AUSTRALIA'S ECONOMIC ACCELERATOR

Quantum

Australia's Economic Accelerator (AEA) is a $1.6 billion Australian Government investment aimed at transforming Australia's research translation and commercialisation landscape. AEA grants support the Australian Government identified priority areas for the economy (outlined in the *National Reconstruction Fund Corporation (Priority Areas) Declaration 2023*). Within these priorities, the first round of grants will prioritise projects that align with one or more of 6 focus areas, including advanced manufacturing, artificial intelligence, digital agriculture, quantum, sustainable fuels, and critical and strategic minerals processing.

Quantum technologies make downstream use of quantum physics principles to deliver innovations in sensing and measurement, positioning and timing, quantum communication and cryptography capabilities, and progress towards industry-ready quantum computation.

Enabling capabilities

> National priority

Quantum technologies require considered and timely investment in research and commercialisation to seize the economic and strategic opportunities that they present. Quantum aligns with the national priority areas through support for transformative technologies that drive cross-sectoral productivity.

- National Quantum Strategy
- List of Critical Technologies in the National Interest
- Future Made in Australia agenda
- National Defence Strategy

Advantage

Australia hosts world-leading research and early-stage commercialisation activity in quantum technologies and is endowed with key input materials for quantum components and goods.

Opportunity

Capitalise on an early-mover advantage to capture a share of the emerging global quantum technologies market and realise productivity and enabling benefits across domestic industries.

> Research strength

Australia's rank in the OECD calculated using 2018-2022 bibliometric data from Elsevier's SciVal. Quantum was defined using the Field of Research (FoR) Code 5108 – Quantum Physics.

11th
Output: number of scholarly papers

>

6th
Impact: field-weighted citation impact

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1st
Quality: share of publications in the top 10% of most-cited journals

> IP potential

Australia's share of publications cited in patent applications compared to the OECD average expressed as a percentage.

Refers to 2018-2022 patent and publication data in the Lens database.

127%

> Market opportunity assessment

- Australian market size of **AU$0.2 billion** in 2023[1]
- Projected compound annual market growth of **31.9%** from 2023-2028[2]
- Global market size of **AU$1.5 billion** in 2022[3]
- Projected global compound annual market growth of **40%** from 2022-2030[4]

> Example industry problems

AEA aims to provide developmental support for promising research commercialisation projects at the proof-of-concept or proof-of-scale level (TRL stages 3-7). Successful projects will scale up to meet emerging industry needs.

Industry problem	Opportunity	Impact
Lack of effective solutions for precision navigation in GPS-denied environments (e.g., subterranean, sub-sea, or space).	Developing GPS-free positioning devices using quantum principles and applying them to vehicle platforms and space.	Accurate and robust positioning for spacecrafts and vehicles in mining, maritime, space and defence applications.
Adapting to the risks for agriculture from increasing climate uncertainty and extreme weather events.	Using quantum computing techniques to more accurately model and forecast complex systems like climate and weather.	Greater resilience and efficiency for agricultural producers.
Conventional computing approaches struggle to accurately model complex molecular interactions.	Developing quantum software and hardware solutions for chemical and molecular modelling to apply to pharmaceutical, energy, and other industries.	Widen the aperture on possibilities in chemical synthesis and drug design and increase the speed of research and development pipelines that rely on computationally intensive modelling.

> Other public investment options

- The National Reconstruction Fund
- Industry Growth Program
- Advanced Strategic Capabilities Accelerator (Department of Defence)
- Critical Technologies Challenge Program

1 CSIRO 2020, Growing Australia's Quantum Technology Industry
2 DISR 2023, National Quantum Strategy
3 GlobalData 2023, Thematic Intelligence: Technology: Quantum Computing
4 GlobalData 2023, Thematic Intelligence: Technology: Quantum Computing