



Science & Technology AUSTRALIA

Submission:

**2030 Strategic Plan for the
Australian Innovation, Science and
Research System**

31 May 2017

Dear Mr Ferris,

Thank you for offering Science & Technology Australia (STA) the opportunity to assist in shaping the 2030 Strategic Plan for the Australian innovation, science and research system.

As the peak body for the sector, we write to provide feedback on behalf of our membership, which represents more than 60,000 scientists and technologists around Australia.

We welcome this Issues Paper and commend the authors on the first step towards drafting a strategy that supports and encourages a collaborative, cross-sector and multi-disciplinary approach to growing a strong knowledge economy in Australia for the next decade and beyond.

STA is particularly pleased to see the focus on opportunities and international trends in science and technology, and an acknowledgement that government has a key role to play in creating the regulatory and cultural framework in which science and technology can be supported to flourish.

We note, however, there is no reference to the urgent need to foster a richly diverse STEM workforce. Assessing and addressing the barriers to gender equity and broader diversity within science and technology is of paramount importance if Australia is to truly reap the benefits of our full intellectual and creative potential.

We further urge a stronger focus on building scientific literacy and understanding among the general public, and encouraging non-scientists to apply critical thinking skills in their decision-making. Additionally, STA encourages the authors to incorporate pathways for Australian researchers to access and fully utilise the vast and growing body of data made available by rapidly evolving digital technologies.

Finally, STA emphasises the importance of considering the strategic directions, findings and recommendations from important recent planning initiatives such as the National Research Infrastructure Roadmap, the National Science Statement, the National Innovation and Science Agenda, the Review of the R&D Tax Incentive, the Australian Medical Research and Innovation Strategy 2016–2021, and the Australian Medical Research and Innovation Priorities 2016–2018.

By taking such a comprehensive approach, this Strategic Plan will provide a strong, inclusive, and representative path forward for Australian innovation, science and research. STA believes the sector would benefit from the development of a framework for the assessment of the success of Australia's innovation, science and research system. Such an agreed framework will ensure

that as we move towards 2030, the opportunities afforded us are recognised and realised.

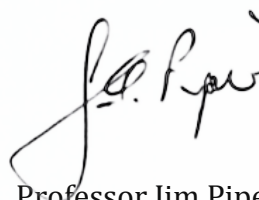
Please find below our specific feedback, and please do not hesitate to be in touch if you have any questions regarding this submission or would like further detail regarding any of our comments or suggestions.

STA is excited by the foresight and potential embodied in this consultation paper, and we look forward to working with Innovation and Science Australia to advance the role, reputation and impact of science and technology in Australia.

Yours sincerely,



Kylie Walker
Chief Executive Officer
Science & Technology Australia



Professor Jim Piper AO
President
Science & Technology Australia

1. Firstly, we have highlighted below several issues that were not covered in the Issues Paper, that we believe must be considered as part of a comprehensive 2030 Strategic Plan. These are:

1.1 Diversity in the STEM sector

Engaging and harnessing the intellect and creativity of a broad diversity of Australians – regardless of their gender, ethnicity, sexuality, or age – is imperative to achieving a strong and resilient STEM sector.

Supporting, welcoming and encouraging people with a variety of perspectives and from a range of backgrounds to consider a career in STEM will enable Australia to enhance its approach to science and technology and access its full potential to grow a robust, thriving and internationally competitive knowledge economy.

1.2 Public confidence in science

Government investment is an invaluable part of the success of science and technology in Australia: to support this, it is vital that the non-scientific public understands the immense value of this investment and the benefits science and technology provide to our broader community. It's also important that our community is able to think critically and make informed choices based on the best scientific evidence and the latest knowledge – whether they're making decisions for their own health, for the environment, about the food they eat, or the power sources they purchase.

As governments change, support for the creation and application of evidence-based knowledge must remain stable. A successful strategy for the science and technology sector should ensure public understanding, confidence and respect for science and technology is built and maintained.

1.3 Research data

Given the rapid development of digital technologies enabling the sharing and exchange of knowledge, it is imperative Australia is at the forefront of these advances to remain competitive.

There are enormous potential benefits for the private and academic sectors, and we must provide Australian researchers with the very best tools and access to empower them to succeed. Part of remaining competitive is prioritising efficient management of data, privacy, ownership, access and the ability to verify and trust data through effective cyber security.

2. STA acknowledges and highlights the valuable inclusion of the following in the Issues Paper:

2.1 A focus on opportunities and trends

Over the span of the Strategy, it will be hard to predict the state of our geopolitical climate, Australia's economic priorities, the global research landscape and other factors impacting the Australian innovation, science and research systems.

It is therefore important that the STEM sector is poised to identify and respond to challenges and opportunities as they arise, and find ways to meaningfully engage and contribute to take full advantage in a timely and effective manner. For the purposes of a 2030 strategy, the focus on opportunities would benefit from a more critical assessment of the sustainability of emerging markets/industries in the face of population growth, rapid environmental change and sustainability.

2.2 Collaboration and the STEM sector coming together

We believe scientific and technological peak bodies, associations and societies can play a role in facilitating this important component of the Strategy.

As the sector is so broad, bringing players together from academia, the private sector, government, research agencies and institutions will be a challenge. Using existing networks to achieve this will mean stakeholders can be linked in the early stages and collaboration can be fostered more easily and effectively. As the peak body spanning all aspects of the sector, STA crosses disciplinary lines, public/private boundaries, and the bridge between knowledge creation and knowledge translation: we are uniquely placed to assist in this respect.

Structural barriers that prevent easy movement between the different sectors of academia, government and industry also need to be addressed. Mechanisms to enable greater mobility between research disciplines, regions, sectors and institutions must be developed.

2.3 The Australian government leading by example

In establishing a culture of innovation and collaboration, the Australian government will empower and inspire the private sector, research agencies, universities and other stakeholders to do the same.

In reducing red tape and actively seeking to partner with the private industry and research institutions, the government's investment in science and technology, which already provides significant dividends, will be boosted even further.

Establishing a mechanism for intra-Departmental collaboration would also ensure better return on research investments within the Australian Public Service internally, and STA would welcome this valuable step towards a more integrated and coordinated research capability.

3. Finally, please find below specific feedback regarding the key challenges and opportunities for the Australian innovation system identified in the Issues Paper:

3.1. Moving more firms, in more sectors, closer to the innovation frontier

For the private sector to meaningfully engage with research and innovation, there must be clear incentives and accessible pathways for them to do so.

We commend the recommendations from the **Review of the R&D Tax Incentive** and urge the Government to act upon them. Reform in the way we reward and support business must be prioritised as a way to encourage more meaningful industry engagement with research translation and application.

We also urge an **emphasis on establishing and expanding spaces for collaboration**, where the private sector, science and technology can meet. Innovation hubs, Departmental liaison officers and research precincts are all important components to a successful move towards the innovation frontier, but we must ensure they are coordinated to maximise impact. We will also need to work to prevent barriers such as red tape and overly bureaucratic processes, which slow down industry-researcher interactions and disable a truly agile and responsive sector.

3.2. Moving, and keeping, Government closer to the innovation frontier

Barriers such as red tape and a risk-averse culture must be addressed before innovation can be truly embedded within government.

One of the main obstacles for innovation is a reactive stance towards policy. Where there is **steady, stable and consistent leadership**, a more favourable environment for innovation exists. STA encourages Government to work towards bi-partisan support for the long-term strategy for science and technology in Australia, as this will achieve the long-term stability and certainty necessary for innovation to thrive.

This will in turn make it easier to effectively implement a **whole-of-government implementation** of science and technology initiatives – an approach which should be a priority.

Furthermore, the **gap between government and research must more openly and effectively be bridged**. Existing programs such as

Innovation Connections must be better resourced and promoted, so that the value of collaboration is truly understood and acted upon by both the private sector and researchers. Engagement incentives and pathways should be created to encourage government departments to engage with the public sector research and innovation agencies.

An example of where this works well has been the Next Generation Technologies Fund. By harnessing the wider research community, Defence will bring more partners together in developing valuable new techniques and strategies, gaining a multiplier on the taxpayer investment. We hope this approach will be replicated across the many Departments that would benefit from the contributions of Australia's scientists and technologists.

3.3. Delivering high-quality and relevant education and skills development for Australians throughout their lives

The inclusion of this challenge is important for two reasons: the value of STEM professionals and the contributions of the STEM sectors to the Australian community and economy; and the broad application of STEM skills, which benefit and enhance the work of other sectors throughout Australia.

Supporting students to return to higher education throughout their lives – regardless of age, gender or other traits – will support Australians to continue to enhance their own skills and contributions.

Additionally, university staff can only teach the skills and knowledge for this new workforce if they themselves understand it. Therefore, systems should be adopted that **facilitate the movement of STEM professionals between the academic and private sectors**; returning to academia with experience and insights that enhance the value for the system as a whole.

Similarly, government should champion those institutions delivering meaningful work integrated learning opportunities to their students, ensuring they are gaining broad, applicable, and work-ready skills.

Many graduates in the STEM sector do not pursue careers in research, and others apply their skills in the broader workforce outside of science and technology. It is important that we acknowledge that their contribution is no less valuable. Securing a high quality education that transfers complex problem solving and analytical skills for graduates across the spectrum is vital and of benefit to the Australian economy.

3.4. Maximising the engagement of our world class research system with end users

As mentioned above, **work integrated learning** will become increasingly important. Not only will it build upon the skills of our STEM professionals in a way formal qualifications cannot, it also has the potential to expose the private sector to the benefits of employing people with STEM qualifications.

Researchers with experience in industry are more likely to understand the needs of the private sector too, and this will likely inform their work as scientists and technologists.

The more we **network the professionals working at each stage of research** – from creation to translation and application – the more collaboration and commercialisation we are likely to see.

In working to promote and achieve **diversity within the sector**, the system will naturally become better connected to the broader community and hold within it professionals with broader perspectives. We believe this will lead to a clearer understanding of the world outside STEM research, helping to facilitate more varied collaboration and consultation.

3.5. Maximising advantage from international knowledge, talent and capital

It must be emphasised that the free movement of scientists and technologists is essential for our success on the global stage.

Immigration, intellectual property, and other relevant policy issues must be addressed in consultation with the sector. By **embedding stakeholders in the decision-making process**, the solution is bound to be richer and more robust.

Additionally, the international environment is shifting, and with the correct preparation and strategic oversight, **Australia will be poised to become an international leader**, to foster collaboration, and establish partnerships throughout our region and beyond to the benefit of all Australians.

3.6. Bold, high-impact initiatives

In a system that can be risk-averse, it is the innovative scientists and technologists that have the greatest potential impact. It is therefore important that we continue to encourage **a balance between 'safe' research and support for taking calculated risks**.

For this challenge, we must invest in our national and regional capacity to conduct this work as a priority, while ensuring the system is open to international collaboration and cooperation.

Starting with Australian science and technology that is already at the cutting edge of global research, an investment to secure and extend this competitive advantage would be well rewarded.

It's also important to consider how to turn to our advantage the international movement of Australian-trained STEM professionals, so that this is not experienced as a brain-drain in coming decades, but rather as an opportunity to create strong and vibrant international networks for knowledge creation and its application which could be leveraged to Australia's advantage.

Challenges to our economic, environmental and social wellbeing will be significant in coming decades through job automation, changes to weather patterns, environmental stresses and increased pressure of land and water resources. Each of these and other potential challenges will demand an increased focus and growing intellectual capacity as we near 2030.

By monitoring, planning for and mitigating these challenges in a strategic and innovative way, we could drive increased high-value employment, mitigate risk, avoid disasters and **turn these challenges into opportunities**. Our investment domestically would impact regions beyond Australia too, as the challenges we face here are replicated across the globe.