



Submission: Accelerating R&D in NSW

NSW Premier and Cabinet

December 2019

INTRODUCTION

The University of Wollongong (UOW) welcomes the opportunity to provide input in response to the New South Wales (NSW) Department of Premier and Cabinet's call for Submissions about Accelerating Research and Development (R&D) in NSW. This Submission provides responses to each of the Inquiry questions, however focuses mostly on the development rather than the research side of R&D.

Universities play a significant role supporting and driving research and development.

State Government should support universities to continue this role by supporting collaboration and commercialisation of research and innovation as a vehicle to drive economic and social development in both urban and regional Australia. The provision of targeted and adaptive government policy and programs can help support and provide incentives to facilitate greater acceleration of research and development.

UOW'S INNOVATION AND COMMERCIAL RESEARCH (ICR) UNIT

In a fast-moving global marketplace, finding a competitive edge means being right at the edge — at the edge of what's possible today and what's coming tomorrow. At UOW, our world-class researchers are continuously redefining what's possible, from advanced materials to future infrastructure, to bio-medical technology and beyond. The Innovation & Commercial Research Unit (ICRU) works as the conduit between industry and university knowledge and equipment. ICRU is Industry and researchers gateway to the edge. The team does this by providing customers with:

- One Team, All the Answers
- Simple Standard Contracts
- Agile Collaboration
- Intellectual Property Made Easy

In some cases, the technology will be technically proven and ready for an early stage licence. In other cases, there may be an opportunity for a business to be a partner in further R&D, potentially leveraging support from State and/or Federal Government programs.

RESPONSES TO QUESTIONS

1. How can the NSW Government better support you/ your organisation in its R&D efforts?

The NSW Government could initiate a model of research collaboration between universities, such as coordination of national research infrastructure bids across universities, the National Commercial Research Infrastructure Strategy (NCRIS), Linkage Infrastructure, Equipment and Facilities (LIEF), and research support for universities by following the models established successfully in Victoria and Queensland.

Australian universities and research institutes have traditionally had poor levels of collaboration with small and medium enterprises (SMEs). Barriers to effective collaboration in the Illawarra region include resource constraints of SMEs, geographic dispersion, operating in a transitioning business environment and, fragmentation and instability of government programs that support innovation.

Research indicates that Australian businesses that engage in collaborative innovation with research organisations, such as UOW, are 242% more likely to report increases in productivity, compared with non-innovating businesses¹.

- Businesses are often unaware of funding opportunities available to them to support R&D efforts. Currently, there is a lack of a clear pathway by which businesses with a potential need for R&D or other collaborative assistance to identify who can assist them.

One of the most valuable ways the NSW Government could improve its support for the R&D efforts of UOW and other universities is through enhanced communication targeted at businesses which clearly informs them about the R&D funding opportunities available, about the benefits that businesses can gain by undertaking R&D, which educates them about the role that universities can play in undertaking such activity.

It is suggested that a concierge service at state government level or via an online platform to help inform business of the funding programs or other incentives which may be available to them and, to help direct them to contacts at universities with the most suitable expertise who they may be able to collaborate with would be a highly effective way of achieving this.

- It is also important to ensure that government advisors at both state and federal level are equipped with the expertise to advise industry about the opportunities available to them in the R&D space, that they understand and communicate the importance of R&D and, have strong networks in government and industry to provide support and facilitate business development in this space.
- It is also recognised that there may be opportunity for government to assist researchers to train and communicate effectively industry about R&D and commercialisation, and to sell the concept of industry engagement themselves. Whilst they may be experts in their field of study, researchers may have limited experience providing training, thereby limiting the effectiveness of this training and communication.
- Permit government R&D funding to be used to allow researchers to travel to meet with companies to discuss business development. Often, funding provided by government is not permitted to be spent on travel, making it difficult for a business to meet with researchers who they are partnered with. Face to face meetings can often make a significant benefit to help build these important relationships and the success of such partnerships.
- The Advantage SME program was successful because it was well planned and implemented program. The NSW Government's approach to the Advantage SME Program, which involved UOW's ICR Unit selecting program recipients and administering government money to selected business direct (rather than the funding being paid separately by government as is often the case with similar funding programs), was very effective. This made the process far more efficient, and grant recipients were able to access and use their money much sooner. It is recommended that a similar approach be undertaken for future programs targeting R&D.
- R&D efforts of universities would be improved through better alignment between NSW TAFE and universities.

2. How can the NSW Government better support the R&D and innovation ecosystem in NSW?

- UOW emphasises the need for NSW Government to encourage the uptake of new technology by businesses. In doing so, it encourages the communication of ways in which new technology is likely to impact the various areas of their business in the short, medium and longer term, help businesses to understand the benefits that the adoption of new technology can have upon their business and, provide incentives to businesses to develop and utilise new technology.
- To help ensure its success and effectiveness, the emphasis of R&D grant funding should be targeted at supporting infrastructure and operational support for new facilities.
- Stop programs that create silos and incubators in the R&D space. Instead, it is recommended that NSW Government resources, such as funding and personnel, be pooled to create a more efficient and common support infrastructure.

¹ Industry Research Collaboration Discussion Paper, NSW Business Chamber, July 2014 - <https://www.nswbusinesschamber.com.au/NSWBC/media/Policy/Industry-Research-Collaboration.pdf>

- There is a lack of support for medium (non-SME) sized companies looking to undertake R&D activities, a gap that could be addressed by NSW Government to encourage and assist this size business to undertake R&D activities.
- Introduction of Incentive Schemes which encourage greater R&D and commercialisation activity in NSW, such as:
 - An incentive system to offer both national and international to undertake research in NSW. This would also assist the supply chain, with more companies being engaged, and would help attract business from outside the area.
 - Payroll Tax incentives such as the introduction of tax breaks (or other incentives) for companies undertaking innovation-related work.
- Regional industry forums such as i3net require NSW Government support to develop programs that assist the reform of family-run mid-cap companies based on products reaching their end-of-life. Many of these companies have aging senior management and family succession that is disinterested in the business. Such programs should seek to introduce innovation and identify R&D needs and include discussions around succession planning; assist with the transition of skills to the next generation with its lack of interest in the field; encourage and inspire them to grow into something bigger and better.
- Provide Next Generation Technology-type grants to support innovation towards products.
- Accelerating Commercialisation funding is currently difficult to obtain. It is that NSW Government establish grants which provide “bootstrap” funding to build the business case and support to allow successful application for Federal Government funding.
- Currently companies are only eligible to apply for TechVouchers if they are incorporated in the NSW. Funding must also only be spent to partner with a university within NSW. Consideration should be given to expand this eligibility to include companies from other Australian states and territories, such as the Australian Capital Territory (ACT) and allow companies to partner with a researcher best suited to their needs, rather than based on location. This will help encourage companies outside NSW to bring more business into NSW, and ensure the best company is placed with the best researcher, not determined by location. Examples whereby such approach has been applied in other state government R&D incentive programs include:
 - Advanced Manufacturing Technology (AMT) is running a scheme for any business, not just research, where they look at their own capabilities first in terms of R&D and support for businesses within Victoria. However, if it is not available within Victoria, then they are allowed to access businesses across the whole of Australia.
 - Defence, Science and Technology (DST) makes the requirement that it is involved with NSW universities. The problem is there may be a very good NSW university, but DST may wish to partner with RMIT, and this is currently not allowed.
- The introduction of a Supply Chain Research and Innovation Program which doesn’t just look at companies individually, but looks at the supply chains. By partnering with the universities and larger companies in NSW we can establish an R&D grant call that ensures innovation flows through the whole supply chain.
- National Training Centres being rolled out by Weld Australia in the TAFE system have received great funding in various states, including Victoria, Queensland, South Australia and Western Australia. The NSW Government should look at the funding models to help support such initiatives that support R&D in important spaces.

3. What barriers for R&D in NSW have you experienced and how can the NSW Government address these?

To ensure support for ongoing R&D in NSW it is important that skills gaps are identified and addressed, innovation is stimulated, and that there are appropriate apprenticeships and internship opportunities available.

- As previously noted, there is a recognised need to provide more readily accessible information and on-the-ground support by NSW Government to educate and encourage collaboration between businesses and universities.

- The current funding of NSW TAFE and its alignment with universities should be significantly improved if in order to capitalise on the strengths that each type of organisation has opportunity to provide in relation to the acceleration of R&D in NSW and, if NSW is to address skills and education shortages and be equipped to meet demands of the future workforce.
- There is also opportunity for the NSW Government to better develop and fund SMEs. This includes the provision of investment opportunities available to SMEs to help them mitigate skill-set shortages
- There is a gap in the range of programs and other incentives aimed at accelerating R&D for companies that just fall out of the definition of SME companies who need incentives to collaborate.
- SME's would stand to benefit from is ensuring a consistent definition of SME for NSW Government and State Government.
- NSW Government needs to ensure that the TAFE system is supported in a way so that it best placed to train/address skills shortages and build skills needed for the future.

4. What does the NSW Government do well in the R&D space and what are the key opportunities for NSW Government to accelerate R&D in NSW?

The NSW State Government offer a number funding programs which have proved effective in supporting collaborative research between university and industry. These include Advantage SME, TechVouchers and, Building Partnerships. UOW support for SMEs has continued to increase in recent years through the provision of a number of these programs.

Advantage SME

UOW has administered the Advantage SME program since July 2016. This program is designed to encourage greater interaction between regional SMEs and UOW, and focuses on the regionally significant sectors of advanced manufacturing, knowledge intensive industries in ICT, shared and financial services, engineering technologies and defence.

Under the Advantage SME Program, the University has:

- Provided a one-stop interface for SMEs to connect with innovation resources and funding
- Developed, promoted and hosted a series of events, workshops and engagement activities to support interaction and engagement between UOW staff, relevant students and small and medium enterprises.
- Provided 'Collaboration Vouchers' that allow eligible small and medium enterprises access research, academic staff time, student programs, educational services, software or equipment as determined by business need in collaboration with at least one other firm.
- Engaged with relevant local business, government and training stakeholders to expand the resources available to small and medium enterprises engaged in 'Advantage SME'.

NSW TechVouchers

NSW TechVouchers support new research collaborations and relationships between SMEs and UOW. Through this Program, businesses can partner with the University to access research, expertise, facilities and equipment that would otherwise be difficult to access. The TechVoucher program funds eligible projects up to \$15,000 in matching cash contribution.

Collaboration Vouchers

Collaboration vouchers are a new concept which have been effectively increasing UOW researcher engagement with SMEs and bringing new capabilities and technology into SMEs. They requires at least two businesses working together with university researchers. Getting businesses to collaborate is an essential ingredient of a successful regional innovation ecosystem. Collaboration vouchers are used to support a wide range of three-way collaborations where the research addresses a common need or opportunity across businesses.

Through the provisions of these programs, UOW has been able to support SMEs to understand and participate in existing local, national and international collaboration engagements and work to develop new opportunities for access to global supply chains.

Businesses of the programs are benefiting via the development of new ideas, products and services, the reduction of research costs, the provision of expert advice and access to the latest knowledge, technology and equipment, access to skills and work-ready researchers and, access to national and international networks.

Whilst Advantage SME funding and the associated programs have proved to be an effective way of supporting SMEs and strengthening their engagement with UOW, based on UOW's experience in administering these, a number of areas where government could further enhance its support for SMEs have been identified. This includes:

- Simplification of information available to SMEs to help these businesses know where to look for information about programs of relevance to them.
- Improve the consistency of government programs available to SMEs
- There is no one central point in government for SMEs to go to find out what is available, in terms of both funding and researcher capabilities and technology. UOW provides this central service through Advantage SME.
- SMEs, which are generally time poor, have reported that the potential pay-off does not always justify the time and effort of applying for innovation grants.
- Provide for next steps support at the end of TechVouchers, such as fast-track pre-approved access to MVP grants. (It is understood that MVP grant is only provided where no income has been received from a product, whereas in the course of very early 'TechVoucher' stage testing, some incidental income may be generated – it is suggested that this should be allowable).

Possible solutions which may address these issues include:

- The development of a national online SME matchmaking platform that provides personalised information on appropriate funding opportunities and, a personalised list of research capabilities and technology available to address the SMEs research problem. This would require an extensive capability mapping exercise and research to understand how best to present the information to businesses. This suggestion is already noted in response to Question 1 of this Submission.
- Assisting SMEs with the innovation process is labour intensive, however the provision of additional funding for universities to help SMEs through the process would be beneficial. Advantage SME has been successful with SMEs by providing a single point of contact and streamlining the process.
- There is currently a gap in the voucher system on offer to SMEs. Despite there currently being a number of NSW government programs aimed at supporting SMEs, there is a gap in the voucher system that inhibits some larger SMEs to access government support. This issue has also already been identified in this Submission.

iAccelerate

UOW's iAccelerate program is a UOW initiative established to drive entrepreneurialism and innovation throughout the region by pairing the skills of UOW students and staff with those of the greater Illawarra community. iAccelerate is the first and largest facility of its kind in Australia as it supports both early stage businesses and more advanced companies with high growth potential, while providing entrepreneurs with the benefits of working alongside a world-class, research-intensive university.

The purpose built iAccelerate Centre at UOW's iC was officially opened in July 2016 to house the growing number of entrepreneurs involved in the program, with funding of \$16.5 million secured from the NSW Government's Restart Illawarra Innovation Fund.

iAccelerate has created over 500 new direct jobs, and assisted over 150 companies in total since 2012. iAccelerate supported 74 companies in 2018 in a range of fields including tech, hardware services, education, health, wellbeing and social, with 131 new jobs created in 2018. iAccelerate is also creating opportunities for members of the community and for researchers and students to gain experience to be involved with a startup, and is creating new pathways for research and innovation to have a greater impact. The Facility also host

entrepreneur groups from established business looking to spin out innovations. In 2018 the iAccelerate program, with support of the Federal Government Incubator Support Initiative, rolled out the iAccelerate program into the South Coast of NSW, with the creation of the Bega Valley Innovation Hub (BVIH). The BVIH is an excellent model which is helping to demonstrate how UOW's iAccelerate model can be rolled out more broadly to help deliver a positive impact in preparing a region for a future that will depend on many new skills including well developed entrepreneurial talent.

Pharmaceutical Industry

There is a key opportunity for the NSW Government to capitalise on the opportunity provided by the Pharmaceutical industry. In doing so, it is noted and suggested that the following issues be considered with relation to important industry:

- Invest in pharmaceutical industry R&D gaps. It is noted that there is a long lead-time and many hurdles between university research and the final product there are particular points along the path that are reliant on Government support and investment.
- Work with / lobby Federal Government to establish a National Growth Centre in Pharmaceuticals. In doing so, the establishment of a NSW pilot Growth Centre in NSW may be considered.
- Develop cluster sites with companies within close proximity to multiple research organisations (Biotech/Pharmaceutical could particularly benefit from this given the multi-tiered nature of pharmaceutical development.

Industry 4.0 TAFE and Apprenticeships

- Remedy challenge of getting Industry 4.0 into the NSW TAFE curriculum
 - Assist businesses to better engage with Industry 4.0.
 - An example of Industry 4.0 gap advised to the Prime Minister (by Siemens):
 - The Prime Minister sent a delegation with the Australian Industry (Ai) Group and Siemens to Germany to obtain information.
 - The Federal Government funded Swinburne for higher apprenticeships and associate degrees
 - Swinburne is moving ahead with Industry 4.0, but there is nothing available to NSW.
- Support the development of 'Factories of the Future' to showcase skills, similar to Swinburne University of Technology, which provides industry and organisations with state of the art facilities to explore conceptual ideas for manufacturing next generation products. Set up in an actual showcase company where visitors can view before and after examples. (www.swinburne.edu.au/research/strengths-achievements/strategic-initiatives/factory-of-the-future/)

UOW has similar capability to this in its Facility for Intelligent Fabrication (FIF), which was launched in March 2018 by UOW, TAFE NSW and the Welding Technology Institute of Australia (WTIA). The FIF is a great example of where companies can come to see, try out a assess new technology and get assistance solving their current and future issues. This collaboration provides a unique facility to assist businesses identify and implement welding and automation-related technology, backed up with technical, education, training and certification support. Companies can use the facility's comprehensive research, consulting, training and prototyping resources to introduce advanced manufacturing technologies and Industry 4.0 principles into their business. (<https://fif.org.au/>)

5. How can NSW better leverage Australian Government investment in R&D?

Support for SME's

There is opportunity to coordinate better support and funding for SME's. This includes investment opportunity available to SMEs to help them to mitigate skill-set shortages impacting their business and growth potential. It would also be of benefit to NSW SME's to have the State definition of SME aligned to that of the Australian Government.

Immigration

- Develop incentives for companies to retain domestic students and keep them in the regions
- Graduate Visa allows students to have up to four years to complete study

- Current Australia visa rules are quite strict and can impact Australia's ability to retain high quality international students wanting to remain in Australia who have the knowledge and skills to contribute to NSW and the nation R&D ambitions more broadly.

Apprenticeship Program

- Develop a better system as there is a skills shortage
- Needs to be able to transfer R&D skills into actual on-the-ground skills

Addressing Gaps in Federal Internships Scheme

- The current Federal Internships Scheme only takes a limited number of overseas students (80% domestic compared to 20% international) and should be reconsidered in order to help attract and retain high quality students who have capacity to contribute to NSW and Australia's R&D efforts more broadly. The allocation of APR internships to domestic and international students is disproportionate to the level of students seeking to obtain one of these, as the proportion of international students undertaking a PhD in Australia is much higher than 20%.
- It is suggested that the NSW Government could replicate some model of this Scheme in order to attract and retain the right students in NSW.

6. Are there examples from other jurisdictions supporting R&D that NSW can learn from/adopt?

As already noted in various sections of this Submission, there is a range of positive initiatives that are already being implemented to support R&D activity. Other examples of other initiatives that the NSW Government may wish to consider adapting are outlined below.

Australian Business Growth Fund

The recently announced Australian Business Growth Fund is aimed at addressing a funding gap for long-term capital to enable high growth potential SMEs. This fund will benefit high growth SMEs with annual turnovers of between \$2 million and \$50 million.

ANZ, CBA, NAB and Westpac will each commit \$100 million to the fund, while HSBC will contribute \$20 million. The federal government has pledged \$100 million.

The fund will be managed by private sector expertise and will invest between 10% and 40% in the chosen businesses, allowing the business owner to maintain their controlling interest, while giving them the funds they need to invest in growth.

Similar models in the UK and Canada have proven successful, giving businesses the chance to thrive with much-needed access to affordable capital.

One of the biggest barriers to growth for SMEs is access to affordable capital and this has been a critical factor holding the economy back. The Australian Business Growth Fund will significantly encourage business growth and promote economic expansion."

Development of more In-Residence Flash Build sites

Development of more In-Residence Flash Build sites to assist start-ups companies in NSW. This program is already being run at the University of New South Wales (UNSW), involving academics, SME's and subject matter experts to come together and create innovation through a Flash Build, by leveraging off the parties' different perspectives. The program brings together people with an interest in understanding technology and creating their own solutions, and in doing so, empowering and inspiring individuals to connect with businesses across Australia. (<http://techconnectglobal.com.au/in-residence-flash-builds/>)

UOW's Generator Labs are a similar concept to the UNSW concept above. The Generator Labs connect SMEs, industry and government enterprises with UOW researchers and other stakeholders to solve their innovation problems by using disruptive technologies and collaborative people power.

Generator Lab is an event-based platform which encourages the development of new products, processes and capabilities for all involved through knowledge sharing in a participatory environment. Its main aim is to increase the regions innovation capacity through partnerships and collaboration. (<https://www.uow.edu.au/industry/generator-lab/>)