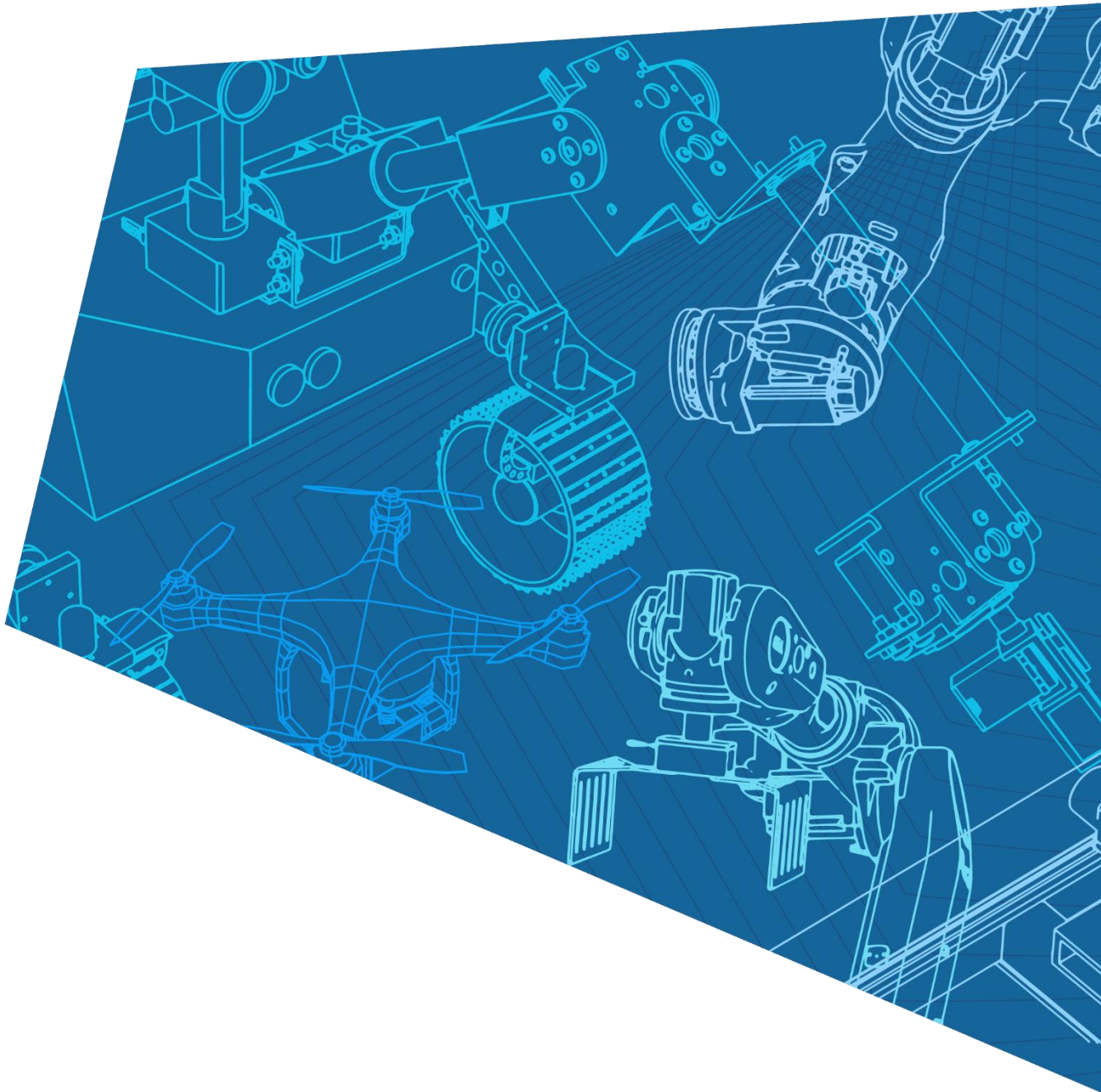




Australian Government
Department of Industry,
Science and Resources

National Robotics Strategy Discussion Paper

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Introduction

About this discussion paper

The Australian Government is developing a National Robotics Strategy to promote the responsible production and adoption of robotics and automation technologies. As enabling capabilities across industries, there is immense potential for Australian industries throughout the economy to benefit from these technologies to:

- address national challenges
- revitalise Australian industries and manufacturing
- provide safe and fulfilling opportunities for Australian workers.

The strategy will address the domestic production of robotics and enabling technologies, and the adoption of robotics and automation technologies throughout the economy. The Minister for Industry and Science has appointed a National Robotics Strategy Advisory Committee to help guide the strategy. The committee is comprised of leading thinkers and practitioners in robotics, technology, industry policy, law and society, manufacturing and labour rights.

In 2021, Australian robotics companies were estimated to be worth \$18 billion in annual revenue, up from \$12 billion in 2018.¹ Automation, in part enabled by robotics, was forecast in 2019 to add an additional \$170 billion to \$600 billion to Australia's annual gross domestic product by 2030 given sufficient investment across the private and public sectors.² Australia is facing widespread and acute skill shortages, with the unemployment rate in February 2023 at 3.5% and the employment-to-population ratio at 64.3%.³ Continued business innovation and investment in new technology, such as robotics and automation, can help lift productivity growth during a period of historically low unemployment.⁴

The Australian Government will use the strategy to:

- set out a vision for the robotics sector in Australia including the value of the domestic market for robotics and automation, and the contribution of these enabling capabilities to the economy
- address challenges across the national robotics and automation ecosystem, including challenges regarding growth, talent, collaboration, cohesion, workforce impacts, public trust and approval
- articulate the potential role of robotics and automation in the government's agendas for the economy, revitalising manufacturing, jobs and skills.

While recognising the tremendous opportunities from the production and adoption of robotics and automation, the Australian Government is aware of concerns in the community regarding the potential impact that increased adoption of robotics may have on people and on jobs in certain sectors. A key focus of this discussion paper is to explore these views so that we can work to address these concerns and best support Australian workers and communities and create job opportunities. We welcome views on how we can collectively address these challenges.

¹ Robotics Australia Group (2022), '[A robotics roadmap for Australia 2022](#)', Robotics Australia Group website, accessed 5 January 2023.

² Taylor C, Carrigan J, Noura H, Ungur S, van Halder J and Dandona G S (2019), '[Australia's automation opportunity: Reigniting productivity and inclusive income growth](#)', McKinsey & Company, accessed 5 January 2023.

³ Australian Bureau of Statistics (2023), '[Labour Force, Australia](#)', Australian Bureau of Statistics website, accessed 17 March 2023.

⁴ The Treasury (2022), '[Jobs + Skills Summit: Issues paper](#)', The Treasury website, accessed 5 January 2023.

Your response to this discussion paper will help to:

- determine areas of focus for the strategy
- highlight areas of comparative advantage and opportunities for further growth within the Australian robotics and automation ecosystem
- identify the benefits of adopting robotics and automation solutions throughout the economy, highlighting those sectors which stand to benefit the most
- identify barriers to greater production and adoption of robotics, including any gaps in existing initiatives
- understand future workforce requirements, including our existing strengths and any gaps that need to be addressed
- identify challenges around adoption, public trust and approval of robotics and automation
- explore measures to ensure safe production and adoption of robotics throughout the economy
- identify settings supporting ethical and responsible use of robotics and automation technologies, and other human factors that support the use of these technologies
- inform engagement with communities across Australia.

Definitions

We intend to use the below definitions for the purpose of the strategy. Your input on these definitions is highly valued, as it will serve to define the scope of the strategy. For more detailed technical definitions, see International Organization for Standardization definitions of robotics and related terms ([ISO 8373:2021](#)).

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

Robotics is the science and practice of designing, manufacturing, and applying robots.⁵

Autonomy is the ability to perform intended tasks based on current state and sensing, without human intervention.⁶

Automation is the performing 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.

Cobotics are robotic systems designed to collaborate and interact with humans within a shared space.

Drones are uncrewed aircraft systems that can be remotely or autonomously operated.

⁵ International Organization for Standardization (2021), '[ISO 8373:2021 Robotics – Vocabulary](#)', International Organization for Standardization website, accessed 5 January 2023.

⁶ International Organization for Standardization (2021), '[ISO 8373:2021 Robotics – Vocabulary](#)', International Organization for Standardization website, accessed 5 January 2023.

Traditionally, robots are divided into industrial and service robot types:

- **Industrial robots** are automatically controlled, reprogrammable multipurpose manipulators programmable in 3 or more axes, which can be either fixed in place or mobile for use in industrial automation applications.⁷
- **Service robots** are robots that perform useful tasks for humans or equipment excluding industrial automation applications.⁸

Field robots are a type of service robot that operate in large, unstructured outdoor domains and include aerial, land and underwater robots.

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

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

⁷ International Federation of Robotics, '[Industrial Robots](#)', International Federation of Robotics website, accessed 5 January 2023.

⁸ International Federation of Robotics, '[Service Robots](#)', International Federation of Robotics website, accessed 5 January 2023.

Australia's robotics opportunity

Robotics and automation, as enabling capabilities used in a range of industries and contexts, have the potential to generate enormous social, economic and environmental benefits for Australia. Australian industries have already adopted robots to work alongside humans to create safer and more productive work environments, from reducing pesticide use in agriculture, to improving asset management, and helping respond to bushfires.

Australia has immense research expertise and growing local capability to produce innovative robotic solutions and put them to novel uses. This is reflected in our global research impact ratings, where we are ranked seventh for autonomous systems operation technology, and ninth for both advanced robotics and drones, and swarming and collaborative robots.⁹ We are already a global leader in field robotics, a class of service robots that operate in large, unstructured outdoor domains and include aerial, land and underwater robots. For example, the Australian mining and logistics sectors use robotic technologies to improve extraction and safety, increase productivity and efficiency, and reduce operating costs. This expertise is now being adapted and applied in new sectors, including soil analysis and crop monitoring in agriculture and remote operations in space.

We need to capitalise on existing Australian know-how and expertise. With our world-class research institutions, political stability, favourable business conditions and skilled workforce we are well placed to seize this opportunity. The government is committed to working with industry to build strategic industry capability in Australia, power future economic growth and create new jobs. Under the National Reconstruction Fund, the government has allocated \$1 billion to expanding Australia's critical technology capability, which includes areas such as robotics.

By focusing on robotics and building our national robotic capability, we will also foster the broader technology ecosystem. The individual components and capabilities going into the construction of a robot span a breadth of expertise and domains, including AI, computer vision, sensors, advanced materials, batteries, satellite positioning and navigation, and advanced communications. With this broad reach, there is a need to have a breadth of skills to support our robotics and automation future. These skills can be developed across the full spectrum of our education system, including our world class TAFE system and universities. Science, technology, engineering and mathematics (STEM) skills will be fundamental in many of these roles.

Increased adoption of robotics can help address skill shortages and realise productivity gains throughout the economy. Robotics is a key enabling capability lifting productivity in areas where the government and industry have identified that Australia has natural and competitive strengths. This includes areas in:

- resources
- agriculture, forestry and fisheries
- transport
- medical science
- renewables and low emission technologies.

⁹ Critical Technologies Policy Coordination Office (2022), '[Action plan for critical technologies: Tech cards](#)', Department of Industry, Science and Resources website, accessed 10 January 2023.

The increased adoption of robotics and automation will also support and improve the competitiveness of Australian manufacturers.

To maximise these benefits, it is not just the technology that needs to be considered, but also the social and human impacts relevant to the development and implementation of these technologies. Robots are best utilised when completing tasks that are repetitive, require precision, are unhygienic or dangerous, and involve working alongside instead of replacing humans. The strategy will reflect the commitment of the government to ensure that robotics and automation technologies are produced and adopted for the benefit of Australians.

The strategy will articulate the Australian Government's vision for robotics and automation in Australia. With your help, we want to develop a shared vision for Australia's future robotics ecosystem that:

- promotes Australia's social, economic and environmental interests
- supports our world-class research and its commercialisation
- supports small-to-medium enterprises in the robotics sector to reach commercial success and revenue
- creates robotics products and services with demonstrable benefits to Australians
- supports the growth of a sustainable robotics industry that positions Australia as a global leader in the development, oversight and use of robotics technologies
- encourages adoption of robotics across sectors to improve safety and productivity, address skills gaps and support small to medium enterprises
- fosters a culture of inclusion, diversity, and positive social impact in both the production and adoption of robotics
- creates more jobs for Australians and reflects the diversity of needs across Australia
- provides access to robotics capabilities that meet Australia's rigorous safety, privacy and security standards, and supports lawful, ethical and responsible development and use
- has the right skills to support the Australian robotics industry into the future
- creates an environment that fosters international collaboration.

Australia, a world leader and essential global partner in robotics

In 2021, a team from the Robotics and Autonomous Systems Group at CSIRO's Data61 won second place in the DARPA (Defense Advanced Research Projects Agency) Subterranean Challenge, demonstrating Australia's cutting-edge software, technology and research expertise.

Our strengths in robotics recently saw the Australian Government sign an agreement with NASA to develop an Australian-made semi-autonomous rover to be a part of a future mission to the moon, exemplifying Australia's global reputation in remote operations.

Areas of focus

Four key themes have emerged from the advice of the advisory committee and the conversations we have had to date with industry, researchers and the broader public:

1. National capability
2. Trust, inclusion and responsible development and use
3. Skills and diversity
4. Increasing adoption

Addressing these themes through the strategy will help Australia realise the benefits of robotics and automation. The rest of this discussion paper outlines what we have heard to date on the issues under each of these themes and seeks your views on these issues.

Theme 1: National capability

Growing Australia's national capability in robotics and fostering a robotics ecosystem will be critical to growing and improving the complexity of our economy. This will depend on the success of Australia's robotics research and development, and the commercialisation of this technology.

Strengths in enabling areas, such as AI and machine learning research, provide competitive advantages to Australia. A thriving robotics ecosystem would support local companies in these enabling fields, by creating highly valuable robotics markets and increased onshore manufacturing. This provides greater opportunity for collaboration and increases the feasibility of receiving intellectual property protections – such as patents – in hardware-based innovations, relative to those that are software-based.

From our consultation to date, key areas of focus identified by industry that would help build our national capability include:

- demonstrating to Australian businesses across a range of industries the potential use cases and commercial benefits from adopting trusted Australian robotics and automation solutions
- improving collaboration across industries and between industry and research organisations
- boosting coordination across state and territory governments and the Australian Government to identify shared national robotics priorities and ensure that legislative frameworks are fit for purpose
- increasing attraction of domestic and foreign investment, especially at the seed and startup stages
- filling gaps in national robotics supply chains, which can hinder Australian companies from scaling up robotic solutions or engaging in end-to-end manufacturing.

We have heard from researchers and industry of challenges in commercialising their innovations. Australia's venture capital investment in advanced robotics, while ranked seventh internationally, is only a fraction of that of leaders such as the US, China and Israel. This leads to lower levels of commercialisation, with Australia ranked 14th in patent filing.¹⁰

¹⁰ Critical Technologies Policy Coordination Office (2022), '[Advanced Robotics Technology Card](#)', Department of Industry, Science and Resources website, accessed 10 January 2023.

Australia's relatively small market size and available capital may present barriers for some Australian robotics businesses seeking to commercialise their intellectual property or scale up their business. This may be compounded by the high level of investment needed to develop and test many robotic solutions. On the other hand, our close proximity to large Asian markets, along with similarities to United States and European markets, can help make Australia's exports internationally competitive.

Australia's large land mass and low population density provide opportunities for testing of particular robotics solutions, and can encourage collaboration between international and local research institutions and industry.¹¹ The development and use of remote test beds in consultation and collaboration with traditional owners and native title holders could create new opportunities for robotics development in Australia.

The government is committed to investing in boosting Australian industry's capability in developing emerging technologies, including robotics technologies, to support local talent, local ideas and local commercialisation. The National Reconstruction Fund has \$1 billion targeted towards investments in critical technologies. The Buy Australia Plan, including the establishment of the Future Made in Australia Office, will support the creation of new firms and strengthen existing ones by leveraging Australian Government spending.

¹¹ Nolan A (2021), '[Making life richer, easier and healthier: Robots, their future and the roles for public policy](#)', OECD Science, Technology and Industry Policy Papers, No. 117, OECD Publishing, accessed 5 January 2023.

Theme 2: Trust, inclusion and responsible development and use

The success of the robotics ecosystem in Australia depends on ensuring public trust and support of robotics and automation. For the opportunities of robotics and automation to be realised, the development and adoption of these technologies needs to accord with settings promoting trustworthy, ethical and responsible use.

There has been a popular conception of robots replacing or taking the jobs of humans since the term ‘robot’ originated in the early 20th century. These perceptions are strengthened by popular culture and portrayals of humanoid robots well beyond current technical limitations. The reality of the development and deployment of robots and their impact on the workplace is much more nuanced.

While the adoption of robotics and automation may disrupt or change particular tasks in certain industries, research indicates that robotics will lead to a net growth in jobs by complementing and improving the productivity and job growth of many sectors.¹² Research from the Organisation for Economic Co-operation and Development (OECD) found that countries that have invested more in robotics have experienced higher levels of employment growth.¹³ Industry has indicated it is only through the adoption of robotics and automation that they have been able to expand their operations and perform, for example, manufacturing tasks that would otherwise have been completed overseas.

It is important that industry and government understand changes brought about from the adoption of robotics and automation.

For decision makers in industry considering adopting robotics and automation technologies, the potential benefits of adoption need to be clear. Before committing to the expense, they will need to understand how these technologies will help them:

- deliver better products and services
- improve productivity
- better respond to customer needs
- be more competitive
- be an attractive place to work or
- grow their customer and employee base.

That is, industry will need to be able to trust that there will be a positive return on their investment. Regulatory settings, standards, reliability, interoperability and robust cyber security arrangements can help foster this trust. Given Australia’s reputation as a trusted source of technology and a leading safety regulator, there is an opportunity for Australia to become a leader in the lawful, ethical and responsible development and use of robotics and automation.

¹² Stayner T (2019), ‘[Robots aren’t stealing our jobs, new report says](#)’, SBS News, accessed 5 January 2023.

¹³ Georgieff A and Milanez A (2021), ‘[What happened to jobs at high risk of automation?](#)’, OECD Social, Employment and Migration Working Papers, No. 255, OECD Publishing, accessed 5 January 2023.

We have heard from stakeholders that public trust and understanding remain large barriers to increased adoption. We have been told that people are more likely to trust technology when:

- they feel in control of setting up the system themselves
- they understand and can see how the technology has practical benefits for their individual circumstances
- the adoption of the technology is normalised.

It is also important to consider the impact of these technologies on the broader community, including those not directly involved in their development and use. There is a role for all in the national robotics ecosystem to play in increasing trust and promoting demonstrable benefits to Australians through the adoption of robotics.

There is an opportunity to improve public education around the role and application of robotics in industry and society. Showcasing positive examples of robotics and automation, including the specific benefits this has had on the workforce, as well as broader social and environmental benefits, will help build this knowledge and trust.

The robotics industry needs to deliberately consider trustworthy, lawful, ethical and responsible development and use of robotics and automation technologies. This could include researchers, engineers, businesses and training providers working closely with social scientists and ethicists. Ensuring all parts of the robotics ecosystem have a diverse workforce will help assist in developing technology that is inclusive and fit for purpose. Feedback mechanisms that provide an opportunity for community concerns to be identified and addressed will also support this.

Theme 3: Skills and diversity

We need to build on the pool of smart, innovative Australians excited about robotics to support a thriving robotics sector, and support adoption of these technologies. This includes building a diverse workforce that can develop robotics and automation technology to service the diverse needs across Australia. Training, attracting and retaining talent locally will assist in attracting investment and help drive the domestic startup ecosystem.

Australia's technical expertise is well-regarded internationally. Our vocational institutions are highly regarded and our universities are highly ranked, and as a result our graduates are sought after by overseas companies and research institutions. In particular, Australia has world-leading expertise in field robotics, including autonomous underwater vehicles and drones. However, we have heard from stakeholders that domestic industry, especially startups, cannot always offer the same salaries and opportunities that large overseas companies can, leading to local talent going abroad.

We have heard from companies developing and adopting robotics that a range of skills and vocational training levels are required in the workforce. Some roles may require tertiary or post-graduate degrees, but in many others, it is trade or vocational skills, or those that can be learnt through on-the-job training. In the resources sectors, for example, tailored courses have been developed to upskill and train existing staff in the use of robotics. This not only provides workers with the skills they need, but allows them to see themselves working with new technologies, and to understand the impact on their work and the benefits from adoption.

As improvements are made to robotics interfaces and usability, particularly in cobotics, the barriers to using and adopting robotics may be further lowered. More broadly, improvements in digital and technical literacy will increase the awareness of robotics and automation technologies in workplaces and board rooms.

The growth of Australia's robotics and broader tech ecosystem would benefit from an increase in STEM graduates at both tertiary and vocational levels. As highlighted through roundtables for the Jobs and Skills Summit, more needs to be done to encourage STEM at all levels of schooling and education, including fostering interest in STEM amongst primary school children. At the other end of the talent pipeline, Australia has a distinctive opportunity to build graduates and workers who are skilled in the translation of STEM and social sciences, law and ethics. To support robotics, organisations may require staff with expertise in building public trust and approval, and expertise in the lawful, ethical and responsible development and use of robotics.

Skilled migration provides another method of securing a talented local workforce in addition to domestic training and education opportunities. Opportunities may come from the employment of skilled migrants in their areas of expertise, and from providing sufficient opportunity for people with skills not available locally to come to Australia or stay in Australia if they have been trained here. The maturity of the robotics industry could also be improved by attracting back the talented Australians that are overseas and who may be unaware of the growing Australian robotics industry.

The Australian robotics industry would benefit from improved diversity. There is a role for government to encourage diversity in STEM and other fields relevant to development and adoption of robotics in society, aimed both at higher education and life-long learning, with a focus on reskilling and upskilling. More could be done to increase the number of women, First Australians and other historically underrepresented groups in the robotics industry.

The government has already taken steps to address these challenges. The Diversity in STEM Review, being undertaken by an independent expert panel, will identify barriers to participation and retention, review how current programs are performing and recommend ways to improve participation. The Digital and Tech Skills Compact, announced at the Jobs and Skills Summit, affirms commitment from industry, government and unions to cooperate to help address skill shortages and grow the Australian tech sector.

As with many technologies, the introduction of robotics and automation will change the way we work. Creating an agile, well-trained workforce will benefit the entire economy as it is predicted that all industry sectors will require increased technological skills in the future.¹⁴ There is a role for industry and government to provide training pathways to support the workforce of the future.

¹⁴ National Skills Commission (2021), [‘State of Australia’s Skills 2021: now and into the future’](#), National Skills Commission website, accessed 10 January 2023.

Theme 4: Increasing adoption

The benefits of robotics and automation are far reaching. For many industries in Australia, robotics and automation will not only make work more efficient, cost-effective and productive, but also safer and higher quality for their workforce.¹⁵ Through the strategy, we are seeking to support Australian businesses to adopt and integrate robotics into existing business practices, to solve specific business needs and realise the benefits that robotics and automation can provide.

We are in a good position to spread robotics across the economy where it makes business sense, starting from the sectors that are already leading in uptake and automation. Australia is currently world-leading in the adoption of whole-of-system automation solutions in resources and mining sectors, improving the safety of work in these industries by removing the need for humans to be exposed to dangerous environments or to perform unsafe tasks.¹⁶ We also lead in remote operations, both in operation of mining equipment and in space operations, lending us the experience and expertise to more broadly utilise these field robotics technologies.

However, in other areas of the economy, Australia lags in robotics adoption. For example, we are behind other OECD member countries in the adoption of industrial robots, which are typically used in manufacturing, with Australia's annual installations of industrial robots ranked 30th globally in 2021.¹⁷

Other sectors, including agriculture and health, have started adopting robotics and automation. In these sectors there is potential for greater adoption to assist with addressing business challenges including workforce shortages and supply demands, and to improve reliability, productivity and sustainability. In healthcare, robotics can assist surgeons to perform surgeries with more precision and efficiency, potentially decreasing surgery waiting times and increasing the time doctors and nurses have to spend with patients. In agriculture, autonomous ground vehicles are being employed to work fields, while drone technology is being deployed in monitoring and surveillance. Meanwhile, autonomous underwater vessels will increasingly be used in management of fisheries.¹⁸ Examples of other sectors where robotics and automation are being used include aerospace, logistics, mineral extraction and emergency management, potentially making these sectors safer, more productive and more internationally competitive.

Despite the benefits robotics can bring to sectors across the Australian economy, Australian businesses, especially small and medium enterprises, currently face challenges in adopting and integrating these technologies into their operations. We are seeking to better understand and identify ways to resolve these barriers to adoption.

Australian robotics producers have told us that there is a low level of awareness across some sectors of the advantages that robotics and automation can afford businesses, limiting companies from investing in robotics. We have also heard from some businesses adopting robotics that they prefer to import well known solutions from abroad, rather than spend perceived additional time or take on perceived greater risk working with a local manufacturer.

¹⁵ DeStefano T, De Backer K and Ran Suh J (2019), '[Industrial robotics and product\(ion\) quality](#)', OECD Science, Technology and Industry Working Papers, No. 2019/07, OECD Publishing, accessed 5 January 2023.

¹⁶ Australian Space Agency (2022), '[Robotics and automation on earth and in space roadmap 2021-2030](#)', Department of Industry, Science and Resources website, accessed 10 January 2023.

¹⁷ International Federation of Robotics (2022), 'World Robotics Industrial Robots 2022: Statistics, Market Analysis, Forecasts and Case Studies', VDMA Services GmbH.

¹⁸ Robotics Australia Group (2022), '[A robotics roadmap for Australia 2022](#)', Robotics Australia Group website, accessed 5 January 2023.

Despite many long-term benefits, there are short-term costs and risks for companies when established business processes are disrupted in order to adopt new processes and technologies, including robotics and automation. For small and medium enterprises in particular, this can be a significant barrier to adoption. We have heard from businesses that have realised significant benefits from adopting robotics that the initial adoption period required investment in training, work health and safety, and updating procedures. There may be other instances where the scale of operations or other considerations in particular sectors or businesses are such that, at this point in time, the return on investment from robotics and automation is not yet commercially viable.

Regulations and standards have a role in providing certainty to businesses so they have confidence to use different technologies in their business processes. We have heard from stakeholders that in some instances, standards and regulations have not kept up with technological changes. Legal frameworks and regulations at times do not extend to robotics, leaving businesses using robotics open to increased uncertainty and potential liability. Additionally, some current industry and workplace health and safety standards do not consider robotics in the workplace or address interoperability that would ensure hardware, software and enterprise systems are compatible.

How to get involved

We welcome your contribution as we work to develop the strategy and create a future vision for Australia's robotics ecosystem.

You may wish to answer some or all of the following questions in your submission.

Definition

1. Do you agree with the definitions in the discussion paper? If not, what definitions do you prefer?

Australia's robotics opportunity

2. What is your vision for the future of robotics and automation in Australia? Are there any sectors or types of robotics that hold particular opportunities for our nation?
3. How should we measure the growth and success of robotics in Australia? What methodologies would ensure robust and reproducible evidence?
4. Is there anything else we should consider for a shared vision to capture Australia's robotics opportunities?

National capability

5. What are Australia's existing strengths in robotics and automation research, development and production? How can we build on these?
6. In what related areas could Australia develop world-leading expertise?
7. How can Australia improve its investment environment and access to capital to support Australian robotics companies?
8. How can Australia improve its robotics supply chain?
9. How can we make it easier to commercialise Australian research and development?
10. How can we encourage more collaboration between industry and research?
11. What are the barriers and enablers to international cooperation and exporting Australian robotics and automation technologies?

Trust, inclusion and responsible development and use

12. What do you think are the impacts and opportunities of robotics and automation in Australia?
13. What would increase trust and approval of robotics and automation?
14. How can Australia ensure robotics and automation are developed and adopted lawfully, responsibly and in a way that improves the lives of Australians?
15. How can we ensure Australian workers benefit from the adoption of robotics and automation?

Skills and diversity

16. What are the existing strengths in the skills and capabilities of Australia's robotics and automation workforce? Are there existing or expected gaps that need to be addressed?
17. What are the barriers to training, attracting and retaining skilled and qualified workers to produce and adopt robotics and automation in Australia? How can these be addressed?
18. How can Australia improve the diversity of its robotics and automation workforce and better include under-represented groups?
19. How can we help workers transition and develop the skills they need to work alongside robotics?

Increasing adoption

20. How are businesses and governments adopting robotics technology in Australia? Do they use Australian-made products?
21. Which Australian industry sectors would benefit the most from more robotics and automation? Why?
22. What are the barriers to increased adoption of robotics and automation? How can we address these barriers?
23. How do current regulations and standards help or limit the adoption of robotics? How could we improve these?