National Semiconductor Roadmap

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Semiconductor Sector Service Bureau

Australia's plan to build, scale and secure semiconductor capability

VISION 2040

Australia's specialised semiconductor capabilities enable the growth and competitiveness of priority sectors, strengthen national resilience, and participation in global supply chains.

Capability Focus Areas

Materials
Semiconductor-grade inputs from Australia's critical minerals base, and advanced materials

Technologies
Quantum, photonics, power and radio

Manufacturing services
Advanced packaging and heterogeneous integration, and metrology, characterisation and test

Products and applications
Device design, and system integration into higher-value products

Priority Pathways

1. Provide national sector and policy coordination
2. Building a skilled semiconductor workforce
3. Develop market access, investment and partnerships
4. Create value and resilience through commercial outcomes
5. Build strategic infrastructure and global integration

Key Markets

- Artificial intelligence
- Energy transition
- Defence
- Data centres and digital infrastructure
- Advanced manufacturing
- Health
- Quantum technologies

The National Semiconductor Roadmap sets out a shared vision for the sector to unite behind. It is the first time industry, research, education and government have come together and articulated where Australia's semiconductor sector could be by 2040, and what it will take to get there.

The Roadmap is about more than just the sector. Semiconductor capabilities are a defining feature of an innovative, capable and complex economy. They enable the growth and competitiveness of key market sectors that matter most to Australia and the world, from artificial intelligence and the energy transition to defence, health and advanced manufacturing, and it strengthens national resilience.

The Roadmap prioritises four Capability Focus Areas where Australia can build a comparative advantage. Capability is built through strategic action and investment across five Priority Pathways, designed to overcome the major challenges raised by stakeholders and to ensure breakthroughs are scaled here, where they create greater value and make the economy more resilient to future shocks.

Australia has foundational capability, expertise and talent to secure its place in global semiconductor value chains. What the sector needs is the national leadership, investment and coordination to turn that capability into scale. This Roadmap sets out how to realise the opportunity before us, and the time to start is now.

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A high value sector to build on

200+
organisations across the value chain

~1B
in semiconductor-related revenue, 2025

$820M
value added to the economy, 2025

5,790
full-time equivalent jobs supported

Australia's semiconductor sector is made up of more than 200 organisations from startups and small and medium-sized enterprises, large domestic anchor firms to, university-linked ventures and research organisations.

In 2025, the sector generated close to $1 billion in semiconductor-related revenue, contributed $820 million in total value added to the Australian economy and supported 5,790 jobs. Its research and IP base is deepest in photonics, quantum technologies, compound semiconductors, radio design and photovoltaics.

Activity is concentrated downstream, in the design and engineering-intensive work of integrating semiconductor technology into higher-value products, backed by a strong research and development base. Australian firms are deeply integrated into global value chains, developing technologies for global markets and drawing on overseas capability to manufacture and scale. Capability is spread across the country, with Sydney the largest hub and each state and territory contributing distinct strengths.

Shared research infrastructure and ecosystem enabling institutions connects this capability. The Australian National Fabrication Facility runs a national network of university nodes that gives researchers and start-ups access to cleanrooms and fabrication tools. CSIRO, ANSTO and the university research system work the same way.

Australia's strength is not in doing everything. It's in developing highly specialised capabilities and globally competitive products, companies and industries. No single economy holds the complete semiconductor supply chain, but Australia is a near-total importer of semiconductor devices, and that dependence leaves it highly exposed to disruption. The Roadmap concentrates effort on four capability focus areas where Australia already holds demonstrated research or commercial strength, and where it can build a comparative advantage and become internationally consequential. Together these areas serve the sectors on which Australia's future prosperity depends.

Capability focus areas

Materials
Australia's mineral endowment connects directly to the front of the chip supply chain.

Technologies
Research depth in quantum, photonics, power and radio technologies is producing commercial activity.

Manufacturing services
Specialised capability in advanced packaging, fabrication, metrology, characterisation and test.

Products and applications
Design and system integration work reaching medical devices, defence, space and communications.

A clear choice for growth and resilience

Semiconductors underpin the technologies, systems and services that modern societies rely on every day, from energy, health and communications to defence, transport and advanced manufacturing. As artificial intelligence, electrification and quantum technologies advance, the world's reliance on them will only deepen.

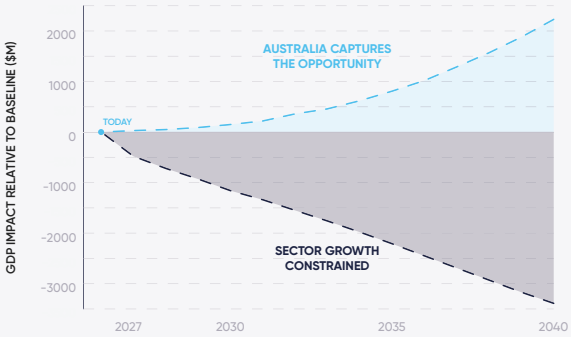
Much of the value is realised downstream, in the industries on which Australia's future growth and security depend. Production of the most advanced chips remains concentrated in a small number of facilities overseas, and pandemic-era shortages showed how quickly disruption flows through to the products that depend on them. For Australia, the economic case and the strategic case call for the same response.

Australia can build on the capability, expertise and talent developed over decades, or step back and allow others to reap the benefits. To measure what is at stake, S3B commissioned Deloitte Access Economics to estimate the economy-wide value of growing the semiconductor ecosystem, and the cost of allowing it to contract. The gap between the two paths is around $20 billion in present value terms to 2040: the value forgone by stepping back, plus the loss if the sector contracts. The Roadmap sets out the path for growth and resilience. In that future, the output of Australia's semiconductor ecosystem could be triple what it is today.

Realising this opportunity means focusing where Australia already holds demonstrated strength, rather than pursuing end-to-end capability. The sector was consistent about what stands in the way: a shortage of industry-ready talent and experienced mid-career professionals, a funding cliff between research and commercial scale, and gaps in the pilot-scale infrastructure that links research to low-volume production. It also called for stronger connections into trusted global supply chains. Above all, it wants national leadership: a long-term strategy, stable policy settings and a coordinating body to bring together capability across jurisdictions and institutions.

Australia's semiconductor sector has more to lose

ANNUAL ECONOMIC IMPACT BY SCENARIO, 2027–2040



GROWTH SCENARIO

+$5.3B

Total net economic impact
Net present value 2027–2040

CONSTRAINT SCENARIO

-$14.7B

Total net economic impact
Net present value 2027–2040

Note: Annual Gross Domestic Product (GDP) impact relative to the economic baseline, $ millions, undiscounted. All headline results are presented in present value terms, calculated over 2027-2040 using a 7% discount rate.
Source: Deloitte Access Economics (2026)

The first steps must start now

The Roadmap outlines key recommendations needed to deliver the 2040 vision. They are structured around two stages of implementation: Immediate Actions that can begin now, and Targeted Investments that will require planning, funding and sequencing.

The first steps need decisions: adopting the national ambition, a whole-of-government semiconductor policy and strategy, and a national industry body. Government and the sector can take these steps now. Every year of delay makes the growth path harder to reach.

Immediate Actions

Adopt a whole-of-sector ambition

A single national ambition for the sector to 2040, adopted by government, industry and research institutions.

Introduce a whole-of-government semiconductor policy and strategy

Aligns the industry, trade, research, skills and defence levers currently spread across portfolios.

Establish a national industry body

Coordinates effort across jurisdictions, represents the sector and provides shared leadership.

Targeted Investments

WORKFORCE

Establish a national industry-ready talent pathway framework

Builds practical skills through structured, hands-on learning, industry participation and clear career pathways, staged to 2040.

WORKFORCE

Establish an international talent attraction program

A coordinated program to attract, recruit and retain experienced international semiconductor professionals.

MARKET ACCESS

Develop an international engagement strategy

Presents Australia's capability internationally and improves access to capital and trusted, diversified supply chains.

MARKET ACCESS

Collaborate on critical mineral refining and processing for chips

Maps Australia's mineral endowment against semiconductor specifications to extend into higher-value processing.

COMMERCIAL OUTCOMES

Establish a national semiconductor innovation and translation centre

A front door to Australian capability, translating research and prototypes into production-ready technology.

INFRASTRUCTURE

Develop pilot-scale and low-volume manufacturing capability

Gives Australian firms access to manufacturing at pilot and low volume, so technologies can be scaled onshore.

INFRASTRUCTURE

Provide enduring support for national advanced packaging capabilities

Sustains advanced packaging beyond initial establishment, so solutions can scale onshore.

INFRASTRUCTURE

Support development of ANSTO semiconductor capabilities

Extends ANSTO's nuclear science and materials infrastructure into new semiconductor applications.

DOWNLOAD THE ROADMAP

SEMICONDUCTOR SECTOR SERVICE BUREAU

Australia's only industry hub for the semiconductor sector

Economic modelling conducted by Deloitte Access Economics, 2026.

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