Australian Academy of Science - initial response to the Blueprint and Action Plan for Critical Technologies

About the Blueprint and Action Plan for Critical Technologies

The blueprint and action plan represent a policy platform for cultivating critical technologies while managing the risks they may present. The Blueprint sets out the framework and identifies the priority technologies. The Action Plan identifies the current list of critical technologies and associated policy mechanisms. Both new and established policies are cited.

The platform defines critical technologies as those with the "capacity to significantly enhance or pose risk to our national interest." As described, it is a policy platform for developing critical technologies and regulating them as necessary.

This submission is an initial engagement with the Critical Technologies Policy Coordination Office (CTPCO), arising from the initial information session on 3 December 2021.

The Academy's initial science policy analysis:

- We welcome the platform and the engagement with the current and future science that it represents. It is appropriate for the Government to make strategic decisions on developing technologies in the national interest.
- The platform's focus is largely on "delivery-end" technologies – technologies with a high market-readiness that require development and commercialisation to bring them to market.
    - This is reflected in the two new initiatives: a centre to commercialise quantum technology and an Indian-Australian Centre of Excellence in critical technology policy.
- Fundamental research receives less emphasis, and this is of concern since a significant proportion of Australian economic activity relies directly on advanced scientific research across many disciplines. The goal of securing critical technologies will require ongoing, stable support for fundamental research.

Consultation questions

CPTCO provided these questions for the briefing sessions. The Academy's responses are provided.

1. *What opportunities are there for greater collaboration between the academic and research community and Government in critical technologies?*

The scientific community should be closely involved in the critical technologies policies. The most obvious areas are:

- Identifying emerging technologies, and assessing their potential impacts. Participation in horizon-scanning activities.
- Advising on implications of technologies, identifying risks and opportunities. Advising on risk management.
- Support for science communication, both with the research sector and with the public. This is particularly important around science and technology risks.

- Advising on implications of policy settings, particularly around regulation. Identifying perverse incentives and drivers of poor outcomes.
- Advising on the development, implementation and assessment of policy mechanisms.
- Direct technological development in partnership with government stakeholders.

Virtual-based collectives have potential to expand the scope of collaboration significantly, provided these collectives are supported.

2. What do you see as the key role for academia in taking Australia's critical technologies agenda forward?

Research is obviously a primary contribution: providing the basis for critical technology development.

It must be noted that there is a very long time between initial discovery and entering the commercial market, but it is a continuum. There needs to be support for the whole research and technology ecosystem. Moreover, while the drive to market can promote innovation, curiosity-driven research at universities and research organisations generates new questions, discoveries and approaches independent of immediate commercial/industry imperatives. It is an investment in the future that will underpin technologies beyond our present understanding.

3. What are the key ways the Government can help critical technologies thrive in Australia?

Long-term, stable funding for fundamental research is essential. Bipartisan support is strongly preferred, as funding programs are ill-served by being tied to the election cycle. It is important to take the long view – a policy horizon of a few years is far too short for transformational change.

Support should ideally be provided across the entire research-to-product pipeline. Moreover, it is important to support communities, collaborations, sectors, ecosystems. Too narrow a focus, especially at the fundamental research end of the spectrum, carries the risk of missing innovations that arise from unexpected directions.

The Critical Technologies policy documents imply an ecosystem of policy instruments, with many inter-related parts. Such a platform needs to be built on the stable foundation of an active, innovative research sector.

4. What are the barriers to the development of critical technologies capabilities in Australia that you see?

Concerns in the scientific community include:

- **Transparency:** How transparent is the listing process? Who makes the decisions based on what advice? Will this change?
- **International engagement:** Will being identified as critical to the Australian national interest lead to overseas collaborations being curtailed? How much control will the Government exercise over these crucial relationships? Will they need to be reported and regulated? How intrusive will this be?
- **Diversity and access to funding and education:** Will critical technologies be impaired through loss of key demographics due to hurdles and access to education? Tackling growing challenges

benefits from diversity in genders, sexes, sexual orientations, culture, abilities and ages. How do we address the exodus of women and LGBTQIA+ individuals from research due to lack of access? Are we fostering new programs to bring more diverse people to both contribute to national critical technologies?

- **Support:** Will critical research receive sustained support? Conversely, will critical technologies be deemed more fundable, leading to funding reductions in other disciplines? Will fundamental research be neglected in favour of applied research and commercialisation?
- **Maturity:** What stage does technology need to be at before it is assessed as potentially critical? Does it need to be ready for market and seeking commercialisation support?
- **Flexibility**: How readily will technologies be added to the critical list? How readily will they be removed? Is this a ministerial decision, will it remain in PMC, will there be a DISER office? Will there be a pool of funds to support emerging technologies to test their viability? Can those funds go back to primary critical technologies if not used?
- **Control:** What happens if the Government decides my research is critical? Do I lose control of it? Do I risk having it taken over by the Government, via Defence, Homeland Security or other department? Will it be regulated, and to what extent? Do my students need security vetting?
- **Adaptability:** How will collaboration and communication change in the period of current disruption, and how can the development of critical technologies be future-proofed?

To discuss or clarify any aspect of this submission, or to arrange further consultations with the Academy, its Fellowship or its National Committees, please contact Dr Stuart Barrow at stuart.barrow@science.org.au or 02 6201 9464.