

PROGRAM 1.1 – GROWING INNOVATIVE AND COMPETITIVE BUSINESSES, INDUSTRIES AND REGIONS

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ASSESSMENT OF FRAUD ALLEGATION RELATING TO THE ENTREPRENEURS PROGRAM

Headline Statement

- The department has taken appropriate action in relation to the complaint of alleged fraud within the Entrepreneurs Programme procurement process.

Key Points

- In August 2022, an unsuccessful tenderer for the Entrepreneurs' Programme lodged a complaint with the Secretary which included allegations of fraudulent behaviour regarding the Entrepreneurs' Programme procurement process.
- It was alleged a success-fee of \$900,000 from the winning tenderer was paid to an Accelerating Commercialisation Advisor who allegedly assisted the winning tenderer.
- In February 2023, assessment of the complaint material was commenced by an independent integrity advisor with relevant expertise to determine if any action was warranted by the department.
- The report of this assessment was finalised on 11 September 2023, and concluded there was no evidence of fraud or corruption, and an investigation was not warranted.
- There is no evidence the success fee was actually paid, and had a success fee been paid, the department's contracts with Commercialisation Advisors did not limit the support they could provide to tenderers. Therefore, such support (had it been provided) would not have breached the contract or indeed any Australian law. The department does recognise that the lack of limits on the support Commercialisation Advisors could provide future tenderers was a flaw in the program design at the time.
- The department has acknowledged the Entrepreneurs Programme procurement fell short of the appropriate standards of transparency, consistency, and fairness in its response to the ANAO audit report. The department accepted all the ANAO's recommendations and has implemented changes to strengthen its

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probity guidance and procurement practices. No other unacceptable behaviour was identified in the assessment.

- A redacted version of the report is publicly available on the department's website. Information in the report was redacted because disclosure could reveal some internal procedures and lawful methods for preventing, detecting, investigating, or dealing with breaches of the law. If the information was disclosed, it could prejudice the effectiveness of our fraud control and investigation methods or procedures. Business information relating to the Integrity Advisor was also redacted due to the nature of the allegations. This is because it could create a risk of reprisal for the advisor who operates a small business and could experience significant commercial and financial detriment in these circumstances.

Background

- In May 2022, in response to the draft ANAO report, the then Secretary commissioned an independent review related to the Entrepreneurs' Programme procurement. This review was undertaken by an independent external consultant who found the same issues the ANAO raised and provided recommendations for the department, however they did not discover any indications of fraud or serious misconduct or receive any allegations of same when speaking with staff.
- On 14 July 2022, the Secretary received a complaint from an unsuccessful tenderer from the Entrepreneurs' Programme procurement process. On 29 August 2022, the complainant also raised concerns information they provided to the department on 4 August 2022 was not actioned, and they believed there may be fraudulent activity related to the Entrepreneurs' program procurement process. The information received on 4 August 2022 was a letter seeking restitution under the Compensation for Detriment caused by Defective Administration due to alleged contraventions of the Commonwealth Procurement Rules.
- On 13 October 2022, the complaint regarding fraud was referred to the department's Fraud Control Officer. A procurement was undertaken to engage an independent Integrity Advisor to assess the allegations.
- In February 2023, the assessment of the complaint material was commenced to determine if any other action was warranted by the department. The report of this assessment was finalised on 11 September 2023, and concluded there was no evidence of fraud or corruption, and an investigation was not warranted. In accordance with AGIS, this assessment report was the first step to determine if there was sufficient information to indicate if a criminal offence has likely occurred and therefore reason to commence an investigation. In this instance, there was no information to indicate there had been non-compliance where dishonesty is the cause – which is more than accident, error, or poor administration. For a fraud investigation to commence there must be information to show intent to deceive or to be dishonest.

INDUSTRY GROWTH PROGRAM

Headline Statement

- The Industry Growth Program (IGP) supports innovative Australian startups and small and medium enterprises (SMEs) to commercialise their ideas and significantly grow their businesses.

Key Points

- IGP provides business advice services for innovative SMEs and startups, and matched grant funding between \$50,000 and \$5 million.
- IGP supports projects under National Reconstruction Fund priority areas and helps to expand the pipeline of businesses working to transform and diversify Australia's economy.
- Funding for the program is \$392.4 million over four years from 2023-24, and \$68.2 million ongoing. This is a combination of administered and departmental funds.

Policy Commitments

- The program was launched on 27 November 2023.
- **Advisory Services:** startups and SMEs receive access to advice from a national network of business growth and commercialisation Advisers. This includes recommending commercialisation and transformative growth strategies and/or development opportunities in a report.
 - The first tranche of 19 directly sourced Advisers started in December 2023 and January 2024. One Advisor resigned shortly after.
 - Currently there are 18 Advisers providing Advisory Services across all states and territories: 3 in Victoria and Tasmania, 6 in New South Wales and ACT, 5 in Queensland, 2 in South Australia and Northern Territory and 2 in Western Australia.

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- Two more Advisors are being onboarded and will commence delivering services shortly. Details of the Adviser contracts (including their remuneration) are located on AusTender.
- Differences in remuneration reflect different levels of experience (e.g. some are former company CEOs), part-time versus full-time arrangements and oncosts (such as insurance, equipment, telecommunications, marketing and other expenses).
- **Industry Partner Organisations (IPOs):** IPOs offer specialised sectoral expertise and advice as part of Advisory Services, complementing the work of Advisers. Four leading Australian not-for-profit industry organisations have been awarded a total \$6.9 million in grant funding over two years.
 - The four successful IPOs are: MTP-IIGC LTD (MTPConnect), Advanced Robotics for Manufacturing Hub Ltd (ARM Hub), Food and Agribusiness Network Limited (FAN) and Hydrogen Mobility Australia Ltd.
 - Advisers and the department will refer eligible IGP participants to receive advice from IPOs as required. IPOs were announced on 2 May 2024 and services will be available for referral shortly.
- **Grant component:** eligible startups and innovative SMEs with commercialisation and growth projects can receive matched grants, ranging from \$50,000 to \$5 million.
 - Grant opportunities for the program opened on 2 May 2024, and are available to eligible IGP participants. Businesses cannot apply for a grant opportunity until they have received an Advisory Service report from their Adviser. Once received, eligible businesses can submit a grant application at any time while the program is open.
 - There are **2 matched funding grants**:
 - : Early-stage commercialisation grants from \$50,000 to \$250,000 for projects at the feasibility, proof-of-concept or prototype stage.
 - : Commercialisation and growth grants from \$100,000 to \$5 million for projects in their prototype through to market readiness stage.
 - **Independent Assessment Committee:** A new committee, established under the Industry Innovation and Science Australia (IISA) Board, will assess applications and recommend grant funding for eligible applicants of the grant component.
 - : On 6 May 2024, members of the committee were appointed by the Minister for Industry and Science following a significant appointments process. The department followed the appropriate procedures, in line with the Cabinet handbook. In preparing its advice, the department undertook an expression of interest process in late 2023.

EP CLAIMS UPDATE

Headline Statement

- The department has received 16 claims for compensation following the release of Auditor-General Report No.42 2021–22, Procurement of Delivery Partners for the Entrepreneurs' Programme. As of 8 May 2024, 12 claims have been resolved.

Key Points

- As of 8 May 2024, 14 claims have been received under the *Government Procurement (Judicial Review) Act 2018* (GPJR Act).
- Eleven GPJR Act claims have been finalised, with the remaining three under consideration.
- As of 8 May 2024, two claims have been received through the Scheme for Compensation for Detriment caused by Defective Administration (CDDA Scheme).
- One CDDA claim has been withdrawn, with the assessment of the remaining CDDA claim on pause at the request of the claimant (as of 8 May 2024).
- Given the claims process is ongoing it would be inappropriate to provide further details including the monetary value of claims as some claim deeds contain confidentiality clauses.
- The statute of limitations for new claims under the GPJR Act runs for seven years from the time the tenderer became aware of the potential claim. Accordingly, new claims could potentially be received until 2029.
- The department has been processing claims for approximately one and a half years. We acknowledge the time taken but note this is a complex process involving the receipt of claims under two compensation mechanisms and the need for the department to take appropriate steps to manage the expenditure of public funds.

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Policy Commitments

- The department accepted all the recommendations in response to the Auditor-General report of the Procurement of Delivery Partners for the Entrepreneurs program, and has completed a program of work to implement a more comprehensive and rigorous probity framework and capability uplift. This program of work was signed off as being implemented by the department's Audit and Risk Committee on 16 June 2023.

Background

- The Australian National Audit Office (ANAO) released its performance audit on the Procurement of Delivery Partners for the Entrepreneurs' Programme (the procurement) on 24 June 2022. The ANAO found the procurement did not comply with the Commonwealth Procurement Rules.
- On 18 August 2022 the department invited unsuccessful tenderers to a debrief with the department's relevant senior executives regarding the procurement.
- Nineteen unsuccessful tenders accepted the invitation for a debrief. Debriefs commenced on 22 September 2022 and all debriefs have been completed.
- All unsuccessful tenderers were informed that if they wished to submit a claim for compensation under the *Government Procurement (Judicial Review) Act 2018* they may do so directly to the department.
- Compensation under the GPJR Act is limited to reasonable expenditure incurred in preparing a tender and the cost of making and seeking to resolve a complaint. Claimants are required to substantiate their reasonable expenditure.
- The Scheme for Compensation for Detriment caused by Defective Administration (CDDA Scheme) provides an avenue for compensation in relation to the department's conduct. Claims can be for any amount and compensation can be provided if the decision maker is satisfied that:
 - The department's conduct constitutes defective administration; and
 - The claimant suffered detriment as a direct result of the defective administration.

RESOURCES EXPLORATION USE OF R&D TAX INCENTIVE

Headline Statement

- Eligibility for the Research and Development Tax Incentive Program (RDTI) is defined in legislation. Decisions about RDTI registrations are made at arm's length from the portfolio minister.

Key Points

- The RDTI is a broad-based, sector agnostic, self-assessment program that encourages companies across all industry sectors to undertake research and development (R&D) to the benefit of all Australians.
- Legislation defines the kind of R&D activities eligible for support under the RDTI. The legislative test for eligibility concerns the R&D *activities* being conducted, not the main business of the company, or the industry the company may operate in.
- With the Australian resources sector spending approximately \$880 million per annum on R&D, it is expected various resources companies claim the RDTI.
- Industry Innovation and Science Australia and its R&D Incentives Committee have powers to register and make findings about the eligibility of R&D activities. This ensures government and industry collaboration underpins the delivery of the RDTI, and the advice of experienced committee members help inform decisions about eligibility.
- Government disclosure of confidential information — including specific information about companies' specific R&D activities or any compliance activities relating to the RDTI — is prohibited by the *Industry Research and Development Act 1986*.

Policy Commitments

- N/A

Background

- Lock the Gate recently raised concerns about resources companies receiving the RDTI for drilling and exploring for gas, despite this being excluded under RDTI legislation. Lock the Gate has also expressed concerns about resources companies publicly associating themselves with government programs like the RDTI as a means to help increase their investment attractiveness.

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BOOSTING FEMALE FOUNDERS

Headline Statement

- The Boosting Female Founders Initiative was announced by the previous government in 2018. It was a terminating program due to end in 2025, which the government has decided to wrap up early in view of its lack of measurable impact on the wider startup sector. In the Budget, the government has increased funding over the next 8 years to support a skilled and diverse workforce.

Key Points

- Boosting Female Founders aimed to help women entrepreneurs overcome disadvantages in accessing finance and support to grow their startups, and scale into domestic and/or global markets.
- The program sought to stimulate private sector investment into women-owned and -led startups, and boost entrepreneurship through increasing the diversity of startup founders.
- Boosting Female Founders has directly supported 123 majority female-owned and -led startups with grants, and over 900 with mentoring and advice.
- Early findings from an evaluation of the program undertaken by the department show that while it directly supported these businesses, it did not have a measurable impact on the wider startup ecosystem.
- The government continues to provide support for founders of startups and innovative small and medium enterprises through measures such as the Industry Growth Program.
- Launched on 27 November 2023, the Industry Growth Program provides business advice and matched grant funding (up to \$5 million) to support innovative Australian startups and small and medium enterprises to commercialise their ideas and significantly grow their businesses.
- The 2024-25 Budget includes \$38.2 million over 8 years to support a skilled and diverse workforce, including an \$8.5 million increase to the *Women in STEM and Entrepreneurship* program.

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Background

- The Boosting Female Founders Initiative provided majority women-owned and -led startups with grants on a co-contribution basis, and access to expert mentoring.
- The initiative offered grants between \$100,000 and \$400,000. More generous matched funding (up to \$480,000) was available for those who face additional barriers, such as women who are regional, rural or remote, Indigenous founders, migrant and refugee founders, and founders with a disability.
- Commencing in 2020, there were three rounds of the initiative.

Round	Launch	No. of applications	No. founders receiving grants	Total value of grants	No. founders receiving mentoring
1	March 2020	2,205	51	\$11.87m	219
2	March 2021	2,557	38	\$11.62m	576
3	May 2022	697	34	\$11.69m	107

- Round 3 was launched by the previous government on 6 May 2022, with Expressions of Interest closing on 2 June 2022.
 - Assessment of EOI applications by an Independent Assessment Committee concluded in June 2023, with delays from the election and government spending audit process.
 - 87 applicants were invited to Stage Two, with applications closing on 20 July 2023.
 - In December 2023 the department notified successful applicants and commenced grant negotiations to be executed as soon as outcomes were finalised.
 - On 7 February 2024, successful grant applicants were published on business.gov.au, and unsuccessful applicants were notified.

Media

- There has been some negative media coverage on the initiative due to several program implementation errors by the department, including incorrect notifications. The department regrets those errors and has focused on improving our systems and processes to avoid future mistakes.

LARGE INDUSTRIAL CLOSURES

Headline Statement

- The Government is committed to a Future Made in Australia – rebuilding Australian manufacturing is a large part of this. This targets investment to develop priority industries and capitalise on opportunities for workers and businesses.

Key Points

- The Future Made in Australia agenda will maximise the economic and industrial benefits of the move to net zero and secure Australia's place in a changing global economic and strategic landscape.
- The Budget measures seek to rebuild manufacturing particularly in high-skilled, high value-add areas consistent with Australia's comparative advantages, and build sovereign capability in areas of national interest.
- Businesses close, restructure, or are sold for several reasons, including market conditions, input and operating costs, ageing facilities, and changes in consumer demand.
- In some cases, workers can retain their jobs (e.g. under a change in ownership), remain working in other aspects of the business, or can be redeployed to other facilities.
- The Government has a set of support measures to help retrenched workers, delivered by the Department of Employment and Workplace Relations (DEWR). Questions should be directed to DEWR.
- The recent increase in companies entering external administration is in part correcting to reflect the pre-COVID levels. Manufacturing sectors are particularly exposed to economic shocks including inflation.
- In the recent Budget, Treasury notes a solid pipeline of business investment, and moderating inflation. **(Budget Paper 1, Statement 1, Budget overview page 5)**

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Policy Commitments

- The Future Made in Australia Act will bring together a package of initiatives to boost investment, create jobs and boost domestic manufacturing. (**SB24-000036** *Future Made in Australia* refers).
- The Net Zero Economy Authority (NZEA) will support workers impacted by the net zero transition, particularly workers in coal-fired power stations and dependent mines, to transition to new employment and other opportunities. Questions should be directed to NZEA.

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AUSTRALIAN MADE BATTERY PLAN

Headline Statement

- Global demand for batteries is set to quadruple by 2030 as the world transitions to net zero. The Government is delivering the Australian Made Battery Plan (the Plan) to ensure Australia can capture economic opportunities from this demand and diversify globally concentrated supply chains.

Key Points

- Under the Plan, the Government has committed to deliver the **National Battery Strategy**, the **Powering Australia Industry Growth Centre** and the **Australian Made Battery Precinct** to transform Australia's battery industry.
- To realise a Future Made in Australia, the Government announced \$549 million in the 2024-25 Budget to support battery manufacturing over seven years, this includes the **Battery Breakthrough** and the **Building Future Battery Capabilities**.

Policy Commitments

- The Government has committed to the following under the Plan:
 - Publish the **National Battery Strategy**, which was released on 23 May 2024 to guide governments and industry towards a shared vision of a diverse and competitive battery industry.
 - \$14.8 million to implement the **Powering Australia Industry Growth Centre** which will support Australian businesses to locally manufacture, commercialise and adopt new renewable technologies – such as batteries.
 - Establish the **Australian Made Battery Precinct** in partnership with the Queensland Government.
- In addition, \$5.4 million to establish the **Battery Supply Chain and Research Working Group** with the United States Government to support bilateral cooperation on battery manufacturing and innovation.
- These commitments are supported by 2024-25 Budget measures, including:

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- The \$523.2 million **Battery Breakthrough**, to promote the development of battery manufacturing capabilities through production incentives.
- The \$20.3 million **Building Future Battery Capabilities** to build future Australian battery capabilities and strengthen national collaboration.
- The \$5.6 million provided to support the Government conduct the necessary due diligence to deliver the Australian Made Battery Manufacturing Precinct

Background

National Battery Strategy (The Strategy)

- The recently released Strategy has been informed by significant public consultation, including industry roundtables and the release of a public consultation paper in February 2023.
- The Strategy draws on Australia's strengths, matched to our mineral availability, manufacturing capacity and local and global demand for products. It signals to international partners that Australia is open for investment and ready to play a role in diversifying global supply chains.

Australian Made Battery Precinct (The Precinct)

- The department is working collaboratively with the Queensland Department of State Development and Infrastructure to progress the proposal. The Precinct will bring together industry and academia to create national manufacturing scale and leverage the benefits of collaboration. The final investment decision is a matter for both governments.
- Funding from the 2024-25 Budget will support further analysis and research to ensure the required commercial, environmental and legal due diligence is conducted to inform the Commonwealth Government's consideration of the proposal.

Powering Australia Industry Growth Centre (the Growth Centre)

- On 16 February 2024, the Government announced Western Australia-based **Powering Australia Limited** as the successful recipient of a \$14 million grant to establish the Growth Centre. This announcement was made after a two-stage application process, reviewed by an Independent Assessment Committee. The Growth Centre will:
 1. Help businesses to manufacture renewable energy technologies and commercialise local ideas.
 2. Encourage connections between critical minerals producers and renewable manufacturers.
 3. Deliver First Nations advisory services to build First Nations business management capabilities.

Battery Breakthrough

- The Battery Breakthrough allows for production incentives to be targeted at the highest value opportunities in the supply chain. This ensures Australia can capture a once in generation opportunity to create a diverse and competitive battery industry.
- The Battery Breakthrough will be delivered by Australian Renewable Energy Agency consistent with the Government's approach under the Hydrogen Headstart and Solar Sunshot programs.

Building Future Battery Capabilities

- The Building Future Battery Capabilities measure will build future Australian battery capabilities and strengthen national collaboration through the provision of funding to the Future Battery Industries Cooperative Research Centre to deliver a supply chain navigator tool, battery innovation and scale-up program, and to support the development of best practice guidelines and standards. In addition, funding provided to the Powering Australia Industry Growth Centre will support the delivery of battery industry skills and training.
- Funding is subject to independent assessment to ensure that successful grant recipients can deliver intended objectives.

FUTURE MADE IN AUSTRALIA

Headline Statement

- The Government's Future Made in Australia (FMiA) agenda will maximise the economic and industrial benefits of the move to net zero and secure Australia's place in a changing global economic and strategic landscape.

Key Points

- The FMiA agenda builds on the Government's existing initiatives and will further strengthen Australia's capabilities in industry, science and resources, in a comprehensive and co-ordinated way.
- The package of FMiA initiatives will incentivise investment in a range of priority industries, capitalising on Australia's comparative advantages, and building sovereign capability in areas of national interest.
- Modern science, innovation and investments in technology will be critical to building an FMiA and creating opportunities to transform a wide range of sectors across the economy.
- A FMiA leverages Australia's critical mineral endowment to ensure Australian capacity and capability to support development of our industries onshore.

Policy Commitments

- The Government will invest \$22.7 billion over the next decade to accelerate investment in FMiA priority industries.

Industry and Science Portfolio

- The Government is supporting Australia to become a renewable energy superpower. This includes:

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- \$1.7 billion over 10 years from 2024-25 for the FMiA Innovation Fund, to be administered by the Australian Renewable Energy Agency, to support innovation, commercialisation, pilot and demonstration projects and early-stage development in priority sectors, such as batteries and green metals.
- \$549 million over eight years from 2023-24 to support battery manufacturing through the Battery Breakthrough Initiative, the Building Future Battery Capabilities measure, and the Australian Made Battery Manufacturing Precinct.
- \$18.1 million over six years from 2024-25 for foundational initiatives to expedite the emergence of Australia’s green metals industry, including through enhanced industry and research collaboration, and undertaking further consultation on incentives to support green metals production.
- The Government will also invest \$1.7 billion over ten years from 2024-25 in innovation, science and digital capabilities to support an FMiA.
 - The nearly \$470 million investment in PsiQuantum, with matching funding from the Queensland Government, will support the construction and operation of a world-leading quantum computing capability in Queensland, and build on our strong national quantum ecosystem.
 - \$145.4 million will be invested over two years from 2024-25 to maintain the National Measurement Institute’s (NMI) core measurement science capabilities to support industry and global trade, and to support NMI’s operations and future planning.
- Additionally, the Government will provide \$218.4 million over eight years from 2023-24 to support an FMiA through the development of a skilled and diverse workforce and trade partnerships.
 - Including \$38.2 million over eight years from 2023-24 to fund a range of Science, Technology, Engineering and Mathematics (STEM) programs to increase diversity in STEM education and industries
- The Government will also soon release the National Robotics Strategy, which will seize Australia’s robotics opportunity to build an FMiA.
- The Government will commission a strategic examination of Australia’s R&D system to determine how we can get more value from every taxpayer dollar invested in research, maximise the contribution of science and R&D to the broader economy, and maintain our competitive edge.

Resources Portfolio

- The Government is investing to support our critical minerals sector.

- The Government will invest in a Critical Minerals Production Tax Incentive.
 - It will provide \$7.0 billion over the decade to 2033-34 (and an average of \$1.5 billion per annum from 2034-35 to 2040-41), to support Australian critical minerals processing.
- The Government will also invest \$10.2 million to grow Australia's onshore processing of critical minerals by partnering with state and territory governments through the Critical Minerals National Productivity Initiative.
 - It will progress feasibility studies for common user minerals processing facilities.
- The Government will accelerate trade efforts to realise the premium of Australia's critical minerals that are produced to high environmental, social and governance standards through \$5.8 million over 3 years for a critical minerals trade enhancement initiative to negotiate and enforce benchmarks.
- The Government will provide \$566.1 million over 10 years to Geoscience Australia to accelerate the discovery of critical minerals and other resources necessary for the net zero transition and an FMiA.
 - The measure is fully funded over 35 years at a cost of \$3.4 billion.

Background

- Initial FMiA priority areas will focus on refining and processing critical minerals, producing renewable hydrogen, exploring production of green metals and low carbon liquid fuels, and supporting targeted manufacturing of clean energy technologies, such as batteries.
- The Government has already been implementing policy initiatives that support an FMiA.
 - The \$15 billion National Reconstruction Fund (NRF) will diversify and transform Australian industry through targeted investments in 7 priority areas of the economy identified by the government.
 - The \$392 million Industry Growth Program supports innovative startups and small and medium enterprises to commercialise their ideas, and significantly grow their businesses, within the NRF priority areas.
- These policy initiatives also build on the work undertaken to date under the *Critical Minerals Strategy* for developing a globally competitive critical minerals sector.
 - These include significant investments made to support Australia's critical minerals sector, including through the \$4 billion Critical Minerals Facility.

MAJOR PROJECTS FACILITATION AGENCY

Headline Statement

- To meet growing demand from industry, the Major Projects Facilitation Agency (MPFA) is constantly improving to provide better services.

Key Points

- In September 2023, the MPFA introduced changes to the way applications are managed.
- This has resulted in faster assessments and a streamlined application experience for proponents.
- Once an application has been formally submitted by a proponent, our commitment is to assess it within 50 business days, including:
 - Initial MPFA assessment (20 business days)
 - Engage with regulators for feedback (20 business days)
 - Provide a brief to the Minister for Industry and Science, who is the decision maker, to consider (10 business days).
- Between September 2023 and 31 March 2024, six applications have been assessed taking an average of 49.5 business days.
 - Prior to September 2023, where applications took longer than 50 business days to assess, this was in part due to:
 - The agency awaiting information from an applicant;
 - Draft applications that were never finalised by the applicant.
- In addition to the streamlined application form and supporting processes, we are looking at ways to further simplify how a business can engage with the MPFA.
 - For example, a business can pick up the phone and get support on specific regulatory issues via our general services offering.

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Background

- The MPFA supports the Australian Government's objectives of economic growth, job creation, and industry development by providing regulatory facilitation services to project proponents that have complex regulatory approvals.
- The MPFA assists project proponents across Australia by:
 - Providing facilitation services and engaging Commonwealth regulators, mapping regulation requirements and guiding proponents through any hurdles; and
 - Providing help tools and resources on our website to help business self-identify regulatory needs.
- MPS does not pre-empt or guarantee that a project will receive a regulatory approval, nor does it influence the outcomes of competitive processes. Proponents must still meet the requirements of the relevant Australian Government regulatory, grant or funding approval processes.
- The MPFA provides extra support and co-ordinated approvals to projects that the Minister for Industry and Science determines meet the following eligibility criteria for Major Project Status (MPS):
 - The project is of strategic significance to Australia with a capital investment of more than \$50 million;
 - Faces complex regulatory approvals; and
 - Has sufficient financial resources and is commercially viable.
- Proponents that qualify for MPS are assigned a dedicated case manager for a period of three years. Over this time the MPFA works with the proponent to map out the regulations that are relevant to their project and establishes a timeline of engagement and support.
- Proponents that have challenges with regulations that can be addressed more readily, can pick up the phone and receive immediate support without an application process.
- Key statistics:
 - The MPFA is providing facilitation services to 19 MPS projects (as at 31 March 2024).
 - The MPS projects industry sectors are: (7) critical minerals, (4) renewable energy, (2) oil and gas, (2) agriculture, (2) batteries, (1) advanced technology, (1) metal ore.
 - MPS projects by state: (9) Western Australia, (3) Northern Territory, (3) New South Wales, (3) Victoria, (1) South Australia.
 - In total, the MPS projects are worth around \$133 billion in CAPEX and plan to create approximately 10,000 ongoing jobs.

NATIONAL RECONSTRUCTION FUND

Headline Statement

- The Government has delivered on its commitment to establish the \$15 billion National Reconstruction Fund (NRF).

Key Points

- The *National Reconstruction Fund Corporation Act 2023* (the Act) commenced on 18 September 2023, establishing the NRF Corporation (NRFC). Mr Ivan Power was announced as CEO of the NRFC on 1 February 2024.
- The NRFC is engaged with businesses, entrepreneurs, financiers and investors all over Australia on a strong pipeline of opportunities.
 - The NRFC does not have fixed funding rounds or closing dates. The NRFC website has investment guidance and a webform that companies can use to provide their detailed proposals.
 - Further questions in relation to NRFC status and enquiries should be directed to the NRFC.
- There is an important balance between seizing opportunities as they emerge and taking the time to ensure investments are commercially sound and will drive the transformation of Australia's industrial base.
- The NRF forms part of a series of initiatives, including those under the Future Made in Australia (FMiA) agenda, designed to enhance Australia's capabilities in manufacturing, technology, and innovation.

Policy Commitments

- The NRF has been established to diversify and transform Australia's industry, create secure, well-paying jobs, and boost sovereign capability.
- The NRF will bolster Australia's resilience by strengthening manufacturing capabilities, improve Australia's ability to capture value adding opportunities, and support the commercialisation of Australian ideas.

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Background

- Following commencement of the Act, **the independent Board is responsible for the NRFC.**
- The Board will make investment decisions to provide finance (debt and equity) for Australian based investments in 7 government identified priority areas of the economy: renewables and low emission technologies; medical science; transport; value-add in agriculture, forestry, and fisheries; value-add in resources; defence capability; enabling capabilities.

NRFC funding

- The **2023-24 Budget** provided \$5 billion for investment on commencement of the Act. A further \$10 billion is to be credited to the NRFC by 2 July 2029.
- Drawing from already provisioned funds, the **2024-25 Budget** provided the NRFC an additional, one-off \$18 million in operational funding to supplement the 2023-24 Budget allocated operations funding of \$53.2 million.
 - It was always contemplated that additional funding may be required to support the NRFC on its path to financial sustainability and to progress its investment pipeline. The NRFC continues to ramp up hiring and operations to meet investment timeline expectations.

NRFC appointments

- NRFC Board members are **statutory appointments** made by the Minister for Finance and the Minister for Industry and Science. Following a process to identify the best candidates, the inaugural NRF Board was announced on 9 August 2023, comprising a Chair and seven members. An additional Board member was announced on 20 October 2023.
 - The Board comprises: Mr Martijn Wilder AM (Chair); Mr Ahmed Fahour AO; Dr Katharine Giles; The Hon Kelly O'Dwyer; Mr Daniel Petre AO; Ms Kathryn Presser AM; Ms Karen Smith-Pomeroy; Mr Glenn Thompson and Mr Daniel Walton.

CEO remuneration

- The Assistant Minister for the Public Service designated the NRFC CEO a Principal Executive Office (PEO) Band E. The Remuneration Tribunal has prescribed a remuneration range for Band E PEOs of 'from \$609,110'.
- Under the *Remuneration Tribunal Act 1973*, the Board may determine the terms and conditions that apply to the CEO, consistent with those determined by the Tribunal.

NRFC legislative framework

- The NRFC's independent Board will make investment decisions in accordance with the Government's priorities as set out in the suite of NRF legislation: the Act (received Royal Assent on 11 April 2023); the *National Reconstruction Fund Corporation (Priority Areas)*

Declaration 2023, (a disallowable instrument tabled in both houses of Parliament on 13 June 2023); and the *National Reconstruction Fund Corporation (Investment Mandate) Direction 2023*, (a non-disallowable instrument registered on 29 November 2023).

Co-Investment Plans

- The Government is working with industry to develop co-investment plans that identify high-level investment opportunities and broader reforms to support growth across the priority areas. The *Medical Science Co-investment Plan* was released on 15 April 2024 with the remaining 6 to be released over the coming months.

AUSTRALIAN SPACE AGENCY

Headline Statement

- The Australian Space Agency (the Agency) contributes to Australia's wellbeing and prosperity through the responsible use of space.

Key Points

- The Albanese Government reaffirmed the role of the Agency in the 2023-24 Budget. The Agency advances Government objectives through five priorities:
 1. Lead policy and coordination of civil space activities across government:
 - The Agency coordinates across 27 government agencies to ensure Australia can access and realise the opportunities of space to help address critical issues on Earth, including climate change, productivity and national security.
 2. Shape and grow national space capability, including delivery of programs:
 - Delivering over 60 space sector-facing procurements and grants, including one of Australia's most ambitious robotics programs to design and build the first Australian rover to operate on the Moon as part of the United States (US) Artemis Program.
 3. Use space to support foreign policy objectives:
 - Collaborative space initiatives with priority international partners such as the US, India and the UK, focused on space infrastructure and manufacturing.
 4. Regulate a responsible space sector:
 - Proactive ongoing improvements to the regulations, guidance and stakeholder engagement in administering the *Space (Launches and Returns) Act 2018*, to minimise unnecessary regulatory burden, while achieving the objectives of the Act.
 5. Promote the value and benefits of space, including to inspire a highly skilled workforce of the future:
 - Inspiring a STEM workforce through programs focused on diversity and skills, including the Kids in Space program delivered to 240 classrooms and over 9,000 school students and hosting over 100,000 visitors to the Australian Space Discovery Centre.
- The space industry can access the \$15 billion National Reconstruction Fund and the \$392 million Industry Growth Program.

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Last updated: 21/05/2024 9:41:00 AM

- The Australian Civil Space Strategy 2019-2028 was published on 1 April 2019 and can be found on the Department of Industry, Science and Resources' website. This plan was published before May 2022 under the previous Australian Government. It is standard practice following a changeover in Government for such plans to remain publicly available.

Regulation of Australian space activities

- Protecting people and property, as well as our natural environment, are critical to the long-term sustainability of the space sector– it builds social license with the community and demonstrates success to our international partners.
- Ensuring the safety of launches from Australia and encouraging entrepreneurialism is not an either-or proposition and is the core purpose of the *Space (Launches and Returns) Act 2018*.

Technology Safeguards Agreement (TSA) and Technology Transfer from the US

- The TSA between Australia and the US was signed on 25 October 2023. A TSA is a US requirement for the launch and return of US spacecraft in countries outside of the US.
- The TSA strengthens Australia's long-standing partnership on space with the US and will create opportunities for Australian companies to benefit from increased US spaceflight to and from Australia.
- The treaty is subject to the domestic treaty-making process. It was tabled in Parliament on 28 February 2024, with entry into force expected in mid-2024.
- The AUKUS Tech Transfer arrangements do not impact on the TSA. Questions on tech transfer reform should be directed to the Department of Defence.

NSMEO – space relationship with the US

- Termination of the National Space Mission for Earth Observation was managed within Australia's broader relationship with the US.
- The Agency continues to cooperate with the US on a range of space programs, including to the benefit of Australian industry.
- One key activity is negotiation of a Space Framework Agreement treaty, which will provide an overarching framework to unlock greater bilateral collaboration, further supporting the interoperability of our space sectors.

REFRESH OF NATIONAL SCIENCE AND RESEARCH PRIORITIES

Headline Statement

- A new National Science Statement (the statement) and new National Science and Research Priorities (the priorities) are being finalised after extensive consultation led by Australia's Chief Scientist, Dr Cathy Foley, and the department in 2023.

Key Points

- The statement will outline the government's vision for science driving a dynamic economy in Australia.
- The priorities will give clarity on the science and research areas Australia will need to focus on to develop new industries, provide well paid jobs and improve our quality of life.
- Together they will set a long-term direction for Australia's science system.
- The priorities and statement are based on extensive consultation, including roundtables in every state and territory, and close to 500 written submissions from two rounds of consultation.
- The priorities and statement are currently being finalised within government.

The department's policy commitments

- The Australian Government released Terms of Reference for the revitalisation of the priorities and statement on 24 November 2022.
- The Terms of Reference state that the government has committed to develop a national policy framework that embeds science into government decision making and better aligns efforts and investment in science to deliver social, economic and environmental benefits for all Australians.
- The Terms of Reference include that the statement will consider how to address areas such as the importance of scientific advice to inform decision making – ensuring appropriate mechanisms for providing government with independent, expert scientific advice.

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Background

- The revitalisation was announced by the Minister for Industry and Science on 27 September 2022 with an aim to finalise within 12 months.
- A taskforce was established within the department to deliver the revitalisation of the National Science and Research Priorities and National Science Statement (as well as the Pathway to Diversity in STEM Review).
- Australia's Chief Scientist, Dr Cathy Foley, led a national conversation during 2023 to inform the development of the priorities and statement.
- The first phase of public engagement ran from 23 February to 6 April 2023 and focused on identifying national challenges and opportunities that science has a role to address.
- This phase included 30 virtual and in-person roundtable events held around Australia with key stakeholders from science, research, government, higher education, industry, and community groups.
- It also included an online consultation, which received 312 submissions. Non confidential ones have been published.
- Following this first phase of engagement, the department developed a list of draft priorities in consultation with select stakeholders, including the learned academies, university groups, First Nations representatives, the National Science and Technology Council, state and territory chief scientists (Forum of Australian Chief Scientists), Australian government departments and agencies with science capability (Government Scientists Group).
- The draft priorities were published for consultation on 7 September and closed 29 September 2023. They included:
 - Ensuring a net zero future and protecting Australia's biodiversity
 - Supporting healthy and thriving communities
 - Enabling a productive and innovative economy
 - Building a stronger, more resilient nation.
- The consultation also invited input to inform development of the National Science Statement.
- The department received a total of 170 written submissions. Non confidential submissions will be published in due course.
- When published, the priorities and statement will replace the outdated 2015 priorities and 2017 statement.

INDEPENDENT REVIEW INTO DIVERSITY IN STEM

Headline Statement

- Through the 2024-25 Budget the Australian Government is providing an additional \$38.2 million over 8 years (and \$1.3 million per year ongoing) to support a thriving, skilled and diverse STEM workforce. This funding will top up existing women in STEM and science engagement programs to reach more diverse cohorts and will address recommendations of the Pathway to Diversity in STEM Review (the Review).

Key Points

- The government will invest \$38.2 million over 8 years (and \$1.3 million per year ongoing) of additional funding to seven existing STEM programs that are working well.
 - By expanding the scope of these existing programs, the additional funding will support more women and girls, First Nations people, CALD people, and people from regional and rural areas to participate in STEM education and careers.
- Additional funding will help address the main findings of the Review that:
 - several existing programs supporting women in STEM are having positive impact (informed by an independent evaluation)
 - there are opportunities to improve programs to attract and retain more diverse people along STEM pathways
 - longer-term funding is needed to deliver sustained impact for underrepresented groups
 - perceptions and stereotypes about who can, and should, participate in STEM must be challenged, including elevating First Nations knowledges.
- The government is preparing its response to all 11 recommendations of the Review, to be released in due course.
- Overall, in net terms more money is being allocated this Budget to diversity in STEM and science engagement programs:
 - an additional \$14.0 million (net) over the forward estimates will see total funding for these Diversity in STEM and science engagement programs increase to \$90.1 million.

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- an additional \$25.0 million (net) is being allocated to these programs over the next 14 years bringing total funding to \$127.7 million.
- The cost of this measure is partly being met by not renewing grants in some other STEM programs.

Background

- The government commissioned the Review in November 2022 to recommend ways to break down persistent barriers preventing underrepresented groups from participating in STEM.
- The expert panel appointed to the Review were Ms Sally-Ann Williams (Chair), Dr Parwinder Kaur, and Ms Mikaela Jade.
- The Review’s final report, released in February 2024, was informed by 12 months of public engagement, research, and an independent evaluation of the government’s existing Women in STEM programs. The Review panel provided 11 detailed recommendations for government, industry and the academic sector, across 4 areas:
 - Government coordination and leadership:
 - : The government establishing a dedicated advisory council to increase diversity and inclusion in STEM, and a suite of impactful diversity in STEM programs.
 - Creating safe and inclusive workplaces:
 - : STEM organisations committing to eliminate workplace bullying, harassment and discrimination, and increasing attraction, retention and promotion of diverse STEM workers.
 - : The government changing grants and procurement processes to incentivise workplace actions, and addressing barriers faced by STEM migrants.
 - Lifelong learning:
 - : Governments working together to improve participation and achievement in STEM education and supporting educators to engage diverse cohorts in STEM.
 - : Governments working together to ensure national tertiary education reforms include a focus on underrepresented cohorts in STEM education.
 - Changing perceptions and valuing diverse knowledge:
 - : The government developing a strategy to increase visibility and importance of diversity in STEM careers, and developing better practices to elevate First Nations Knowledges, and support First Nations scientists and researchers.

SAFE AND RESPONSIBLE AI OVERVIEW

Headline Statement

- The Government is taking action to ensure the design, development and deployment of Artificial Intelligence (AI) in legitimate, but high-risk settings is safe and can be relied upon, while ensuring AI in low-risk settings can continue largely unimpeded. This will lift trust in AI, boosting adoption to transform industries, create new jobs and drive innovation.

Key Points

- The 2024-25 Budget continues Government's workplan to deliver Australia's safe and responsible AI agenda. This builds upon our consultation through the *Safe and responsible AI in Australia* discussion paper and interim Government response released in January this year.
- The Government has provided \$39.9 million over five years from 2023-24 for the development of policy and capability across Government to support the adoption and use of AI technology in a safe and responsible manner.
- These measures build on action already taken to implement the interim response including:
 - developing, with industry, a voluntary AI Safety Standard through the National AI Centre (NAIC). The first version is expected to be released soon.
 - establishing a temporary AI Expert Group to develop options for further public consultation on implementing mandatory guardrails for AI in high-risk settings.
- The 2024-25 Budget builds on other investments to boost AI capability including:
 - the AI Adopt program, which will provide \$17 million to establish up to five new centres giving Small to Medium Enterprises (SMEs) support and training to make more informed decisions about using AI to improve their business.
 - \$34.5 million continues for the Next Generation Artificial Intelligence and Emerging Technologies Graduates programs.
 - \$1 billion in enabling capabilities in the National Reconstruction Fund and support through the Industry Growth Program.

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Policy Commitments

- AI funding in the 2024-25 Budget:
 - repurposing \$21.6 million to bring the NAIC into the Department of Industry, Science and Resources (the Department). This positions the NAIC as the Commonwealth's key organisation for enabling industry engagement and driving new models of collaboration among researchers, academics and industry on AI.
 - investing \$11.5 million in the Department over two years from 2024-25 to support industry analytical capability and coordination of AI policy development, regulation and engagement activities across government.
 - : This funding will strengthen in-house technical capability.
 - : The government needs technical expertise to inform its work on the safe and responsible use of AI so Australia can seize the opportunities presented by this technology,
 - measures in other portfolios:
 - : \$4.2 million for Treasury, the Attorney General's Department and the Department of Health to conduct initial regulatory reviews of priority areas including health care, consumer and copyright law; and
 - : \$2.6 million in Home Affairs to lead work addressing the national security risks of AI.
- A permanent AI Advisory Body will be established to build on the work of the temporary AI Expert Group.
 - The AI Advisory Body will provide advice to policymakers and regulators.
 - It will ensure government has access to leading independent expertise as part of its ongoing response to the opportunities and risks of AI. It will include expertise from civil society, industry and academia.
- Work is underway to develop options for mandatory guardrails, as well as laws that may need to be strengthened. It will focus on AI in settings that are legitimate, but high-risk settings.
- The temporary AI Expert Group has supported this work. It has considered definitions of high-risk; possible testing, transparency and accountability measures; and options for regulatory mechanisms to give effect to these measures.

Background

- Australia's plan to be a leader in the safe and responsible adoption of AI technologies builds on related work across all government portfolios to strengthen existing laws and practices to address risks and harms from AI, including:
 - The work of the AI in Government taskforce;
 - Implementing privacy reforms;
 - Strengthening eSafety Measures;
 - Implications of AI on copyright;
 - Introducing new laws to combat mis and disinformation;
 - Implementing the Robodebt Royal Commission Recommendations;
 - Implementing the Cyber Security Strategy; and
 - Developing the National AI Schools Task Force and framework for the use of generative AI in schools.
- The Department provided a written submission to the Senate Select Committee on Adopting AI. The submission covered:
 - Potential opportunities and risks of AI;
 - The importance of adoption of AI to Australia's economy;
 - Government work providing regulatory clarity and certainty;
 - Government work supporting best practice for safety and adoption;
 - Related work across government;
 - International approaches; and
 - Data and environmental considerations.

NATIONAL ROBOTICS STRATEGY

Headline Statement

- The National Robotics Strategy (the Strategy) was released on Tuesday 28 May 2024. It sets a vision for Australia's robotics ecosystem to excel in developing, manufacturing and using responsible robotics and automation technologies to support a Future Made in Australia.

Key Points

- The Strategy outlines the Australian Government's commitment to harnessing Australia's strengths in robotics and automation and the actions needed to accelerate the responsible development, manufacture and adoption of these technologies in priority sectors. These sectors include manufacturing, mining, health and aged care, and agriculture.
- Automation, including robotics, is predicted to increase annual productivity growth in Australia by 50 to 150 percent and add an additional \$170-600 billion per annum to GDP by 2030 (McKinsey, 2019).
 - For example, responsible development, manufacture and adoption of robotics and automation will improve Australia's productivity and manufacturing capabilities, while helping to respond to climate change and workforce shortages.
- The Strategy sets a national direction for our robotics ecosystem and envisages using automation to build national resilience and a promote Future Made in Australia through four core themes:
 - National capability: Build a strong collaborative robotics and automation ecosystem that delivers world leading research, has clear pathways to market and exports globally.
 - Increasing adoption: Increase the adoption of robotics and automation across the economy, particularly Australian solutions in critical industries like advanced manufacturing, mining and agriculture.
 - Trust, inclusion and responsible development and use: Ensure the design and deployment of robotics and automation solutions are responsible, secure, ethical, lawful and inclusive.

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- Skills and diversity: Support Australians from all backgrounds to contribute to and benefit from the development and adoption of robotics.

Policy Commitments

- The Strategy is supported by a suite of flagship government policies, including:
 - The National Reconstruction Fund, which makes targeted investments to help Australia capture new, high-value market opportunities to diversify our industries and strengthen our economy. This includes investing \$1 billion into enabling capabilities such as robotics.
 - The Industry Growth Program, which supports innovative small and medium-sized organisations, inclusive of robotics and automation businesses, by providing commercialisation and growth advice.
 - This includes partnering with the Advanced Robotics for Manufacturing Hub as an Industry Partner Organisation to provide specialised robotics advisory services to start-ups and SMEs.
 - The Advanced Strategic Capabilities Accelerator, which will drive development and acquisition pathways for Australian robotics and autonomy researchers and industry.
- The Government will monitor the implementation of the Strategy and growth of Australia's robotics ecosystem and will consider further measures where gaps are identified.

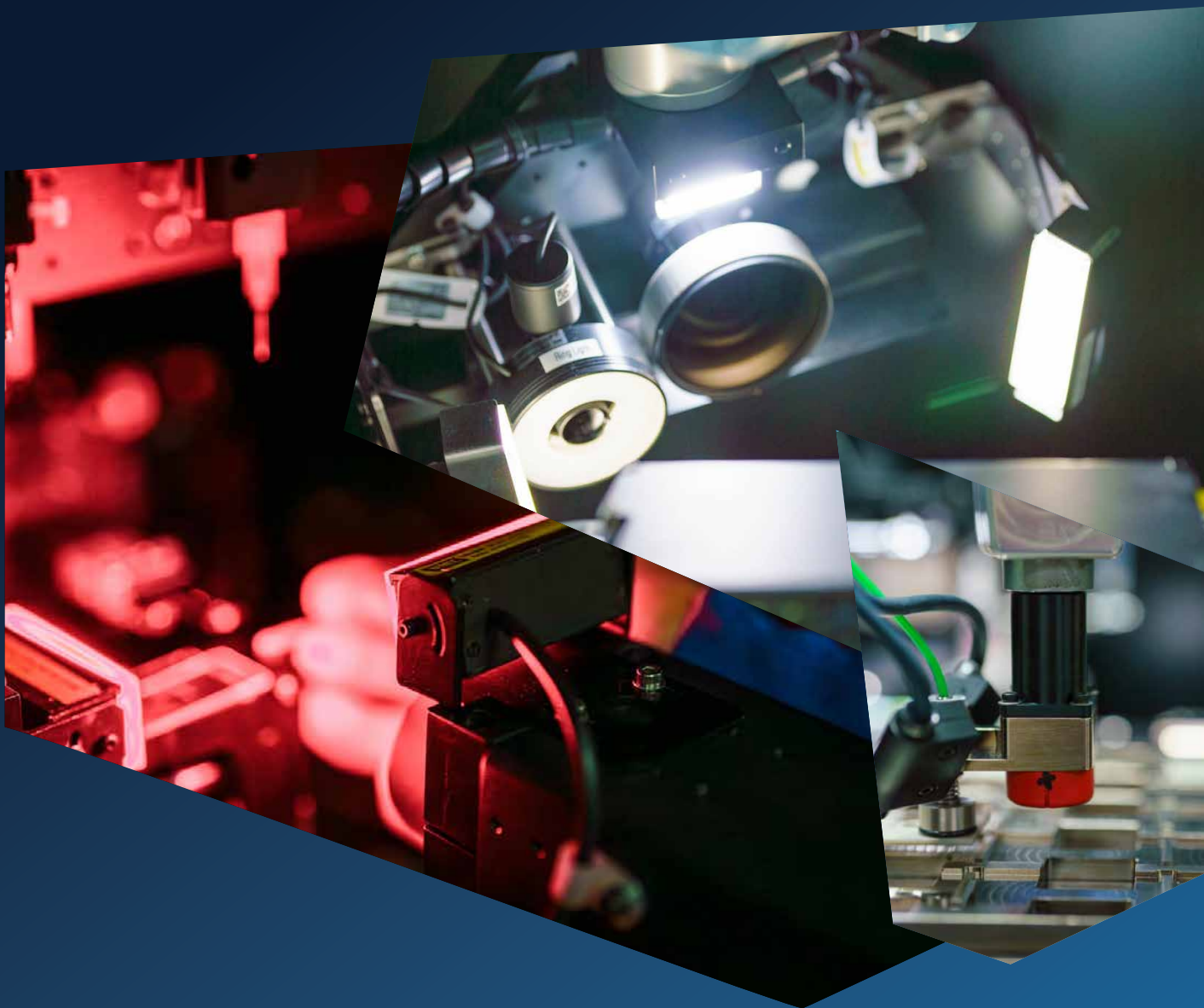
Background

- In August 2022, Minister Husic announced the development of the Strategy and appointed the National Robotics Strategy Advisory Committee on 13 December 2022 to help guide the development of the Strategy.
- The Strategy has been informed by extensive stakeholder consultation, including over 100 submissions, and a series of workshops across Australia that attracted over 155 unique participants spanning from industry, peak bodies, academia and community organisations.



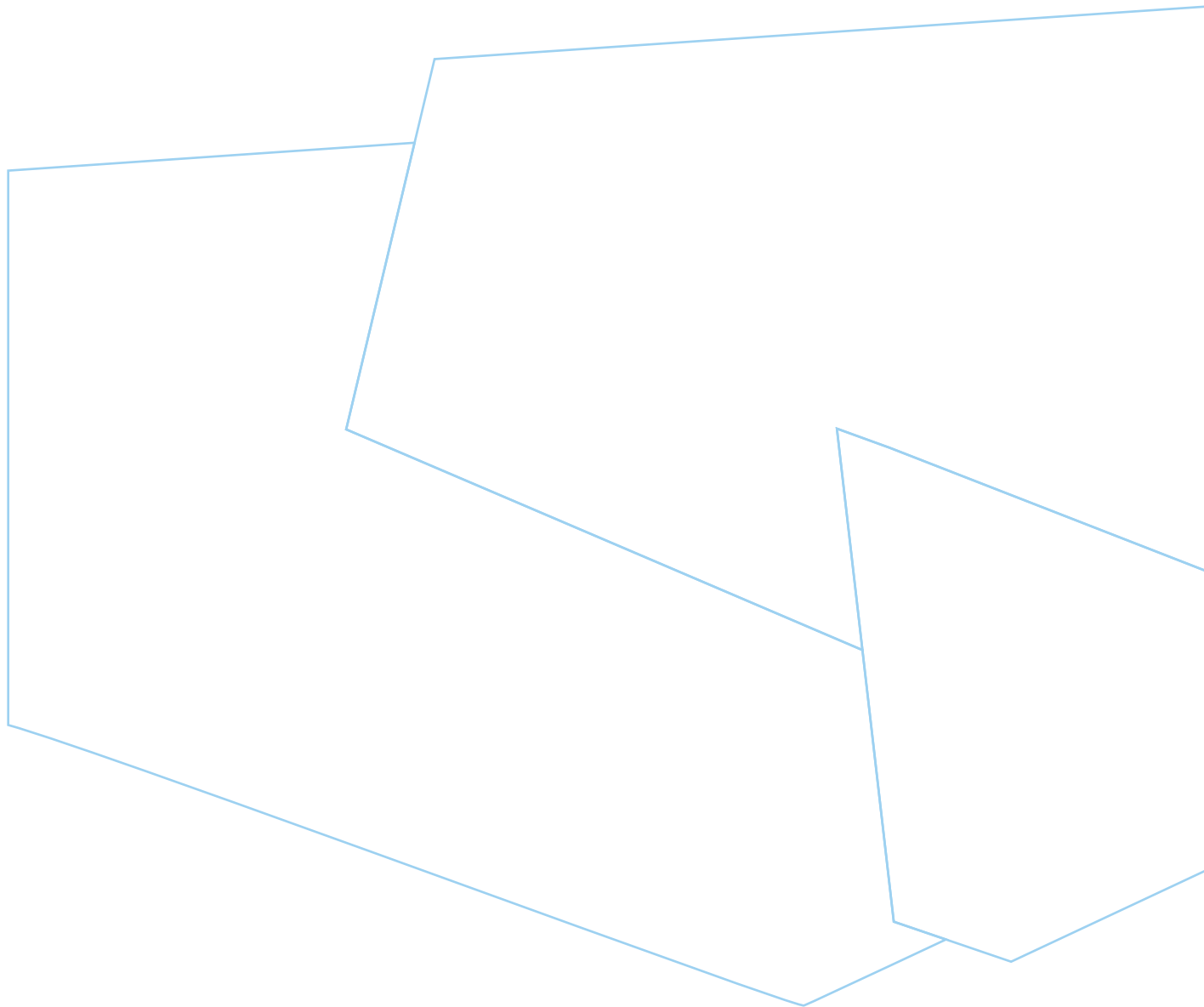
Australian Government
Department of Industry,
Science and Resources

National Robotics Strategy



| industry.gov.au/NationalRoboticsStrategy

National Robotics Strategy



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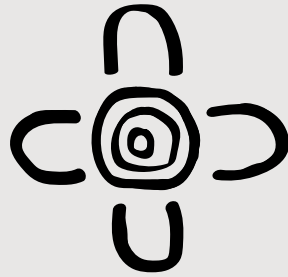
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Acknowledgement of Country

Our department recognises the First Peoples of this Nation
and their ongoing cultural and spiritual connections to the lands,
waters, seas, skies, and communities.

We Acknowledge First Nations Peoples as the
Traditional Custodians and Lore Keepers of the oldest living
culture and pay respects to their Elders past and present.
We extend that respect to all First Nations Peoples.



| Photo caption: An autonomous robot surveying farmland.
| Photo credit: SwarmFarm Robotics.

Message from the Minister for Industry and Science

Robotics and automation are critical to building a Future Made in Australia.

Around the world, countries are investing in revitalising their manufacturing base. Despite recent improvements, over the last 15 years, Australia's manufacturing industry has shrunk more than any other sector in our economy. The retirement of manufacturing assets in Australia currently outpaces investment, with capital stock depreciating by \$190 million. A healthy manufacturing industry onshores supply chains, lowers production costs, and drives innovation and jobs growth.

Australia's limited uptake of robotics and automation to date is holding back Australia's manufacturing industry. We know the benefits of these technologies. Only a 1% increase in robotics can lead to a whole of economy 0.8% increase in productivity by automating high-value manufacturing and enabling production at scale.

Yet, Australia ranks 32nd globally in the adoption of industrial robots. Lifting the adoption of these technologies will allow our manufacturers to produce higher quality products in less time and make them more internationally competitive.

And it's not just in manufacturing. We're seeing robotics across our economy combat workforce shortages in sectors under pressure like agriculture, health and aged care, and emergency response. Developments in artificial intelligence allow robots to harvest crops, deploy and maintain solar panels, respond to emergencies and much more. Today robots are also supporting complex surgeries, boosting production capability in small businesses and keeping our workers safe in factories, construction sites and mines. And our aspiration should be to make more robotics and automation solutions here in Australia.

Adopting robotics and automation is about supporting workers, not replacing them. Countries investing in robotics and automation have higher manufacturing outputs alongside increased employment, growth, and job satisfaction. That's because robotics and automation can take care of the dirty, dull and dangerous activities, leaving skilled workers to focus the tasks where they can add the most value.

The National Robotics Strategy is the first of its kind in Australia. It sets a vision to develop and adopt our own robotics solutions to secure Australia's future and seize the opportunity in front of us. It highlights that the development and deployment of these technologies is supporting more rewarding, safe and dynamic jobs across our economy. It demonstrates pathways to support manufacturers upgrading and renewing capital stock. It builds on our strengths and expertise in robotics, outlining how robotics and automation can work for us, and how we can develop the right skills to build a Future Made in Australia.

I want to thank the Advisory Committee Chair, and committee members, for their efforts developing a strategy that demonstrates the immense value of robotics to our economy, if we can seize the opportunity.



The Hon Ed Husic MP
Minister for Industry and Science

Message from the Advisory Committee Chair

The responsible adoption of robotics and automation technologies will be transformative for Australia.

The recent, rapid advances in artificial intelligence are allowing robots to perform complex tasks and solve problems in almost every industry in collaboration with people. We are seeing more sophisticated and user-friendly robots being used in Australia, making robots more practical and efficient than ever.

From addressing national challenges such as labour shortages, improving productivity and revitalising our manufacturing capabilities to providing safer and more fulfilling opportunities for workers, robotics are a critical part of our future. It will enable extraordinary new innovations in everything from medical technologies to architecture.

That's why this National Robotics Strategy is such a timely and important document. What makes it powerful is that it's been forged and formed by the views, ideas, comments and concerns of many, many Australians. We consulted extensively across the country and engaged with leading minds in robotics, technology, industry, productivity, ethics, community and workplace issues.

Every submission we received was carefully addressed, every idea weighed, every concern considered, and every recommendation made with meticulous attention to the opportunities, the risks, the context and ultimately the benefits for Australia. On behalf of the Advisory Committee, I would like to offer my sincere thanks to everybody who contributed to the strategy's development.

Australia already has enormous capabilities in robotics and automation, a deep expertise and experience accrued over decades. This strategy celebrates that, including through diverse case studies that showcase Australia's know-how, strengths and success in robotics and automation. The time to systematically and strategically build on this know-how and use the experiences of what we can learn from other countries and address the gaps and opportunities at home, is now.

It is critical for Australia's future that we get this right. The National Robotics Strategy is about creating a clear and shared vision so that we can work at pace with what is a truly transformative technology.



Professor Bronwyn Fox

CSIRO Chief Scientist, and Chair of the
National Robotics Strategy Advisory Committee

Strategy at a glance

Vision

Australian industries are responsibly developing and using robotics and automation technologies to strengthen competitiveness, boost productivity and support local communities.

Goals and objectives

National capability

Goal: Australia has a strong, collaborative robotics and automation ecosystem that is recognised for its strengths, has a thriving domestic market and exports globally.

- Boost research and development, commercialisation and scaling up of Australian solutions targeting areas of Australian strength.
- Use government's purchasing power to grow domestic demand for robotics and automation.
- Raise the profile of Australia's robotics and automation capabilities and supply chains locally and globally.
- Leverage Australia's international partnerships and networks, as well as state and territory governments, to create new opportunities.

Increasing adoption

Goal: Australian industries are supported to integrate robotics and automation technologies into their operations in ways that benefit Australian workers and communities.

- Raise awareness of robotics and automation technologies and their benefits for critical industries, like advanced manufacturing, agriculture and mining, to support Australia's future competitiveness.
- Support and incentivise Australian businesses to adopt local robotics and automation solutions.
- Improve digital and telecommunications infrastructure underpinning robotics and automation.

Trust, inclusion and responsible development and use

Goal: Robotics and automation technologies designed and adopted in Australia are safe to use alongside Australian workers, and are secure and inclusive by design.

- Ensure regulatory and legal frameworks enabling and applying to automation technologies are fit for purpose.
- Better understand and address the social impacts of robotics and automation in critical industries.
- Promote Australia's engagement in relevant bodies for setting international standards.
- Improve safety and cyber security of robotics and automation technologies.

Skills and diversity

Goal: Australians from all backgrounds contribute to and benefit from the development and adoption of robotics and automation.

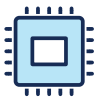
- Strengthen pathways into robotics-related careers.
- Identify ways to better promote diversity and inclusion in robotics industries.
- Monitor and plan for workforce changes and skills development alongside greater adoption of robotics and automation technologies.
- Attract skilled migrants to increase our economic prosperity and security.
- Raise awareness of the skills needed to support a technologically advanced economy.

Robotics technologies

The National Robotics Strategy uses the following definitions:¹



Robots are machines with a degree of autonomy that can move in their physical environment or manipulate objects. All robots have 4 essential characteristics: sensing, movement, energy and autonomy.



Robotics is the science and practice of designing, manufacturing and using robots.



Autonomy is the ability to perform intended tasks based on current state and sensing, without human intervention.



Automation is the performance of actions based on a set of predefined criteria, without human intervention. Automation will be considered in the strategy where it is enabled by robots.



The field of robotics encompasses many **enabling technologies** that are used in robots, such as computer and machine vision, sensors and sensing systems, artificial intelligence (AI) and machine learning.



The term **robotics and automation technologies** is used to refer collectively to all technologies listed above.

Robots are traditionally divided into industrial and service robot types:



Industrial robots are automatically controlled, reprogrammable and multi-purpose manipulators that can move in 3 or more axes. They can be fixed in place or mobile and are used in industrial automation applications.



Service robots are robots that perform useful tasks for humans or equipment, excluding industrial automation applications.

¹ For detailed technical definitions, refer to the International Organization for Standardization (2021),

'[ISO 8373:2021 Robotics – Vocabulary](#)', International Organization for Standardization website, accessed 14 August 2023.

The strategy refers to specific types of robots, including:

Field robots

Robots that operate in large, unstructured outdoor domains.

Case study: Solar Energy Robotics is a specialist division of [Innovative Energy Solutions](#). It has developed an autonomous robot to clean solar arrays in the harsh, arid environments of remote mine sites.

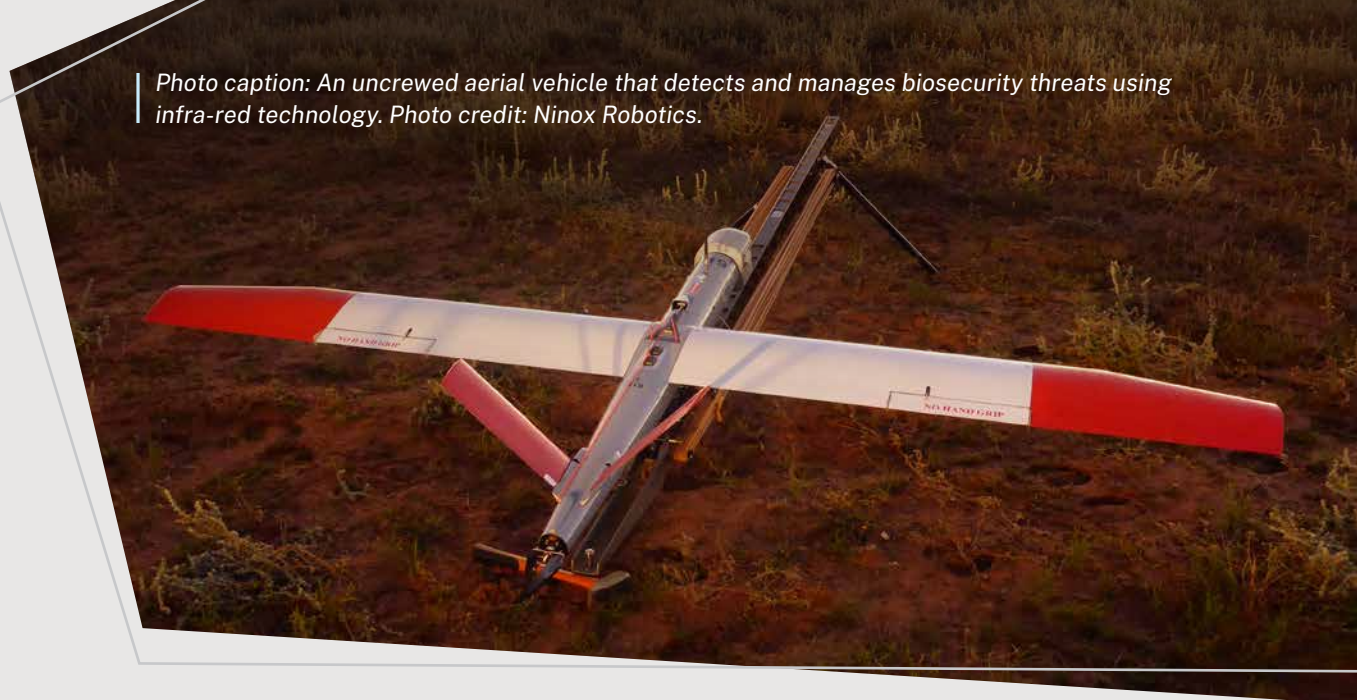
The autonomous solar cleaning robots are installed directly onto solar arrays and programmed to independently remove dirt and debris from solar panels. This helps ensure the solar panels work efficiently to provide a reliable power supply to critical mine site infrastructure.

Photo caption: An autonomous solar cleaning robot clearing dust build-up from solar panels.

Photo credit: Innovative Energy Solutions.



Photo caption: An uncrewed aerial vehicle that detects and manages biosecurity threats using infra-red technology. Photo credit: Ninox Robotics.



Drones

Uncrewed air, land, surface or underwater systems that can be operated remotely or autonomously.

Case study: [Ninox Robotics](#) use long-range uncrewed drones for a variety of purposes, including emergency management.

Ninox Robotics has worked with the NSW Rural Fire Service, streaming real-time video to monitor and detect environmental threats and obstructions. Using drones helps keep firefighters safe and preserve Australia's unique landscape.

Cobots

Robots designed for direct interaction with a human in a defined collaborative workspace.

Case study: Peak body [Weld Australia](#) uses a welder training system with augmented reality. The system teaches welding skills to apprentices while evaluating their performance in a hands on, interactive and controlled environment. TAFEs, high schools and registered training organisations have used the system in their own training programs.

The augmented reality system has also been integrated with a cobot. This lets an apprentice safely learn automated robotic welding skills as well as the skills to use robotics in other applications. This helps future welders gain skills and self confidence in both manual and robotic welding before moving into real world welding workshops.

Photo caption: A cobot used with augmented reality to safely simulate welding.
Photo credit: Weld Australia.



Australia's robotics opportunity

In the years ahead, national and global trends will shape the future of Australia's economy and society. These include climate change, an ageing population, geopolitical risks, labour market pressures and stagnant productivity. Robotics and automation technologies will be critical to Australia's response, as well as growing our economic diversity and building a Future Made in Australia.

Robotics and automation will transform industries and reshape work processes on a global scale, as they have already done over the preceding decades. For many years, we've used robots in mines, logistics and manufacturing assembly lines to complete tasks that need precision or are repetitive or dangerous. Advanced robotics are now changing how people engage with technology at work, improving workplace safety and creating new jobs. This will continue as robotics and automation technologies become more affordable, effective and common in workplaces throughout Australia.

Internationally, developing and adopting robotics and automation technologies has been critical for boosting productivity and raising the competitiveness of industries. Recent advancements in AI, component technologies and robotic design are improving the rate and benefits of development and adoption globally. This momentum is already visible in Australia's robotics industry. Local robotics companies were worth about \$18 billion in annual revenue in 2021, up from \$12 billion in 2018 (Robotics Australia Group 2022).

In Australia, productivity growth has slowed to 1.2% per year in the 20 years to 2021–22 – the lowest level in 60 years (The Treasury 2023a). The Productivity Commission's 5-yearly *Productivity Inquiry Report* and the Treasury's *Intergenerational Report* highlight the need for investment in new technologies to improve productivity (The Treasury 2023b; Productivity Commission 2023). Automation, including robotics, is predicted to increase annual productivity growth in Australia by 50% to 150%. These technologies have the potential to add a further \$170–600 billion per year to GDP by 2030 (Taylor et al. 2019).

Australia has strong robotics expertise, renowned academic institutions and local capability in areas such as field robotics. Despite these strengths, the lack of a mature and well-coordinated supply chain for locally made solutions means we risk missing many of the opportunities these technologies present. Australia faces barriers in commercialising and scaling up our innovations, preventing us from taking full advantage of our leading research capability. These include the rationing of investment capital, high upfront costs needed to develop robotic solutions, limitations in our supply chains and our geographic isolation. Many Australian industries lag in adopting robotics technologies, which means many businesses are not tapping into the benefits these technologies can deliver.

Acting now to address these barriers will support revitalising Australia's economy by growing national manufacturing capabilities and help to address labour and skills shortages. Robotics and automation technologies will also play a role in supporting Australia's transition into a renewable energy superpower and net zero economy. The increased development and adoption will allow businesses to become more globally competitive, strengthen onshore supply chains and create safer work environments for Australians.

The Australian Government has already recognised the importance of revitalising sectors across our economy through critical technologies such as robotics. To support this effort, the government has the \$15 billion [National Reconstruction Fund](#) (NRF). The NRF will make targeted investments to help Australia capture new, high-value market opportunities to diversify and transform our industries and strengthen our economy. A priority area for NRF investment is enabling capabilities. This concerns manufacturing technologies and products, including robotics, that support advancing Australia's industrial capability. How companies adopt robotics and automation technologies will contribute to their competitiveness across all NRF areas.

The government is also supporting industry through the [Industry Growth Program](#) (IGP). The program assists innovative small and medium-sized enterprises (SMEs) and startups in their most challenging development phase. Finally, the [Future Made in Australia](#) agenda will support investment in modernising and digitising our industries to revitalise our advanced manufacturing base and onshore supply chains.

Building on these priorities, the National Robotics Strategy establishes a shared vision, goals and objectives for Australia, informed by extensive national consultation. The strategy shows the immense potential for Australian industries throughout the economy to benefit from robotics and automation technologies. The strategy seeks to use our strengths for Australian industries are responsibly developing and using robotics and automation technologies to strengthen competitiveness, boost productivity and support local communities.

Robotics and automation at the global frontier

Germany

Germany is one of the world's major manufacturing powerhouses, partly because of its leadership in developing and adopting robotic and automation technologies. Germany's manufacturing industry has been a leader in robotics and automation for decades. It has deployed more robots than any other country in Europe and is a leading innovator in developing industrial robots (IFR 2023c). This means that German manufacturers have been able to operate domestically rather than outsourcing to overseas competitors who have lower labour costs. By innovating and incorporating new technologies, Germany has improved the cost competitiveness of its manufacturing.

Japan

Japan is a leader in robot production, producing 45% of the global supply of industrial robots (IFR 2023a). Japanese companies have been at the forefront of robotics and automation production and adoption for decades. Adopting these technologies in industrial processes has been a critical factor in Japan's economic success. Japan is also turning to robotics and automation to address barriers posed by their rapidly ageing population. While not without its issues, efforts in nursing homes have promoted more flexible work and improved staff retention.

United States

The United States is one of the world's top food producers and exporters and is a leader in adopting new technologies in agriculture. Robotics and automation have improved productivity in the sector, including through more reliable monitoring and management of natural resources. Greater control over production, distribution and storage has resulted in increased efficiencies, lower prices and reduced environmental impacts (United States Department of Agriculture 2023).

China

China has been the largest industrial robot market for nearly 10 years, and in 2022 accounted for 52% of the world's industrial robot installations (IFR 2023b). These robots, a mix of imported and locally produced technologies, are used in electronics, automotive and other manufacturing activities. This has helped China become the world's largest manufacturer, including of electric vehicles, and address trends such as skills shortages and an ageing population.

Robotics and automation in Australia

Robotics and automation technologies have the potential to generate real social, economic and environmental benefits for Australia. We have unique advantages that will allow us to capture these benefits, such as our diverse landscape, education and training system and research capabilities.

Australia has an emerging robotics and automation industry that is growing in size and influence. In 2018 and 2022, industry peak body [Robotics Australia Group](#) released 'Robotics Roadmaps' for Australia. These showed the breadth of expertise in Australia and helped raise the profile of cutting-edge Australian capabilities.

Many Australian industries have already adopted robots to work alongside humans to create safer and more productive workplaces. Robots are used in Australian underground mines, assembly lines and in dangerous settings like emergency response operations. Increasingly, medical professionals use robots to improve diagnosis, treatment and rehabilitation, as well as accuracy and patient recovery from invasive surgeries.

In agriculture, field robots support crop and livestock monitoring, and autonomous farming technologies increase crop yields and reduce pesticide use. The advanced manufacturing sector relies on automation to scale and export at a vastly increased level than what would otherwise be possible. Now, robotics and automation technologies are helping our nation transition to net zero, allowing us to install and maintain renewable energy infrastructure on a large scale.

Australia has strong research expertise and growing local capability to continue producing innovative robotic solutions. Field robotics is a particular opportunity for Australia. We have the research and development (R&D) expertise, local market and potential for high growth through global exports. In 2023, Australian research in robotics and related fields ranked in the top 10 countries globally for quality of research. We are 4th in additive manufacturing, 5th in data analytics and autonomous underwater vehicles, 6th in autonomous systems operation technology and 8th in advanced robotics (ASPI 2023). In addition, 3 Australian universities rank in the top 50 globally for robotics research publications (ASPI 2023).

Growing a sustainable robotics ecosystem will depend on the success of Australia's robotics and automation R&D and commercialising these technologies. However, researchers and startups can face barriers to commercialisation. Attracting early-stage and long-term capital are barriers because of the upfront expense of robotics and automation hardware. Australia is also not a large-scale manufacturer of many robotics components, meaning industry and developers need to import from overseas suppliers. Building Australia's domestic manufacturing capability will help address these issues by allowing access to secure, reliable and cost-effective robotics and automation technologies.



Case study: World leading Australian manufacturer using robotics and automation

[Finisar Australia](#) develops and manufactures optical switching technology to increase the bandwidth, connectivity and flexibility of optical fibre networks.

Finisar's innovative solution selects and switches light, transmitting high-speed data around the fibre network. The technology is used by multinational telecommunication companies to provide internet connectivity all over the world. Robotics and automation are essential to manufacturing this technology. Finisar uses a wide range of automation technologies, including:

- machine vision and robotic systems that accurately position optical components at a level of precision invisible to the human eye
- lasers to locate components in multiple axes
- machine learning to optimise and automatically program unique software for every unit.

Finisar research, develop and deploy their own bespoke robotics and automation technologies from their headquarters in Sydney, where they currently employ 250 staff. This results in a product that has a competitive advantage in performance, reliability and cost and protects the company's intellectual property. Using robotics and automation allows Finisar to perform advanced manufacturing in Australia, create jobs and open new export opportunities.

Photo caption: A robotic arm manufacturing optical switching technology.

Photo credit: Finisar Australia and the Department of Industry, Science and Resources.



Case study: Optimising farming through robotics

[SwarmFarm Robotics](#) uses robots to optimise agricultural processes. The company's SwarmBot robot and SwarmConnect® developer ecosystem work together to deliver better farming systems for sustainable agricultural production.

SwarmBot is an autonomous vehicle that can be used for tasks such as spraying, weeding and harvesting. SwarmConnect® is an agricultural 'app store' that lets third-party developers build applications for SwarmBot robots. The system is highly versatile and can be tailored to specific crops, farming conditions and agronomic challenges.

SwarmFarm's robots have already commercially farmed more than 2 million acres of farmland and reduced the amount of pesticides going into the environment by an estimated 1.8 million litres.

Photo caption: An autonomous vehicle spraying, weeding and harvesting crops.

Photo credit: SwarmFarm Robotics.

Case study: Australia's prize-winning performance

[CSIRO's Robotics and Autonomous Systems Group](#) is a world leader in researching and developing applied robotics. The group was one of 11 teams from around the world chosen to participate in the [United States' Defense Advanced Research Projects Agency's Subterranean Challenge](#). The challenge explored new approaches to mapping, navigating and searching underground environments.

Australian company Emesent was also part of the CSIRO challenge team. Emesent has expertise in developing autonomous and lidar mapping with drones, including in GPS-denied environments. This lets drones collect data in challenging places for the mining, geospatial, construction and engineering industries. To navigate harsh subterranean environments during the challenge, the team combined:

- drones mounted with Emesent's Hovermap
- all-terrain ground robots from Australian company BIA5
- CSIRO's autonomy and mapping capability.

The team beat organisations such as NASA, MIT, California Institute of Technology, and Carnegie Mellon University to claim the silver medal, winning \$1.3 million in prize money.

Photo caption: The BIA5 All Terrain robot mounted to an autonomous all-terrain vehicle that navigates and collects data in harsh environments. Photo credit: CSIRO.



World leading adoption of robotics and automation in Australian mining

Australia is one of the world's biggest mineral resource producers. Estimated energy exports reached a record \$459 billion in 2022–23 and mineral resources made up 69% of Australian export revenue in 2021–22 (DISR 2023a). Australia's resources sector accounts for 14% of our GDP (Office of the Chief Economist 2022) and employs more than 300,000 people (ABS 2023).

The Australian resources industry is a world leader in using robotics and automation. Our mining industry has over 700 autonomous haulage trucks, with more in production (Mine 2022). Automating future mines will improve productivity and will help limit environmental impacts through reducing the scale of mining operations.

Robotics and automation play a crucial role in transitioning to low-emissions technologies. Australia has abundant reserves of critical minerals, including rare earths. These are essential inputs to clean technologies such as solar panels, wind turbines and electric vehicle batteries. Australia has joined an international grouping, the [Sustainable Critical Minerals Alliance](#). The alliance commits us to sustainability and the highest environmental, social and governance standards for the mining and processing of critical minerals.

Many tasks can be done by automatic or remotely operated equipment such as load-haul-dump vehicles and rock breakers. Robotics and automation improve worker safety in hazardous underground environments. The Australian resources sector will continue adopting a range of robotics and automation technologies in the coming decades, including:

- smaller cooperative autonomous vehicles
- smarter sensors to detect and track ore
- better use of information to manage and optimise mining operations
- developing skills in systems integration and digital technologies for completely autonomous mines.

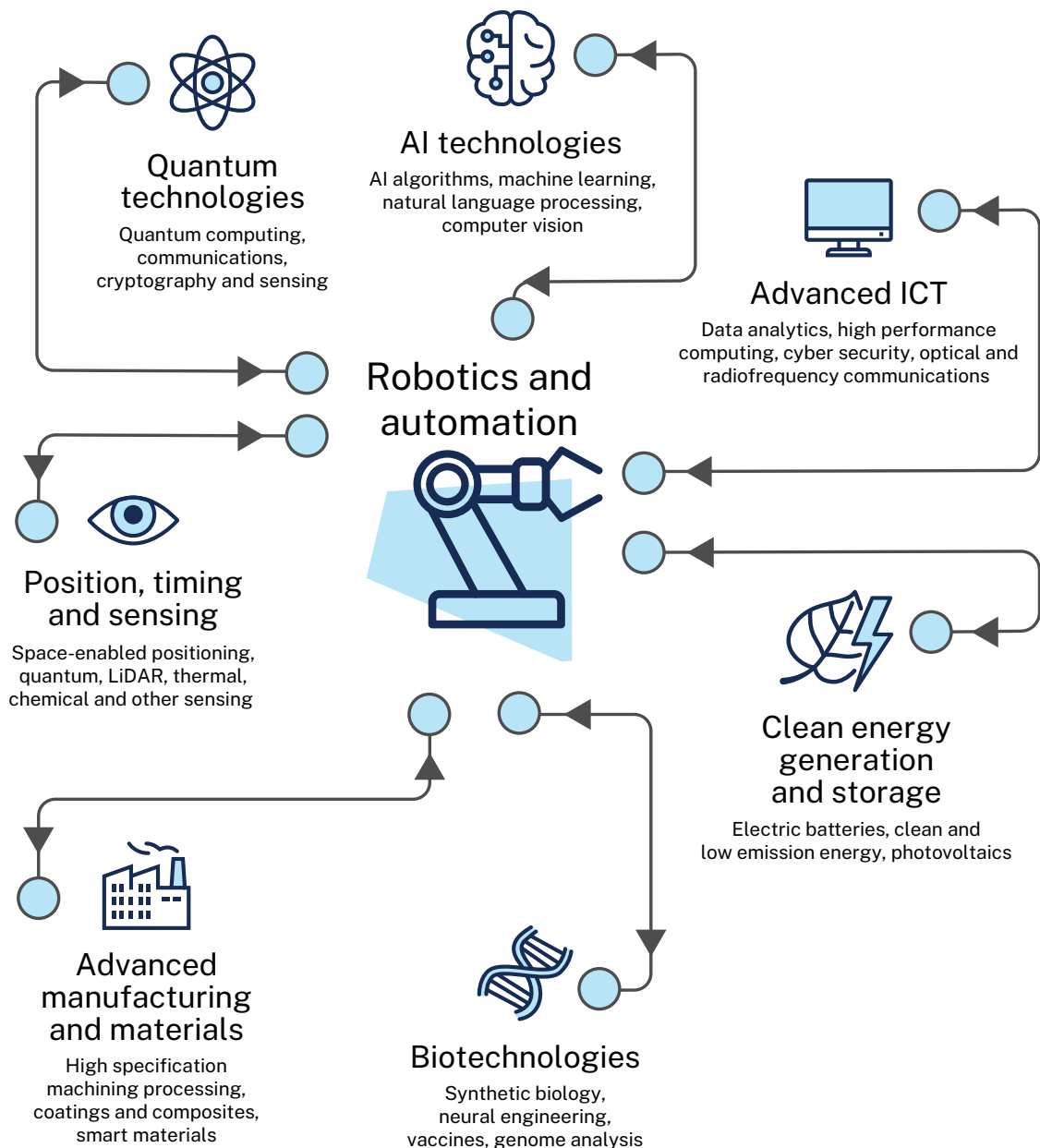
By 2030, adopting and integrating robotics and automation in the resources sector could add another \$74 billion to the Australian economy. This will create new employment opportunities (AlphaBeta 2019) while supporting Australia's transition to net zero.

Robotics and critical technologies

Critical technologies are current and emerging technologies that can either enhance or pose risk to our national interest. In 2023, the Australian Government released the [Critical Technologies Statement](#) and updated the [List of Critical Technologies in the National Interest](#). The list of technologies identifies 7 key enabling technology fields that impact Australia's national interest, including our economic prosperity, national security and social cohesion. Autonomous systems, robotics, positioning, timing and sensing is identified as one of the critical technology fields.

Critical technologies are important enablers of robotics and automation. Intelligent robots can rely on machine learning algorithms, advanced information and communications technologies such as semiconductors and radiofrequency communications. Robotics and automation technologies are also used in developing other critical technologies. For example, manufacturing semiconductors and technology to create and store clean energy both require precise robotic equipment.

Figure 1: Critical technologies in the national interest that are enabled by or used in robotics and automation.



Artificial intelligence and robotics

AI has revolutionised the capabilities of robots. It has helped create new types of robots that are more flexible, adaptable and intelligent. Through AI, robots have gained the ability to learn from data and experiences, adapt to changing situations and make decisions autonomously. The benefits have been far reaching, including improved navigation in dynamic and uncertain environments such as in mines, farms and disaster zones.

Combining AI and robotics has created situationally aware robots that can perform complex tasks across domains and work safely alongside humans. AI-enabled robots can recognise objects, faces, emotions, speech and gestures and communicate with humans and other robots. They can optimise their actions, plan their goals, cooperate with others and learn from feedback. AI is also being used to develop and optimise robots, creating safer and more efficient and precise equipment.

Advances in AI have enabled entirely new classes of robots. For example, autonomous mobile robots (AMRs) use AI to make near-real-time decisions as they navigate without assistance. AMRs are being used in many domains, including healthcare. They can deliver medication, disinfect surfaces and facilitate interaction between healthcare professionals and patients that are in different physical locations.

The possible applications of robotics are rapidly expanding thanks to generative AI, deep learning, computer vision, large language models (LLMs) and other AI technologies. For example, LLMs have the potential to enhance robotics and automation technologies by improving their learning, communication and decision-making capabilities. The exponential growth in AI applications for robotics means it is increasingly important for robotics firms to invest in AI capabilities. Governments around the world have recognised this economic imperative and are investing accordingly.

Australia has unique advantages in contributing to the AI systems that will continue to revolutionise robotics into the future. Not only is Australia a leader in AI R&D, but our companies and researchers are already actively developing robotics software solutions to address problems across a range of industries. Responsibly developing and exporting secure-by-design AI products and services for robotics presents an immense opportunity for Australia. The Australian Government's Safe and Responsible AI Agenda will ensure the design, development and deployment of AI systems in Australia in high-risk settings are safe and reliable, while the use of AI in low-risk settings can continue to be developed largely unimpeded.



Case study: Maximising the potential of robotics through AI

The University of Adelaide's [Australian Institute for Machine Learning](#) (AIML) is Australia's first facility dedicated to AI research and development. With more than 180 researchers, students and engineers, AIML performs detailed research on a range of topics such as machine learning, robotic vision and trusted autonomous systems.

AIML researchers have developed many computer vision systems and other AI-enabled solutions that have been deployed across various industries. These include:

- automated loading and unloading of shipping containers
- computer vision systems to detect material for recycling
- systems for autonomous vehicles.

AIML's research, when applied to industry problems, has led to increased productivity, product quality and workforce safety.

Photo caption: A robot interacting with a human using camera hardware and computer algorithms to process visual data. Photo credit: Australian Institute for Machine Learning.

Case study: Improving quality of life with companion robots in aged care

[Andromeda Robotics](#) uses AI and robotics technologies to design robots that improve the lives of those in need, including the elderly and children in hospitals. The company has launched a pilot project testing its AI-enabled companion robot, Abi, at an aged care facility.

Abi offers emotional support and acts as a source of entertainment, aiming to help alleviate loneliness and isolation. It uses a LLM to conduct conversations with residents at the facility, machine learning to recognise individual residents and AI to allow autonomous social interactions. Using these tools, Abi can tailor conversations based on previous interactions, and even give hugs.

Companion robots have the potential to ease labour shortages in aged care and can contribute to improved care quality, staff efficiency and overall quality of life. Through Abi, Andromeda Robotics also hopes to inspire people to think differently about the role that technology can play in critical industries.

Photo caption: Companion robot Abi providing support at an aged care facility.

Photo credit: Andromeda.



Consultation

To develop the National Robotics Strategy, the Australian Government consulted extensively across Australia with industry, academia and the wider community. Guided by the [National Robotics Strategy Advisory Committee](#), the strategy draws on [public submissions](#), workshops and one-on-one interviews.

The active participation of stakeholders across Australia highlighted the importance of Australia's robotics ecosystem and the need for action. We heard that for Australia to maximise the benefits from developing and adopting robotics and automation technologies, we must use our unique strengths and address a range of barriers.

Areas of opportunity

Our expertise

- Australia is a global leader in certain R&D areas, such as field robotics, collaborative robots, safe and responsible AI and computer vision. This provides a strong foundation for our local robotics ecosystem.
- Australia is a leader in adopting and using robotics in mining, emergency response and defence. We can apply these capabilities in a range of other industries.

Comparative advantages

- Australia has strengths in responsible technology, safety standards and regulation. This promotes trust, provides a competitive advantage for Australian industry and benefits our international collaboration and partnerships.
- Australia has robotic test sites, shared infrastructure and other facilities that could encourage further collaboration and coordination.
- Australia's geography offers a unique opportunity to test and prototype robotic solutions, as well as develop field robots including drones and autonomous vehicles.
- Australia's highly educated workforce can benefit from technological advances and the increased adoption of robotics and automation.

Skills

- Australian universities are internationally regarded for the quality of their robotics-related science, engineering, technology and mathematics (STEM) courses, which create world-leading robotics talent in Australia.
- Australia's robotics workforce has proven strengths in integration services, developing software and bespoke solutions for existing robotic systems.
- Australia is an attractive destination for skilled migrants, providing another method of securing a talented workforce.
- Sectors facing skills shortages, such as agriculture, construction and healthcare could benefit from the increased adoption of robotics. Robotics can lift productivity and provide fulfilling opportunities for the workforce.

Areas for development

Commercialisation

- Low levels of industry-research collaboration can limit commercialisation.
- Attracting early-stage and long-term capital can be a barrier for robotics startups due to the long lead times and capital-intensive nature of the technology.
- The costs for manufacturers upgrading or transitioning capital stock to more autonomous infrastructure can be high.
- Australia is not a large-scale manufacturer of many robotics components, forcing companies to import components when developing robotic solutions.

Awareness

- Some businesses are unaware of the benefits or return on investment of robotics and automation, limiting rates of adoption.
- Australia has limited uptake of industrial robots. The skills and infrastructure that businesses need to integrate robotics into their operations are specific to individual contexts. Adoption will need specialised training and development.
- Businesses have limited awareness of Australia's robotics and automation success stories, achievements and investment opportunities.

Trust and inclusion

- Australia's STEM workforce lacks diversity, particularly in the participation and inclusion of women and First Nations peoples.
- Negative perceptions or lack of trust may limit acceptance or use of robotics in the workforce.
- Despite Australia's strong social and governance frameworks, regulations struggle to keep pace with emerging technologies.
- Workers that will be impacted by robotics and automation need greater support to reskill and upskill. This may include job placement support, retraining programs and further education.

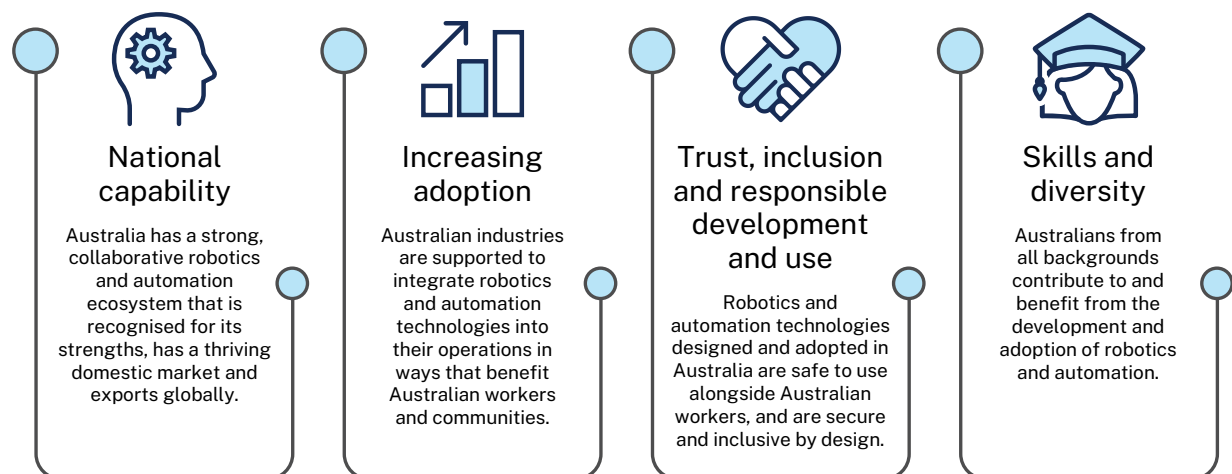
National vision

The National Robotics Strategy is a national framework to grow Australia's robotics and automation ecosystem and realise the government's vision:

Australian industries are responsibly developing and using robotics and automation technologies to strengthen competitiveness, boost productivity and support local communities.

To achieve this vision, the strategy sets out goals and objectives organised around 4 themes that represent areas of focus. These goals and objectives call for a collaborative effort across Australia, supported by the active engagement of government, industry, researchers and the wider community. Outcomes show what success looks like, and we have proposed a series of indicators to track progress. Benchmarks will be set following the first periodic review.

Figure 2: Strategy themes and goals





Theme 1: National capability

Goal: Australia has a strong, collaborative robotics and automation ecosystem that is recognised for its strengths, has a thriving domestic market and exports globally.

What we've heard

Australia is internationally renowned for our strong technical expertise and innovations. Some of our inventions are well-known and widely celebrated, such as the cochlear implant, black box flight recorder, Wi-Fi and polymer banknotes. Others go underappreciated, including some of our major achievements in robotics and automation. For example, research performed by the [Australian Centre for Field Robotics](#) (ACFR) between 1995 and 2001 produced one of the most important advances in robotics in the past 2 decades. The papers published by members of the centre on the Simultaneous Localisation and Mapping (SLAM) method are among the most highly cited in robotics world-wide. The SLAM method allows a robot to build a map of its environment while it determines its location. This innovation is vital to technologies across the globe, such as autonomous vehicles, drones, robot vacuum cleaners and virtual reality headsets.

Australia has leading academic and government robotics institutions. They produce globally competitive research and innovation, with a strong focus on field and other service robots. This expertise is partly shaped by our geography – our vast and diverse landscape is ideal for testing and deploying large or remotely operated robots. Our R&D strengths and field robotics expertise are the foundation of our current robotics industry.

Australia has a competitive advantage in developing niche and high-quality robotic systems. We excel in integrating and customising robotics and automation solutions, particularly autonomous vehicles and drones for the mining, resources and defence sectors. Australia is increasingly commercialising solutions for medical sciences and agriculture, such as robots to support health research and drones for crop and livestock monitoring. Australia's robotics industry also has strengths in:

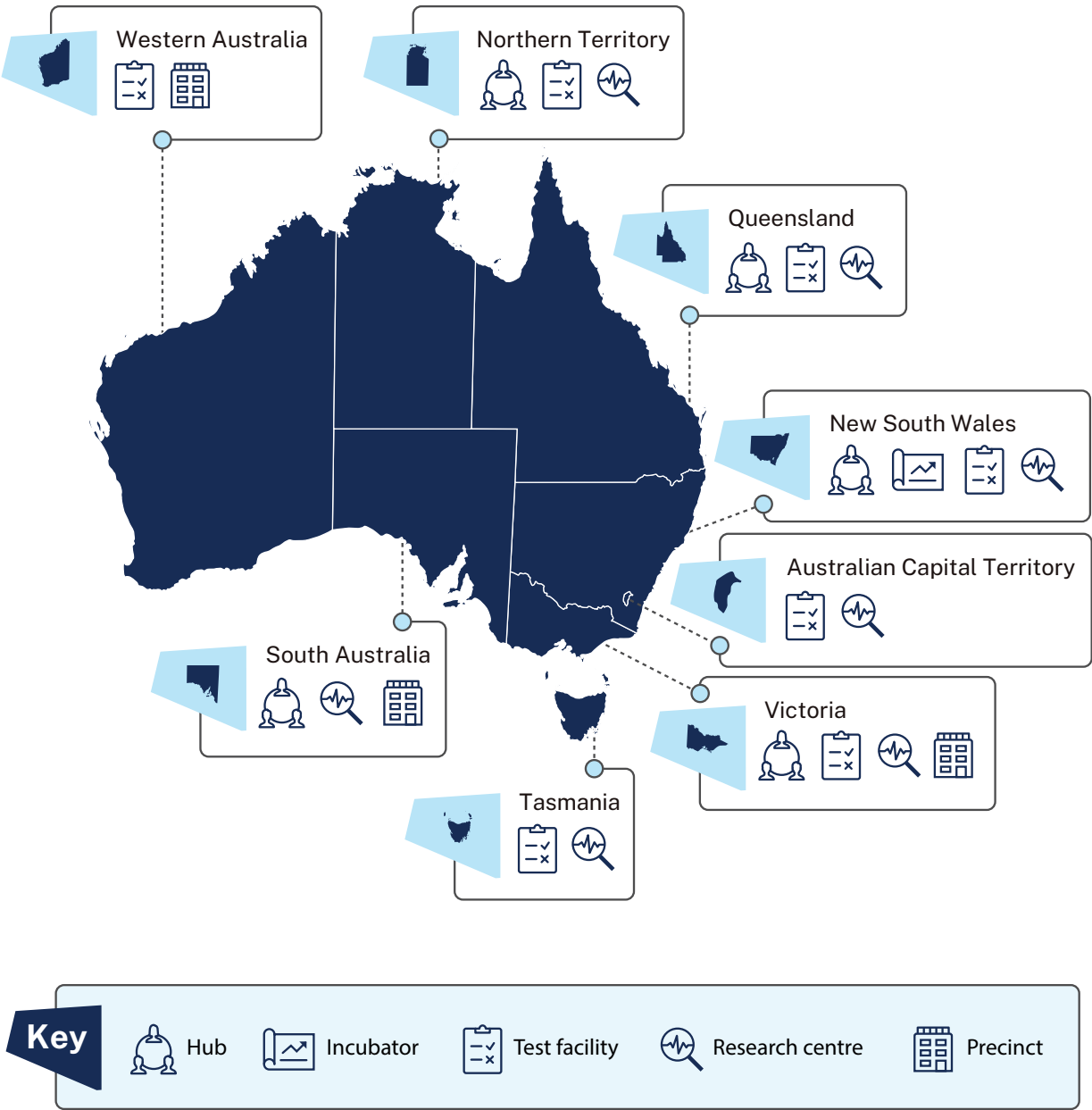
- Supplying and customising hardware for robotic platforms. This involves adding bespoke features and capabilities to existing industrial robot systems.
- Providing integration services such as analysing business processes and optimising them through robotics and automation.
- Developing software and AI technologies for robots, including computer vision and sensing technologies.

By using our strengths and investing strategically, we can build a Future Made in Australia and grow an internationally competitive robotics and automation sector. However, Australia faces barriers in commercialising and scaling up our innovations. This is partly because of the limited availability of domestic and foreign capital where investors may see robotics as a risky investment. They can also be unwilling to fund technologies which have a longer expected return on investment.

Australia's robotics and automation industry consists mostly of small companies, rather than end-to-end manufacturers of large-scale robotics solutions. These small companies tend to focus on niche areas of robotics and automation technologies or different points of the research-to-integration pipeline. Several of these companies are leading global exporters in their field.

Australia is home to many robotics facilities that offer collaborative spaces with specialised equipment, expertise and resources. These spaces bring industry, researchers and government together to collaborate and help industry development. Robotics facilities are spread throughout the country and have developed strong expertise in their areas of focus. These spaces present opportunities to further scale, improve coordination, support collaboration and bring together Australia's robotics industry.

Figure 3: Facilities in Australia supporting the robotics industry that offer collaborative spaces with specialised equipment, expertise and resources.



Case study: Researchers partnering with industry

The [Australian Centre for Robotics](#) (ACFR) at the University of Sydney is an established research centre, which over its 20-year history has made many major contributions to the science and technology of robotics. The ACFR's foundational research in field robotics has enabled high-impact industry collaborations including:

- automation and optimisation of mining processes from pit to port, improving safety, productivity, and reducing energy footprint
- advanced flight planning systems for commercial aviation that reduce fuel use and carbon emissions in long-haul flights
- novel designs of ground and aerial robotics for agriculture industries.

Today, the ACFR is continuing to expand into new areas. It is leading the Australian Robotic Inspection and Asset Management (ARIAM) Hub, an Industrial Transformation Research Hub with 3 university and 15 industry partners. The ACFR is also developing a robotic surgery facility in collaboration with Sydney Medical School and has conducted research in space robotics funded by the Australian Space Agency. ACFR's staff and research students have helped create many robotic startups and supported the broader Australian robotics ecosystem.

| Photo caption: Staff on site at the Australian Centre for Robotics.

| Photo credit: Australian Centre for Robotics.





Case study: Collaborative model fosters innovation

Located in Brisbane, the [Advanced Robotics for Manufacturing \(ARM\) Hub](#) uses a collaborative model to contribute to a successful and sustainable technology ecosystem. ARM Hub gives Australian manufacturers access to information, facilities and industry networks to develop and adopt robotic solutions and to source investment to implement the solutions.

The hub provides access to a network of world-leading experts in robotics, AI and design-led manufacturing. Working with in-house technical teams, they help companies use advanced manufacturing technologies, develop new products or overcome technology barriers.

Photo caption: A robotic arm at ARM Hub demonstrating potential applications of robotics in industry.

Photo credit: Advanced Robotics for Manufacturing Hub.

Case study: Robotics research protecting the Great Barrier Reef

Researchers from the [Centre for Robotics](#) at the Queensland University of Technology have developed a series of surface and submersible robots. The robots help protect the Great Barrier Reef, using computer vision and AI.

The robot's capabilities are applied to tasks such as coral reef restoration, detection and control of crown-of-thorns starfish and 3D mapping. The robots can function remotely, autonomously and in fleets, allowing researchers to quickly gather large amounts of data to help protect the reef.

Photo caption: The submersible robot, RangerBot, monitoring the Great Barrier Reef for marine pests.

Photo credit: Centre for Robotics, Queensland University of Technology.





Case study: Enhancing Defence capability through automation

The Australian Army worked with Deakin University to design and build a convoy of autonomous trucks with GPS, LIDAR, optical cameras, radar and ultrasonics.

Regular trucks were augmented with an 'autonomy stack' which mimics how a human operates the truck, including moving the steering wheel, handbrake and pedals. The convoy can operate for long periods of time in all weather conditions, reducing human driver fatigue.

Working with the National Transport Research Organisation, the Army successfully tested the convoy on public roads with other road users. The convoy followed one crewed truck, and each autonomous truck made decisions about collision avoidance in real-time. The convoy has now been transitioned into the Army's Land Mobility Program for further trials in the field.

Photo caption: An autonomous convoy of trucks being tested on an Australian highway.

Photo credit: Robotic & Autonomous Systems Implementation and Coordination Office, Australian Army Research Centre.

Case study: Navigating subsea environments with AI and robotics

Headquartered in New South Wales, [Advanced Navigation](#) develops AI, robotics and navigation technologies. The company has sold 65,000 Australian-made solutions to over 70 countries.

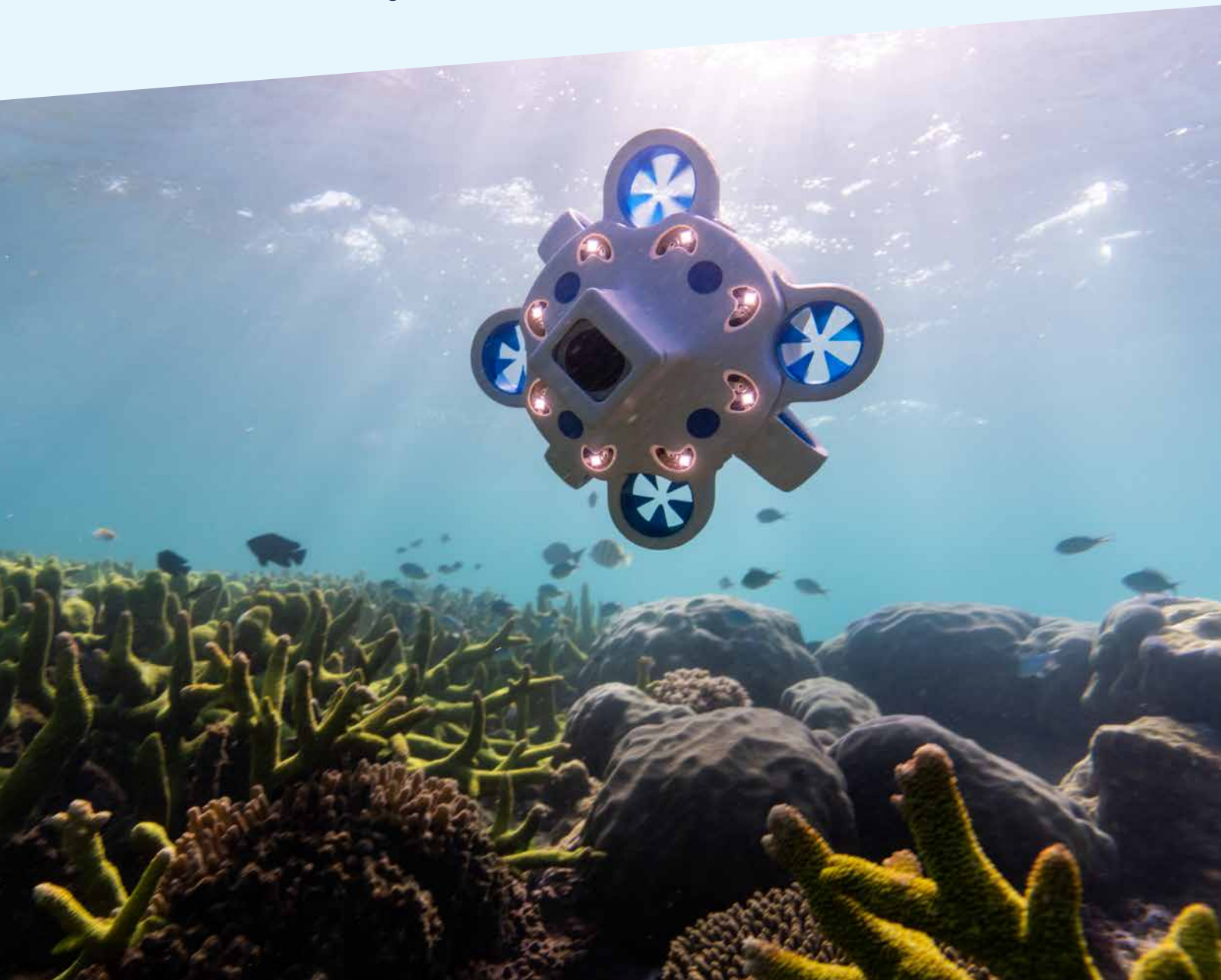
Advanced Navigation opened Australia's largest subsea robotics centre in Western Australia. The high-tech manufacturing and R&D facility accelerates the production of the company's core underwater technologies, including its autonomous underwater robot, Hydrus.

Hydrus combines navigational, sonar and propulsion technologies with artificial neural network intelligence. This makes it well suited for research, survey and exploration by making data capture simple and accessible. Built on an open platform, users can load custom software and train the AI to recognise specific marine species or objects.

In 2023, Advanced Navigation partnered with the University of Technology Sydney's Tech Lab to open an AI robotics manufacturing site for autonomous systems. The site supports Australia's manufacturing capability, focusing on high-value sectors and expertise in deep technology research fields.

Photo caption: Autonomous underwater robot Hydrus surveying a marine environment.

Photo credit: Advanced Navigation.



Supporting government initiatives

The Australian Government has many initiatives underway to support industry and improve our national capability in research, development and commercialisation.

- The [Future Made in Australia](#) agenda strengthens Australia's capabilities in key industries, securing Australia's place in a changing global economic and strategic landscape and maximising the economic and industrial benefits of the move to net zero.
- The [National Reconstruction Fund](#) provides funding for projects that diversify and transform Australia's industry. As part of the \$15 billion NRF, the government has announced a target investment level of \$1 billion for critical technologies, which may include robotics technologies, and \$1 billion for advanced manufacturing.
- The [Industry Growth Program](#) provides commercialisation and growth advice to innovative start-ups and SMEs with one or more of the 7 government identified priority areas of the Australian economy for the NRF.
 - This includes providing Industry Partner Organisation grant funding for [ARM Hub](#), which will provide specialised sectoral advice and expertise to businesses participating in the program and complement the one-on-one Advisory Service of IGP.
- The [Research and Development Tax Incentive](#) encourages additional business investment in R&D, providing tax offsets for business expenditure on eligible R&D.
- The [strategic examination of Australia's research and development](#) system determines how we can maximise the impact of science, research, and innovation and get more value from investment in R&D.
- [AusIndustry](#)'s national network of Regional Managers provides local business connections and impartial, trusted guidance tailored to businesses.
- The [business.gov.au](#) website and contact centre provide continual support, connecting businesses with information from across all levels of government.
- The [Buy Australian Plan](#) builds domestic industry capability by leveraging government procurement.
- The [Australian Industry Participation policy](#) gives Australian industry a full, fair and reasonable opportunity to compete for supply opportunities.
- The [Business Research and Innovation Initiative](#) provides SMEs with grant funding to develop innovative solutions for government policy and service delivery challenges. Australian Government agencies support the program to develop new-to-market technologies that they can negotiate to buy.
- The [National Critical Minerals Strategy 2023–2030](#) highlights focus areas to help deliver diverse, resilient and sustainable supply chains, meet net zero ambitions, maximise the economic opportunity presented by minerals endowment, and maintain and grow sovereign capability.
- The [Moon to Mars Initiative](#) supports multiple robotics and automation technologies, including the Trailblazer rover to demonstrate robotics and remote operation on the moon.
- The [AUKUS Pillar II: Advanced Capabilities](#) technology partnership focuses on trilaterally accelerating the delivery of advanced capabilities.
- Defence's [Advanced Strategic Capabilities Accelerator](#) facilitates collaborative partnerships between Defence, industry and academia to accelerate the development and transition of innovative technologies into capability, including in the area of trusted autonomy.
- The [Defence Industry Development Strategy](#) supports reforms and capabilities to deliver the National Defence Strategy.
- The [Defence Industry Development Grant](#) provides support to SMEs for acquiring and commissioning new defence capabilities, international accreditation and certification, skills development and security posturing for suppliers, aligned with the seven [Sovereign Defence Industrial Priorities](#).
- The [Australian Trade and Investment Commission](#) continues to support exporter journeys to new and priority markets and attract productive foreign investment to scale Australia's sovereign capabilities in the robotics sector.

- The [Rural Research and Development Corporations](#) drives innovation and productivity growth in the agriculture, fisheries and forestry sector through government and rural industry co-investment.
- The [Research Translation and Commercialisation Agenda](#) boosts collaboration between universities and industry, driving commercial returns, including:
 - The [Trailblazer Universities Program](#), which builds new research capabilities, drives commercialisation outcomes and invests in new industry engagement opportunities.
 - The [Australia's Economic Accelerator](#), which helps create a research ecosystem where our worldclass university research is translated and commercialised into real world innovations and productivity gains.
 - The [National Industry PhD Program](#), which builds a bedrock of research talent skilled in university-industry collaboration.
- The [National Collaborative Research Infrastructure Strategy](#) delivers national research infrastructure to help support Australian researchers to remain internationally competitive and maximise the potential for economic benefits from scientific discoveries.

To build our national capability in robotics, the strategy has set the following objectives, outcomes and indicators of success.

Objectives



Boost research and development, commercialisation and scaling up of Australian solutions targeting areas of Australian strength



Use government's purchasing power to grow domestic demand for robotics and automation



Raise the profile of Australia's robotics and automation capabilities and supply chains locally and globally



Leverage Australia's international partnerships and networks, as well as state and territory governments, to create new opportunities

Outcomes

- Australian industry has improved access to robotics facilities that encourage collaboration, innovation and commercialisation.
- A larger, sustainable Australian robotics and automation industry that produces trusted, reliable solutions and exports globally.
- An ecosystem where researchers and industry work together to deliver innovative, world-leading commercial outcomes that address critical challenges.
- Government and industry have a deeper understanding of Australia's robotics capabilities and supply chains, helping to develop targeted actions, encourage collaboration and grow the local robotics ecosystem.
- Government purchasing power maximises local industry's robotics and automation capabilities and grows domestic demand.
- Increased access to both domestic and international markets and investment helps Australian robotics companies to scale up their innovations and grows our robotics industry.

Indicators of success

- Improved performance of Australia's robotics industry across multiple measures of business performance.
- Growth in the size of Australia's robotics industry.
- Growth in employment in Australia's robotics industry.
- Increased robotics-related R&D expenditure and patent filing activity.
- Increased number of high-quality research publications for robotics.
- Increased rates of collaboration, co-investment and commercialisation.
- Increased value of government procurement of Australian-made robotics systems.



Theme 2: Increasing adoption

Goal: Australian industries are supported to integrate robotics and automation technologies into their operations in ways that benefit Australian workers and communities.

What we've heard

Robotics and automation technologies have far-reaching benefits. They will improve productivity and worker safety in many Australian industries, as well as create higher quality work for Australians. We are well positioned to increase the adoption of these technologies across the economy. Sectors that have high costs associated with upgrading business processes and infrastructure can learn from sectors who are already leading in the uptake of these technologies.

Australia is a leader in adopting whole-of-system automation solutions in mining and resources. These solutions have improved worker safety by removing risks in dangerous environments or the need to perform unsafe tasks. In other sectors, greater adoption could help address business problems by filling gaps in skills and labour, scaling production as well as improving sustainability. Stakeholders told us that companies adopting robotics have seen a range of benefits, including:

- increased labour productivity across industries
- increased scalability of production and manufacturing capability
- improved precision and reliability
- reduced operating costs
- reduced waste and environmental impact
- optimised resource management
- more employment opportunities due to increased scale of operations
- improved health and safety
- increased worker satisfaction.

Despite the benefits of robotics and automation, there are several barriers to adoption. Australian businesses need help to understand the advantages of robotics and automation. It can be difficult for organisations to find information on new technologies, including developments, trends, costs and installation time. Organisations need better visibility of how other Australian companies have adopted robotics and how this has improved their business.

There are also short-term costs and risks for companies looking to adopt robotics and automation solutions. Many businesses, particularly SMEs, are hesitant to adopt robotics because of a perceived high cost of entry. Existing business processes will need to change to realise the full benefits of adopting new technologies, and costs associated with upgrading infrastructure can be high. This often involves buying new stock, upgrading underpinning infrastructure, updating procedures and investing in training and work health and safety.

These barriers are compounded by Australian businesses often seeking international off-the-shelf solutions, rather than bespoke Australian solutions that may offer more localised support. Some businesses told us they chose international solutions because they were overwhelmed by the range of robotics and automation solutions available. Some businesses were also deterred by the perceived risks of working with a newer Australian robotics business. The availability and reliability of supporting infrastructure is also important for businesses looking to adopt these technologies. For instance, reliable internet connections and high upload speeds depend on digital infrastructure, which, if inadequate, can be a barrier to successful operations and growth.

For Australian industry, reliable access to strong, trusted domestic and international supply chains for essential materials and components is critical. Complex global supply chains can be vulnerable to disruption, resulting in unpredictable availability and costs for manufacturers. For example, industry has reported wait times of up to 36 months for some industrial robot arms. Without strong, secure and diverse supply chains, Australia faces barriers in maintaining, growing and diversifying our local manufacturing capabilities. These barriers will continue to result in businesses relying on overseas suppliers to import robotics technologies that we could supply ourselves.

Technological advances have helped address some of these barriers. Improvements made to robotics interfaces and usability, particularly in cobotics, have lowered technical barriers to adoption. Similarly, the use of digital twins – the virtual modelling of physical objects and environments – allows adopters to visualise how they can use robotics in their business by affordably simulating robotics in context.

Through increased adoption of robotics and automation, businesses can develop more productive business models, help build scale and access new markets for products. Sectors that are earlier adopters can also demonstrate to other businesses the potential use cases and commercial benefits from adopting trusted Australian solutions. These collaborative efforts can ultimately attract domestic and foreign investment for robot manufacturers and businesses who are adopting solutions, especially for manufacturers at the seed and startup stages.

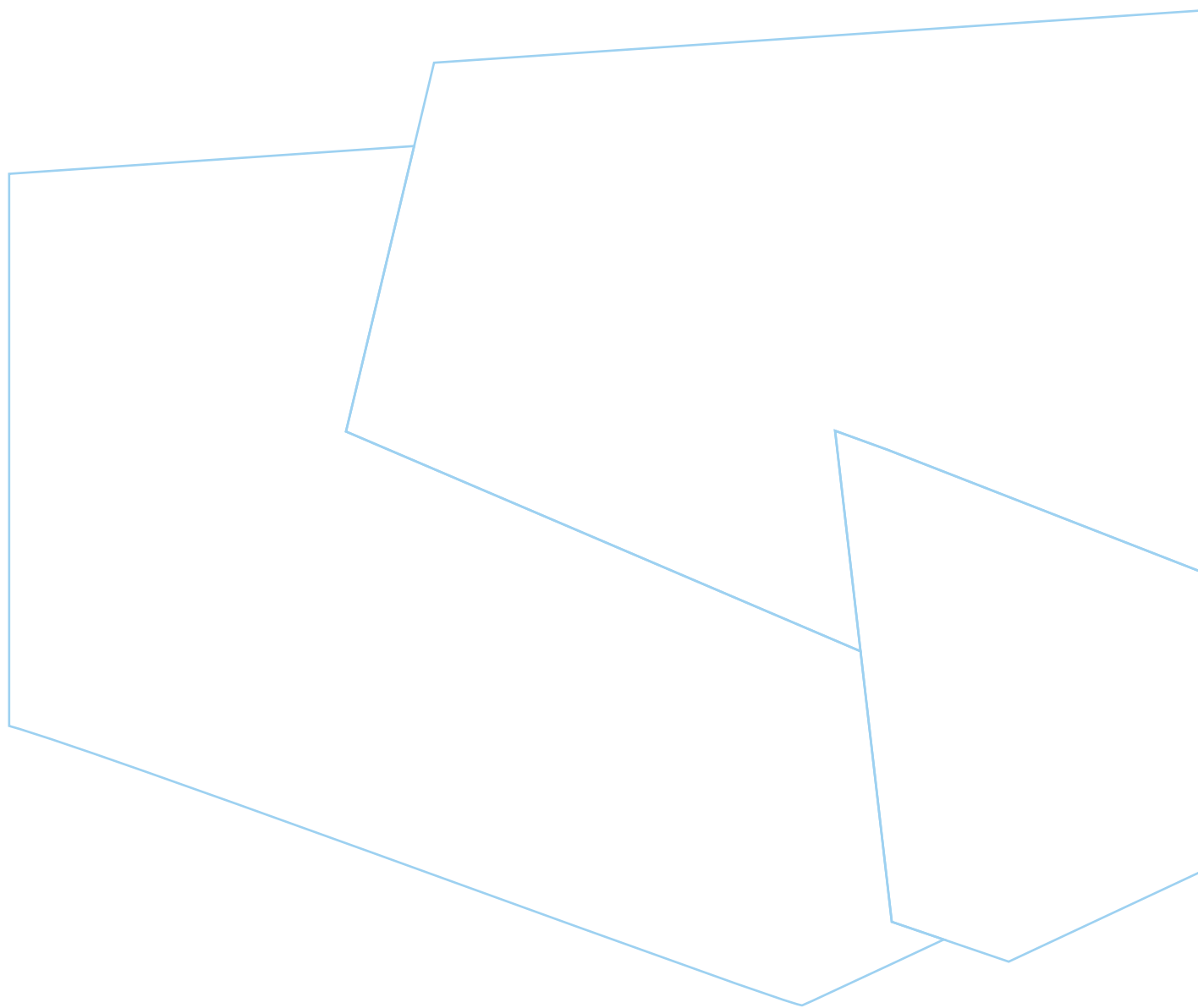




Photo caption: Lettuce grown in an autonomously controlled vertical farm.
Photo credit: Stacked Farm.

Agriculture

Robotics can help address widespread workforce shortages in the agriculture industry and help maximise yield. A range of solutions are currently being used, including:

- autonomous tractors
- fruit-picking robots
- drones for crop monitoring and precision agriculture.

Case Study: [Stacked Farm](#), a Gold Coast-based indoor vertical farm, integrates AI, robotics and machine learning in the agricultural technology sector. The business has automated all stages of the production process on its 2,300 m² farm, from growing crops to packing final produce.

Stacked Farm uses end-to-end automation to address inefficiencies. By stacking their vertical crop beds using automation, the company reduces the physical footprint of the farm and the manual strain on workers. This approach is sustainable, repeatable, scalable and safe.

Construction

Robotics and automation are being used in construction for a variety of applications including autonomous earth-moving; materials handling (robotic cranes and mobile robots); structural joining (assembly); and robotic 3D concrete printing.

These applications are driven by the need to reduce costs and address skills shortages while simultaneously improving consistency, predictability, environmental sustainability and safety.

Case Study: [Hadrian X](#) is a fully autonomous bricklaying robot developed by the Australian company FBR Limited. It is designed to build structures quickly and efficiently by converting wall sketches into block data and autonomously placing blocks precisely to minimise handling and product waste.

Hadrian X can lay up to 300 large blocks or 8,000 standard bricks per hour. That means it can construct a traditional 4 bedroom, 2 bathroom home in one day, increasing productivity in construction projects. By handling repetitive bricklaying tasks, Hadrian X also reduces the risk of construction workers developing strain injuries and excess waste through precise brick placement.




Photo caption: Bricklaying robot, Hadrian X, autonomously building the walls of a house.
Photo credit: FBR Limited.



Defence

Australia is a leader in robotics technologies for defence, including niche systems for land, sea, air and harsh environments. Australia is also at the forefront of combining robotics and AI for defence purposes.

Our expertise in field robotics means Australia could lead the world in robotics applications for dynamic and harsh environments. These include defence applications, as well as in extreme weather events, mines and disaster zones.

Case Study: [Boeing](#), supported by the [Royal Australian Air Force](#) and over 55 Australian companies, has developed and built an uncrewed aircraft called the MQ-28 Ghost Bat. This innovative autonomous aircraft is designed to work closely with crewed aircraft to support a range of missions.

Photo caption: MQ-28 Ghost Bat, an uncrewed teaming aircraft.

Photo credit: Boeing.

Health and medical science

Robots are becoming increasingly common in general hospital settings, such as transporting medical supplies and more precise medical tasks such as helping perform surgery.

Working with AI, robots can help diagnose and interact with patients. In the future, robots will be increasingly used in prosthetics and assistive technologies.

Case Study: [Macquarie University Hospital](#) has been an early investor in robotic-assisted technologies. It has a particular focus on using robotic surgery for the management of urological conditions, including prostate cancer.

The hospital also uses robotics to achieve better patient outcomes in cardiology, neurosurgery, colorectal surgery, orthopaedics and gynaecology. Research shows that certain types of robotic surgery are associated with shorter operating times and faster patient recovery.



Logistics and transport

Logistics and transport are some of the fastest growing applications for mobile robotic systems. Robots are typically used for order fulfilment, warehousing and delivery. They can increase the speed and effectiveness of supply chains and reduce errors and accidents.

Case Study: [Swoop Aero](#) is an Australian-based robotics company. Its end-to-end automated drone logistics platform gives remote and regional communities reliable access to essential healthcare supplies.

Swoop Aero operates networks in 5 countries including Malawi, Democratic Republic of the Congo and Australia, and has conducted over 27,000 flights to deliver more than 1.4 million items, including vaccines, pharmaceuticals and test kits. The on-demand deliveries have improved many communities' access to quality healthcare.

| *Photo caption: A drone being prepared for the delivery of critical supplies.*
| *Photo credit: Swoop Aero.*

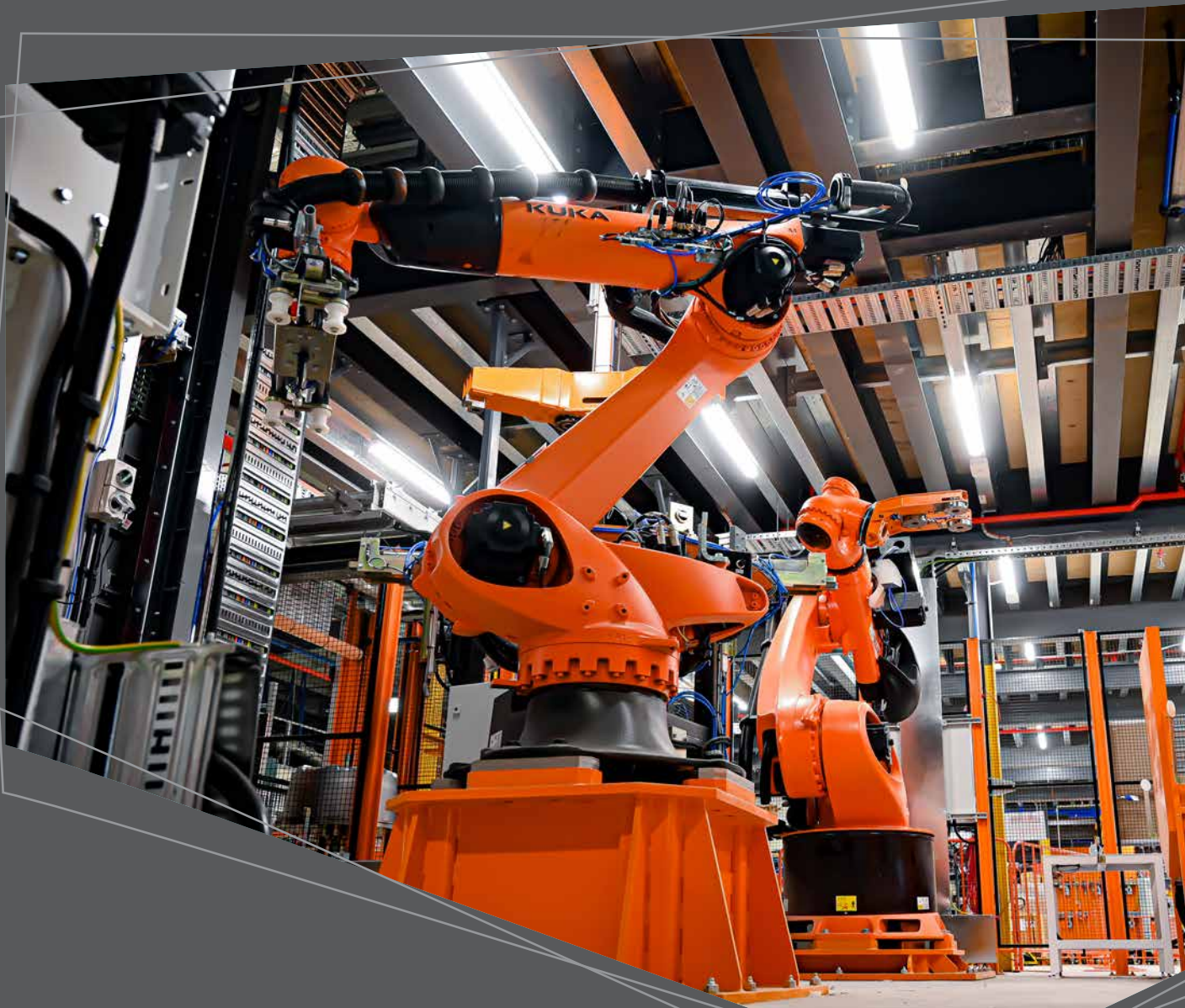
Manufacturing

The manufacturing sector has been using robotics and automation for decades. Robots are used to do repetitive and unsafe work, as well as increase production efficiency and quality.

Case Study: Based in Geelong, [Carbon Revolution](#) is an Australian company that manufactures carbon fibre wheels for the global automotive industry.

The company uses robotics in their manufacturing process to make one-piece carbon fibre wheels that are 40% to 50% lighter than comparable aluminium wheels. These wheels can be used to reduce the weight of electric vehicles, leading to better fuel efficiency.

Photo caption: Custom designed robots automating manufacturing processes for carbon fibre wheels. Photo credit: Carbon Revolution.



Mining and resources

Robots are well established in Australia's mining and resources sector, where they can perform tasks that are highly repetitive or too dangerous for humans. Robots are commonly found in:

- utility line inspections
- autonomous vehicles including trucks and trains
- undersea and underground exploration.

In the future, robotics and automation will become increasingly important in supporting the extraction and processing of critical minerals, and allow for whole of mine automation.

Case Study: IMDEX is a global mining technology company focused on detecting and extracting minerals safely, quickly and precisely. Its semi-autonomous Blast Dog system gives mining and mineral exploration companies crucial measurement data before they start drilling and extraction. This:

- increases productivity
- supports decision-making
- improves safety
- reduces environmental impacts in the resources sector.

Photo caption: Blast Dog, a semi-autonomous system providing real-time measurement data to workers on a mining site. Photo credit: IMDEX.





Space

Australians rely on space-based technology to transmit essential data for everyday activities like weather forecasts, internet access and online banking.

Robots in space collect data remotely and go places that humans can't go. The future of robots in space could see applications such as remote monitoring and maintenance site preparation, material handling, and transport and logistics.

Case Study: The [Australian Space Automation AI and Robotics Control Complex](#) (SpAARC) is based in Perth. It is a joint initiative between the Australian Space Agency, Fugro and the Western Australian Government. SpAARC's infrastructure supports start-ups, small businesses, major international companies and researchers in developing and performing robotic activities for applications in space. These technologies allow monitoring for environmental impact and the operation of remote robotic assets that perform challenging and hazardous work.

SpAARC partners with local companies, harnessing Australia's world-leading expertise in field robots to overcome the environmental challenges of space. This has created a shared space for companies to test robotic technologies and remotely operate systems for use in space, on Earth and under the sea.

*Photo caption: Mission control room at the Australian Space Automation AI and Robotics Control Complex.
Photo credit: SpAARC*



Case study: Enabling future growth in manufacturing

[Bosch Australia Manufacturing Solutions](#) (BAMS) was established to provide advanced automation and robotic systems to Australian manufacturers. This includes custom machine building, engineering and manufacturing solutions.

BAMS is helping [3RT](#) convert wood waste into timber with similar physical characteristics to old-growth hardwood. The result is a low-carbon, non-toxic building material that reduces native forest depletion and helps secure global supply chains.

BAMS will supply digital production units and fully automated production cells to help 3RT improve its manufacturing efficiency. The technology can be customised and easily scaled.

3RT forecasts revenue of \$44.5 million over 5 years and expects the project to create new opportunities in their workforce.

Photo caption: 3RT's robot handling hardwood, converted from renewable growth logs, on the production line built at the BAMS facility. Photo credit: Bosch Australia Manufacturing Solutions.

Supporting government initiatives

The Australian Government has a number of initiatives to support the right conditions for increased robotics adoption.

- The [Future Made in Australia](#) agenda strengthens Australia's capabilities in key industries, securing Australia's place in a changing global economic and strategic landscape and maximising the economic and industrial benefits of the move to net zero.
- The [National Reconstruction Fund](#) provides funding for projects that diversify and transform Australia's industry. As part of the \$15 billion NRF, the government has announced a target investment level of \$1 billion for critical technologies, which may include robotics technologies, and \$1 billion for advanced manufacturing.
- The [Industry Growth Program](#) provides commercialisation and growth advice to innovative start-ups and SMEs with one or more of the 7 government identified priority areas of the Australian economy for the NRF.
 - This includes providing Industry Partner Organisation grant funding for [ARM Hub](#), which will provide specialised sectoral advice and expertise to businesses participating in the program and complement the one-on-one Advisory Service of IGP.
- The [Australian Industry Participation](#) policy gives Australian industry a full, fair and reasonable opportunity to compete for supply opportunities.
- [AusIndustry](#)'s national network of Regional Managers provides local business connections and impartial, trusted guidance tailored to businesses.
- The [business.gov.au](#) website and contact centre provide continual support, connecting businesses with information from across all levels of government.
- The [Better Connectivity Plan](#) delivers digital infrastructure, improved network connectivity and consumer awareness across regional and rural Australia.
- The [TAFE Technology Fund](#) invests \$50 million to modernise IT infrastructure, workshops, laboratories, and other facilities at TAFEs across Australia.

To improve the adoption of robotics in Australia, the strategy has set the following objectives, outcomes and indicators of success.

Objectives



Raise awareness of robotics and automation technologies and their benefits for critical industries, like advanced manufacturing, agriculture and mining, to support Australia's future competitiveness



Support and incentivise Australian businesses to adopt local robotics and automation solutions



Improve digital and telecommunications infrastructure underpinning robotics and automation

Outcomes

- Increased adoption of robotics and automation throughout the economy that has helped diversify, revitalise and strengthen the competitiveness of Australian industries.
- A visible and celebrated Australian robotics ecosystem that lets Australians see the benefits of living and working with robotics and automation.
- Strengthened digital infrastructure that supports the adoption and use of robotics and automation in regional and remote locations.

Indicators of success

- Increased robot density.
- Growth in the number of new applications and uses for robotics.
- Increased uptake of Australian-made robotics solutions.
- Improved business perceptions and fewer barriers to adoption.
- Increased industry awareness of robotics solutions.



Theme 3: Trust, inclusion and responsible development and use

Goal: Robotics and automation technologies designed and adopted in Australia are safe to use alongside Australian workers, and are secure and inclusive by design.

What we've heard

Robotics and automation are fast becoming part of everyday life, from fulfilling online shopping orders to improving patient health outcomes in our hospitals. The successful integration of these technologies into our society depends on their development and adoption being responsible, secure, ethical, lawful and inclusive.

Companies and industries that adopt robotics have been able to stay competitive and scale their operations, creating jobs that wouldn't otherwise exist. Without robotics and automation, Australia will struggle to remain internationally competitive and adapt to future trends like our ageing population and tight labour market. Research shows that robotics and automation often complement human labour, increasing employment and job satisfaction (OECD 2023). Robotics and automation can also reduce workplace injuries and automate routine or repetitive work, improving productivity and letting workers focus on more meaningful and rewarding tasks.

However, there is public debate on the potential impact of robotics and automation on jobs. The course of history has shown that technology can lead to structural changes in the economy. Education, targeted regulation and increasing the overall awareness of how these technologies function and benefit society will help to address concerns around employment, reliability and safety. To ensure that the development and use of robotics is responsible, we can:

- update governance frameworks to promote robotics and automation solutions that improve social wellbeing, inclusion and safety
- introduce robotics and automation into areas of the economy experiencing skills shortages
- build awareness so workers can see themselves working alongside robotics
- provide robust and flexible training systems to support workers to reskill and upskill.

To realise the opportunities and benefits from robotics and automation it's important that industry and government work together to involve users, communities and workers. By involving these groups in the design of robotics and automation solutions, we can develop them responsibly and inclusively. Australia has a record of doing this effectively, including through shared consultation on work health and safety regulations and currently in responsibly developing AI.

Given the lack of diversity in the robotics industry, communities, industry, academia and government need to bring together a range of perspectives to identify potential biases and adverse consequences. As robotics, automation and AI technologies evolve, we must work together to have the right frameworks and settings in place so everyone uses these technologies responsibly.

Promoting the safe, secure, lawful and ethical design and use of robotics and automation technologies will help protect Australia against potential risks. Fit for purpose regulatory settings and standards, as well as robust safety and cyber security arrangements can guide developers and adopters so they can adhere to best practice. For example, as cobots become more common, it is important that people and robots can work alongside each other safely and securely.

Managing cyber security, data privacy, collection, storage and use will be important to protect our industries and the wider community. Many robotics and automation technologies collect sensitive and personal data to perform their functions. They may capture information on personal identifiers, health conditions and the layout of homes or workplace environments. It is vital that Australians are aware of the potential cyber security risks robotics and automation technologies can present and mitigate these where possible. Awareness will ensure Australia adopts secure and trusted solutions to take full advantage of the opportunities that these technologies present.

Case study: Ethical protocols for drone use on Jawoyn Country

Jawoyn Traditional Owners in the Northern Territory have collaborated with CSIRO, Charles Darwin University and the University of Western Australia to develop [ethical guidelines](#) for guided, authorised drone use in Kakadu National Park.

Drones have rapidly become a vital aerial survey tool across northern Australia but need to be introduced responsibly to support First Nations data sovereignty protocols. Developing the guidelines was part of a larger project to co-design and apply healthy country indicators to monitor and manage this unique World Heritage Area.

The protocols were first applied to drones at Jarrangbarnmi, an important biocultural landscape. These protocols can guide First Nations-led innovation in the future by:

- empowering First Nations governance around how data is collected, curated and shared
- developing ethical and trusted research relationships
- enabling ongoing First Nations-led technological innovation.

Case study: Improving accessibility with robotics and automation

[aKin](#) integrates AI and robotics to create assistive technologies. The company is working with people who have spinal cord injuries to develop a robotic assistant tailored to their needs. It can sense its environment and respond to people, objects and commands, as well as modify its responses to improve patient wellbeing. The assistant will use autonomous reasoning to complete tasks such as:

- social companionship and cognitive support
- picking up items from the floor
- moving objects aside
- retrieving items from shelves
- carrying items around the house
- connecting patients to telehealth.

The robot is now in codesign and human trial phase. When complete, it will improve quality of life and sense of independence for people with spinal cord injuries.



*Photo caption: An assistive robot using AI to sense its environment.
Photo credit: aKin.*

Supporting government initiatives

The Australian Government has several initiatives underway to build trust and ensure the use of robotics and automation is safe and responsible.

- Supporting safe and responsible AI, noting the [interim government response](#)'s focus on preventing harms, clarifying and strengthening laws, working internationally and maximising the benefits of AI.
- Engagement in international [technology standards setting](#) enhances industry capacity and ensures robotics developments meet the needs of Australians.
- The [2023–2030 Australian Cyber Security Strategy](#) sets a vision for Australia to be a world leading nation in cyber security. Cyber security is an essential component of internet-connected robotics.
- Coordinating [regulatory frameworks for the emerging applications of drones](#) ensures the use of drones is safe and respects privacy.
- Establishing a regulatory framework for the [safe operation of automated vehicles on public roads](#).
- The [National Strategy to Achieve Gender Equality](#) guides whole of community action to make Australia one of the best countries in the world for a gender equal society.
- [Fee Free TAFE](#) supports over 355,000 student enrolments nationally, of which over 10,900 were directly in the Technology and Digital Sector.

To promote trust, inclusion and responsible development and use of robotics in Australia, the strategy has set the following objectives, outcomes and indicators of success.

Objectives



Ensure regulatory and legal frameworks enabling and applying to automation technologies are fit for purpose



Better understand and address the social impacts of robotics and automation in critical industries



Promote Australia's engagement in relevant bodies for setting international standards



Improve safety and cyber security of robotics and automation technologies

Outcomes

- Regulatory and governance frameworks promote trust and ensure robotics and automation technologies are produced and adopted responsibly.
- A deeper understanding of the social impacts of robotics and automation allow for targeted measures that enhance benefits for society and mitigate potential risks.
- Improved consultation with representative and community sector organisations builds diverse communities' capacity to integrate, adopt and engage with robotics and automation.
- International standards are widely adopted and consistent with Australia's interests.
- Robotics and automation technologies are secure and trusted by industry and the community.

Indicators of success

- Improved performance on measures of regulatory transparency and compliance.
- Reduced work-related injuries in industries adopting robotics.
- Improved performance in studies on quality of life, job satisfaction and job mobility.
- Increased energy efficiency, and reduced waste and emissions.
- Improved community perceptions of benefits from adoption.
- Improved adoption of cyber security standards to ensure robotics and automation solutions are safe and secure.



Theme 4: Skills and diversity

Goal: Australians from all backgrounds contribute to and benefit from the development and adoption of robotics and automation.

What we've heard

Australia has a highly skilled and diverse population that stands to benefit from robotics and automation. These technologies can open new career opportunities and allow workers to focus on higher value and more rewarding activities. Supporting Australian workers to adapt to technological change will need ongoing education, training and reskilling. Building a diverse workforce in the robotics and automation industry will further increase the size of our talent pool and include broader perspectives, improving innovation, creativity and problem-solving.

Building sustainable education pathways

While Australia has a highly skilled workforce, the growth of our robotics and broader technology ecosystem will benefit from an increase in STEM graduates at tertiary levels. To achieve this, we need to support quality STEM education at all levels of schooling. This would include fostering digital literacy and interest in STEM for children in early learning environments and primary school.

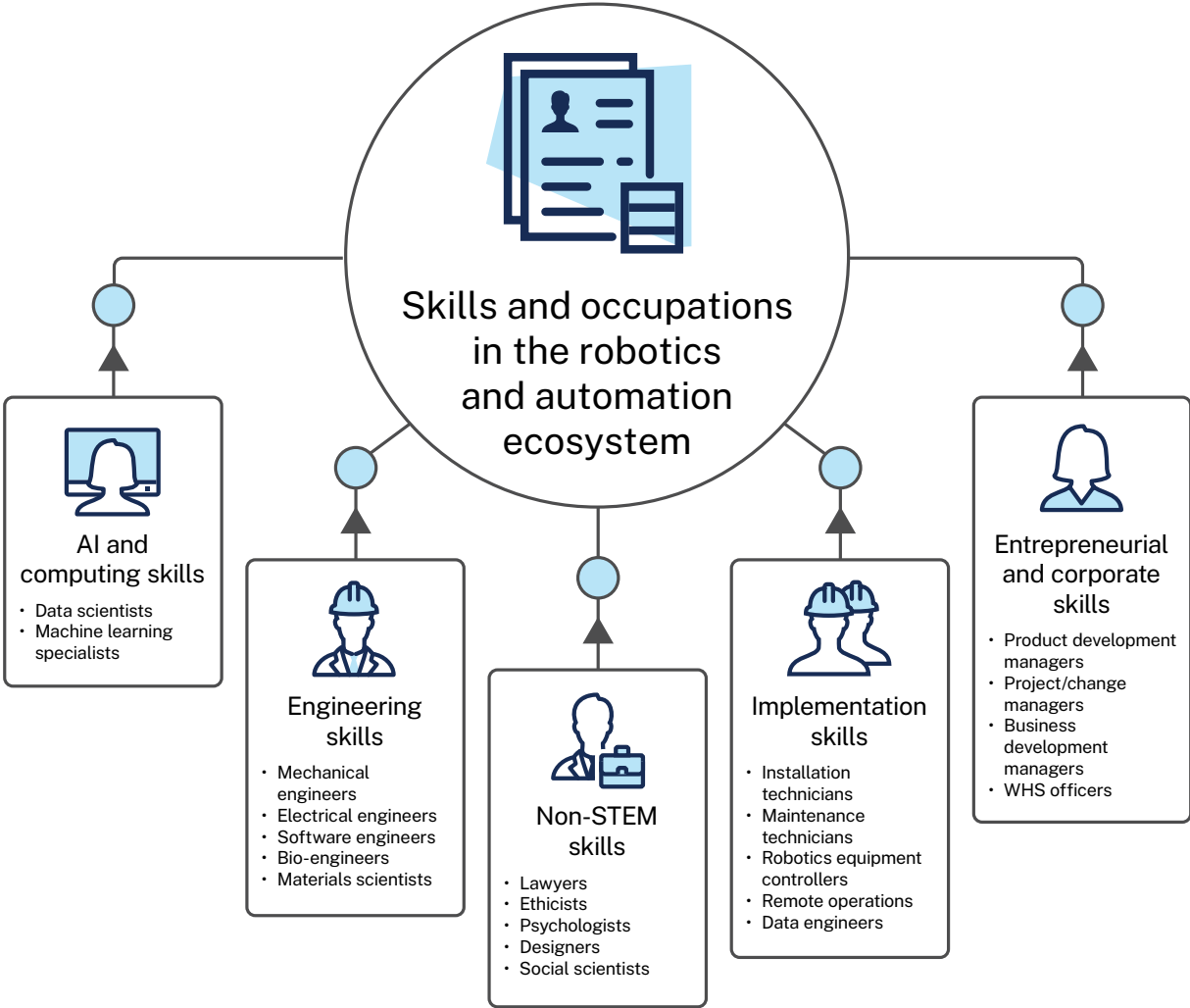
Many primary schools offer robotics as part of their curriculum as an engaging way to generate student interest in problem-solving and other STEM skills. Using robots in classrooms can help to foster critical thinking, coding, engineering, mathematics and design skills. Engaging early is important for the future robotics and automation workforce to be representative of Australia's diverse population. It is also important to provide support to schools and teachers so they have the knowledge and capacity to deliver robotics-related Australian Curriculum content.

After leaving school, pathways into robotics and automation careers are varied. There is a large list of accreditation and qualifications relevant to robotics and automation. However, understanding the skills needed and navigating the pathways through education and training and into the workforce can be difficult. This can limit the attraction to, and accessibility of, robotics and automation careers.

Some roles require undergraduate or post-graduate degrees. Australian universities are highly regarded internationally for the quality of their STEM courses. This is especially true for aeronautical engineering, bio-engineering, civil and structural engineering, computer science, electronic engineering and materials science degrees. Other roles require trade or vocational skills that students can get through on-the-job training and vocational education and training (VET) courses. TAFEs and other vocational institutions are introducing relevant courses across Australia. We have already seen an increase in the popularity of robotics-related micro-credentials, vocational courses and qualifications.

Degrees in mechatronics engineering – a hybrid of mechanical and electrical engineering – can be a direct pathway into robotics. However, STEM training and qualifications are not the only options for pursuing robotics and automation careers. Other disciplines including design, social sciences, law and ethics, play an important role in the responsible development and use of robotics and automation. Multidisciplinary robotics skills will create a workforce with diverse experiences and backgrounds that can lead to more varied perspectives and improve the quality of solutions.

Figure 4: Sample of skills and occupations in the robotics and automation ecosystem



For those already in the workforce, upskilling and reskilling pathways need to be accessible and available. Accessible pathways are vital so workers can develop the skills needed to work alongside robotics and automation technologies. Industry has an important role to play in this, alongside our education providers. Support for workers may involve training programs that focus on the skills and knowledge needed to work safely alongside robotics and automation, as well as through hands-on experience operating these technologies.

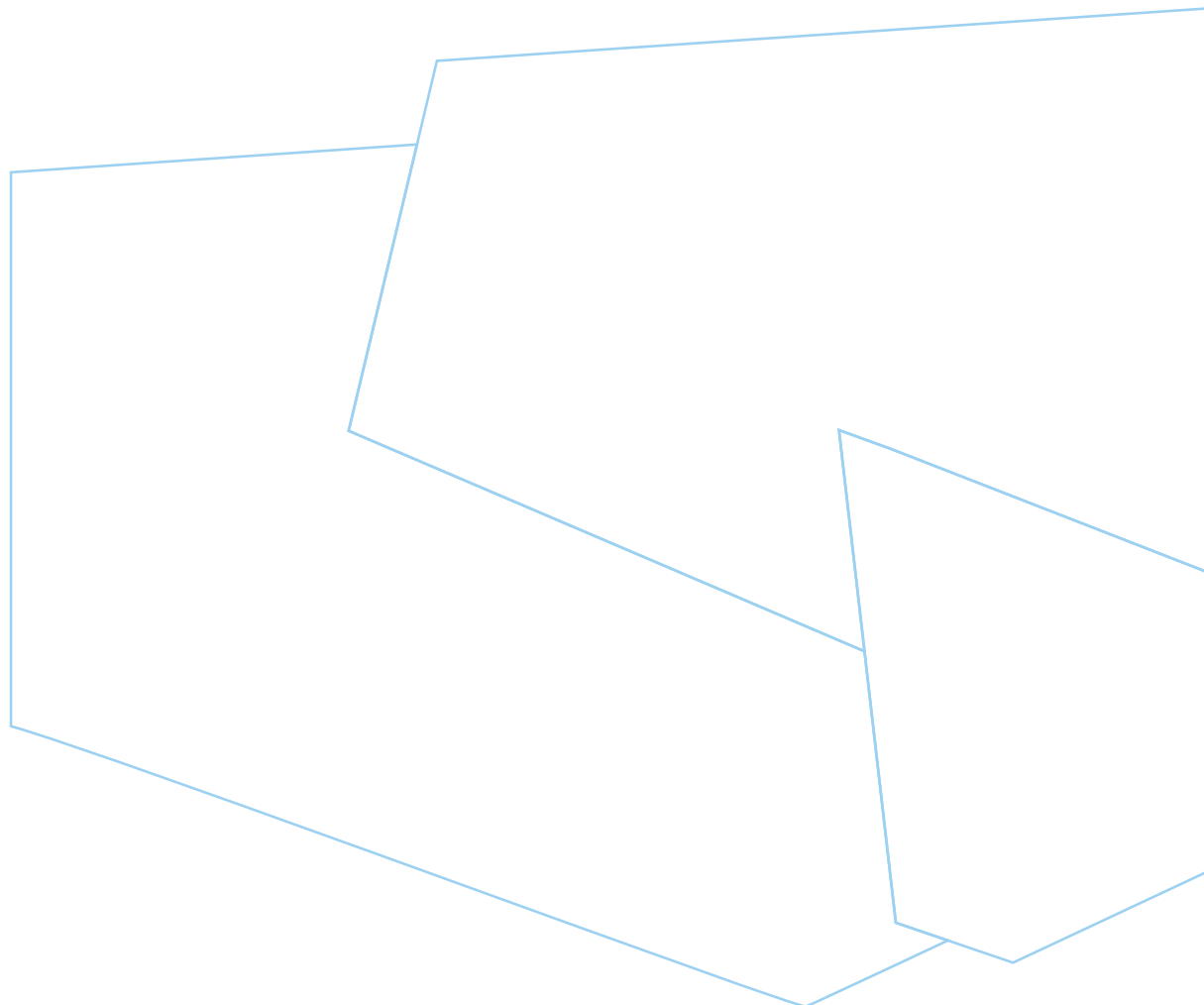
In the mining and resources sector, for example, tailored courses are available to upskill and train staff in the use of robotics specific to their industry. This approach is not only giving workers the skills they need, but also a greater understanding of the benefits of adopting robotics and automation technologies in their work. Additionally, creating a supportive environment for workers, such as through cultural awareness, inclusion and safety measures, can help ensure that no one is left behind in the transition to more automated work environments.

Attracting and retaining a diverse workforce

To improve the diversity of the robotics and automation workforce, industry, academia and government must create opportunities for under-represented groups. We can achieve this through targeted training and education programs, inclusive hiring practices and research-informed support. Marginalised groups in STEM fields include women, First Nations people, people with disability, older people, people from culturally and linguistically diverse backgrounds and LGBTIQ+ people.

A report from the Office of the Chief Scientist shows that only 0.5% of Aboriginal and Torres Strait Islander people hold a STEM degree. This compares to 5.2% of people in the wider community (Office of the Chief Scientist 2020). In 2021, the proportion of women in STEM-qualified occupations was only 15% (DISR 2023b). This trend carries into the robotics industry, where women make up somewhere between 7% and 19% of robotics engineers (Department of Defence 2023).

There are already several initiatives that support diversity in the robotics and automation industry. However, we need to do more so that the industry reflects, supports and benefits broader Australian society. Encouraging and supporting a diverse robotics workforce will help Australia combat domestic labour and skills shortages. It will also bring a range of perspectives, knowledge and understanding to the workforce. Research across industries shows that diversity in the workforce boosts innovation, creativity and problem-solving. While diverse workers should not be made primarily responsible for making their industry more inclusive, diversity in the workforce can encourage the development of inclusive and trustworthy technologies.



A photograph showing a person from behind, wearing a blue shirt, working on a robot inside a wooden frame. The robot has a red light and some wires. The background shows a white fence and some equipment.

Case Study: Robotics labs as a practical learning environment

Australian TAFEs are working with industry to develop and offer new pathways to robotics and automation jobs and preparing Australians for the workforce of the future. Both TAFE Queensland and South Metropolitan TAFE in Western Australia (WA) deliver accredited and non-accredited programs in robotics and automation to industry and students.

In April 2018, WA's South Metropolitan TAFE and the WA Government partnered with Rio Tinto to begin the development of Australia's first dedicated qualifications in automation, which were designed to prepare West Australian students for mining jobs that utilise robotic and automation technologies.

Through their specialist training facility, the Munster Campus at South Metropolitan TAFE delivers a [Certificate IV in Autonomous Control and Remote Operations](#) and a [Certificate II in Autonomous Workplace Operations](#) to give students the capability to work alongside autonomous technologies.

In 2019, TAFE Queensland and Central Queensland University (CQUniversity) Australia were engaged by BHP Mitsubishi Alliance to form the Queensland Future Skills Partnership. The partnership has delivered 10 new microcredentials, 12 Skillsets and a [Certificate II in Autonomous Technologies](#). These programs combined, which have been rolled out to more than 800 participants since 2021, aim to upskill the existing workforce and provide pathways for students into robotics and automation jobs of the future.

Several TAFE Queensland and CQUniversity Australia campuses deliver these and other applied technology programs through their robotics labs. Other courses offered include a [Certificate IV in Industrial Automation and Control](#) and a [Diploma of Applied Technologies](#).

These qualifications delivered by South Metropolitan TAFE and TAFE Queensland seek to address Australia's skills shortages in robotics-related trades and occupations while providing fulfilling opportunities to Australian workers.



Case study: Sparking creativity and critical thinking through robotics workshops

The [Western Australian Robotics Playoffs](#) (WARP) engage and educate 13 to 18-year-old high school students about robotics in industry through competitions. WARP also gives the industry a chance to nurture and encourage future robotics talent. WARP is a collaboration between:

- WA's Department of Primary Industries and Regional Development
- Curtin University
- Murdoch University
- Macquarie University
- International not-for-profit organization FIRST®.

Students who participate in WARP develop skills that are vital for future careers, such as critical thinking, communication, teamwork and resilience. In 2022, students participating in WARP designed and built robots to compete in 3 on 3 basketball-style games. Agriculture and AgTech industries also attended the event to showcase automation technologies in agriculture and promote career opportunities.

*Photo caption: High school students competing in the Western Australian Robotics Playoffs.
Photo credit: Western Australian Robotics Playoffs.*



Case study: Attracting and retaining diverse talent in robotics careers

The [Monash Nova Rover](#) (MNR) is an award-winning student team that is designing and building the next generation of Mars and Lunar rovers. The team has 96 students with expertise in engineering, science, business, commerce, IT and design.

In 2023, the team won the Australian University Rover Challenge for the third year in row. They also placed second at the University Rover Challenge, competing against 104 teams from around the world.

MNR has created a fair and inclusive environment that helps attract and retain diverse talent in STEM. MNR proudly attribute their success and achievements to their team's diversity.

In February 2023, the MNR team launched a pink rover called 'Waratah' to spark conversations about women in STEM. Their campaign is designed to start these conversations through 3 missions:

- empower through education
- bring visibility and foster engagement
- address barriers and bias.

*Photo caption: Pink rover 'Waratah' competing in the University Rover Challenge.
Photo credit: Monash University.*

Case study: First Nations pathway to STEM careers

The [Young Indigenous Women's STEM Academy](#) (the Academy) supports 600 First Nations women to study and work in STEM. CSIRO delivers the Academy in partnership with [CareerTrackers](#). The Academy is funded by the National Indigenous Australians Agency.

The Academy supports young women from Year 8 onwards. It provides a culturally safe, inclusive practice and targeted long-term support. It aims to build a generation of First Nations female leaders, role models and game-changers in STEM fields. The Academy collaborates with organisations and STEM professionals to support these young women to participate in robotics-related initiatives, including the RoboRAVE Australia competition in 2022.

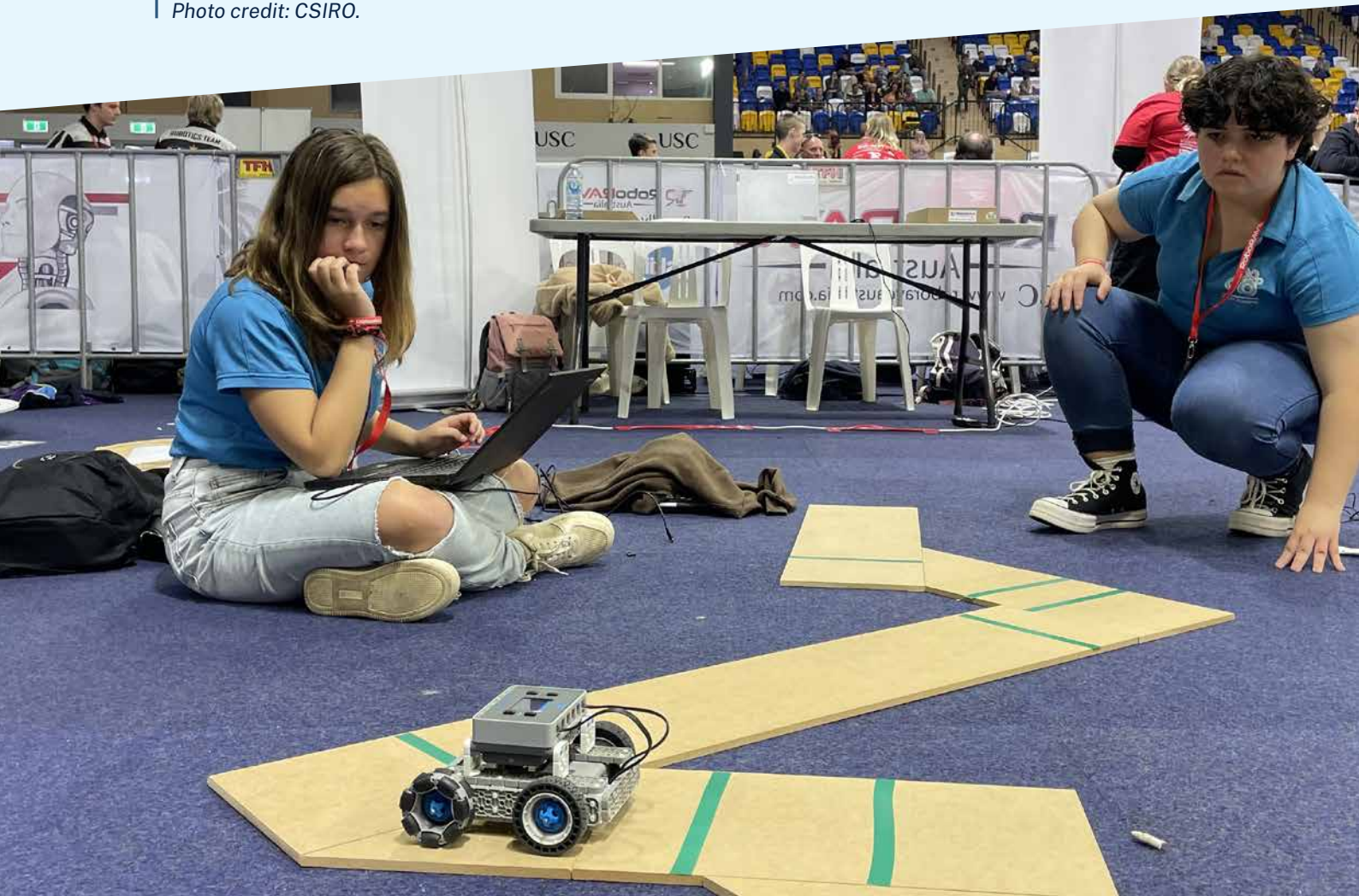
RoboRAVE is a unique format in that participants can enter using any robotics platform, at any age, with any level of experience and from anywhere in the world. To compete, competitors needed to design, build and program a fully autonomous robot to complete a given task, such as:

- climbing vertical surfaces
- battling in a sumo arena
- negotiating mazes
- using vision technology to follow lines and track objects.

By supporting a team of young First Nations women to compete, the Academy gives students valuable skills in programming, designing and problem-solving. These are all qualities of successful entrepreneurship in STEM fields.

Photo caption: Students competing at RoboRAVE Australia.

Photo credit: CSIRO.



Supporting government initiatives

The Australian Government has many initiatives underway to increase skills and diversity in Australian industries. A number of these initiatives support the government's commitment to reach 1.2 million tech-related jobs by 2030.

- [Supporting a thriving, skilled and diverse STEM workforce](#) by boosting STEM programs that focus on women and science to reach more diverse cohorts.
- The [National Strategy to Achieve Gender Equality](#) guides whole of community action to make Australia one of the best countries in the world for a gender equal society.
- The [Employment White Paper](#) provides a roadmap for Australia to improve access to digital skills, promote tech adoption and grow the digital workforce. This will allow the workforce to harness the opportunities of the economic transformation associated with digitalisation and emerging technologies.
- The [Australian Universities Accord](#) pursues meaningful reform improve the quality, accessibility, affordability and sustainability of higher education.
- The [National Skills Agreement](#) expands and transforms access to the VET sector, support quality training and implement reforms to address critical skills need.
- [Jobs and Skills Australia](#) provides high quality data, analysis, and insights to better understand Australia's skills and labour shortages across the economy.
- [Jobs and Skills Councils](#) strengthen industry engagement in the VET sector including one dedicated for Finance, Technology and Business sectors with responsibility for undertaking skills and workforce planning to support and strengthen Australia's digital and technology workforce.
- The [Migration Strategy](#) simplifies visa application processes and ensures that migration programs complement the skills and capabilities of Australian workers.
- [Fee Free TAFE](#) supports over 355,000 student enrolments nationally, of which over 10,900 were directly in the Technology and Digital Sector.
- The [TAFE Technology Fund](#) invests \$50 million to modernise IT infrastructure, workshops, laboratories, and other facilities at TAFEs across Australia.
- The [Australian Skills Guarantee](#) leverages government purchasing power to help address skills shortages and gender segregation in the building and construction and maintenance services and information and communications technology (ICT) sectors.
- The [Building Women's Careers program](#) expands support for women training in male-dominated industries, including in STEM.

To improve our skills and diversity in the robotics ecosystem, the strategy has set the following objectives, outcomes and indicators of success.

Objectives



Strengthen pathways into robotics-related careers



Monitor and plan for workforce changes and skills development alongside greater adoption of robotics and automation technologies



Raise awareness of the skills needed to support a technologically advanced economy



Identify ways to better promote diversity and inclusion in robotics industries



Attract skilled migrants to increase our economic prosperity and security

Outcomes

- Improved STEM and digital literacy build the skills Australians needed to develop, produce and adopt robots, and prepare for the future of work.
- Improved diversity and inclusivity in the robotics ecosystem and workplaces help address jobs and skills shortages, and improves the innovation and inclusivity of robotics and automation solutions.
- Clear pathways attract Australian and international talent to the Australian robotics industry and workforce.
- A deeper understanding of Australia's tech and robotics workforce allows for more targeted actions to boost strengths and address skills needs of the future.

Indicators of success

- Increased number of robotics-related job vacancies in Australia.
- Increased enrolments and completions in robotics-related STEM courses.
- Increased number of robotics-related STEM training and education programs.
- Increased skilled migration intake for robotics-related occupations.
- Increased diversity in STEM course enrolments and workforce participation.

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INVESTMENT IN PSIQUANTUM

Headline Statement

- On 30 April 2024, the Australian and Queensland Governments announced they would invest almost \$1 billion into frontier technology company PsiQuantum to build its world first fault tolerant quantum computer in Brisbane.

Key Points

Details of the transaction

- The Commonwealth will provide \$466.4 million through a mix of debt and equity.
 - This structure is designed to secure the Government a long-term return on its investment, via repayment of loans and participation in equity (shareholder returns).
- PsiQuantum is required to meet milestones and deliverables as part of the package.
 - Funding obligations are managed against agreed technology and infrastructure milestones.
 - Conditions and milestones have been informed by technical, legal and commercial due diligence by experts. These are contractually binding. Details are commercial in confidence.
 - Security arrangements will also reduce the commercial exposure and secure performance under the contract.
- PsiQuantum is expected to raise additional funding from existing and new investors as part of its contributions toward the project.
- Commonwealth financing is being provided through Export Finance Australia.
 - EFA will disclose details in accordance with its normal reporting requirements and in a manner that respects the commercial confidentiality of the company.
- The terms and conditions of the financial package are commercial in confidence.

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Ecosystem benefits

- The Government is committed to ensuring Australia's quantum sector remains a global leader, as outlined in the National Quantum Strategy.
 - The strategy presents the Government's vision to unlock the potential of quantum technologies, including an ambition to build the world's first error-corrected quantum computer in Australia.
- PsiQuantum's Australian operations will include:
 - Establishing its Asia-Pacific headquarters in Brisbane, along with facilities to build and operate the quantum computer. The company has said publicly that it is on an aggressive plan to have the site operational by the end of 2027.
 - Delivering successive generations of a commercial scale quantum computer and maintaining the product site as a flagship global facility over an expected 20-year life.
- The investment in PsiQuantum shows the Government is serious about delivering a world-leading quantum ecosystem. It is designed to crowd in talent, create opportunities for advanced manufacturing and supply chains, and seed more investment.
- PsiQuantum will deliver on a number of commitments over the life of the agreement. These include:
 - Proactively building opportunities for partnerships with local industry and government, including to support the creation of advanced manufacturing clusters and participate in the development of an innovation precinct adjacent to the quantum computing site
 - Collaborating with universities and research institutions on R&D
 - Funding PhD positions and operating dedicated internship and mentorship programs
 - Creating hundreds of direct, local, high-skilled jobs
 - Leveraging its existing relationships with global leaders in technology to bring additional expertise and experience to the Australian quantum ecosystem
 - Establishing a dedicated climate-related research centre in Brisbane.
- PsiQuantum has committed to providing Australian researchers and companies with access to the capability (in line with PsiQuantum's commercial strategy).
 - The Government will continue to work closely with industry to build 'quantum readiness' so that industry can grasp the opportunities this capability will bring.

Process

- PsiQuantum's initial engagement with the Commonwealth Government was via Austrade, commencing in 2019.
 - Austrade's role is to attract direct foreign investment.
 - Austrade provided information on market opportunity in Australia and relevant government programs, and introduced the company to state and territory governments.
 - The company provided a proposal to government in late 2022.
- There were multiple phases of due diligence, increasing in intensity, with Government decision-points / gateways throughout.
 - Deloitte was engaged in February 2023 to lead an initial phase of commercial, technical and economic due diligence on PsiQuantum's proposal.
 - The department subsequently engaged commercial, legal, economic and external probity advisers to support this work (Lazard Australia, King & Wood Mallesons, Sententia Consulting).
 - The Commonwealth and Queensland governments jointly engaged Boston Consulting Group (economic analysis of the quantum computing opportunity in Australia), Deloitte (financial) and Aurecon (independent infrastructure experts).
- There was appropriate governance with a Commonwealth Band 3 interdepartmental committee.
- Australia's Chief Scientist, a quantum physics and semiconductors expert, is a public champion of Australia's quantum opportunity:
 - "...it's important to remember that this won't be Australia's only quantum computer. As the developments already underway in Australia demonstrate, the future of quantum computing is likely to be as diverse as classical computing is today..." [AFR Op Ed, 7/5/24]
 - "To reach critical mass and achieve a globally competitive industry, we need to crowd in quantum companies, big and small." [AFR Op Ed, 7/5/24]
 - "We must take advantage of the quantum technology wave to reach the industry scale needed by attracting quantum companies to set up manufacturing here. This investment shows Australia is serious about its quantum industry development by ensuring we are at the front of the pack in the global race to build the first useful quantum computer." [PM/Minister media release, 30/4/24]
- As the Prime Minister has said:
 - "This wasn't a decision taken lightly. This was examined in all its aspects.... All of the aspects went through an enormous amount of work and many hours of many meetings, at every level of our cabinet processes, to make sure it was the right thing to do."

- “And the government’s absolutely convinced that it was, as were all of Treasury and Industry and other agencies as well.”
- “... there is in this case, an example of a first mover advantage as well. If we get ahead of the pack this is an extraordinary breakthrough.” [*Capital Brief*, 13/5/24]
- In Minister Husic’s words:
 - “...we’re bringing PsiQuantum home...to build the world’s first fault-tolerant quantum computer in Brisbane, and it will give our industries and our economy the power needed to stay ahead of the pack. Quantum computing is vital to both our economic and our national security.” [*Question Time Hansard*, 16/5/24]
 - “We are investing in multiple quantum computing technologies, having provided continued backing for (former Australian of the Year Michelle Simmons’ company) Silicon Quantum Computing...” [*The Australian*, 20/5/24]
 - “We are covering all bases to ensure Australia can develop onshore its own fault tolerant quantum computer.” [*The Australian*, 20/5/24]
 - “We have gone through a rigorous process of market testing, and then subjecting that to technical analysis, backing it in with legal and commercial advice to structure a deal...and also with commitments to the local economy. It’s not just investing in them and saying that’s that, they’ve got to work with the local community and economy as well.” [*Interview, Sky News*, 17/5/24]
- Extensive technical diligence was undertaken by Commonwealth experts.
 - Technical assessments were supported by oversight from a Technical Advisory Group, which included senior representatives with relevant expertise from DSTG and CSIRO, as well as Australia’s Chief Scientist.
 - Queensland engaged its own expertise.
- An EOI process was run from August to September 2023 to test the market to ensure an effective, efficient, economical and ethical use of Commonwealth funds consistent with the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and the Commonwealth Investment Framework.
 - The EOI was released in August 2023 to 21 companies identified based on market research and advice from technical experts, with review by the Technical Advisory Group.
 - The EOI tested interest and capability in developing, building and operating a commercial-scale universal fault tolerant quantum computer in Australia, as well as associated benefits to strengthen Australia’s quantum sector and contribute to the national interest.
 - The Department of Finance is responsible for the Commonwealth Investment Framework and the department has worked closely with Finance on this transaction.
 - Details of who responded to the EOI are confidential.

- The Government will provide \$466.4 million for a financing package of equity and loans for PsiQuantum to construct and operate its quantum computing capabilities and associated investment in industry research and development in Brisbane.
- Additional funding of \$27.7 million will be provided over 11 years from 2023-24 for the Department of Finance, the Department of Foreign Affairs and Trade, the Department of Industry, Science and Resources and the Department of the Treasury to manage and provide oversight of the investment.
 - This includes funding of \$16.1 million over 11 years from 2023-24 for the Department of Industry, Science and Resources to manage and provide oversight of the investment.
- The financial implications are included in the 2024-25 Budget measure *Future Made in Australia: Investing in Innovation, Science and Digital Capabilities*. The impact over the Forward estimates is set out in the table below:

	2023-24 (\$m)	2024-25 (\$m)	2025-26 (\$m)	2026-27 (\$m)	2027-28 (\$m)		Total (\$m)
Export Finance and Insurance Corporation – National Interest Component	nfp	nfp	nfp	nfp	nfp		nfp
Department of Industry, Science and Resources	nfp	nfp	nfp	nfp	nfp		nfp
Department of Finance	0.9	-	-	-	-		0.9
Department of Foreign Affairs and Trade	0.1	0.3	0.3	0.3	0.3		1.5
Department of the Treasury	-	0.7	0.7	0.7	0.7		2.7
Total	1.0	1.0	1.0	1.0	1.0		5.1