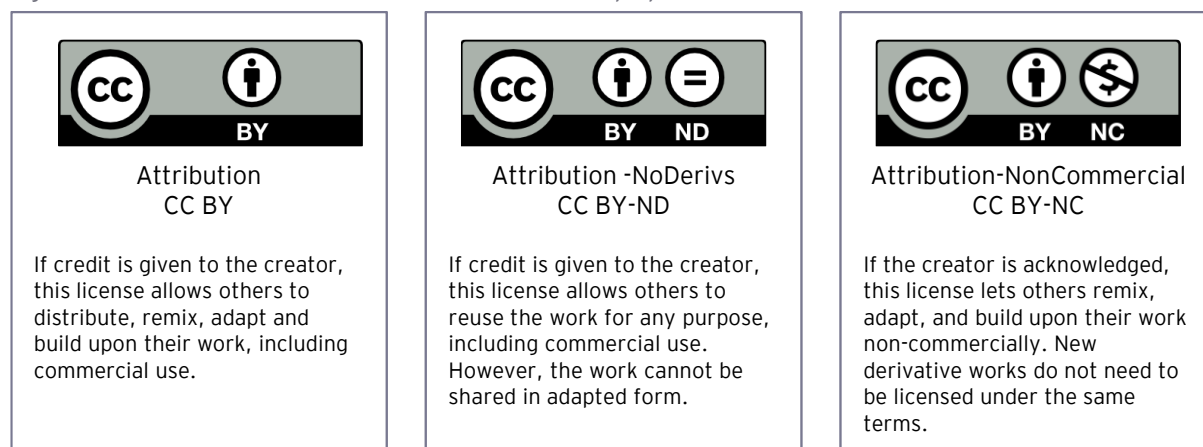
### Creative commons licensing

Under the traditional publishing model, authors typically assign the copyright of their author-accepted manuscript to the publisher in exchange for publishing services. To publish an individual article in an open access journal, publishers typically charge a one-off fee (APC) as compensation for the required publishing services. Under the read-and-publish agreements, the central implementation body would fund any associated cost for publishing Australian-led journal articles in open access journals.

As authors would retain the copyright of their submitted journal article through the read-and-publish agreements, the preferred model intends to give authors maximum choice when deciding how their journal article is licensed. Stakeholders suggested that the Creative Commons Licensing suite provides multiple options for authors and allows specific licensing conditions based on individual circumstances. For example, there may be specific restrictions around indigenous works and literature where Creative Commons Licensing may not be appropriate. Creative Commons Licensing also allows the greatest distribution of research for educational uses and commercial applications.

Figure 19 provides three different options for licensing conditions under the proposed read-and-publish agreements.

Figure 19: Creative Commons licenses to consider under the proposed model



The Creative Commons Licensing is the internationally accepted standard for open access publishing, it provides the greatest opportunity for re-use which would drive future research and innovation. The proposed open access model is consistent with current licensing conditions.

## 5.2 National agreements between publishers and central implementation body

The model involves the central implementation body executing individual agreements with publishers. Each individual agreement may vary depending on the publisher circumstances, range of journals and current level of Australian-led journal publishing. However, each individual agreement should adhere to a common set of principles:

- ▶ Support unlimited Australian-led open access publishing in participating gold and hybrid journals.
- ▶ Allow open licensing conditions (as outlined in Figure 19).
- ▶ Over time, reduce subscriptions as a proportion of total costs.
- ▶ Be transitional, enabling publishers to continue to transition to hybrid journals to gold.

Ensuring individual agreement adhere to the above principles would provide a consistent approach towards agreements and is likely to drive the greatest benefit for Australian stakeholders.

### **A government-funded central implementation body manages all payments to publishers under national read-and-publish agreements**

Under the preferred model, the central implementation body would manage all subscription fees and APCs paid to publishers within each read-and-publish agreement. The central implementation body draws funding from the Australian research sector and other sectors as outlined in Chapter 6.

Centralising funding through the central implementation body essentially forms one consortium representing all Australian stakeholders. This is likely to increase the bargaining power of Australia in negotiating new agreements with publishers. Centralising payments and funding should also improve visibility of journal expenditure, ensuring a consistent standard is applied to new agreements.

## 6. Design and deliverability

Australia's open access scheme substantially changes how primary users manage, access, and publish academic research. Based on stakeholder consultation, key benefits include reduced operating costs, greater opportunities for innovation, and improved access to resources. Important delivery issues centre on technical aspects of the scheme's design and underpinning governance arrangements.

The design of the central implementation body is crucial to the scheme's success. There are several important design features which need to be settled including the scheme's governance, supporting IT and delivery timeframes.

This chapter details major feedback on design and delivery from stakeholders, and how the central implementation body could be designed moving forward.

### 6.1 Stakeholder engagement

As part of this briefing paper, EY and the Office of the Chief Scientist consulted stakeholders from a range of sectors, including the publishing market, universities, research institutions, industry, and government. A complete list of stakeholders is provided in Appendix B.

Stakeholders across all groups strongly supported Australia's open access scheme and the driving principles behind the model. Stakeholders emphasised the scheme's potential to:

- ▶ Reduce costs for current subscribers of academic journals and the research sector more broadly
- ▶ Drive new opportunities for commercial innovation
- ▶ Increase Australia's access to academic journals.

Some concerns and key challenges for a national open access scheme were also raised by stakeholders. The major concerns focused on the overall governance and cost of the model, including:

- ▶ The potential loss of university autonomy around journal access
- ▶ Issues on future funding sources and the potential for rising operational costs
- ▶ The required lead time to develop an operating open access model
- ▶ How the model authenticates prescribed users
- ▶ How the governance structure will manage associated risks.

Overall, stakeholders noted that the preferred approach to open access could drive significant benefits across the Australian research community, businesses and the broader community but would require further stakeholder buy-in and engagement.

While stakeholders raised several concerns around the design and deliverability of the central implementation body, the issues were considered manageable. Stakeholders cited that several commercial solutions addressed the key design issues. They also noted considerable scope for Australia to learn from other international open access models to successfully deliver a national open access scheme. The following sections outline stakeholder views.

### 6.1.1 Publishers

Publishers recognised the growing trend towards open access, with governments, consortiums and individual institutions across the globe seeking to move away from 'pay-to-read' to a 'pay-to-publish' agreements. Publishers also recognised their role in disseminating research, including coordinating the peer review process, typesetting and providing IT infrastructure to enable individuals to read journal publications.

Publishers are keen to see how Australia's proposed model aligns with the shift towards 'pay-to-publish' open access agreements. Encouragingly, publishers welcomed the level of stakeholder engagement from the Office of the Chief Scientist and that the role of publishers in the national open access model is being recognised.

As the Australian model varies from other approaches by including industry and public users, publishers emphasised the need for extended negotiation lead times, as they will be pricing a new agreement and set of readers. One major publisher suggested the model would need a 12-month lead time to negotiate new agreements under the proposed model.

Publishers also emphasised that the current traditional publishing model enables them to continue to promote emerging fields of research by using revenue from older established journals to help meet the establishment costs of new journals in different disciplines. Transitioning from the traditional model may impact their ability to launch new journals and quickly meet demand in a growing field.

The biggest concern from publishers on the new model was the potential for users outside Australia to access paywalled journal articles at no cost. This academic 'leakage' was a key concern that needed to be addressed in authenticating Australian users to prevent security breaches.

Moreover, publishers raised issues about negotiating with a single national purchasing desk. Specifically, they were concerned that with the Australian market being consolidated under one purchasing entity this could erode future and diversified revenue streams. While they agreed that CAUL currently acts as one purchasing desk, the proposed model would consolidate the entire Australian market into one purchaser. Again, publishers indicated that comprehensive stakeholder engagement and longer negotiation lead times would support them in striking new agreements with the central implementation body.

### 6.1.2 Universities

Universities expressed that as the primary users and producers of academic research, the proposed approach would have major impacts to them. Buy-in across the research sector would thus be crucial for the success of the scheme. Universities expressed strong support for the ambition of a national open access scheme.

Universities expressed that the growing costs of journal access continues to place increased pressure on their library budgets, sometimes leading them to reduce their journal collection or find savings elsewhere. Additionally, universities through CAUL are attempting to negotiate better deals with publishers and reduce the costs of accessing research.

Universities identified that the traditional publishing model can be inequitable, with academics providing their time to peer review and referee journals with no remuneration from publishers. While this is a longstanding practice which often is used to further academics' fields of research, a consequence is that publishers typically benefit from access to these freely provided services.

Universities also suggested that several new authors are unaware of the publishing process, how to meet the various funders' requirements, and how current publishing agreements transfer copyright to publishers. Universities suggested the open access model needs to consider these issues,

especially around copyright, with the JISC Collective read-and-publish agreements being a good point of reference.

A critical concern from universities was the potential loss of university autonomy and funding. While universities recognised that at full scheme, they will be better off, any loss of funding in the transition could lead to reduced subscriptions to smaller journals that may be specific to their collection.

Another issue for universities was their funding being used to subsidise other stakeholders' access to academic journals. Specifically, individual universities were concerned that their funding could be used to subsidise the journal access of other universities, industry, and/or the wider Australian community.

### **6.1.3 Industry**

Industry stakeholders expressed strong support for a national open access scheme and how increased access to academic journals could support new research and commercial innovation.

Apart from businesses in the health and pharmaceutical sectors, most businesses do not subscribe to academic journals. Instead, organisations tend to access academic articles from a secondary source (such as a university-affiliated employee) or look for other accessible sources of information, where necessary.

Industry stakeholders indicated that access to academic literature would support the early stages of R&D, potentially provide solutions to problems, and support their literature reviews. The impact of open access would be especially prominent for research-intensive organisations and start-ups.

Industry stakeholders also emphasised that open access could create a new source of research capital and drive greater linkages between academia and industry. For example, open access could further publicise new research projects to industry, facilitating capital investment and further research funding.

While industry organisations agreed that open access could support more significant levels of research, industry users asserted they would need the support of research tools to filter and synthesise journal publications.

### **6.1.4 Government**

Consulted government departments expressed their strong support for a national open access model for Australia and the broader benefits this could bring to the economy and community.

The Digital Transformation Agency expressed support for utilising existing platforms and technologies. They confirmed that several existing commercial solutions could solve the authentication of prescribed users within a national open access scheme. They also agreed that focussing on a simple solution that captures the majority of the scheme's requirements was the best way forward and could reduce the costs and delivery timeframes overall.

Departments responsible for wider government policy and fiscal budgets indicated that clearly defining the next steps for government would be essential to moving the scheme forward, including securing cross-departmental and ministerial support.

Interestingly, the Department of Defence identified that academic research was crucial to national security. Specifically, the Department engages in horizon scanning of future technologies to identify critical developments within the defence, aerospace and IT space. The Department also indicated it incurs direct costs to access academic literature and has invested heavily in developing

this capability. An open access model would reduce these operating costs and improve the Department's horizon scanning capabilities.

The Australia Competition and Consumer Commission identified that further advice would be needed to ensure the proposed open access scheme complied with Australian competition laws. While the Commission confirmed that a national open access scheme has a strong public benefit rationale and competition issues are likely to be minimal, they suggested that further legal advice on this issue could support ongoing design and delivery activities.

## 6.2 Governance

Governance of the central implementation model will be crucial to the successful delivery of a national open access scheme. The central implementation body will need a clear governance framework with established decision-making functions and monitoring and reporting structures with significant representation from major stakeholders.

Australia's open access scheme has some unique features which will challenge implementation and roll-out:

- ▶ Accounting for an extensive range of stakeholders that are heavily invested in providing open access to academic literature.
- ▶ Unwinding or transitioning longstanding universities' and research organisations' publishing and access arrangements with publishers.
- ▶ Setting up supporting IT infrastructure exposed to timing, cost and technical and operational continuity risks.
- ▶ Striking new – and newly structured – access arrangements with a diverse set of publishers at acceptable terms and costs.

Considering the potential cost of the scheme and delivery risks, utilising existing capability and knowledge across university libraries, government and academia will be crucial to managing the challenges facing the scheme. While the open access scheme faces challenges, stakeholders strongly support the rationale of an open access scheme, and stakeholder buy-in will help mitigate several implementation risks.

Australia is in strong position to learn from other international approaches for open access, including government-led negotiations and consortia-type approaches, as demonstrated by CAUL. This movement demonstrates the growing objective of the international and Australian research community to reduce publisher paywalls which Australia can leverage to establish a new open access scheme.

### Managing Australia's open access scheme

Governance structures for the central implementation body will require high levels of procedural integrity, technical advice, and commercial acumen. The central implementation body will need to have delegated authority to enter into agreements with publishers, leading to a commercial decision around costs and terms acceptable to Australian taxpayers.

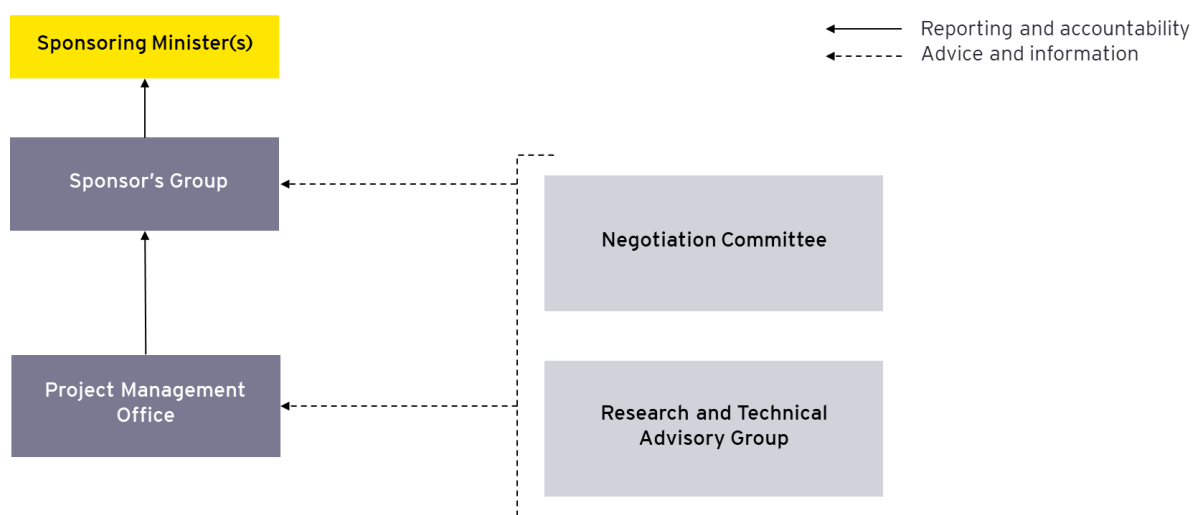
Further, the success of the scheme will rely on effectively transitioning universities to the new central implementation body model. Universities are the largest subscription base in terms of their expenditures and levels of access. The scheme proposes one central access point to all academic journals which leverages existing expenditures within the system.

Considering these factors, the central implementation body will need to be delivered with a project management discipline and internal resourcing similar to other national schemes.

Successful implementation of a national open access scheme will require a robust fit-for-purpose governance structure. New governance arrangements (see Figure 20) could involve:

- ▶ A dedicated delivery agency, recognising the scheme’s position as a new national knowledge centre (for example, the National Library of Australia). Implementing the scheme through an existing body would avoid additional costs and risks of standing up a new organisation.
- ▶ A Project Management Office (PMO) to support design and early implementation of the scheme. The PMO would have direct responsibility for implementation, project controls, assurance, and reporting.
- ▶ An external advisory group to provide stakeholder input on design matters and access, and academic content covered under the scheme. This group could provide representation for major stakeholders such as universities and research institutions.
- ▶ A specialised negotiation committee to establish foundation agreements with publishers and transitional arrangements with universities. Negotiations are likely to be resource-intensive, especially the initial agreements with the major publishers. As such, the committee would require appropriate commercial skills and experience in the process of structuring agreements with publishers.

Figure 20: Proposed governance structure



### 6.3 Supporting IT infrastructure

As noted, the central implementation body would negotiate read-and-publish agreements with publishers to facilitate read access to academic journal articles for prescribed users and open access publishing for Australian-led research papers. Under the central implementation model, prescribed users will continue to search for journal articles through current public (e.g. Google Scholar) and institutional platforms (e.g. ANU SuperSearch).

Australia’s open access scheme creates an online geofence around Australia, with access determined on physical location rather than citizenship and permanent residence. Supporting IT infrastructure will be a mechanism to identify prescribed users under the scheme. There are multiple ways to authenticate a user’s physical address, ranging from IP addresses to digital identities.

#### Focussing on critical users

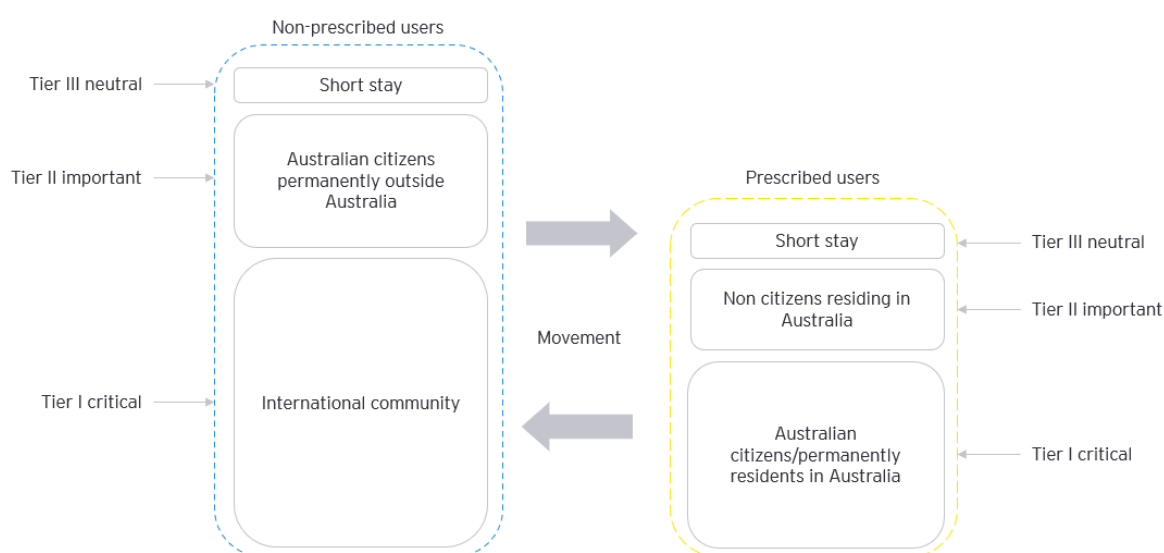
While multiple commercial solutions support central authentication, the central implementation body needs to balance appropriate restrictions with ease of use. Australia’s open access scheme would define users based on location rather than nationality, citizenship or permanent residence.



As prescribed users are based on location rather than citizenship or nationality, an individual can move between Australia and the rest of the world, testing the central implementation body's ability to locate a user at any given time. To balance the needs of prescribed users with publishers' concerns around academic leakage, it is useful to consider prescribed and non-prescribed users through a tiered system (see Figure 21).

- ▶ **Tier 1 Critical** – Relates to differentiating Australian citizens and permanent residents from the international community. A system which differentiates between these two groups is critical to the success of the scheme.
- ▶ **Tier 2 Important** – Refers to Australian citizens and non-residents currently outside of Australia (thus would no longer be a prescribed user), and individuals from other nations who are residing in Australia but are not permanent residents or citizens (but who are now prescribed users). Differentiating between these two populations is an important consideration for the scheme.
- ▶ **Tier 3 Neutral** – Relates to individuals who are moving between Australia and the rest of the world on a short-term basis. This could include Australian citizens travelling for business reasons or holidays (these would be no longer prescribed users when they leave Australian shores). Alternatively, individuals travelling to Australia would be considered prescribed users while in Australia. Considering the relatively small number of individuals this relates to at any one time, authenticating between these users has a minor impact on the success of the scheme.

Figure 21: Tiered users' assessment



It is important to distinguish between these prescribed and non-prescribed user bases in designing a central authentication system. The scheme needs to balance restrictiveness with being easy to use. Perfectly capturing all user bases to either allow or prevent access would significantly increase the complexity and costs of the authentication system.

This occurs through requiring several authentication steps which may be slow to use and prone to issues. However, not effectively distinguishing between prescribed and non-prescribed users can lead to academic leakage which is primary concern for publishers.

### Potential authentication solutions

As noted above, solutions for a central authentication system range from the location of IP address to an Australian digital identity. Other options include using an Australian MyGov account, a similar

system to Singpass (Singapore's digital identity), and access through an Australian institution. Table 7 outlines Australia's potential options for an IT solution.

Table 7: Assessment of IT solutions

IT System	Live location	Tier I	Tier II	Tier III	Ease of use	Potential for leakage
IP Address	Yes	Yes	Yes	Yes	High	High
Digital Identity	No	Yes	Yes	No	Medium	Low
Proof citizenship or residence	no	Yes	Yes	No	Low	Low
Australian Institution	no	Yes	Yes	Yes	Medium	Medium

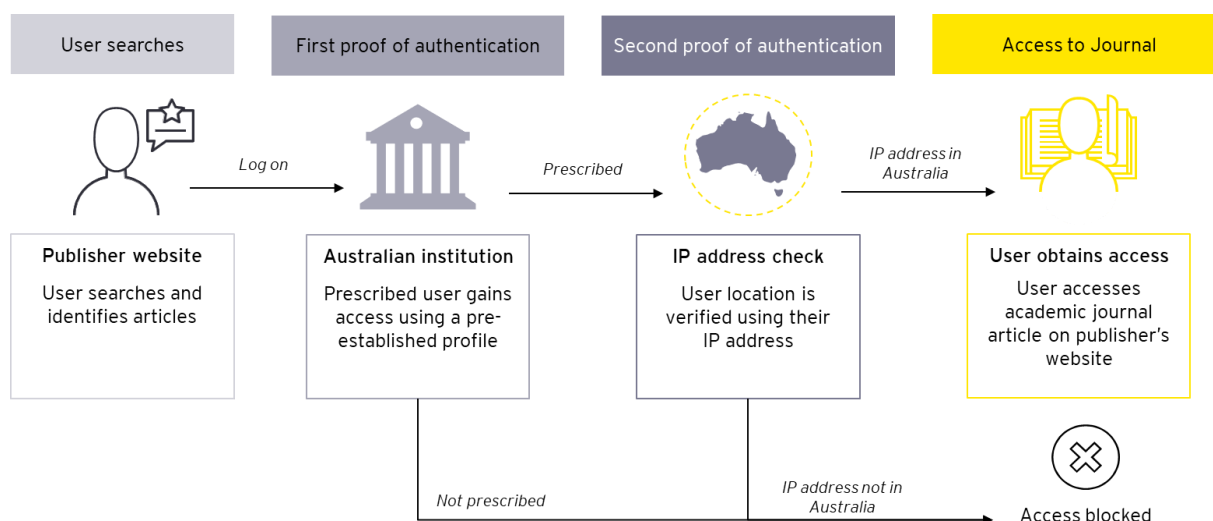
- ▶ **IP address** – Identifying users through their IP address captures all users and is easy to use as users can access journals without additional authentication. However, this option has a high potential for unauthorised access, with individuals outside Australia potentially able to falsify their IP address with a Virtual Private Network (VPN).
- ▶ **Digital identity** – Using Australia's digital identity system is a more robust system to identify Australian residents. However, as this does not provide a live location and requires higher levels of address and identity verification, it has low ease of use and may allow Australian citizens outside Australia to continue accessing journals.
- ▶ **Proof of citizenship/residence** – Like a digital identity system, proof of Australian citizenship or residence places a higher level of security on access. As this is not a live location tracking system, individuals who are currently staying within Australia who are not citizens or do not have permanent residence will not be able to access the scheme. Alternatively, citizens who have left Australia will be able to continue to access journals, but they are not prescribed users as may be defined by the scheme.
- ▶ **Australian institution** – The most common current authentication system for journal access is through a subscribing institution. Prescribed users could log in from a current Australian institution, but again, as this does not provide a live location tracker, users may be able to continue to access the system outside Australia.

As noted above, the central implementation body must balance ease of use with access. Each system presented above has key advantages but has limitations including the ability to provide a live location system and maintain ease of use.

One alternative is multifactor authentication, which combines an IP address with an authentication through an Australian institution. For example, the National Library of Australia could be the central institution with an additional location-based secondary authentication. Prescribed users would still access journals through the publisher's website.

Figure 22 provides an illustration of the multifactor system.

Figure 22: Authentication system



## 6.4 Timing and delivery

Delivering Australia's open access scheme will likely occur over multiple years with a gradual transition to full access. The level of resourcing, governance and government support will drive this timeline. The central implementation body will need to support universities and research institutions transition to the national open access scheme, negotiate and execute agreements with publishers, and build supporting IT infrastructure.

Delivery of the open access scheme could occur over three phases:

- 1. Implementation planning, funding approvals and setup (18 months)** – This phase builds on the foundation of this paper and progresses to detailed design of the open access scheme. This includes structuring read-and-publish agreements, developing a negotiation strategy and transition planning. This phase also involves securing funding approvals, implementing a preferred governance structure, and acquiring IT solutions.
- 2. Build out journal coverage (18 months)** – This phase involves the scheme going live, enabling Australian stakeholders to access and publish journal articles under a centralised system. This phase will also expand journal coverage through continuous onboarding of publishers and transitioning Australian stakeholders from existing arrangements.
- 3. Full scheme (continuing)** – At this stage, all Australian stakeholders will have transitioned from existing arrangements and would continue access and publish journal articles through the central implementation body.

Figure 23 provides a potential delivery timeline.

Figure 23: Proposed timeline



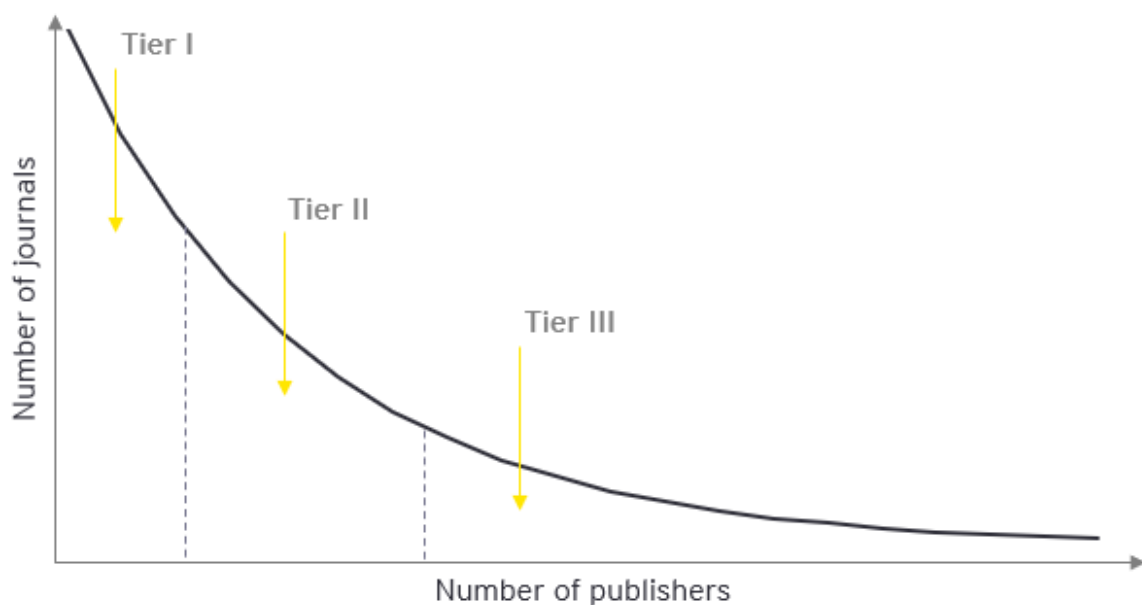
### 6.4.1 Onboarding publishers

As Chapter 2 outlines, the publishing landscape is complex and relatively concentrated. At full scheme, Australian stakeholders will have read access to all peer-reviewed academic journal articles, and all Australian-led research will be published in open access journals. Transitioning to the full scheme will involve executing agreements with a wide range of publishers, which will require varying negotiation lead times due to differences in journal collections.

Executing agreements with all publishers before the scheme goes live would substantially push out timeframes and be practically infeasible without substantial resourcing of the central implementation body. Alternatively, as the publishing market is heavily concentrated, executing agreements with large publishers enables the broadest coverage at the go-live stage of the scheme.

Similar to the tiered system presented above, critical publishers can be identified by the size of their journal collections and the number of published articles. These tiers relate to the size and significance of publishers, with Tier 1 publishers (including Elsevier and Wiley) being the largest. Figure 24 depicts a stylised tiering of publishers.

Figure 24: Tiering publishers



Onboarding large publishers first is a common open access strategy, with the UK, Sweden and Switzerland approaching publishers with the highest number of publications. Negotiating with larger publishers first will enable the central implementation body to have the largest volume of coverage initially. Further, large publishers are crucial to the success of the scheme and will provide momentum as the central implementation body expands coverage to smaller publishers.

### **Moving from individual to boilerplate agreements**

The transition from individualised agreements to standard contracts with publishers will be a crucial focus of delivery. Initially, larger publishers will likely need individualised agreements and longer lead times due to their substantial collections and management of payments. It is intended that individual agreements for larger publishers will conform to overarching principles of the scheme. However, these may vary based on journal numbers and other variables.

As the central implementation body expands coverage to smaller publishers, standardised agreements can support onboarding a larger volume of publishers. This process could also be facilitated by content aggregators which can package multiple journals within a single commercial subscription.

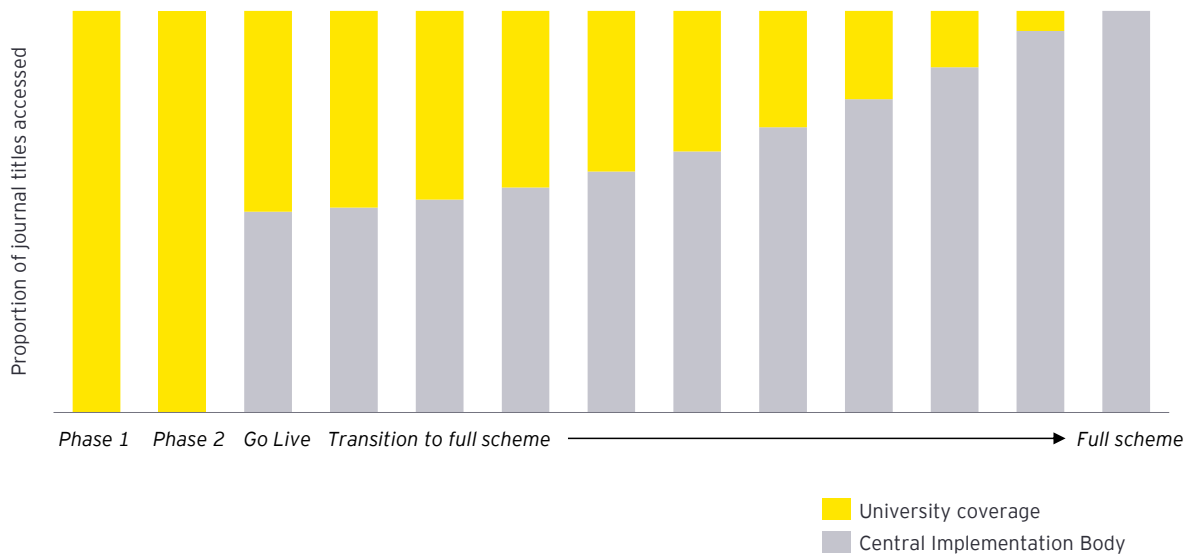
### **Transitioning universities and research institutions to the scheme**

Transitioning universities and research institutions will be critical to the success of the scheme due to the substantial unwinding of existing arrangements and agreements with publishers. At full scheme, all previously held agreements will transition to the central implementation body. Currently, the university sector holds most agreements and will be the major stakeholder group transitioning to the national open access scheme.

Accessing and publishing academic journal articles and ensuring continuity of access is crucial to the university and academic research sector. To facilitate a smooth transition, universities and research institutions will need to gradually unwind existing arrangements after the go-live stage of the scheme. This will ensure that universities and research institutions maintain continuity of access as the scheme ramps up.

Figure 25 provides a transition pathway for universities. As universities transition onto the scheme, they will gradually move away from direct negotiations with publishers and shift their access through the central implementation body.

Figure 25: Universities transition to the central implementation body



For example, at the go live point, the central implementation body is expected to cover around 50% of all academic journals by having struck arrangements with the biggest publishers. Here, Australian stakeholders will still need to hold agreements with individual publishers which the central implementation body does not cover.

As the central implementation body transitions to full scheme by executing agreements with more publishers, Australian stakeholders would progressively roll off existing contracts and continue to access and publish under the national scheme.

## 7. Costs and risks

A national open access scheme represents a step change in Australia's level of access to academic journals. Key to the success of the scheme is leveraging existing expenditure within the system and negotiating commercially acceptable terms with publishers.

Australia's open access scheme creates a platform for national access to academic journals. Consistent with key international approaches, Australia's open access scheme seeks to leverage existing expenditure within the university and research system to allow a wider range of users to access academic journals and drive higher levels of Australian-led open access publishing.

This chapter sets out a high-level estimate of the potential costs of the scheme. The costing methodology utilises a building block approach based on current journal subscription expenditures published by CAUL, surveys conducted by the Department, and industry-tested assumptions relating to IT system costs and resourcing an implementation body.

In considering the potential costs of the scheme, significant opportunities for cost offsets should also be noted. These could primarily occur through repurposing expenses currently made by universities and governments to access and publish academic journal articles.

There are some key risks to successfully deliver Australia's open access scheme, including executing acceptable read-and-publish agreements with publishers, implementing a secure but easy-to-use central authentication system, and transitioning academic literature to the central implementation body while ensuring continuity of access. While these will require careful planning and execution, stakeholders confirmed that the challenges for government in delivering a national open access scheme are manageable and unlikely to involve excessive costs and risks.

### 7.1 Costing a national open access scheme

Australia's preferred open access model has three main cost components:

1. Subscription payments for the Australian community to access academic journal articles which sit behind publisher paywalls
2. APC costs associated with publishing Australian-led journal articles in open access journals
3. Resourcing the central implementation body and supporting IT system costs.

The preferred model involves a central implementation body which would negotiate read-and-publish agreements with publishers. This creates a new market dynamic in which the central implementation body would act as a single purchasing desk representing all Australian stakeholders.

Through case studies of other international agreements, publishers typically negotiate transformative agreements that equate to their existing revenues from subscribing universities.<sup>31</sup> Read-and-publish agreements under the proposed open access model are a type of transformative agreement, and it is thus reasonable to expect that a central implementation body could negotiate these agreements on a cost-neutral basis with publishers. The costs of new transformative agreements would be largely based on the sum of existing access agreements.

---

<sup>31</sup> Natalia, N, Rycko, N, Seiwick, K & Szprot, J 2021, *Transformative Agreement: Overview, Case Studies, and Legal Analysis*, Wydawnictwa ICM Warszawa.

### **7.1.1 Understanding Australia's current expenditure on accessing and publishing academic journal articles**

As the largest user group, the university sector currently incurs the highest expenses for academic journal articles. CAUL publishes aggregate expenditure from all Australian and New Zealand libraries which includes costs of accessing online academic journals, faculty and student populations, and system IT costs. In 2020, aggregate expenditure from Australian universities was approximately \$270 million for journal subscriptions.<sup>32</sup>

Research institutions, government departments and industry comprise the next largest expenditure group. There is limited information available on journal access costs for these groups. The Department recently conducted a survey to understand spending by these users on accessing journal articles. The survey, which included 90 respondents, indicated total annual subscription expenditures of around \$30 million.

The survey also examined current expenditure on APCs across Australian stakeholders as well as spending on transformative agreements. The survey found that Australia spends an additional \$14.5 million on accessing and publishing academic journal articles. However, many survey respondents noted they currently have poor visibility of current expenditure on APCs, with a variety of other funding sources paying for open access publishing.

The wider Australian community's spending on accessing and publishing journal articles is largely unknown. However, this expenditure is likely to be relatively minor, with individuals who access and publish journals more likely to fall within the other stakeholder groups.

Based on current access expenditures, the baseline cost for subscription agreements is around \$320 million annually. However, as noted above, these costs do not incorporate extending access to the entire Australian community, or the resourcing costs for the central implementation body. As such, the \$320 million likely underestimates the total costs of the scheme.

### **7.1.2 A building block methodology to estimate the cost of the scheme**

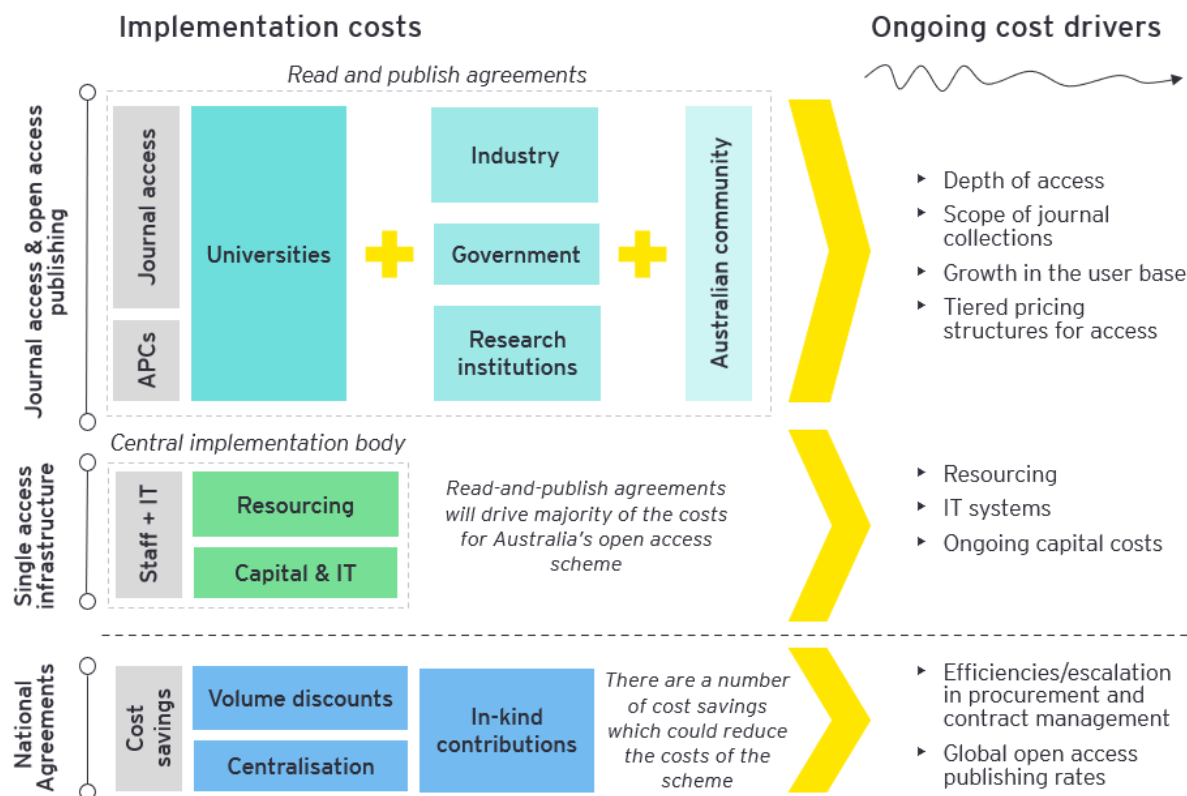
The building block cost methodology focuses on key cost elements of a national open access scheme. An outline of the methodology is provided in Figure 26.

---

<sup>32</sup> CAUL Statistical Services, *CAUL Analytics Portfolio*, viewed 20 July 2022, <https://www.caul.edu.au/programs-projects/statistics-services>



Figure 26: Costing methodology



As noted above, while CAUL publishes the aggregate expenditure for Australian and New Zealand libraries, current expenditure levels across industry, government, research institutions, and the Australian community are relatively unknown. To estimate each element, the model extends current expenditure aggregates to forecast the costs of the read-and-publish agreements and the costs of the central implementation body and supporting IT infrastructure.

Key cost drivers for the scheme include:

- ▶ Increasing the depth and level of journal access to individuals and organisations residing in Australia (growth in the user base).
- ▶ Tiered pricing structures currently within the system (publishers use different pricing structures based on different user profiles).
- ▶ The ramp-up and delivery timeframe will increase the costs of resourcing the central implementation body.

Key elements that are likely to lower the costs of the scheme include:

- ▶ Volume discounts, with the central implementation body purchasing the entire publisher's collection for all Australians. This could realise large price discounts.
- ▶ Centralising the backend functions of university libraries and research institutions could deliver cost savings across the system. There is also likely to be efficiency gains from centralising contract management and procurement functions.
- ▶ In-kind contributions from non-remunerated 'peer-review' services could increase the central implementation body's position in negotiations with publishers, with the potential to extract greater value from the read-and-publish agreements.

In line with these cost drivers and potential avenues for cost efficiencies through national agreements, the estimated costs of the preferred national open access model are in the order of \$420 million per year (see Table 8).

This estimate should be considered indicative, with a potential cost envelope of between \$320 to \$550 million per year. This aligns with the delivery timeframe for full scheme after 18 months from implementation. This aligns with a timeframe for a fully developed and operational scheme after 18 months from initial implementation.

Table 8: Potential open access scheme costs

Cost element (\$ million)	Implementation (Year 1)	Go live (Year 2)	Full scheme (Year 3)	Ongoing
Read-and-publish agreements	-	\$185	\$369.3	\$380.4
Central implementation body	\$11.9	\$11.9	\$11.9	\$11.9
IT system costs	\$20	\$38.8	\$38.8	\$38.8
<b>Total</b>	<b>\$31.9</b>	<b>\$216</b>	<b>\$420</b>	<b>\$431.1</b>

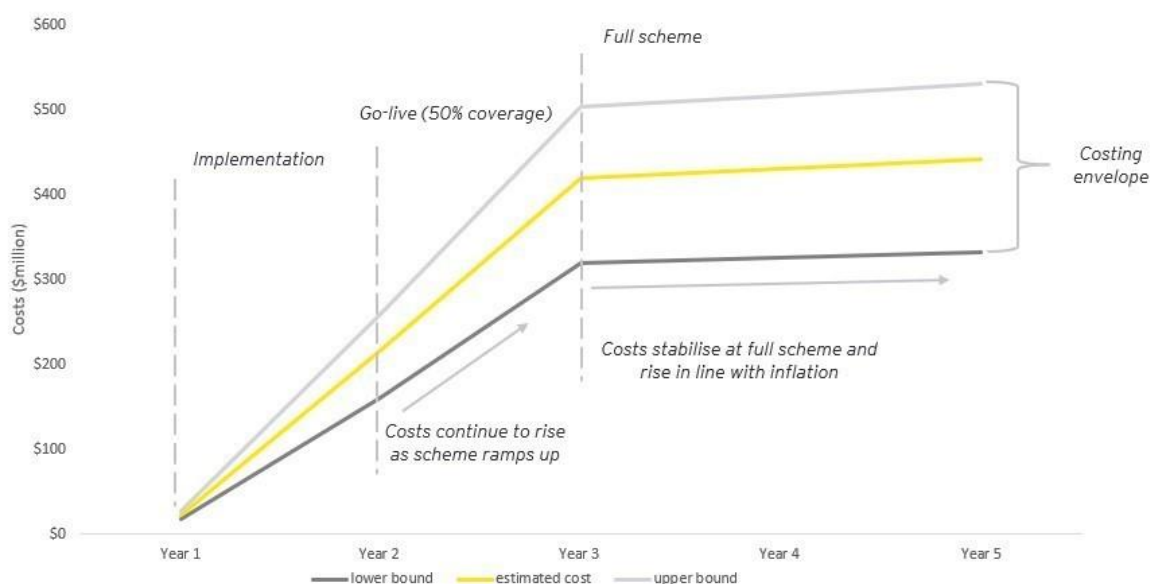
Source: EY analysis

There is likely to be a transition period in which the national scheme is built out to achieve full coverage of academic journals (see Chapter 6). The costs of the scheme are likely to rise in line with this delivery timeframe. At the go-live stage (year 2), the central implementation body is expected to have 50% of total coverage and will enter a build out phase to achieve 100% coverage. At the go-live stage (year 2), the central implementation body is expected to have around 50% of total journal coverage and will then progress to a build out phase to achieve 100% coverage.

The main cost driver during the build out phase involves the expansion of read-and-publish agreements as more publishers are brought onto the scheme. Resourcing and IT system costs are expected to remain largely consistent as coverage is expanded. After this point, resourcing costs may fall as the open access scheme enters a fully operational stage. At this point, subsequent negotiations with publishers could become more straightforward than executing initial agreements.

Figure 27 shows the estimated cost pathway for the scheme for five years after implementation. An upper and lower bound outlines the potential cost envelope which reflects a range of highly variable costing elements.

Figure 27: Estimated costs of the Australia's open access scheme



Source: EY analysis

- ▶ **Lower bound** – Aligns with currently known annual expenditures within the university and research system of \$320 million. This cost pathway provides a lower bound of the potential costs of a national open access scheme, and is based on the central implementation body being able to negotiate favourable terms with publishers
- ▶ **Upper bound** – Shows a higher cost trajectory than current expenditure for journal access and publishing. This cost pathway reflects the potential that publishers require higher revenues to cover the expansion of journal access for the whole Australian community, rather than their traditional academic and research user base.

It is important to note this cost estimates provide orders of magnitude for what the scheme could cost. There are other global factors which could reduce these costs moving forward, such as, the global movements toward higher volumes of open access publishing and publishers transitioning to a new business model.

### 7.1.3 Limitations to costing the scheme

It is important to note that the cost estimates for the preferred national access model are high level and should be considered indicative.

Working through the costings has highlighted a range of areas where information is limited or does not exist. These predominantly comprise:

- ▶ Some of the current costs associated with providing access to academic journals, which may be absorbed in other service costs met by universities and institutions.
- ▶ Relatedly, some of the potential costs involved in transitioning to open access and ultimately expanding access to the broader community.

A major consequence of the information limitations is to increase uncertainty around the potential costs to implement a national open access scheme.

Further, there are other global factors which could place downward pressure on the costs of the scheme moving forward, such as the global movement toward greater open access publishing which could accelerate the transition to new publishing business models.

Table 9 below sets out the key information gaps and their implications for the briefing paper.

Table 9: Key information limitations

Area of information	Key data limitations	Implications	Impact
<b>Current costs</b>			
University services and costs	<ul style="list-style-type: none"> <li>▶ Australian libraries' individual journal holdings</li> <li>▶ Library expenditure on individual journals, or packages of journals</li> <li>▶ Number of individuals who have access through the library's subscription agreements</li> <li>▶ Spending on APCs, and the average APC costs across a wide array of journals</li> </ul>	<ul style="list-style-type: none"> <li>▶ Some costs may be hidden or 'buried', leading to an underestimate of the current costs of journal access and publishing</li> <li>▶ Impact of APCs under full open access arrangements may be uncertain</li> </ul>	High
Government agency costs	<ul style="list-style-type: none"> <li>▶ State and federal government department expenditure on journals (across all departments)</li> <li>▶ Government officials' level of access to journals, including the number of individuals who have access</li> </ul>	<ul style="list-style-type: none"> <li>▶ May provide a key cost offset in moving to a national open access scheme</li> </ul>	Medium
Medical sector	<ul style="list-style-type: none"> <li>▶ Journal access subscriptions and associated costs incurred by the medical sector</li> </ul>	<ul style="list-style-type: none"> <li>▶ As a core user group, these access expenditures could point to potential cost savings under a national open access scheme, or transition issues to be managed</li> </ul>	Low
Researchers' in-kind contributions	<ul style="list-style-type: none"> <li>▶ The extent, type and 'value' of in-kind contributions provided to journals by Australian researchers</li> </ul>	<ul style="list-style-type: none"> <li>▶ As most in-kind contributions are from researchers employed by universities or public institutions, the value of these contributions could be a key negotiating principle in moving to a national open access scheme</li> </ul>	Medium
<b>Commercial aspects of a national open access scheme</b>			
Volume discounts	<ul style="list-style-type: none"> <li>▶ The extent of any discount related to the central implementation body purchasing access to all journals – like the 'big deals' currently offered by publishers</li> </ul>	<ul style="list-style-type: none"> <li>▶ May provide a key cost saving in moving to a national open access scheme</li> </ul>	High

Area of information	Key data limitations	Implications	Impact
Community access	<ul style="list-style-type: none"> <li>▶ The likely costs of expanding access to a large volume of non-core users who have little, if any, commercial potential for publishers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Will be central to constraining the costs of a national open access scheme, particularly the likelihood of delivering a largely cost neutral outcome</li> </ul>	Medium
Size of journal subscriptions	<ul style="list-style-type: none"> <li>▶ Cost of increasing the coverage of journals under a national open access scheme, especially beyond the major publishers</li> </ul>	<ul style="list-style-type: none"> <li>▶ There is limited information on the subscription costs for 'long tail' publishers</li> <li>▶ The costs of expanding coverage of journals will impact the future costs of the scheme</li> </ul>	High
Level of journal access	<ul style="list-style-type: none"> <li>▶ The cost of providing access rights (e.g. read, download, ancillary data) for core and non-core users</li> </ul>	<ul style="list-style-type: none"> <li>▶ The costs of proving sufficient coverage, and any necessary 'top up' rights for researchers, will impact the future costs of the scheme</li> </ul>	High

## 7.2 Risks to the successful delivery of an open access scheme

While Australia's open access scheme would utilise proven and ready-to-deploy technologies and platforms and is well supported by stakeholders, there are challenges to successfully establishing the central implementation body. Further, particular attention would be needed to manage access arrangements and funding implications for universities, as well as the delivery of technical infrastructure underpinning the central authentication system.

A dedicated project management office could help support delivery and provide clear line of sight on project delivery.

Securing early agreements with major publishers will also be critical to managing cost and delivery risks. There is likely to be limited capacity to manage cost overruns should they occur because once primary users of academic research (e.g. universities) have transitioned to a national scheme, it will be difficult to move back to the current system of access.

The risk management strategy should encompass the following:

- ▶ A well-established 'walkaway' or exit strategy for negotiations with major publishers.
- ▶ Standard access agreements developed with input from the publishing industry and university libraries.
- ▶ A phased implementation approach to help manage operational risks, control access costs, and build momentum in negotiations.

Major risks to the delivery of the scheme are outlined in Table 10.

Table 10: Major delivery risks

Risk element	Implications	Key mitigation
<b>High risk</b>		
Costs are unacceptably high	Funding structures are unable to support the model without significant additional government expenditure. High costs may lead to the open access initiative being significantly reduced or stopped.	Benchmarking of costs against other international models and significant lead time for publisher negotiations, IT set-up and a phased delivery approach.
A major publisher does not get on-boarded	Lack of journal coverage and access to academic literature, and universities seeking to continue their existing arrangements.	Long lead times, and in-depth negotiation strategy with major publishers. Access to commercial expertise for the implementation body.
<b>Medium risk</b>		
Small publishers are locked out due to budget or administrative burden	Leads to consolidation in the publishing market and falling sentiment from smaller publishers.	Developing standard agreements and approaching a wide cross section of publishers.
Implementation is delayed	The model is not delivered in initial estimated timeframes.	Long lead times, user testing and public awareness campaigns.
Academic leakage/ free riding	Larger publishers pull out of agreements.	Strong user access management process to identify Australian users.
Universities do not wish to participate in the scheme	Universities work against the model and seek to dismantle it.	Inclusion of major universities and libraries in the design, delivery and commercial negotiations.
Coverage is sup-optimal and duplicates universities coverage	Insufficient access to academic journals, and publishing choice for authors.	Strong stakeholder engagement and identifying a cross section of publishers and journals critical to university and research institutions' day-to-day activities.
Central implementation body lacks sufficient capability and capacity	Central implementation body is unable to negotiate satisfactory agreements with publishers on time, and IT infrastructure does not support the model, and there is lack of coordination between government agencies.	Central implementation body has access to a cross-disciplinary team leveraging DISR, DTA, CAUL and the National Library with a high-level advisory group.
<b>Low risk</b>		
IT infrastructure is unreliable and prone to error	Users are unable to access academic content.	Utilising extensive existing platforms, and consultation with the DTA.
Academic leakage/ free riding	Larger publishers pull out of agreements and walk away from the scheme.	Strong user access management process to identify Australian from non-Australian users.

## 8. Alternative open access models

Two alternative open access models, funding mandates and repository-based open access, are examined in this briefing paper. Both alternatives are considered viable but less effective compared to the preferred model.

Two alternative models – funding mandates and repository-based open access – were considered in this briefing paper. Appendix A details the multi-criteria analysis and the underpinning framework for assessing each open access model. These models represent different pathways for a nationally consistent approach toward open access. However, all models (central implementation body, funding mandates, repository-based open access) are not mutually exclusive and could be pursued simultaneously as part of a broader open access ecosystem approach.

This chapter outlines the other two models and provides a high-level overview of how each approach could be designed and indicative costs.

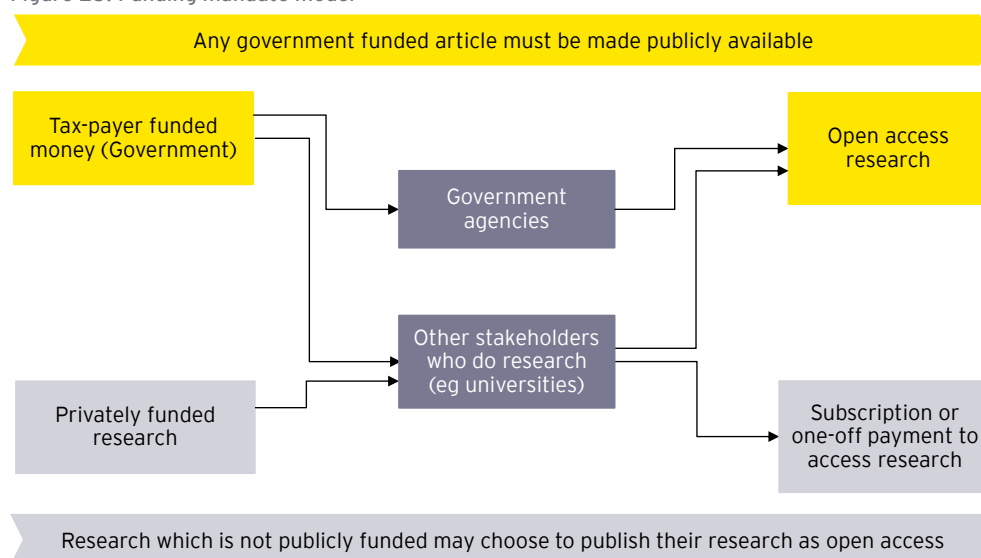
### 8.1 Funding mandates

Under this model, the Australian Government implements a policy which mandates, that as a condition of receiving public funding, all resulting journal articles are to be published in open access journals, on open access platforms, or made immediately available through an open access repository without an embargo period.

Examples of this model include the new US open access announcement and the ARC and NHMRC open access policies. Currently, these three examples allow a 12-month embargo period before the final version of the journal article is to be made open access. To comply with funders' policies, authors deposit the article's final version within an institutional repository. The NHMRC and the US funding mandate models are changing their policy stance and will now require final versions of articles to be made open access immediately on publication in the near term.

A diagram of the model is shown in Figure 28.

Figure 28: Funding mandate model



Source: EY

A national approach to funding mandates could have the following features:

- ▶ All peer reviewed journal publications produced from taxpayer funded research would be available as open access without an embargo period, whether by gold, hybrid, or green open access pathways.
- ▶ Government agencies, and organisations which receive and administer government funding for research must have an open access policy which aligns with the principles of Australia's Open Access Mandate to continue to receive funding.
- ▶ There is an allowance for APC costs within government research grants.
- ▶ A central body to coordinate with government departments, government funded organisations and universities to ensure compliance with Australia's open access mandate.

The funding mandate model could be delivered in line with other international approaches, like the European-led plan S approach. Delivering the funding mandate model would likely require a central program office coordinating with Australian research funders to deliver consistent funding mandates. As noted above, this model is already being implemented by ARC and NHMRC, and a nationally consistent approach should adopt critical principles from each of these policies.

This model's key point of success is encouraging the wider university and research sector to implement open access policies to enable all Australian-led research to be published on an open access platform (gold, hybrid and green). This could involve key government and university stakeholders working together to drive broader open access reform. This approach would involve relatively minimal costs and risks for government. It could also be adopted as a complement to a central implemental body model.

The below points outline potential mandates that could be considered by government to drive a national approach toward open access. The mandates below are consistent with Plan S.<sup>33</sup>

1. Authors or their institutions retain copyright to their publications. All publications must be published under an open license, preferably the Creative Commons Attribution license (CC BY), to fulfil the requirements defined by the Berlin Declaration.
2. The funders will develop robust criteria and requirements for the services that high-quality open access journals, open access platforms, and open access repositories must provide.
3. In cases where high-quality open access journals or platforms do not yet exist, the funders will, in a coordinated way, provide incentives to establish and support them when appropriate; support will also be provided for open access infrastructures where necessary.
4. Where applicable, open access publication fees are covered by the funders or research institutions, not by individual researchers; it is acknowledged that all researchers should be able to publish their work open access.
5. The funders support the diversity of business models for open access journals and platforms. When open access publication fees are applied, they must be commensurate with the publication services delivered and the structure of such fees must be transparent to inform the market and funders potential standardisation and capping of payments of fees.
6. The funders encourage governments, universities, research organisations, libraries, academies, and learned societies to align their strategies, policies, and practices, notably to ensure transparency.
7. The funders will monitor compliance and sanction non-compliant beneficiaries/grantees.
8. The funders commit that when assessing research outputs during funding decisions they will value the intrinsic merit of the work and not consider the publication channel, its impact factor (or other journal metrics), or the publisher.

---

<sup>33</sup> Coalition S, 'Plan S Principles', accessed September 2022, <[https://www.coalition-s.org/plan\\_s\\_principles/](https://www.coalition-s.org/plan_s_principles/)>



## Indicative costings

The costs for the funding mandate model will likely be minimal and will be largely driven by staffing costs associated with a central program office. Further, the costs of implementing this model will largely be up front, with initial drafting of the funding policies and coordinating between several organisations.

A preliminary estimate identifies the costs for the model could be around \$0.5 million over a 12 to 18-month period. This assumes five FTE dedicated to delivering this model over the initial delivery period.

The ongoing costs of this model will likely be minor, with ongoing policy reviews decentralised and coordinated between relevant research funders and the government.

## Take away

The funding mandates model would facilitate outputs from publicly funded research to be published on open access platforms without an embargo period. This model can have a wider impact if the university and research sector also adopt a nationally consistent approach when funding new research within Australia. The model is relatively straightforward to implement compared to the preferred approach and will involve much lower costs.

However, the funding mandate model focuses solely on Australia's public funding of research and is future focussed. Specifically, the model will only lead to new Australian Government-funded research to open access and does not facilitate access to international research and publishers' extensive back catalogues. As such, the potential economic benefit would likely be significantly smaller than the preferred approach. A high-level estimate suggests the model could deliver additional economic output of approximately \$300 million over the next 30 years.

The funding mandate model is inconsistent with the governing principles of one national approach to open access as it does not allow individuals and organisations in Australia to access the world's academic literature. This is a key differentiator between the funding mandates model and the preferred approach.

Alternatively, the funding mandates model could be pursued as part of a broader open access mandate and in combination with the preferred model. Indeed, the funding mandates model has its merits and would drive higher levels of Australia-led open access publishing. However, it still does not provide significant reform and limits the economic benefits of increasing access to research.

## 8.2 Repository-based open access

The repository-based or green open access establishes a central (or virtually linked) repository that aggregates content currently within Australia's repositories of academic research. This model is similar to the CORE, which aggregates scientific content from repositories and journals worldwide into one location.<sup>34</sup>

Repositories are a key contributor to the open access ecosystem and allow the sharing of academic documents and research. Under this government-led model, Australia would invest in building a centralised repository to aggregate research papers from Australia's institutions and potentially extend this to other global aggregators.

---

<sup>34</sup> Jisc scholarly communications, '*CORE becomes the world's largest aggregator*', accessed September 2022, <<https://scholarlycommunications.jiscinvolve.org/wp/2018/06/01/core-becomes-the-worlds-largest-aggregator/>>

Creating a centralised repository would provide a single point of access for all stakeholder groups to access open access documents and create supporting infrastructure for the university and academic research sector.

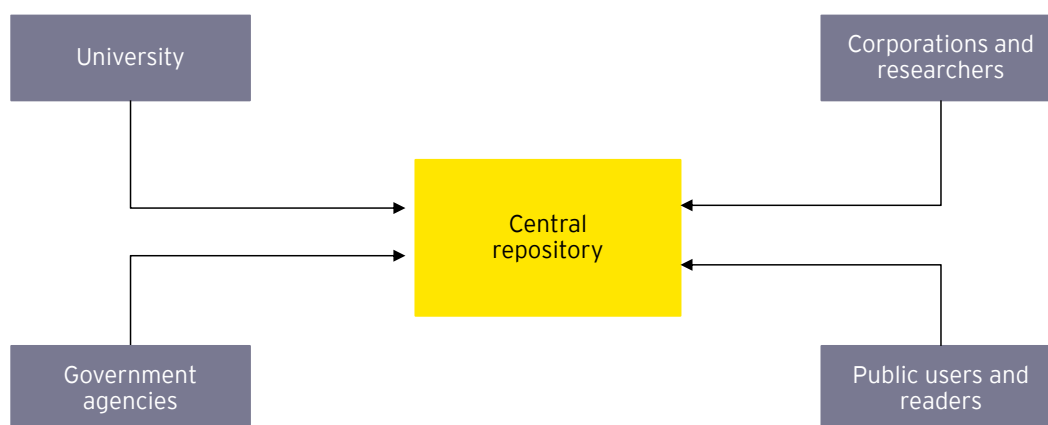
The centralised repository would enable all stakeholder groups to deposit academic outputs to support the wider dissemination of research and allow Australian institutions and organisations to collaborate on research. However, the repository would need monitoring and oversight to ensure submissions constitute academic outputs and are relevant to the repository.

This model has several key aspects, including:

- ▶ Investing in a centralised (virtual) repository which links to Australian affiliated repositories, to create one access point for users.
- ▶ Enables research tools (API, Data Mining, etc) to work over the top of the virtual repositories to enable the greater dissemination of academic research, by investing in the interoperability of different repositories.
- ▶ Monitoring to ensure only academic research is placed into the repository.

Figure 29 provides an example of how documents would flow into the central repository.

Figure 29: Repository based open access



Source: EY

## Indicative costings

Investing in a centralised repository will require substantial upfront costs, with ongoing expenses around maintenance and monitoring. To establish a new virtually linked repository with sufficient capacity to hold Australian-led research outputs, indicative estimates suggest this could cost around \$50 million upfront, with ongoing costs of approximately \$1 million per year for maintenance and monitoring.<sup>35</sup>

These costs are highly indicative and will largely depend on how the central repository is set up. For example, linking repository-held documents rather than storing them would be much less costly. However, this would require individual institutions to continue investing in and maintaining their repositories.

Investing in a centralised repository also offers significant cost savings across the system, with intuitions currently needing to maintain their own repositories. Under one national approach,

<sup>35</sup> D-lib Magazine, 'Institutional repositories: Exploration of Costs and Value', accessed September 2022, <<https://www.dlib.org/dlib/january13/burns/01burns.html>>

universities and institutions could transition to using the centralised repository without needing to preserve their own.

### **Take away**

Repository-based open access supports the broader ecosystem and supports the wider dissemination of academic research and outputs. Investing in a centralised repository would create a single point for Australian stakeholders to access academic content. Further, repositories allow metadata and mining tools to run over the top and support further research.

Repository-based open access indirectly supports open access by creating critical infrastructure. Unlike the funding mandates and the preferred model, it does not directly intervene in the academic research sector. For example, providing supporting infrastructure may support the broader dissemination of research. Still, it does not directly increase Australian-led open access publishing or facilitate access to paywalled journal articles and publishers' back catalogues.

Therefore, the economic benefits of a repository-based open access scheme would likely to be smaller than the preferred model, potentially increasing economic output by around \$400 million over the next 30 years.

## 9. Conclusion

A national open access scheme represents a major reform to Australia's knowledge and innovation system. To advance the scheme, ahead of an implementation decision by government, a range of further work is needed. This includes further assessment of publishers' pricing structures and the resourcing requirements of the implementation body and central IT infrastructure.

The scheme, as proposed, represents a major change in how Australians would access academic journals and open access publishing. The scheme has the potential to drive new opportunities for economic growth, boost productivity across Australian industry and provide a wide range of social benefits. There is significant stakeholder support for the scheme and, based on international experiences, Australia could deliver an open access scheme in around two years.

Moving to the next phase of a national open access scheme would involve the following key steps:

- ▶ Further consultation with industry, government and universities to understand the level of public funds which are used to pay publishers for subscriptions and APCs.
- ▶ Engaging with publishers to determine realistic negotiation lead times.
- ▶ Establishing a greater understanding of publisher pricing structures, including how they typically differentiate and price market segments and levels of access.
- ▶ Understanding the central implementation body's resourcing requirements, where staff with appropriate skills currently reside and how they could be transferred to support implementation.
- ▶ Developing specifications for the central authentication system to support the scheme.
- ▶ Identifying potential funding arrangements and the potential to repurpose existing public funding for journal subscriptions.
- ▶ Negotiating proposed read-and-publish agreements, including addressing issues around copyright and around identifying Australian-led research publications, building on arrangements already secured by CSIRO and CAUL.

As discussed within this briefing paper, the delivery of the scheme is manageable and is unlikely to involve excessive costs and risks for government.

Building on strong stakeholder buy-in, and with appropriate resourcing and project management, a national open access scheme can transform how Australian's access and capitalise on cutting-edge academic research over the long term. It would help drive Australia's knowledge economy.

## Appendix A Multi-criteria analysis

This appendix provides the framework and approach for evaluating the different open access options using multi-criteria analysis (MCA). MCA is a proven methodology used on complex multi-disciplinary problems assisting policy decision making and investment pioneering.

The MCA establishes preferences between open access options through an assessment against selected evaluation criteria for Australia's national open access strategy. The evaluation criteria provide a measurable base to assess how each option achieves the Strategy's goals, and the economic wider impact of each option. Chapter 3 outlines the principles and objectives of the open access strategy. Chapter 5 and Chapter 8 provide a detailed description of the open access models assessed in the MCA.

### Evaluation criteria and rating mechanism

The evaluation criteria in Table 11 assess the potential long-term impacts of each open access model, the immediate challenges of implementing each open access model, and each open access model's alignment to guiding principles of the national open access strategy.

Table 11: Assessment criteria

Criteria	Details
<b>Australian access to academic journals articles</b>	Measures Australia's access to academic journal publications
<b>Australian journal articles published as open access</b>	Measures likely proportion of Australian led research journal articles published in an open access platform (gold, hybrid and green)
<b>Research integrity and discoverability</b>	Measures the model's ability to facilitate quality metadata, keeping version of record, and assisting in discoverability
<b>Cost</b>	Measures the likely cost of each open access model
<b>Market and competition effect</b>	Measures the potential impact on the research market and publishers
<b>Economic impact</b>	Measures the likely economic benefit of each open access model
<b>Deliverability</b>	Measures the deliverability of each open access model
<b>Strategic alignment</b>	Measures the open access model alignment with the national open access guiding principles and objectives

The MCA analysis in this briefing paper employs a five-level rating system to assess each model against the evaluation criteria, as set out in Table 12.

Table 12: MCA analysis ratings to assess each model

Rating	Meaning
<b>High positive</b>	High positive means the proposed open access model rates highly against the base case for the given criterion
<b>Medium positive</b>	Medium positive means the proposed open access option exceeds the base case for the given criterion
<b>Neutral</b>	Neutral means the proposed open access model rates equally against the base case for the given criterion
<b>Medium negative</b>	Medium negative means the open access model rates lower than the base case for the given criterion
<b>High negative</b>	High negative means the proposed open access option rates significantly lower than the base case for the given criterion

It is important to note that some of the evaluation criteria have relatively comparable metrics for model evaluation, such as access to journal articles and publishing Australian journal articles as open access. However, other evaluation criteria require qualitative judgements informed by technical and quantitative analysis.

### Assessment considerations

The MCA assesses each of the open access models against a comparable base case. The base case here, is the 'do nothing' approach or choosing not to pursue any of the proposed open access models. In assessing each proposed open access model against the base case, this briefing paper made the following considerations in combination with the MCA criteria:

- ▶ Current expenditure on subscription fees, and publishing articles as open access (within gold and platinum).
- ▶ Current expenditure on publishing journal articles as open access (within gold and platinum open access journals).
- ▶ The number of journal articles currently open access.
- ▶ The number of Australian journal articles currently published as open access.
- ▶ The economic multiplier of increasing access to academic literature.

## Assessment results

		Open access models		
Criterion		Repository based open access	Funding mandates	Central implementation body
Flow of information	Australian access to academic journal articles	Neutral	Medium positive	High positive
	Australian journal articles published as open access	Neutral	Medium positive	High positive
	Research integrity and discoverability	Medium positive	Neutral	High positive
Long term impact	Cost	Medium negative	Medium positive	Medium positive
	Market and competition effect	High negative	Medium negative	Medium negative
	Economic impact	Neutral	Neutral	High positive
Workability	Deliverability	Medium negative	Neutral	High negative
	Strategic alignment	Medium positive	Medium positive	High positive

Criteria	Description and assessment methodology	Preferred model	Summary justification
Flow of information			
Australia's access to academic journal articles	The analysis looks at Australia's access to peer-reviewed journal articles once each model is at full operation	Central implementation body	<p>At full scheme, the central implementation body will enable Australian users to access all academic journals.</p> <p>Compared to the repository-based open access and funding mandates which will likely only increase Australia's access to Australian-led research, the central implementation body targets the international community's research, facilitating the highest level of access.</p>
Australian-produced journal articles published as open access	This analysis assesses Australian authors' incentives, pathways, and funding arrangements to publish their journal article as open access.	Central implementation body	<p>At full scheme, under the central implementation body model, authors will be able to publish in all participating journals at no extra cost.</p> <p>While funding mandates also force all government-funded research to be published in an open access platform, this model does not account for privately funded research.</p> <p>Read-and-publish agreements between the central implementation body don't differentiate between publicly and privately funded research, removing the price disincentive for authors to publish their article as open access.</p>
Research integrity and discoverability	<p>Measures the authors' autonomy in choosing where to publish, and the model's ability to facilitate quality metadata, keeping version of record, and assisting in discoverability</p> <p>This analysis looks at which model supports the role of publishers within the research system as the primary factor.</p>	Central Implementation body	<p>The central implementation body scores the highest as it maintains the role of publishers through read-and-publish agreements funding APC costs.</p> <p>Publishers play a crucial role in the integrity and dissemination of academic research through coordinating peer-review services, typesetting, formatting and maintaining IT infrastructure.</p> <p>Gold, hybrid and platinum journals have higher discoverability compared to repository based open access and hold versions of record and metadata.</p> <p>By funding APC costs associated with gold and hybrid open access, the central implementation body removes the costs disincentive for authors to publish in these journals, making it the preferred option.</p>
Long term impact			
Costs	The total costs associated with accessing and publishing journal articles.	Central implementation body	While the central implementation body will have the highest cost compared to other open access models, the other



Criteria	Description and assessment methodology	Preferred model	Summary justification
	This analysis considers impact on costs each model will have on the entire Australian expenditure on accessing research journal articles		<p>models do not address the rising costs of maintaining access to academic journals.</p> <p>The central implementation body redistributes funding cost-neutrally, which should reduce the overall expenditure within the system over time.</p> <p>However, the effect of the total costs will depend on the successful negotiations with publishers and the additional costs of extended access to stakeholders beyond the users currently covered by the scheme.</p>
Market and competition effect	<p>The potential to have adverse reduce competition within the publishing sector.</p> <p>This analysis considers the models impact on internal competition within the publishing sector.</p>	Central implementation body	<p>While the central implementation body consolidates all Australian stakeholders into one purchasing desk, this model still enables publishers to function in this newly formed market.</p> <p>Specifically, compared to the other models, the central implementation body still preserves the role of the publisher and competition for Australian-led research articles in their journals.</p>
Economic and social impact	The economic benefits across the Australian economy	Central implementation body	<p>The model that significantly increases Australia's access to journal publications is critical to maximising the economic and social benefits.</p> <p>The central implementation body maximises Australia's access to new research, creating the biggest flow on effect to industry and the public.</p>
<b>Workability</b>			
Deliverability	<p>The likelihood of successfully delivering each open access model.</p> <p>Considers, implementation strategy, likely governance structures and delivery methodology.</p>	Funding mandates	<p>Compared to the other open access models, the funding mandates model is likely to be the easiest to implement requiring coordination across government organisations. However, such a mandate would require resourcing to ensure compliance.</p> <p>The central implementation body and repository-based open access need agreement and investment across multiple stakeholder groups and coordination across various departments.</p>
Strategic alignment	The models alignment with the strategies goals and objectives	Central implementation body	The central implementing body at full scheme aligns with the guiding principles of scheme, by facilitating access to academic journal articles and publishing of Australian-led research as open access.

Criteria	Description and assessment methodology	Preferred model	Summary justification
			This model also enables Australia to leveraging existing expenditure within the system, to generate greater equity across the research.

## Summary of MCA findings

The MCA establishes preferences between the possible open access models based on eight criteria. The criteria were developed to ensure the objectives of Australia’s Strategy towards open access were captured through analysis to provide a measurable point of differentiation between open access models compared to the base case.

These models are not mutually exclusive, and theoretically, Australia could pursue each option concurrently. However, each model is assessed against the base case, excluding the inclusion of other open science and open scholarship pursuits as this is common across all models. Formal weighting has not been applied to the criteria, and therefore, the preferred open access model needs careful consideration of other project objectives, benefits and constraints, as well as additional objectives that the government may pursue.

### Preferred open access model – Central implementation body

The primary differentiator between each open access model is its ability to increase Australia’s access to international academic journals. Australian-led research is only a small portion of total academic content and facilitating access to the international research content is crucial to achieving the greatest economic uplift.

At full scheme, the central Implementation body will enable access to the publisher’s entire journal catalogue while facilitating open publishing for Australian-led research. The other models impact only Australian-led research. Thus, in terms of meeting the primary goal of Australia’s approach toward open access, the Central Implementation body is the preferred model.

The central implementation body will likely cost the most on a direct cost basis. However, in the case of the other two models, individual organisations and universities will still need to maintain ongoing subscriptions with publishers. Thus, on a whole system approach, the preferred model will likely drive costs down on accessing and publishing research by centralising backend library functions, drive greater value through volume agreements, and transition publishers to new agreements which drive down costs.

## Appendix B Stakeholder engagement list

EY and the office of the Chief Scientist engaged with stakeholders across the publishing industry, universities and research institutions, industry, and government to support the development of this briefing paper. Stakeholder engagement was run from May 2022 - August 2022.

The full list of stakeholders is presented in the below table.

Sector	Organisation
Publishers	<ul style="list-style-type: none"><li>▶ Brill Publishers</li><li>▶ Elsevier</li><li>▶ Taylor &amp; Francis</li><li>▶ Springer Nature</li></ul>
Universities and research institutions	<ul style="list-style-type: none"><li>▶ Council of Australian University Librarians</li><li>▶ Open Access Australasia</li><li>▶ Universities Australia</li><li>▶ Flinders University</li><li>▶ University of New South Wales</li><li>▶ Sydney University</li><li>▶ Queensland of University Technology</li><li>▶ University of Technology Sydney</li><li>▶ CSIRO</li><li>▶ Imperial College London</li></ul>
Industry	<ul style="list-style-type: none"><li>▶ BHP</li><li>▶ Australian Hydrogen Council</li><li>▶ V2food</li><li>▶ MTP Connect</li><li>▶ Emapper</li><li>▶ Gilmour Space Technologies</li><li>▶ Quintessence Labs</li><li>▶ Tenacious Ventures</li><li>▶ AULIVE</li></ul>
Government	<ul style="list-style-type: none"><li>▶ Department of the Prime Minister and Cabinet</li><li>▶ Treasury</li><li>▶ Department of Finance</li><li>▶ Department of Defence</li><li>▶ Digital Transformation Agency</li><li>▶ Australian Competition and Consumer Commission</li></ul>

## EY | Building a better working world

EY exists to build a better working world, helping to create long-term value for clients, people and society and build trust in the capital markets.

Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.

Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via [ey.com/privacy](https://ey.com/privacy). EY member firms do not practice law where prohibited by local laws. For more information about our organization, please visit [ey.com](https://ey.com).

© Commonwealth of Australia 2024

### Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia.



[Creative Commons Attribution 4.0 International Licence CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)

All material in this publication is licensed under a Creative Commons Attribution 4.0 International Licence, with the exception of:

- the Commonwealth Coat of Arms
- content supplied by third parties
- logos
- any material protected by trademark or otherwise noted in this publication.

Creative Commons Attribution 4.0 International Licence is a standard form licence agreement that allows you to copy, distribute, transmit and adapt this publication provided you attribute the work. A summary of the licence terms is available from <https://creativecommons.org/licenses/by/4.0/>. The full licence terms are available from <https://creativecommons.org/licenses/by/4.0/legalcode>.

Content contained herein should be attributed as Ernst & Young (2022), A national strategy for open access: briefing paper. A report to the Office of the Chief Scientist, Australian Government, Canberra.

This notice excludes the Commonwealth Coat of Arms, any logos and any material protected by trademark or otherwise noted in the publication, from the application of the Creative Commons licence. These are all forms of property which the Commonwealth cannot or usually would not licence others to use.