

18<sup>th</sup> September 2015

## ATN Response to the Review of Research Policy and Funding Arrangements

Australian universities rely primarily on funding from Government and student contributions for revenue. With a range of complementary reviews currently underway it is timely to re-examine the public investment in Australia's research funding. It is important to note that the investments into Australia's research system have contributed to our successful research reputation and standing in international rankings. However, Australia's ability to translate research knowledge into commercial outcomes has been widely documented as a consistent failing<sup>1</sup>. The ATN believes that a balance can be achieved in maintaining support for Australia's excellent research base and unlocking our innovation capacity.

The ATN urges the review panel to take a broad definition on the 'commercial returns' from research, and consider the social, environmental, cultural, and quality of life impacts of research, in addition to purely economic gains. In describing 'industry' in this response, the ATN is referring to a range of end-users of research including businesses, NGOs, state-owned enterprises, government bodies and private entities.

As detailed in the ATN's report *Innovate and Prosper*<sup>2</sup>, co-authored with the Australian Industry Group, there are a number of factors driving poor collaboration between research organisations and industry on innovation, including:

- Misaligned reward and incentive structures at universities;
- Lack of funding available to take research along commercial pathways;
- IP ownership and commercialisation issues;
- Issues of size and scale;
- Differing priorities and cultures of universities and industry; and
- Structural mismatch between Australia's industry base and the current areas of capacity and excellence in our universities.

The purpose of this response is not to reiterate these barriers, but to examine how we can address these problems in a more strategic and coordinated manner. Therefore the ATN will address the following key strategies relating to research funding and research policy as a priority:

- Creating incentives for industry-university collaboration on innovation via the research block grants (RBGs);
- Aligning competitive funding with areas of National Research Priorities;
- Changing incentive and reward structures at universities and industry;
- Improving the assessment and measurement of research engagement;
- Removing barriers to IP where possible;
- Ensuring stability of innovation initiatives, looking to the UK model for 'best-practice'; and
- Changing the research training system to ensure that broader, transferrable, industry-relevant skills are gained in addition to fundamental research skills.

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<sup>1</sup> See for example: Boosting the Commercial Returns from Research (2014); ACOLA (2014) The Role of Science, Research and Technology in lifting Australian Productivity; Prime Minister's Manufacturing Taskforce: Report from the non-government members (2012)

<sup>2</sup>[https://www.atn.edu.au/Documents/Publications/Reports/2015/ATN%20Innovate%20and%20Prosper\\_web\\_version.pdf](https://www.atn.edu.au/Documents/Publications/Reports/2015/ATN%20Innovate%20and%20Prosper_web_version.pdf)

It must be noted that the current dual funding system has been effective in terms of contributing to Australia's good performance on international research indicators. However, ATN supports better aligning funding for direct and indirect costs of research. As noted by Universities Australia, "*in contrast with some other dual-support systems, in Australia there is no automatic mechanism for ensuring increased indirect support when the level of direct support rises.*"<sup>3</sup> While the absolute value of RBG has increased by 19 per cent since 2010 (to the value of \$1.9 billion), the real value of support via RBG as a proportion of GDP has remained relatively stable over a number of years<sup>4</sup>. In this same period, the real value of Australian Competitive Grants has more than doubled to \$1.56 billion. As the grants do not cover the full cost of research, the current dual funding system as it stands is not fit for purpose. The ATN would view with great concern any move to reduce block grant funding as a means to pay for other research activities (e.g. the Industry Growth Centres).

Furthermore, both direct and indirect funding allocation need better alignment with industry priorities so that economic and social outcomes are maximised across all funding streams.

### **Creating incentives for industry-university collaboration on innovation via the research block grants (RBGs)**

Research Block Grant (RBG) funding still has an important role to play in research, however it is appropriate to review the formulae used to allocate the funds to increase the transparency and effectiveness of incentives. It is imperative to ensure that the funding formulae for the individual RBG schemes align with the individual scheme objectives. Piecemeal reform of the RBG, evolving operations of universities and a shrinking funding pool has meant that the current funding pool is not currently fit for purpose.

Given the importance of research training to the fabric of our research system, we propose no significant changes to the schemes which support the training of researchers (Research Training Scheme (RTS), Australian Postgraduate Awards (APA) and International Postgraduate Research Scholarships (IPRS)). However, consistent with the ATN response to the ACOLA Research Training Review<sup>5</sup>, if there is a shift toward more transferrable skills being incorporated into the PhD, increases in completion time may require an extension of the APA and IPRS program. This will be discussed in greater detail later in the response.

In order to increase transparency of the allocation, the ATN supports careful strategic realignment of non-research training related RBG inputs to put the balance between 'research excellence' indicators and end-user engagement indicators at 50:50.

The ATN supports a simplification of funding mechanisms, giving universities greater institutional freedom to decide how to optimise their research activities:

1. Research Training Scheme – The ATN does not propose any changes to RTS at this time.

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<sup>3</sup> Universities Australia (2014), University Research: Policy Considerations to Drive Australia's Competitiveness

<sup>4</sup> Universities Australia (2015) Higher Education and Research: Facts and Figures

<sup>5</sup><https://www.atn.edu.au/Documents/Submissions/ATN%20Research%20Training%20Review%20Submission.pdf>

2. 'Excellence funding' as driven by category 1 funding (as a proxy for excellence) and ERA<sup>6</sup> should be 50% of RBG, not including RTS
3. 'End-user engagement funding' as driven by categories 2-4 as a proxy for end-user engagement should be 50% of RBG, not including RTS

As it currently stands, there is not enough incentive within the RBG for universities to prioritise engagement with industry and end-users. See Table 1 below:

**Table 1: Current arrangements for non-Research Training related schemes**

<b>Block Grant</b>	<b>2015 Amount</b>	<b>Excellence Component</b>	<b>Industry Engagement Component</b>	<b>HDR Load</b>
<b>SRE</b>	\$192,587,968	100%	0%	0%
<b>RIBG</b>	\$240,129,907	100%	0%	0%
<b>JRE</b>	\$357,193,645	10%	60%	30%
<b>Non-RTS Total (100%)</b>	\$789,911,520	59%	27%	14%

The ATN supports the rebalance of the drivers which feed into the RBG funding formulae to incentivise industry engagement and collaboration. For example, the Joint Research Engagement (JRE) scheme is driven by two data types which do not directly align to the scheme's policy intent to reward institutions for diversifying their sources of income and encouraging collaboration with other universities, industry and other end-users. Currently, in the JRE formula, categories 2-4 research income (i.e. income derived from direct engagement with end-users) is weighted at 60 per cent, student load is weighted at 30 per cent and research publications are weighted at 10 per cent. The ATN questions the relevance of publications in the JRE formula as it is primarily a measure of research output and volume. Similarly, HDR load is essentially a volume measure recognising a university's share of government funded research training places (i.e. RTS load). One alternative is to include HDR load that is funded through engagement with industry and end-users to incentivise universities to seek out partnerships with industry on PhD projects.

The ATN acknowledges that in order for data inputs to be included in the RBG allocation formulae, the data collected must be robust, reliable and collected nationally in a systematic manner. With this in mind, the ATN suggests that any significant change to the RBG will need to undergo significant consultation, with transitional arrangements considered. The ATN continues to support the use of multi-year performance metrics to ensure that there is some degree of stability in RBG allocations. While the following may not initially pass the robustness, reliability, and collectability test, over time, types of data that may be appropriate to collect include:

- Proportion of HDR students with an industry partner;
- Employment of HDR graduates by research users; and
- Mobility of research staff between the institution and research users.

<sup>6</sup> The ATN supports the continued use of ERA as a moderator in the RBGs, with no change to the amount of the funding pool it influences.

The ATN is supportive of the proposed work via the National Survey for Research Commercialisation (NSRC) to explore additional ways of capturing a broader range of data relating to research engagement, transfer of knowledge and impact.

### **Aligning competitive funding with areas of National Research Priorities**

The ATN recommends aligning portions of competitive funding to National Research Priorities and the sectors identified in the Industry Growth Centres. Noting that the priorities are quite broad, one possible approach is to call for industry defined or end-user driven problems that can be answered with research. This problem-based approach will be a welcome hallmark across competitive programs and should encourage better collaboration between research institutes. Whilst individual universities have their own strengths, and are rightly proud of them, for the good of the nation, it is hugely important that the block grants and in particular the competitive grants are structured so they incentivise the very best researchers in any one discipline to band together to solve research problems and to align their research direction to opportunities and challenges relevant to Australia. Some international examples of this are the National Science Challenges Process in New Zealand, and UK's action plans for priority areas via Innovate UK funding streams and Catapult Centres.

### **Changing incentive and reward structures at universities and industry**

As noted in the issues paper, broader recognition of industry experience is currently being implemented in relevant ARC and NHMRC schemes. The ATN supports a balanced approach to increased recognition of industry experience in addition to research excellence in competitive grant processes where appropriate.

ATN universities have been taking the initiative to recognise industry experience and encourage mobility of researchers between academia and industry. For example, at UniSA, the introduction of the position of 'Industry Professor' takes industry track record and equivalent experience outside of academia into account in the recruitment and internal promotion processes of staff.

Recognising that improving the collaboration of research and industry is a two-sided problem, the ATN also supports improved strategies targeted at industry to encourage them to partner with universities. The R&D tax incentives account for approximately 30 per cent of the Government's overall support for science, research and innovation, however they do not specifically promote collaboration. The ATN recommends having a portion of the R&D tax incentives targeted at R&D projects that involve partnering with public sector research organisations. Another consideration to encourage mobility and knowledge transfer between sectors could be granting businesses tax deductions to hire recent graduates and claim their salary for first three years post-graduation.

### **The UK model and the importance of stability of innovation initiatives**

There is no shortage of international models to look to in aspiring to improve our research-industry collaboration. The UK model has been one Australia follows closely, with the Queensland Government recently announcing \$8 million funding for the Advance Queensland Knowledge Transfer Partnerships program<sup>7</sup>, based on the long running UK scheme. The scheme is targeted at helping SMEs partner with universities on strategic innovation projects. The benefits are two-fold, with SMEs able to access the technical expertise of research graduates, and graduates gaining

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<sup>7</sup> <http://advanceqld.initiatives.qld.gov.au/funding/knowledge-transfer-partnerships.aspx>

invaluable experience working in business, helping to bridge the gap between universities and businesses and creating an innovation culture.

Initiatives run by the UK's innovation agency, Innovate UK, such as the Knowledge Transfer Partnerships, Knowledge Transfer Networks and the Catapult Centres have contributed to the UK's strong performance on innovation outcomes, ranking them 3<sup>rd</sup> in the world in the Global Innovation Index (Australia is ranked 19<sup>th</sup>). Perhaps most importantly, in the UK there has been stability in the innovation ecosystem, particularly in the support mechanisms available to businesses and the research sector. Over a decade, industry has had time to build up knowledge and experience of various schemes available to support innovation and collaboration with research institutions. Gratifyingly, over time, new ministers and indeed those involved at the various changes of government have avoided the temptation to rebadge, re-logo and rehash schemes, preferring to go for stability of mechanisms to support innovation. Throughout this period, the UK have noted and aimed to emulate the success of the German, Scandinavian and Singaporean economies with their consistent approaches, and it has now paid major dividends.

To illustrate, the UK's Knowledge Transfer Partnerships program has been running since 2003, replacing the Teaching Company Scheme established in 1975. A review<sup>8</sup> has found that per £1 million Government investment in KTPs, the return on investment is:

- £11.7 million increase in annual profit before tax;
- £2.2 million investment in plant and machinery;
- 25 new jobs created;
- 353 staff trained; and
- £3.1 million investment in R&D.

During 2013 to 2014, over £85 million was invested into KTP partnerships via grant support and business contributions. As a result of this investment, UK businesses projected a £211 million increase in their annual profit. Additionally, from the 600-odd active KTP projects, over 450 new jobs were created and 6,000 company staff were trained.<sup>9</sup>

Australia's new Industry Growth Centres initiative<sup>10</sup> bears some similarities with Innovate UK's Catapult Centres. While it remains to be seen what the Industry Growth Centres implementation will look like, if we are aspiring for impact akin to the Innovate UK model, they need to be genuinely resourced with adequate research infrastructure and supported by a policy structure which addresses the mismatch between Australia's industry base and the current areas of research capacity and excellence.

### ***Assessment of university/industry engagement***

The ATN has long championed the measurement and assessment of research engagement and impact (e.g. the ATN-Go8 trial, Excellence in Innovation for Australia; EIA). While the case study approach has been criticised for being both costly to administer and time consuming, it must be noted that the UK has successfully incorporated the collection and assessment of case studies via its REF exercise. As a result of the most recent REF 2014, the UK now holds a repository of nearly 7000

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<sup>8</sup> Technology Strategy Board (2015) Knowledge Transfer Partnerships: Achievements and outcomes

<sup>9</sup> Technology Strategy Board (2015) Knowledge Transfer Partnerships: Achievements and outcomes

<sup>10</sup> <http://www.business.gov.au/advice-and-support/IndustryGrowthCentres/Documents/IndustryGrowthCentresInitiative.pdf>

case studies highlighting multiple pathways to impact. This is undeniably a powerful resource for policy making, understanding how research knowledge is translated into a range of social, economic and cultural outcomes.

The ATN acknowledges the different direction Australia is exploring with the ATSE Research Engagement for Australia, and while it may not encompass the full range of engagement and impact to the extent of the UK's REF assessment, it is a positive and pragmatic first step in recognising that more should be done to encourage engagement and the transfer of research knowledge with end-users. It is worthwhile noting that a number of international rankings agencies have flagged their interest in developing measures that go beyond existing research quality driven metrics to better focus on university engagement or graduate employability.

This is reflective, perhaps, of the changing focus of many universities as well as feedback from students about what matters most to them when choosing a university<sup>11</sup>. Given this likely shift in the collective ranking environment, Australia would be well advised to take early action and address this issue as it evolves worldwide.

The ATN are currently conducting an internal trial of complimentary metrics aimed at capturing end-user engagement and knowledge transfer. These metrics have had input from industry, and the ATN is keen to work with Government and other stakeholders to help improve engagement assessment processes and reliability of measures.

### ***Removing IP as a barrier***

The ATN is supportive of initiatives which remove barriers to collaboration between research organisations and industry. One such initiative is the Easy Access IP model of licensing<sup>12</sup>, which has been successfully adopted by ATN member university, University of Technology Sydney (UTS). The core aim of the Easy Access IP approach is to ensure that more IP created from research is transferred into commercial use to benefit society and the economy.<sup>13</sup> Under certain conditions, universities offer their IP to businesses and individuals for free, noting that industry partners are often in a better position to bring technologies to market.

Given that IP agreements are a barrier at the early stages of collaboration, initiatives such as Easy Access IP presents the opportunity for universities and their industry partners to enter into long-term relationships and encourage further engagement opportunities. Noting that not all types of IP are appropriate for such an approach, the ATN is also supportive of the Government's efforts of simplifying discussions and negotiations around IP via the IP Toolkit; and additionally support individual universities publishing clear and easily accessible guidance on how to approach and engage with IP agreements.

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<sup>11</sup> QS (2015) How Do Students Use University Rankings? <http://www.topuniversities.com/blog/what-would-student-created-university-ranking-look>

<sup>12</sup> <http://easyaccessip.com/>

<sup>13</sup> <http://www.uts.edu.au/sites/default/files/article/downloads/uts-easy-access-ip-for-industry-partners.pdf>

### ***Research Training and Employment***

As covered in the ATN's submission to the ACOLA review<sup>14</sup>, the ATN believes that research degrees should incorporate training in broader, industry relevant skills, and transferable capabilities in addition to the highly specialised research skills and knowledge gained from a traditional research degree. This includes skills in project management, leadership and communication, research commercialisation, entrepreneurship, and public policy, which are delivered via the ATN's e-Grad School Australia (eGSA), and form part of the professional development component of PhD students undertaking research training through the ATN Industry Doctoral Training Centre (IDTC).

The ATN also recommends that the Government consider funding APA and IPRS scholarships for four years in line with the additional time needed to successfully accommodate industry experience through work placements, internships, and/or additional training and education in generic and transferrable skills.

In order to meet the challenges of a growing knowledge economy, research training (where possible) should be aligned to areas of national priority. Taking such an approach mobilises the potential human capital of research students (with some 55,000 students currently studying higher degrees by research) and ensures that Australia is well placed to meet current and future challenges.

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<sup>14</sup><https://www.atn.edu.au/Documents/Submissions/ATN%20Research%20Training%20Review%20Submission.pdf>