

Australia's Future in Research and Innovation
Trade and Investment Growth Committee
PO Box 6021
Canberra ACT 2600

Dear Trade and Investment Growth Committee,

Re: Inquiry into Australia's Future in Research and Innovation

The Australian Technology Network (ATN) of Universities, representing five of the most innovative and enterprising universities across Australia, would like to present the Trade and Investment Growth Committee with the following recommendations to the *Inquiry on Australia's Future in Research and Innovation*.

Recommendations:

1. Australian universities must work more collaboratively within the sector, so that research offerings for industry are bolstered and strengthened, clustered around genuine areas of excellence (here 'excellence' very clearly includes the value of the research to industry), and so that research efforts can address grand challenges for individual industry sectors, where no one company or university has the critical mass or depth of ability/resourcing to achieve 'game changing' innovations. This will strengthen Australia's global competitiveness, and drive stronger links between Australian-based industry and Australian universities.
2. Identify, map and better engage with SMEs that exhibit 'characteristics of innovation', but who are not currently engaged or connected to the research sector. This will both better inform resourcing of the nation's innovation effort, and deepen the depth of national participation in innovation. This will help to drive innovative products that will drive Australia's future exports.
3. Support more targeted resourcing of industry-focussed research, with a more strategic, market-led approach to government support for key technologies in areas where Australian industry can commercially take advantage.
4. Monitor and incentivise industry to invest better in R&D and innovation through a more targeted, collaborative approach.
5. Support the training of graduates for diverse careers by: integrating industry experience into the training of undergraduate and research students; incentivise businesses to offer internship and employment to researchers; and promote industry-focused PhD projects via the co-creation of projects with end-users. This will strengthen Australia's innovation ecosystem.

In the Government’s National Innovation and Science Agenda (NISA)¹, the importance of innovation has been highlighted with a number of new initiatives earmarked to strengthen the relationship between our innovative businesses and research organisations.

The ATN encourages the committee to refer to the recently reported Senate Economics References Committee inquiry into [Australia’s Innovation System](#), from which much of the evidence-base for NISA was drawn. In particular, the ATN supports the inquiry report’s call for:

“...stability and certainty in relation to both funding and policy settings; coordination, cross-sector collaboration and a strategic approach to building innovation capability; nurturing start-ups and the need for an innovation culture; and an education system (including schools, vocational education and universities) focused on the development of skill sets and knowledge creation to ensure that Australians are fully equipped to engage productively in the future economy”²

The impetus for supporting a whole of Government approach should not be lost, and the ATN encourages the committee to align its work with other initiatives in this space (e.g. the current R&D Tax review).

Achieving innovation at scale: Overcoming Australia’s geographic and economic challenges

Poor collaboration between research organisations and industry to date is in part due to Australia’s industry structure, dominated by micro firms and small businesses.

Australia’s industry structure is characterised by over 2 million micro (0 – 4 FTE) and small (5 -19 FTE) businesses accounting for approximately 97 per cent of Australia’s total industry, with medium business (20 – 199 FTE) and large business (200+ FTE) accounting for less than 3 per cent of Australia’s industry make-up.³ A lack of medium sized companies and large multi-nationals within Australia emphasises the importance of the small and micro business in the Australian innovation ecosystem. Medium and large companies are more likely to engage in innovative activity than micro and small businesses (refer to Table 1), which often results in an incomplete supply-chain, and a reduction in demand on improvement and innovation. Furthermore, collaboration within priority areas is often driven through industry-to-industry efforts, rather than reaching out to research organisations for partnership.

¹ Commonwealth of Australia (2015), Department of the Prime Minister and Cabinet, National Innovation and Science Agenda.

² Commonwealth of Australia (2015), Senate Economics References Committee: Australia’s Innovation System

³ ABS Cat. No. 8165.0, Counts of Australian Businesses, 2013-14

Table 1. Summary of innovative activity in Australian business, key indicators, by employment size(a), 2013-14

	0-4 persons %	5-19 persons %	20-199 persons %	200 or more persons %	Total %
Businesses which introduced any new or significantly improved:					
goods or services	19.3	31.0	34.3	34.7	24.1
operational processes	13.4	22.3	34.3	44.4	17.9
organisational/managerial processes	15.6	29.1	39.0	53.2	21.7
marketing methods	16.0	25.9	30.6	40.2	20.3
any of the above (i.e. innovating businesses)	34.1	54.1	60.7	73.9	42.5
Businesses with innovative activity which was:					
still in development(b)	19.0	31.7	40.4	53.8	24.7
abandoned	7.5	10.3	8.3	6.8	8.4
Businesses with any innovative activity (innovation-active businesses)	39.9	59.9	66.7	79.5	48.3

(a) Proportions are of all businesses in each output category.

(b) As at the end of the reference period, 30 June 2014.

Source: ABS 8167.0 - Selected Characteristics of Australian Business, 2013-14

One way of countering Australia's issue of company size is by aggregating and pooling areas of strength across and within sectors. Research efforts need to be centred on solving problems collectively (for example, Centres of Excellence), with models and resourced structures for different players to work together. The Australian Government's Science and Research Priorities⁴ and Industry Growth Centres⁵ are a step in the right direction, although how they exactly will address issues of scale remains to be seen. From a government perspective, effort can be made to channel funding to specific industry problems where individual companies do not have scale to address in order to bring smaller businesses into the fore. Furthermore, there could be flexibility in funding contribution depending on the size of a firm (e.g. in-kind contributions may be more appropriate for smaller firms). It is hoped that the government's 'Innovation Connections' initiative⁶, announced as part of NISA will help address some of these issues.

Additionally, innovation activities and discussions are often undertaken by the small proportion of converted companies who are already innovation-active. It will be critical to widen the net of participating companies in the nation's innovation ecosystem, many of whom are not visible to those

⁴ Australian Government, Science and research priorities, <http://www.science.gov.au/scienceGov/ScienceAndResearchPriorities/Pages/default.aspx>

⁵ Australian Government, Industry Growth Centres, <http://www.business.gov.au/advice-and-support/IndustryGrowthCentres/Pages/default.aspx>

⁶ Australian Government, Innovation Connections, <http://www.innovation.gov.au/page/innovation-connections>

who can provide support, nor the policy makers who develop initiatives arguably targeted at them. More needs to be done to identify, map and then engage with ‘innovation-potential’ companies who are not currently actively part of key ecosystems.

De-risking the market: Investing in innovative solutions

Access to robust intelligence and supportive policy and regulatory regimes is key to de-risk the investment in industry/university collaborative research.

Government needs to support the innovation process via procurement practices whereby they act as a lead customer, particularly enabling long term, high risk ‘research-to-market’ activities in areas of critical importance to the nation such as defence and health. The UK Small Business Research Initiative (SBRI) and US Small Business Innovation Research (SBIR) programs are examples where this has worked successfully. It is argued that this would turn Australia into a country that invests in its own ability to generate innovative solutions, rather than adopt them.

In the Food and Agribusiness domain, provenance and the traceability of food is a key area where Australia has a competitive advantage in the Asian market. The ATN recommends that the government consider establishing a consumer insight centre to enable Australia to be more responsive and hit the mark in relation to desired tastes, health issues, convenience, and freshness and drive the technologies to support that (e.g. environmentally sustainable systems and manufacturing systems), potentially through the Industry Growth Centre.

Such an approach has been adopted by Singapore with the Asia Consumer Insights Institute, established in 2011 as an initiative of the Singapore Economic Development Board.⁷ The initiative aids businesses to build unified customer focussed strategies and create value in the areas of innovation and new market development, including linking through to relevant research organisations and institutes. Australia would benefit in developing a provenance approach to food and value-added product production, leveraging its reputation as a safe and certified producer. Government regulation will be critical in supporting the sophistication of our food provenance systems. The Food and Agribusiness Industry Growth Centre have already made strides in this area, developing key resources in supporting a connected and collaborative industry including their Export Markets Insights database and the Enterprise Solution Centre.⁸

Evaluating National Innovation Efforts

The OECD Innovation Strategy 2015 makes clear that the monitoring and evaluation of innovation policies allows nations to learn from experience and ensure efficient delivery of government objectives and actions.⁹ There may be value in developing a national R&D Scoreboard, and/or an Innovation Index, along the lines of similar entities that have been in operation in the UK for many years. Entities such as R&D scoreboards can create an evidence base for the precept that innovation drives growth and profitability, showing that companies that concentrated on organic growth through investment in R&D with associated capital investment and market development, are more likely to have increased shareholder returns, and has been important in driving company behaviour.

⁷ Asian Consumer Insight, http://www.aci-institute.com/index.php/web/about_aci/vision-and-goals/1/70

⁸ Australian Government, Food Innovation Australia Limited, <http://www.fial.com.au/>

⁹ The OECD Innovation Strategy – 2015 revision, <http://www.oecd.org/sti/innovation-imperative.htm>

Similarly, a national Innovation Index could look at investment in intangible assets, such as design, organisational improvement, training and skills development, software development, advertising and market research, as well as the more traditional R&D, as measures of innovation investment, giving evidence as to why these ‘soft’, or ‘intangible’ innovation elements can make a difference in achieving a successfully innovative enterprise.

The ATN notes that the government are intending on investing in a national system to measure the engagement and impact of university research via NISA, however a holistic approach encompassing the entire innovation system would also be a beneficial benchmarking and evaluation exercise.

Meeting Australia’s Labour Challenges: Training Graduates for Diverse Careers

The ATN has consistently advocated that the Australian education system should aim to train graduates for diverse careers to meet Australia’s current and future workforce requirements¹⁰. Significant efforts are already underway to help support the capacity of Australia to produce a pipeline of ‘work-ready’ and innovation-capable students through the landmark National Work Integrated Learning Strategy, developed in collaboration between Universities Australia, the Australian Chamber of Commerce and Industry, Australian Industry Group, the Business Council of Australia and the Australian Collaborative Education Network, supporting broad scale adoption of activities such as internships, work placements, career mentoring and industry-led projects for university students.¹¹

This strategy understands the importance of human capital in remaining competitive internationally and equipping the skills and knowledge required to meet future labor challenges.

The ATN’s Industry Doctoral Training Centre (IDTC) is another initiative with similar aims, offering flexible programs that combine traditional PhD research with training in professional and broad technical skills. Students work on industry co-created projects with the goal to prepare graduates for both careers in academia and within industry.

Internationally, countries with high R&D intensity are characterised by strong cultures of a PhD qualified workforce in business and mobility and co-operation between the research and business sectors. For example, in Israel, over 83 per cent of researchers are employed by the business sector, with only 15 per cent employed in the higher education sector. In contrast, approximately 60 per cent of researchers in Australia are employed in the higher education sector, with only 30 per cent in business enterprise.¹² Researchers working in business are more likely to re-engage with the higher education sector when looking to engage in business and innovation solution, creating a fluid link between the two sectors.

¹⁰ ATN (2015), Innovate and Prosper: Ensuring Australia’s Future Competitiveness through University-Industry Collaboration, <https://www.atn.edu.au/Documents/Submissions/ATN%20Research%20Training%20Review%20Submission.pdf>

¹¹ Universities Australia, Australian Chamber of Commerce and Industry, Australian Industry Group, the Business Council of Australia and the Australian Collaborative Education Network (2015) National Strategy on Work Integrated Learning in University Education, <http://cdn1.acen.edu.au/wp-content/uploads/2015/03/National-WIL-Strategy-in-university-education-032015.pdf>

¹² OECD, Science, Technology and Innovation Scoreboard, 2013