This article presents a collaborative project, the ‘Austrian Transition to Open Access’ (AT2OA), initially running from 2017 to 2020, which had the overarching goal of enabling the large-scale transformation of publishing outputs from closed to open access (OA) in Austria. The initiative, which has recently secured funding for a second four-year cycle from the Austrian Federal Ministry of Education, Science and Research, brings together all key players: universities, research institutes, the national library consortium and a cOAlition S funding member, the Austrian Science Fund. The project outcomes include a transition feasibility study that builds on the methodology of the 2015 Schimmer et al. article, the seeds of a national OA monitoring data hub and transformative agreements with major publishers. In addition, the project helped launch institutional OA Publishing Funds across the country and explored alternative publishing models. Furthermore, it saw the emergence of a nationwide network of OA experts. The authors also share their thoughts on lessons learned.

Keywords
open access; transformative agreement; cost allocation model; workflows; publishing data

Introduction: the open access landscape in Austria

Recent years have seen an exponential rise in the number of open access (OA) publishing arrangements between institutions and publishers, small and large, and increasingly on a global scale: the 300 agreements listed in the ESAC Transformative Agreement Registry as of 25 May 2021 span five continents and 31 countries. Some of these, such as the agreement reached by the California Digital Library with Elsevier and the preceding negotiations, made global headlines. However, if we have a closer look at the registry, it might come as a surprise to some that Austria was among the first movers – the offsetting deal with the Institute of Physics in 2014 being the very first of its kind in the world.

This early start in the field was possible thanks to the close collaboration of the Austrian Science Fund (FWF) on the one hand and the network of higher education and research institutions joined under the umbrella of the Austrian Academic Library Consortium (KEMÖ) on the other. A national funding body for basic science, FWF, has introduced increasingly strict OA policies while enabling compliance through its dedicated funding pots and its participation in transformative agreements.
while enabling compliance through its dedicated funding pots and its participation in transformative agreements. FWF’s efforts culminated in the launch of Plan S, possibly the most significant OA initiative in recent years, with a group of research funding organizations, cOAlition S.

Meanwhile, the KEMÖ consortium plays a pivotal role by negotiating transformative agreements on behalf of its members with an ever-increasing number of publishers. The AT2OA project was born out of this collaborative spirit, where harnessing existing expertise and innovative thinking go hand in hand. It offered a platform for testing new ideas and helped join the dots in the Austrian OA landscape.

**Project overview**

The project set the ambitious goal of advancing ‘the large-scale transformation of scientific publications from Closed to Open Access’. The subprojects (SPs) listed below aimed to provide a holistic framework for the delivery of this goal:

1. Impact analysis of the transition to OA (SP1).
2. Funding for transformative OA business models (SP2).
3. Establishment, expansion and financial support for OA publication funds (SP3).
4. Promotion of OA publications and alternative OA publication models (SP4).

Twenty-four institutions signed up to the project, mainly universities, but also research institutions, the Austrian Academy of Sciences and the FWF. A complete list of participating institutions, project and sub-project leaders, as well as participants, can be found in the AT2OA Final Report (in German). The institutions delegated staff to the Project Assembly and to the various working groups that were set up around the subprojects. A steering committee of rectors and vice-rectors, led by the Vice-Rector for Research at the University of Vienna, provided oversight while dedicated project-funded staff at Vienna University Library carried out the project management duties. Below we present the main achievements of the project, focusing on SP1 and SP2.

1. **Taking stock: impact analysis of the transition to open access (SP1)**

   **AT2OA publication dataset**

   The bibliographic dataset underpinning the various deliverables of this subproject has played an influential role throughout the project’s entire life cycle. The bulk of the data comes from the Web of Science (WoS) and Scopus bibliographic databases that the AT2OA data analyst gathers on behalf of the participating institutions for each calendar year, going back as far as 2015. After a thorough data cleansing and normalizing exercise, the dataset is enriched with information extracted from other sources, such as the DOAJ (Directory of Open Access Journals), Open APC, Crossref and Unpaywall. In addition, authorship types (e.g. corresponding author, co-author) are established for each publication. The dataset can be expanded to include further fields as required. At the time of writing this article, the most recent, complete AT2OA dataset comprised bibliographic information on articles published in 2018, with work on the 2019 data well under way. A detailed description of the methodology was published in German in 2019.

   The SP1 working group undertook two significant pieces of analysis: the ‘AT2OA Transition Study’ and the ‘Post Transition Study’.
**AT2OA Transition Study**

The AT2OA Transition Study,\(^9\) one of the main deliverables of this subproject, looked at the potential impact of the transition period to OA on the participating libraries’ budgets between 2019 and 2021. As part of this exercise, the SP1 working group developed a template that each institution could adapt for identifying potential financial needs required to support the transition to OA while maintaining access to resources needed by staff and students. It was intended as a management tool for financial planning. The template incorporated data from various sources: existing local OA expenditure, consortial transformative agreements already up and running and estimates for those in the pipeline. Furthermore, it included article processing charges (APCs) paid to date by the FWF and funding for OA from other sources, as well as average APCs. These data segments were then mapped against the publishing profile of each institution as extracted from the AT2OA publication dataset described above, focusing on APC-relevant papers. In other words, on research and review articles in journals with a corresponding author affiliated to the institution.

The Transition Study concluded that the coexistence of fully open access, hybrid and subscription-only resources could be expected for the coming years. Furthermore, the study’s authors concluded that a reduction in subscription expenditure during this period is unlikely to materialize.

**Is there enough money in the system in Austria? AT2OA Post Transition Study**

While the Transition Study focused on the years 2019–2021, the Post Transition Study’s\(^{10}\) authors devised a thought experiment to explore the implications for AT2OA members if the global scholarly publishing system were to transform overnight into a fully OA world. The study sought to answer, among others, pressing questions senior university management raise whenever the topic of a complete transition to OA comes up, such as, how would a full transition to OA affect my institution’s budget? and would we be able to maintain our current level of publishing output without having to invest additional funds? For other institutions, the questions might be more along the lines of how much they can save on subscriptions in a fully OA world.

While it remains impossible to make precise predictions about an industry in a constant state of flux, the AT2OA Post Transition Study explored potential scenarios that the participating institutions and the wider higher education and research sector could incorporate into their strategic planning. Building on the methodology developed by Schimmer et al.,\(^{11}\) it examined the financial viability of a complete transition to OA in the Austrian higher education sector and whether the funds currently invested in subscriptions and publishing would be sufficient to cover the costs of switching to a fully OA world.

In order to answer these questions, the SP1 Team needed access to recent financial and bibliographic data. The AT2OA database served as the latter as it provides a granular overview of the institutional and AT2OA-level publishing output, including APC-relevant articles. Information on relevant expenditure comes from mostly publicly accessible sources: wide-ranging statistics, including annual spend, are captured in the Austrian Library Statistics (ÖBS) database.\(^{12}\) The project team drilled down to the categories considered relevant for this exercise: current electronic and print journal subscription fees as well as institutional OA spend, including APCs currently paid through the libraries. APCs paid by FWF on behalf of its grant holders affiliated with the institutions participating in the AT2OA project were also added to the relevant costs. These are also published on Open APC.\(^{13}\)

It should be noted that any APCs researchers paid directly to publishers could not be tracked, and as such, the study’s authors were unable to include these in their calculations. Thus, the figures given below as calculated expenditure per article are likely to be underestimated to some extent. The SP3 team has done some initial work on tackling the

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issue of ‘APCs in the wild’. The second cycle of the AT2OA project is expected to deliver solutions in this regard.

The Post Transition Study’s authors carried out the analysis on three levels: 1) on a project level (AT2OA-participants as a whole, excluding FWF and the Austrian Academy of Sciences), 2) separately for each institution and 3) on a cluster level, whereby each institution was assigned to a subject-based cluster. On a project level, if we divide all relevant expenditures by the number of APC-relevant publications, the calculated expenditure per article comes to €2,476. In other words, if all relevant expenditures were repurposed for publishing, a cost-neutral transition to OA would be possible as long as the average theoretical APC is not higher than €2,476. This value varies significantly on an institutional and cluster level, with universities specializing in the life sciences (medical universities, veterinary science, natural resources and life sciences) being able to afford the lowest theoretical APC based on these parameters (Figure 1). (The ‘Special’ cluster comprises two institutions that did not fit well in the other categories: a research institute, Institute of Science and Technology Austria, and the Vienna University of Economics and Business). We will discuss the implications of this uneven distribution in the section Lessons learned.

Open access monitoring

Having a good handle on the publishing data is essential for navigating the bumpy road to transition, which is why a second working group was tasked with developing a framework for an OA monitoring tool that would provide as close to live information as possible. As the outcome of various networking events and discussions with expert bodies and international consortia, a new theoretical model, called ‘Tuples’, was developed for categorizing OA content. It has been tested successfully on various AT2OA datasets by deploying a software prototype and will be launched as part of the AT2OA project. The project will continue to draw upon the expertise of the network of data practitioners involved in the preparation, including those from the field of current research information systems (CRIS).

2. Austrian Transition to Open Access, one agreement at a time: funding for transformative open access business models (SP2)

Funding criteria

The aim of the second subproject, building on the AT2OA dataset and reports, was to negotiate new transformative agreements with publishers and enable the participation of
AT2OA project members by covering some of the associated costs. In advance of shortlisting publishers for negotiations, the SP2 team prepared a catalogue of conditions that would-be contracts had to satisfy to qualify for AT2OA funding. An essential requirement was that the agreement must be genuinely transformative, meaning that a minimum of 80% of the publishing fees is offset against the subscription fees. For example, let us say an institution pays a subscription fee of US$100,000/year to a publisher in a given year. This publisher has a list-price hybrid APC of US$2,000, and corresponding authors from this hypothetical institution publish 25 research and review articles a year. Without a transformative deal, the total costs for reading (US$100,000) and publishing all relevant articles OA (US$50,000) would come to US$150,000/year. With a transformative agreement, 80% of the publishing fees (in this case, US$40,000) is deducted from the overall costs. An AT2OA-compliant publisher would thus be expected to offer an agreement, combining reading and publishing, for no more than US$110,000/year to this institution.

It should be noted that as the project and the OA landscape evolved in recent years, the offsetting threshold has risen and exceeds 90% for current negotiations. The remaining conditions, inspired by the ESAC recommendations, lay out a framework that a transformative agreement requires to be successful, such as well-thought-out OA publishing workflows, minimum metadata requirements and reporting and the use of Creative Commons licences.

Read and publish agreements with Springer and Wiley, fully OA pilot with Elsevier

Having engaged with various publishers, the SP2 team settled on Wiley and Springer based on their relevance to the scientific community as represented by the AT2OA members, the timing of renewals through the KEMÖ consortium and the companies’ willingness to adhere to the AT2OA requirements. Both contracts are what we call ‘read and publish’ (R&P) agreements, whereby the consortium pays a lump sum for licensing content (‘read’) and for making its research output freely accessible under Creative Commons licences (‘publish’). The pool of articles to which all participating institutions had access was negotiated on a consortium level.

The funding provided by AT2OA helped bridge the gap between the project participants’ existing subscription-based expenditure and the lump sum negotiated for each of the read and publish agreements, which included additional costs associated with publishing and the upgrade to the complete collection. The first instalments of the Springer and Wiley contracts were supported. The first Springer agreement ran from 2016 to 2018 and received AT2OA funding for the second and third years of the agreement. The first year of the deal was supported by a one-off grant from the University of Vienna. The Wiley contract covered the period 2018–2020, and the institutions benefitted from the AT2OA funding throughout the three years of the deal. These agreements have been renewed since and are now entirely funded by the participating institutions without financial support from AT2OA.

The results of this subproject speak for themselves: over 5,500 research and review papers were published OA as part of these two agreements (2016–2018 Springer and 2018–2020 Wiley combined), the vast majority of which would have ended up behind a paywall had it not been for these deals. An added and much-appreciated benefit was that staff and students at participating institutions could enjoy access to the broader Springer and Wiley portfolios.

More recently, AT2OA funding was awarded to fund a fully OA pilot agreement with Elsevier, running from January to December 2021.
Cost-benefit analysis of the AT2OA-funded agreements

The SP2 team also carried out a cost-benefit analysis for the agreements with Springer and Wiley. It examined the following aspects:

- the share of OA content globally, in Austria and across the institutions participating in the AT2OA-funded contracts: based on AT2OA data and information provided by the publishers
- journals in which authors affiliated with AT2OA institutions publish most frequently
- actual ‘publish and read’ (PAR) fees: calculated by dividing the total agreement costs by the number of articles made OA as part of the agreement in a given year
- potential PAR fees: total fees divided by all eligible articles, regardless of their respective OA status
- COUNTER usage: the most accessed journals as well as cost per use aggregated on a consortium level.

PAR fees featuring in the assessment of R&P agreements might be considered unusual. However, it was deemed an easily understood metric for high-level benchmarking, which can be applied to any transitional arrangement, regardless of the type of transformative mechanism. Figure 2 is an extract from the Wiley report, looking at the first year of the 2018–2020 agreement:

As the chart demonstrates, 74% of the total relevant output was made OA during the first year of the agreement, outstripping the global or the overall average in Austria. The 26% of articles that were not made OA include articles by authors who chose not to publish OA or could not be correctly identified by Wiley due to missing data or other reasons. It should be noted that thanks to improvements in workflows and communication, the percentage of eligible articles not made OA sank by the end of the agreement to single digits. We will look at the impact of workflows in the section Lessons learned.

New cost allocation model for transformative agreements

While the AT2OA Post Transition Study provided some answers to the question of whether there is enough money in the system in Austria to sustain a wholly OA world, the actual implementation of transformative agreements brought into stark relief the financial challenges this represented for some institutions.
As a whole, with all resources (existing subscription spend and temporary project support) pulled together, the consortium could enter into these agreements with Wiley and Springer. However, the disparity between some institutions’ existing subscription spend and their publishing output was evident from early on. Based on the assumption, as highlighted by the Transition Study, that the sector is likely to operate in a mixed ecosystem at least in the medium term, the decision was reached to develop a new cost allocation model that was better aligned with the realities of a field in transition. The new model had to satisfy the following two core requirements:

1. It had to have transformative elements, and as such, the publishing output had to be taken into account when calculating the new fees.
2. The shift from the existing subscription-based expenditure had to be gradual, and the annual increase any institution would pay could not exceed 10%.

The new cost allocation model also aimed to wean libraries off AT2OA funding and make future agreements sustainable for all. The first transformative cost-sharing model was introduced for the second Springer agreement (2019–2021) and then rolled out for the second Wiley (2021–2023) contract. Starting with the Springer contract, the institutions were divided into four Tiers, based on the ratio between their share of the consortium’s publishing output and associated APC value and their existing subscription-based spend during the first agreement (2016–2018). The calculation of the APC value was based on the number of articles published OA as part of the agreement multiplied by Springer’s list-price APC. Thus, institutions with the highest subscription spend relative to their publishing output were assigned to Tier 1, while those where the estimated APC value far outstripped their existing subscription spend were allocated to Tier 4. Figure 3 provides an example for each Tier, as introduced for the 2019–2021 Springer contract, based on expenditure and APC value between 2016 and 2018.

The institutions in the higher Tiers pay higher annual increases than those in the lower Tiers, with the aim that over time, the institutional agreement costs and list-price APC values will even out across the participating institutions. A similar methodology was used for the second Wiley agreement.
3. Networking and standardization: establishment, expansion and financial support for open access publication funds (SP3)

Thanks to the transformative agreements, institutions have been able to repurpose some of their existing subscription fees for hybrid OA publishing. However, the ability to pay for articles in fully OA journals is often dependent on securing funding from new sources, which is never an easy feat to achieve. The third subproject offered at least a temporary solution for this very problem by providing start-up funds for newly established OA funds and injecting additional money into existing ones.19

The SP3 working group also addressed the urgent need for guidance on funding and administrative policies and published a set of recommendations called 'Open Access Publication Funds – Establishment and Funding Conditions',20 as well as a template for the record-keeping of article and book processing charges (APCs and BPCs).21 The group members also initiated conversations with the institutional finance departments and sought out standardization methods to better track APCs and BPCs ‘in the wild’.22

4. Moving beyond the established: promotion of open access publications and alternative open access publication models (SP4)

Many aspects of the initiatives undertaken in the previous subprojects focused on analyzing the publishing output and looking at ways of transforming it from closed to open. The project, however, did not limit itself to the major publishing houses. The SP4 working groups reached out to the local university and associated presses, such as the TU Wien Academic Press23 and mdwPress,24 and organized networking events and workshops to further raise awareness of OA publishing. SP4 also explored the issues surrounding OA monographs in the humanities, in social and cultural sciences and contributed to several conferences on this topic and on open infrastructures.25 A recent study26 by one of the SP4 participants surveyed the current landscape of the OA journals in Austria, most of which are published by non-commercial organizations and do not charge publication fees. It serves as an essential source of information for further initiatives to promote alternative open access models and establish community-led, publisher-independent open access journal infrastructures.

Lessons learned

Two of the central themes of this project, and indeed of the broader OA movement, have been the financial feasibility of transitioning to OA and the data underlying the transformation.

An essential ingredient of a successful transformative agreement: well-thought-out workflows

The University of Vienna has been vocal about the potential pitfalls around publishing workflows.27 Even so, it is worth repeating the message: a well-thought-out workflow with clear signposting that takes the author through the publishing process from submission to publishing, with the necessary checkpoints for the institution, is a key ingredient of all successful transformative agreements. Thanks to the close collaboration between the consortium members’ OA specialists and Wiley, workflow issues were ironed out for 2019. A growing awareness around OA also contributed to the increase in the Wiley OA uptake, which in 2020 was approaching 100%, up from under 80% in 2018. A similar trend can be observed across other KEMÖ publishing agreements. After a steep learning curve, most of the medium-sized and larger publishers have by now developed their own homegrown system or partnered up with solution providers, such as the Copyright Clearance Centre.28 The OA Switchboard29 as an intermediary service also looks very promising. However, there is clearly room for improvement, especially in the area that affects the entire
publishing and contracting life cycle, namely metadata fields. Cognizant of its importance, ESAC, through a workflow task group, is currently developing a set of recommendations for data fields required from negotiations through implementation to assessment and monitoring.

The importance of good quality bibliographic data

The AT2OA publication dataset has emerged as probably the most important tool in negotiations with publishers, especially for new agreements. Time and time again, it has proved to be a more complete and accurate data source than what most publishers have been able to provide. Publishers themselves have acknowledged that this is a core issue within their organizations. For example, at a recent CHORUS Forum meeting of publishers committed to OA (e.g. PLOS, ACM) experimenting with new business models, it was explained that the ‘biggest hurdle that each organization faced in executing its plans was gathering and analyzing author data’.

The AT2OA dataset put the consortium and the project team in a good position when forecasting the likely article output through the lifetime of the agreements, thus steering negotiations accordingly. This way, the inconvenience of having to pause OA publishing mid-contract could be avoided, and the consortium could hold some publishers’ claims about AT2OA members’ publishing output in check. The dataset also informed the discussions around the various cost-sharing scenarios among members.

A fair transformative cost allocation model: mission impossible?

Although all consortium members signed up to the new cost-allocation model described above for the duration of these agreements, the discussions around its fairness and fitness for purpose are ongoing. For example, it could be argued that not just publishing output but also other factors, such as usage statistics, size and profile of an institution and income, should be integrated into the calculations. Furthermore, as the Springer and Wiley agreements have matured, real-life data have shown an increase in the number of articles published, often by institutions already in the higher Tiers, cancelling any progress in shifting costs from the primarily reading institutions. Thus, a logical solution could be to increase the fees even more for the higher Tiers. Yet, price increases nearing 10% are already pushing these institutions to their limits.

Instead of pooling their resources together and thus maximizing the number of APCs available to the consortium as a whole, libraries could also simply purchase a set number of APCs their researchers require or what their institution can afford. Although it would ensure more transparency on an institutional level, the consortium’s central purchasing power would be diluted. Moreover, such a scenario could ultimately benefit publishers who could collect more in publishing and reading fees from a fractured group of libraries or, even worse, would result in less research made accessible to all. An outcome like this would undermine the whole ethos of what the community in Austria is trying to achieve.

Outlook

The AT2OA project leaders and participants can look back at the last four years with a sense of achievement. Not only were all the individual goals met, the overall awareness and availability of OA also significantly increased in Austria during this time. In addition, the project participants, including the University of Vienna, were better prepared than most to meet the Plan S requirements thanks to the wide-ranging transformative agreements and support for fully OA publishing venues, covering close to three-quarters of the relevant publishing output.
However, it is clear that there is still some way to go before the Austrian Transition to Open Access is complete. The follow-up project, aptly named AT2OA, running from 2021 to 2024, will continue to pave the way towards an OA future on multiple fronts, focusing on agreements, different data types and outreach. There will be a drive to widen the portfolio of transformative agreements with publishers, and the members will continue their quest for a fair cost-sharing model. To be launched as part of the project, the Austrian Datahub will support the entire life cycle of OA publishing and negotiations. A further subproject will establish and analyze the OA-related costs and their current management at the participating institutions. Researchers and librarians alike will benefit from a set of training and outreach programmes about the perils of predatory publishing, and the visibility of OA publications will also be examined.

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Abbreviations and Acronyms

A list of the abbreviations and acronyms used in this and other Insights articles can be accessed here – click on the URL below and then select the ‘full list of industry ALAs’ link: http://www.uksg.org/publications#aa.

Competing interests

The authors have declared no competing interests.

References


