Science & Technology AUSTRALIA

Australia's Manufacturing Industry

10 September 2021

To the Senate Standing Committee on Economics,

Thank you for the opportunity to provide a submission to the inquiry on the Australian manufacturing industry.

Science & Technology Australia wants to ensure that what is discovered in Australia is made in Australia wherever possible.

But to bolster the Australian manufacturing sector, we need to look to the future of manufacturing. That future requires skills in additive and modern manufacturing - with a focus on low-emissions energy products.

Australia is uniquely situated. We have a research workforce capable of developing new products ripe for commercialisation, an abundance of the rare minerals needed to manufacture low-emissions products, and a highly skilled workforce working with an inside industry.

All of the ingredients for bolstered manufacturing are there; they need only a kickstart to get them moving in the right direction.

To this end, STA recommends:

- the introduction of a Research Translation Fund;
- long-term secure funding for National Collaborative Research Infrastructure and a funding boost to establish industry broker positions at these facilities to engage with industries like manufacturing;
- provide funding through the Research Training Program to cover the cost of PhD industry internships and their salary; and
- a national strategy to incentivise the manufacture of low-emissions technology.

We would welcome the opportunity to discuss our recommendations further with the committee.

Yours sincerely,

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Introduction

Australia is the home of countless innovations from the cochlear implant to new vaccines. Science & Technology Australia wants to ensure that what is discovered in Australia is made in Australia wherever possible. To achieve this, we need a strong manufacturing sector in Australia that is intrinsically linked to the science and technology sector.

The future of manufacturing will rely on advanced manufacturing techniques and the development of new industries that come from the work of our world-class researchers. The COVID-19 pandemic has shown the country how important strong sovereign manufacturing capabilities are to the nation. From creating the jobs of the future to ensuring a secure supply chain, manufacturing is essential.

In responding to this inquiry into Australia's manufacturing sector STA focuses on the following aspects of the Terms of Reference:

- The role that government can play in assisting our domestic manufacturing industry through:
    - research and development;
    - supply chain support; and
    - skills and training.
- The role that our manufacturing industry can play in delivering the reliable, cheap, renewable energy that is needed.

Research and development

There is currently a strong drive to improve research translation from the university sector. STA envisages the manufacturing sector will be a key beneficiary of this imperative. Australia has a very strong research track record including but not limited to the development of medical technologies, solar technologies, battery technologies and agricultural products. Too often, however, these discoveries are commercialised or produced overseas - rather than here at home.

As the recent ABS figures on Research and Development Investment show, manufacturing is the biggest area of investment for the country. Unfortunately, the biggest growth in business expenditure in research and development is occurring in expenditure incurred overseas and not in Australia.

The well-established Research and Development Tax Incentive and the soon-to-be-introduced Patent Box are both indirect measures to encourage research and development in industry. Treasury's proposed scope of the Patent Box will apply to biotechnology - and STA has proposed it should also cover clean energy technologies. If the design parameters are right, this measure will help to incentivise onshore manufacturing of Australian discoveries in Australia. Programs like the Modern Manufacturing Initiative, Accelerating Commercialisation and the CRC-Projects all play a role to improve the conditions for manufacturing in Australia's areas of competitive advantage.

The missing piece of the puzzle, however, is the level of direct incentive to turn Australian ideas into Australian products. A Patent Box and the R&D Tax Incentive are indirect incentives and do not provide upfront support to industry and research to cross the innovation 'valley of death' between concept and product.

Science & Technology Australia has long advocated for a new Research Translation Fund. This would complement the role of the well-established Medical Research Future Fund and perform a similar catalysing and commercialising boost for science and technology breakthroughs in all fields.

Research translation programs have proven effective in other countries with similar economies. Canada, for example, has a Strategic Innovation Fund, part of which focuses on:

> "for-profit entities looking to undertake projects that encourage research and development (R&D) activities to accelerate technology transfer and commercialization, facilitate the growth and expansion of Canadian firms and/or attract and retain large-scale investments to Canada".

A Research Translation Fund in Australia would deepen the current incentives in Australia's economy which is a high proportion of small and medium business enterprises (SMEs).

STA recommends: the introduction of a Research Translation Fund.

Supply chain support

Australia's Collaborative National Research Infrastructure not only sustains Australia's world-class research infrastructure facilities but also plays an important role in the manufacturing supply chain. This role is already well established in infrastructure like ANSTO which produces irradiated silicone essential in the manufacture of power-grid infrastructure. The Australian National Fabrication Facility is another prime example of national research infrastructure which can, and does, provide important manufacturing capabilities as part of Australia's supply chain.

Work on the 2021 National Research Infrastructure Roadmap is already underway. It is imperative that we ensure long-term funding security for these large-scale shared research infrastructure facilities that are essential to Australia's research capabilities.

Deeper industry engagement has been highlighted as an area for further enhancement. One idea worth considering is a funding boost to create extra 'industry broker' staff positions at the NCRIS facilities whose role is to reach out to industries, including manufacturing, and encourage them to engage with these facilities. STA supports this idea. It would not only improve industry access to research and development facilities, but also highlight the capacity of Australia's Collaborative National Research Infrastructure to play an essential role in manufacturing and the supply chain.

STA recommends: long-term secure funding for National Collaborative Research Infrastructure and a funding boost to establish industry broker positions at these facilities to engage with industries like manufacturing.

Skills and training

The future of manufacturing in Australia lies in the areas of advanced and additive manufacturing. It is crucial that we can produce customised products on demand for consumers. To achieve this, the manufacturing sector is going to require additional skills and training, extending the skilled workforce needs of the sector. The new opportunities ahead will require expertise in engineering, software, design, and material science sciences - to name just a few of the specific fields of expertise.

Many of these skills are already available in the Australian research sector and research has shown that more and more PhDs want to enter industry rather than remain purely in research post-graduation). The Australian Government is already making moves to create links between research students and industry by growing industry internships. This initiative provides an incentive to universities to encourage industry internships. To encourage manufacturers to take up the opportunity to take on a PhD industry intern, the Australian Government should cover the salary

cost of these interns during the internship. This would remove a cost barrier for an industry to take on a PhD intern and, in turn deepen ties between manufacturers and researchers.

STA recommends: provide funding through the Research Training Program to cover the cost of PhD industry internships and the salary of students while on placement.

The role that our manufacturing industry can play in delivering the reliable, cheap, renewable energy that is needed

Australia can play a leading role in the manufacturing of low- or no-emissions energy products. Australia is rich in the mineral resources needed to produce solar cells, lithium batteries and can even become the hydrogen fuel production capital of the world.

The global drive toward net zero emissions also mean there is a market for these low-emissions energy products. It is estimated that the production and export of hydrogen fuel alone could be worth $26 billion to the Australian economy by 2050.

Governments are already making moves to incentivise the shift to clean energy in Australia but have not yet seized the vast economic opportunity to provide clean energy to the world. Time is of the essence for Australia to seize a share of a new global market. The proposed Patent Box initiative announced in the 2021 May Budget should be extended to apply to clean energy technologies to maximise these opportunities for Australia's economic benefit. This is crucial - and would enhance the onshore manufacturing of ***new*** clean energy technologies. However, further measures are also needed to encourage onshore manufacturing of ***current*** clean energy technologies such as solar cells, batteries, and wind turbines in Australia. To capitalise on the opportunities available in clean energy manufacturing, a comprehensive strategy should be developed and implemented.

STA recommends: a national strategy to incentivise the manufacture of low-emissions technology.