
Australian Government

Department of Industry, Science and Resources

# Senate Select Committee on Adopting Artificial Intelligence (AI)

Department of Industry, Science and Resources
Written Submission

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# Contents



# Introduction

The Department of Industry, Science and Resources (DISR) welcomes the opportunity to contribute to the Senate Select Committee on Adopting Artificial Intelligence (AI).

DISR coordinates a whole-of-government effort on Safe and Responsible AI, supporting a cohesive response to AI across portfolios. DISR is consulting with industry, academia and civil society to deliver advice to government on how to harness the benefits of this technology while mitigating against its serious risks.

This submission will highlight the opportunities presented by AI and how Australia can make the most of them. It will outline the options available to government to ensure the design, development and deployment of AI is safe and responsible. A summary of current government action is also provided.

# Background

The potential for AI systems and applications to improve wellbeing, quality of life and grow our economy is well known. The design, development and deployment of AI will transform industries, create new jobs, drive innovation, improve decision-making, enhance customer experiences, and support small businesses. AI and automation could generate between $170 to $600 billion a year towards Australia's GDP by 2030.[1]

[1] C Taylor, J Carrigan, H Noura, S Ungur, J van Halder and G Dandona, *Australia's automation opportunity: Reigniting productivity and inclusive income growth,* McKinsey & Company, 2019.

At the same time, AI presents a potential to create or amplify harms to individuals, organisations, communities, and social cohesion. Harms include discrimination, bias, mis- and dis-information, socio-economic disparities, and health and safety risks. These harms may disproportionally affect vulnerable and marginalised groups, particularly people with cognitive disability, displaced workers and older people. It may also pose higher risks of harm to culturally and linguistically diverse communities, regional communities, women and girls, and gender equality more broadly.

Advances in AI are occurring at a time of heightened geostrategic competition. Around the world governments are grappling with how to harness potential AI benefits while mitigating the risks. Countries are acting collectively, and within their jurisdictions, to introduce regulatory requirements and investing in AI capability. The Australian Government recognises that getting the appropriate guardrails and regulation in place will support innovation and increase adoption, ultimately leading to benefits for Australia.

## What makes AI different?

Although AI shares many similarities with other technologies, it has several characteristics that when considered together make it different and justify the current focus on the safe and responsible adoption of AI. Many of these differentiating attributes were drawn out in submissions to the government's 2023 Safe and Responsible AI discussion paper,[2] including:

| | |
|---|---|
| ***Adaptability and learning*** | AI systems can improve their performance over time and adapt by learning from data.<br><br>As AI has become capable of generating data and even programming code it has also become a creator of information, technology and imagery. |
| ***Autonomy*** | AI systems can make decisions autonomously– without human intervention if designed or implemented that way. |
| ***Speed and Scale*** | AI has an unparalleled capacity to analyse massive amounts of data in a highly efficient and scalable manner. It also allows for real-time decision-making at a scale that can surpass the capabilities of traditional technologies. |
| ***Opacity*** | Decisions made by AI systems are not always traceable and humans cannot always obtain insights into the inner workings of algorithms. |
| ***High realism*** | The advancement of AI and particularly generative AI has reached a point where AI can emulate human-like behaviours in some tasks or create such realistic outputs that make it challenging for end-users to identify when they are interacting with AI or a human, or distinguish between artefacts that are AI-generated rather than human generated. |
| ***Versatility*** | AI models are a multipurpose technology that can perform tasks beyond their intended uses, even when deployed for a general or specific purpose. |

[2] Department of Industry, Science and Resources (DISR), *Safe and responsible AI in Australia Discussion Paper*, Australian Government, 2023.

***Ubiquity*** AI, particularly generative AI, has become a readily accessible and increasingly dominant part of our everyday lives, and continues to be developed and adopted at an unprecedented rate.

# Opportunities offered by AI

AI has been identified as a critical technology field in Australia's national interest,[3] with the potential to increase productivity and energy efficiency, reduce carbon emissions, enhance healthcare and improve citizens' interaction with one another and with government. AI offers a vast range of opportunities, including but not limited to:

- **Automation and efficiency:** AI enables automation of simple or repetitive tasks like writing emails or summarising documents, freeing up human workers to focus on tasks that require human input like care, leadership, and creative problem solving. This leads to increased productivity and efficiency within organisations, ultimately driving economic growth.
    - In the healthcare sector, AI can analyse medical images, assist in diagnosis, handle administrative tasks, and predict patient outcomes, alleviating the burden on professionals and allowing them to focus on complex tasks and patient care.
    - In education, AI can provide personalised assistance to students. 'ABii' is a robot tutor that acts as a classroom assistant, using AI to provide students from kindergarten to fifth grade with step-by-step maths and reading instructions, adapting to individual learning habits.[4]
    - In manufacturing, AI can assist with quality control - inspecting for defects and identifying the root cause of those defects. It can also support supply chain optimisation improving demand forecasting and balancing inventory levels.
    - In banking, AI chatbots are enabling 24/7 customer interactions, allowing staff to focus on more complex customer cases or issues like fraud. The Commonwealth Bank's chatbot 'Ceba' deals with over 200 simple tasks - from checking account balances to activating cards.[5]
- **Addressing skill shortages:** The adoption of AI can address skills shortages which are currently holding back key industries and products that Australians need.
    - Skills shortages are a key concern of the agricultural sector, with surveys showing 57% of horticulture farms experienced recruiting difficulty in 2021-22.[6] AI can monitor crops, conduct quality checks, assist in planting and harvesting, and improving yields. This improves efficiency and productivity, addressing the shortage of skilled labour.[7]
    - AI can help reach broader talent pools and reduce bias in recruitment, tailor gender-sensitive training, and use predictive analytics for policy impact

[3] Department of Industry, Science and Resources, *List of Critical Technologies in the National Interest*, Australian Government, 2023.
[4] Van robotics, *https://www.smartrobottutor.com/*, accessed 09 May 2024.
[5] Commonwealth Bank, *Commonwealth Bank Launches Chatbot Named Ceba*, Commonwealth Bank, 19 January 2018
[6] A Brown, C De Costa, C and F Guo, *Our food future: trends and opportunities*, ABARES, Research Report 20.1, 2020, DOI: 10.25814/5d9165cf4241d. CC BY 4.0.
[7] Y Gao, *AI and the future of farming, Griffith University*, 30 Oct 2023.

assessment. This in-turn has the potential to increase women's representation in leadership roles and make contributions to close the gender pay gap.

- Generative AI has been shown to perform well at STEM tasks, which may alleviate Australia's skills shortages in related professions, such as augmenting software development.[8]
- AI connected motion sensors are being used in the aged care sector to detect deviations from the normal movements of people living with dementia and alerting carers.[9]
- AI can prompt where to hold an ultrasound probe and what amount of pressure to apply. This has already allowed First Nations health practitioners to produce usable echocardiograms from remote communities, to enable diagnosis by cardiologists.[10]

- **AI-driven innovation:** AI facilitates innovation across industries by enabling the development of new products, services, and business models.
  - AI is being used by scientists to screen existing medicine for new applications and predict which molecules can treat different illnesses. For example, using AI, researchers found that an antimalarial drug can also be used to treat osteoporosis.[11]
  - Emerging research shows that AI can be used to circumvent assumptions or knowledge limitations of medical professionals to reduce disparity in health outcomes for women and culturally and linguistically diverse groups.[12]
  - Co-designed with First Nations Australians, AI is being used to empower Traditional Owners to respond to environmental challenges and support caring for country.[13]
  - An AI algorithm used to examine lesions (including photos taken on phone cameras) for early identification of skin cancer has demonstrated similar performance to board-certified dermatologists.[14]
- **Improved decision-making:** AI algorithms can analyse vast amounts of data and provide valuable insights to support decision-making processes. This leads to better-informed decisions across various sectors, driving efficiency and competitiveness in the economy.
  - AI supports human decision-making in the context of energy and emissions reduction by forecasting renewable energy production. It analyses weather patterns, historical data, and grid conditions to predict the production of renewable energy sources like solar or wind power. This helps balance energy supply and demand, which ensures efficient utilisation of renewables, reduces reliance on fossil fuels, and lowers emissions.

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[8] Mandala/LinkedIn, *Preparing Australia's Workforce for Generative AI*, March 2024.
[9] Z Corbyn, *The future of elder care is here – and it's artificial intelligence*, The Guardian, 3 Jun 2021
[10] S Schubert, *How artificial intelligence is helping to detect heart disease in remote Australia*, ABC news, 22 Mar 2023.
[11] R Wang et al. *Deep Learning-Predicted Dihydroartemisinin Rescues Osteoporosis by Maintaining Mesenchymal Stem Cell Stemness through Activating Histone 3 Lys 9 Acetylation*, ACS Central science, 2023, https://doi.org/10.1021/acscentsci.3c00794
[12] T Simonite, *New Algorithms Could Reduce Racial Disparities in Health Care*, Wired, 2021
[13] S Schmidt, *How healthy country AI is delivering on-ground benefit*, CSIRO, 2024
[14] L R Soenksen, T Kassis, S T Conover, B Marti-Fuster et al., *Using deep learning for dermatologist-level detection of suspicious pigmented skin lesions from wide-field images*, Science Translational Medicine, Vol 13, Issue 581, 2021, DOI: 10.1126/scitranslmed.abb3652

  - In mining, AI provides real-time information that allows quicker and more precise decisions about hazardous conditions, lowering the chance of injuries.
  - AI can also overcome human bias in decision-making, for example in recruitment in male dominated sectors.
  - An AI Algorithm which analyses a database of eardrum photos will empower health workers in remote communities to inform interventions or decide when refer to a specialist. This is particularly beneficial for First Nations children in remote communities, as First Nations children have some of the highest rates of hearing loss and ear disease in the world.[15]

- **Tailored experiences and accessibility:** AI-powered technologies such as chatbots, recommendation systems, and personalized marketing tools allow tailored engagement that may improve experiences. Satisfied customers lead to increased sales and business growth, contributing to overall economic prosperity. These applications of AI can also improve access to vulnerable or marginalised groups.
  - In the hospitality industry, AI-powered virtual assistants accessed through the hotels website or app provide personalised recommendations and assistance to guests ranging from automated check-ins or ordering room service to giving recommendations about the local area.
  - Text to speech can help those with low vision, voice-enabled interfaces can aid those with typing difficulties, generative AI can summarise essential points in simple language for those who have cognitive impairments, AI can translate or interpret different languages, accents, or speech disorders.[16]
  - 'Sophia' is a chatbot available 24/7 to domestic violence survivors. It is fully encrypted, leaves no digital trail, and requires no download or registration. Sophia can provide advice, direct people to support, and create a 'digital safe' for collection of evidence.[17]

Adapting to the use of AI will not always be automatic and it may take time before these benefits are fully realised. For example, automation of simple or repetitive tasks may lead to work intensification where workers feel the need to be 'always on' for complex tasks or required to match the speed of automated systems. As businesses across Australia begin to adopt AI, augmenting the productivity of their workers, benefits will be more rapidly realised throughout the economy.

# Potential risks of AI

While AI has a range of legitimate uses, there are documented instances of harm. Through the government's consultation on the *Safe and Responsible AI in Australia* discussion paper it heard that the current regulatory framework likely does not sufficiently address known risks presented by AI systems.[18] It is likely that existing laws do not sufficiently prevent AI-facilitated harms *before* they occur. Putting in place guardrails against these risks will create the right settings for AI innovation and adoption in Australia, allowing benefits to be fully realised across all sectors.

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[15] C Gooley, *Hopes AI program can treat Indigenous hearing loss in remote areas*, The Sydney Morning Herald, 14 November 2021

[16] R Ravinutala, *AI's Inclusive Touch: Transforming Customer Service for Individuals With Disabilities*, 16 Feb 2024

[17] S Ganguly, *Tech for Good: How AI is empowering survivors of domestic violence*, Zendesk Blog, 20 Feb 2024

[18] DISR, *Safe and responsible AI in Australia Consultation Australian Government's interim response*, Jan 2024.

Consultations presented diverse views on the most serious, urgent and probable risks of AI. These are broadly categorised as technical risks, unpredictability and opacity, domain-specific risks, systemic risks, and unforeseen risks.

- **Technical and data risks**: the outputs of AI systems can be compromised by technical limitations, including inaccuracies in system design or biases in training data. This can result in inaccurate or unfair outcomes for people or groups. For example, if AI models in healthcare are trained on non-representative data, they may contribute to disparity in health outcomes for underrepresented groups.
- **Unpredictability and opacity**: opaque AI systems can make it difficult to identify harms, predict sources of error, establish accountability, explain model outcomes and assure quality. For example, if job applications are assessed by AI systems where internal workings are automated and invisible, people affected by discriminatory outcomes may have limited ability to understand or question decisions.
- **Domain-specific risks**: where AI interacts with existing harms, systems, or legislative frameworks, new risks can arise, or existing risks can be exacerbated. Examples include the generation and spread of online harms like deepfake pornography or AI generated cyber-abuse, and the undermining of social cohesion through misinformation or disinformation generated, tailored and spread by AI.
- **Systemic risks**: emerging AI developments can create systemic risks including risks associated with the development of highly capable and potentially dangerous frontier models as well as the greater accessibility and useability of generative AI models. These developments can lead to unpredictable harms on a scale and at a speed not previously possible.
- **Unforeseen risks**: AI is evolving with a speed and complexity that will likely pose unforeseen risks. The rate of technological change makes it difficult to ensure that regulation is future-proofed and can meet unforeseen challenges without stifling innovation and the chance for AI to solve some of our most pressing problems. Accordingly, regulatory approaches must be flexible and responsive to risks as they emerge.

These harms can occur on three broad levels:

- **Individual**: harms to individuals including discrimination, exclusion, bias, defamation and reputational damage, threats to physical or psychological safety, breaches of privacy.
    - AI used to predict recidivism can disproportionately target marginalised groups.
    - Recruitment algorithms can unfairly penalise diverse groups, including women, people with disabilities and culturally and linguistically diverse people.
    - AI may be misused to generate deepfake images and videos, including non-consensual and sexually explicit deepfakes which almost exclusively target women.
- **Organisational**: harms to organisations including reputational or commercial damage.
    - Increased digitisation exposes organisations to greater chances of cyber-attacks which may expose personal data of clients.
    - Profit loss due to AI errors like incorrect valuations.
    - Legal risks from AI that results in biased or discriminatory decision-making for example in recruitment which may breach Commonwealth laws including the

*Racial Discrimination Act 1975* and the *Sex Discrimination Act 1984* and expose an organisation to civil liability.

- **Societal**: harms to society at large including environmental damages, perpetuating inequality or bias, and distributing harmful content.
    - Dissemination of misinformation or disinformation at scale.
    - AI-generated videos undermining electoral and democratic processes.
    - AI driven facial recognition technology being used for combatting theft may risk discrimination based on skin colour (with higher rates of error).
    - Increased uptake of AI may lead to increased energy usage and emissions.
    - AI algorithms which seek to suppress harmful content may demonstrate bias against women and women's bodies, or "shadow ban" content with images of women, with implications for online reach and women's online businesses.[19]
    - First Nations cultural intellectual property rights may be at risk from AI, for example imitations of arts that resemble an 'Indigenous style'.[20]

There is potential that these risks and harms may affect vulnerable or marginalised groups including First Nations communities, gender diverse Australians, women, people with disability, LGBTQI+ communities, and culturally and linguistically diverse Australians. Accordingly, government is acting to capture the views and needs of these groups when exploring options to support safe and responsible AI.

# Why AI adoption is important to Australia's economy

The Productivity Commission identified AI as one of the transformative digital technologies that can help to drive productivity growth in Australia, including through the support it provides for the production and adoption of robotics.[21] Generative AI alone could add $45 billion to $115 billion to the economy.[22]

To capitalise on this opportunity and keep up with global momentum, Australia must increase adoption of AI. Globally, Australia lags in AI adoption, ranking second last out of 14 leading economies.[23] A large component of this is due to a lack of trust by the public in AI systems, reinforcing the need to get the settings right to ensure the design, development and deployment of AI is safe and responsible.

Civil society and industry are grappling with what the widespread use and increasing sophistication of AI means for them. This curiosity is reflected in Google's latest search data with Australian searches for AI increasing by 50% in the first quarter of 2024. However, this curiosity has two sides - enthusiasm and apprehension. People are searching how to use AI, but also how to detect its use. They are searching for how to improve their business with AI, but also whether AI will negatively affect their industry.[24]

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[19] G Mauro and H Schellmann, *There is no standard': investigation finds AI algorithms objectify women's bodies*, The Guardian, 8 Feb 2023

[20] T Worrell, *Generative AI in the classroom risks further threatening Indigenous inclusion in schools, The Conversation*, 6 Feb 2024.

[21] Australian Government Productivity Commission, *Advancing Prosperity 5-year Productivity Inquiry report*, Australian Government, 2023.

[22] Microsoft and the Tech Council of Australia, *Australia's Generative AI opportunity*, Tech Council of Australia, 2023.

[23] Deloitte, *Generation AI: Ready or Not, here we come, 2023.*

[24]J Dudley-Nicholson, Aussie curiosity about AI tech reaches all-time high, Canberra Times, 2024[24]J Dudley-Nicholson, *Aussie curiosity about AI tech reaches all-time high*, Canberra Times, 11 April 2024.

This duality is reflected in multiple surveys. Nearly two-thirds (62%) of business and technology leaders surveyed by Deloitte in early 2024 reported excitement about generative AI, but 30% also reported uncertainty.[25]A survey by UQ and KPMG showed that only one-third of Australians agree Australia has adequate guardrails to make the design, development and deployment of AI safe.[26]

These views were reflected in submissions to the government's 2023 discussion paper *Safe and Responsible AI in Australia*.[27] Submissions highlighted enthusiasm for the possibilities AI presents alongside low public trust in AI systems, with concerns that they are not currently being designed, developed or deployed safely.

Increasingly, governments and consumers are demanding that companies developing and deploying AI in high-risk contexts take proactive steps to make their products safe to use, are transparent and fair. Some companies are responding by voluntarily applying guardrails. In parallel, governments worldwide are focused on ensuring there are sufficient guardrails for AI development and deployment both as part of a global governance approach and within their domestic realm.

As government moves to support increased adoption, potential inequalities will need to be mitigated through support of safe and responsible design, development and deployment of AI. For example:

- Without building an appropriate technical infrastructure and skill base across the economy, opportunities of AI may not be distributed equally. For example, small businesses may not be able to fully harness benefits from AI given they do not have the same scale as large business to procure and test AI approaches.
- As job roles transition to the use of AI, some workers are more likely to be impacted than others, including women and those in lower-wage jobs. One report suggests women are 1.5 times more likely to need to change jobs because of AI impacts.[28]

# Supporting the safe and responsible use of AI

Across all AI policy initiatives, government is focused on operationalising Australia's AI Ethics Principles.[29] These principles provide important values-based guidance for the intent of regulatory design and are strongly aligned to internationally recognised principles on ethical and responsible AI.[30]

With AI systems becoming increasingly powerful and pervasive across our economy and society, the overwhelming view from stakeholders is that voluntary compliance with Australia's AI Ethics Principles and standards is no longer sufficient for high-risk AI applications – implementation of principles through practical strategies, clear obligations and effective enforcement will be key.

In line with the Australian Government's Interim Response on *Safe and Responsible AI in Australia (the Interim Response)*, government is taking action to ensure the Australian economy and community secure the benefits of safe and responsible AI (Figure 1), through:

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[25] Deloitte (2024). *Now decides next: Insights from the leading edge of generative AI adoption: Deloitte's State of Generative AI in the Enterprise Quarter one report*, Deloitte, 2024.
[26] N Gillespie, S Lockey, J Pool and A Akbari, *Trust in Artificial Intelligence: A Global Study*, The University of Queensland and KPMG Australia, 2023.
[27] DISR, *Safe and responsible AI in Australia Discussion Paper*
[28] K Ellingrud et al. *Generative AI and the future of work in America, McKinsey Global Institute*, 26 July 2023.
[29] Department of Industry, Science and Resources, 'Australia's AI Ethics Principles', Department of Industry, Science and Resources, 2019.
[30] Organisation for Economic Co-operation and Development, 'OECD AI Principles Overview', OECD, 2019.

- Delivering regulatory clarity and certainty.
- Supporting and promoting best practice for safety.
- Ensuring government is an exemplar in the use of AI.
- Engaging internationally on how to govern AI.

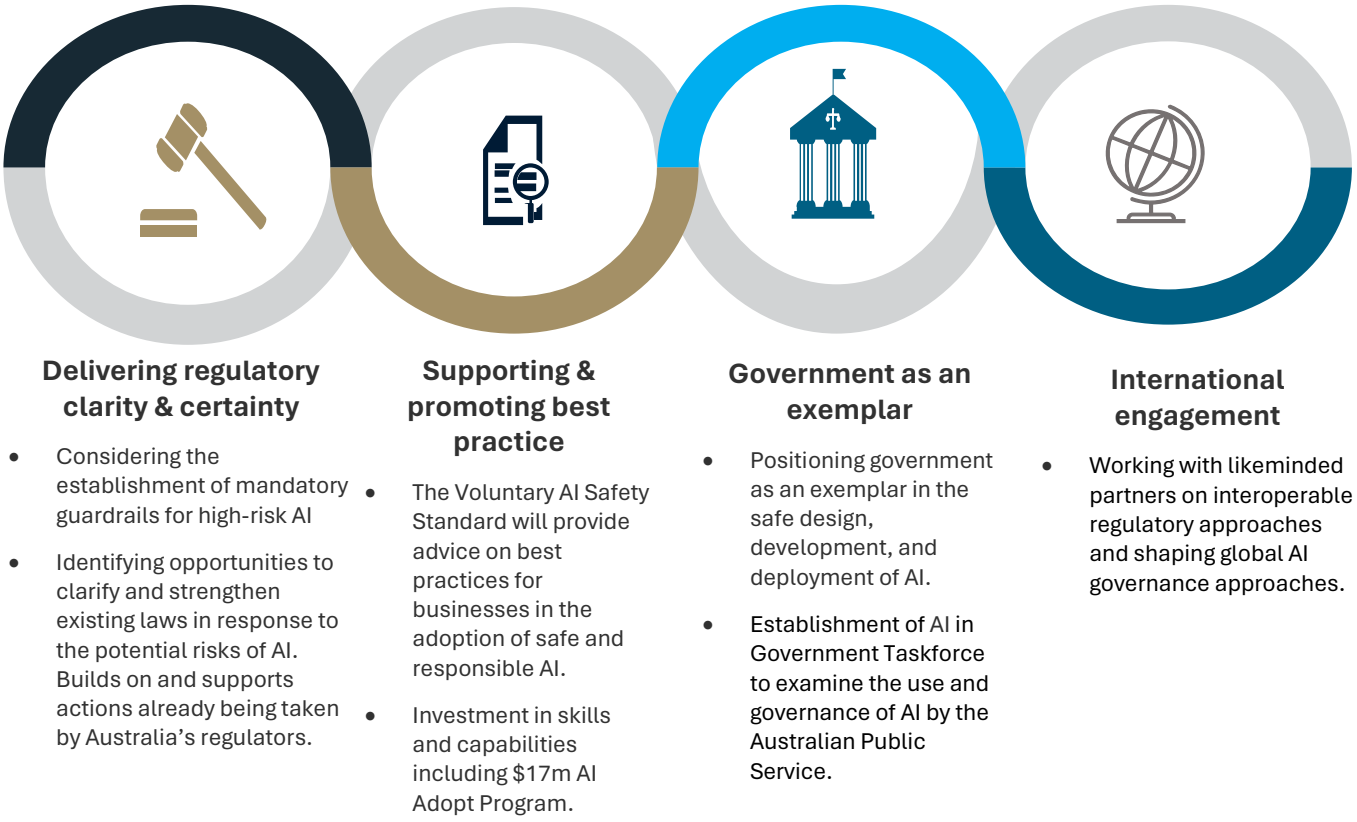


**Figure 1: Safe and Responsible AI in Australia: government action.**

# Regulatory clarity and certainty

Industry and civil society have been clear that clarity and certainty on how AI will be regulated is required to fully realise the opportunities AI presents. Government is progressing two key streams of work:

- Considering options for mandatory guardrails for organisations designing, developing and deploying AI systems in high-risk settings.
- Strengthening and clarifying existing laws to address risks and harms of AI.

## Considering options for mandatory guardrails

Business and individuals who design, develop and deploy AI are already subject to various Australian laws. These include economy-wide laws such as those relating to privacy, online safety, corporations, intellectual property and anti-discrimination laws and sector-specific laws such as those applying to medical devices, motor vehicles, airline safety and financial services.

These laws will respond, and in some cases already are, to some of the risks of AI. This includes reform processes such as the review of Australia's privacy regime, or through guidance being provided by regulators. However, many of our laws, including our consumer laws, are primarily focussed on providing redress after a harm has taken place. This may not be appropriate when harm is generated at speed and scale before any enforcement activity can take place. The fact that individuals may not know they are engaging with AI systems means they may not know they are being harmed and will be unable to seek redress.

Governments around the world are considering regulatory responses that focus on preventing harms before they arise. This is a seismic shift in the way governments approach regulation of technology. There has been increasing recognition globally of the potential value of preventative interventions, for example, in the context of competition regulation of digital markets.[3132]

As outlined in the Interim Response, the government is working to ensure the design, development and deployment of AI systems in Australia in legitimate, but high-risk settings, is safe and trustworthy, while allowing the use of AI in low-risk settings to continue to thrive within the bounds of existing laws.

The government has committed to a risk-based approach in the consideration of new mandatory guardrails for AI. In designing a risk-based regulatory regime for AI, consideration needs to be given to:

- The *levels* of risk and *key characteristics* of known risks.
- The balance of preventative and remedial regulatory measures to effectively target and mitigate known risks.

Several features of AI make this technology well-suited to a risk-based and preventative approach to regulation:

- Potential for harms to spread across the economy and community at speed.
- Potential for catastrophic harm, such as AI being used to manipulate electoral processes on a mass scale or causing wide scale disruptions to the energy grid.
- Highly context-specific harms - An AI system deployed within one sector for a particular purpose may present very low risk of harm, yet once applied within a different sector present a high-risk of harm due to differences in domain-specific risks or impacted parties. For example, an AI driven chatbot system could be deployed with low risk in a customer service setting but its deployment in a health care context may lead to serious consequences if a recommendation is incorrect.
- Potential harms arising not only to individuals, organisations, communities, social cohesion, and society at large.
- Uncertainty about how and what types of AI harms might arise as technology evolves. This uncertainty will require regulatory measures and enforcement tools which can successfully adapt to new forms of high-risk AI.

The government has established a temporary **AI Expert Group**[33] (Expert Group) with 12 appointees spanning industry, academia, and legal expertise to advise on options ahead of the government's consideration and public consultation. The government has asked the Expert Group to provide advice on options for mandatory guardrails for high-risk AI with a focus on

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[31] OECD, *Ex Ante Regulation and Competition in Digital Markets*, Accessed 10 May 2024
[32] The Treasury, *Government Response to ACCC Digital Platform Services Enquiry*, The Australian Government
[33] Department of Industry, Science and Resources, *New expert group will help guide the future of safe and responsible AI in Australia*, Australian Government, 14 February 2024

testing, transparency and accountability measures. If adopted, mandatory guardrails could place obligations on those in the AI supply chain (that is designers, developers and deployers) that are best placed to take early action to prevent harms.

The Expert Group is considering the following issues:

- A **definition of high risk.** Internationally, several jurisdictions have, or are, considering how to define high-risk. This consideration has included:
    - A principles-based approach grounded in individual's safety, health and rights.
    - Flexibility to ensure low risk applications are not inadvertently captured.
    - Interoperability with international definitions and markets.
    - Applicability to General Purpose AI, the risks of which are not defined by specific applications.
- **Options for mandatory guardrail measures** for high-risk systems with a focus on testing, transparency and accountability. Examples of guardrails, based on approaches overseas, include:
    - Conducting risk or impact assessments.
    - Requiring conformity assessments.
    - Ensuring organisational accountability frameworks are in place including clear roles, responsibilities and reporting structures.
    - Implementing human-in-the-loop requirements commensurate with the potential risks.
    - Testing systems before they are deployed.
    - Ensuring that best efforts are applied where digital output is generated so the public can identify the output is AI generated.
    - Informing individuals when they are communicating or interacting with an AI system.
    - Establishing processes for people impacted by AI systems to challenge use or outcomes.
    - Keeping and disclose certain records to assist with compliance.
- **Options for regulatory mechanisms**.

# Supporting and promoting best practice for safety and adoption

The government is committed to fostering a thriving AI industry in Australia and supporting broad adoption of AI across the economy, complementing efforts to ensure that Australia has the necessary guardrails in place to build trust and confidence in the use of AI.

Around the world, countries are investing in their industrial base, manufacturing capability and economic sovereignty. Canada, the United Kingdom, the Republic of Korea, Singapore and the United States are all investing in AI initiatives because they realise that investing in AI is a strategic, economic and industrial necessity. The ability of Australia to remain competitive will be underscored by the adoption of automation and AI. Considering the rapidly changing global

environment, there is a role for government to play alongside industry and civil society to ensure the opportunities of AI are captured for all Australians.

In line with the government's objective to maximise the opportunities that AI presents, it acknowledges the importance of supporting industry to put in place appropriate governance arrangements to use AI safely and responsibly.

## Budget 2024-25

In the 2024-25 Budget context, the government 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. Budget measures relating to the Department of Industry, Science and Resources include:

- The establishment of a permanent AI Advisory Body that will advance the role carried out by the temporary AI Expert Group. The AI Advisory Body will include expertise from civil society, industry and academia and will provide advice on Australia's ongoing response to the opportunities and risks presented by AI. This includes providing advice on AI capability development in Australia, as well as regulatory settings to ensure the safe design, development and deployment of AI systems in high-risk settings.
- Repurposing $21.6 million to bring the National AI Centre (NAIC) into the Department of Industry, Science and Resources. This support the NAIC's role as the Commonwealth's flagship organisation for enabling industry engagement and driving new models of collaboration among Government, researchers, academics and industry on AI.
- Investing $11.5 million over 2024-25 and 2025-26 to uplift the Department of Industry, Science and Resources to analyse industry capability and to lead and coordinate the Australian Government's safe and responsible AI agenda.

## Voluntary Safety Standard

Recognising the need to support organisations using AI to promote best practice for safety, the government asked the National AI Centre (NAIC) to develop Australia's first **Voluntary AI Safety Standard**.

In February 2024, the NAIC, supported by DISR, convened a meeting of leading AI specialists to develop the scope, design principles and subsequently, the core content of the voluntary standard. Roundtables were hosted by Responsible AI Network partners in March 2024 with industry representation including Australian Institute of Company Directors, Australian Information Industry Association, AI Group, Governance Institute of Australia, Committee for Economic Development of Australia, Choice, Tech Council of Australia, Responsible AI Thinktank, and Business Council of Australia. Key insights from the roundtables and early content were tested with a cross section of stakeholders including COSBOA, Centre for Inclusive Design, Social Policy Group and the Diversity Council of Australia.

## AI Adopt

The **AI Adopt Program**[34] 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. Each AI Adopt Centre will:

[34] Department of Industry, Science and Resources, *$17 million to boost AI adoption by SMEs*, Australian Government, 8 December 2023

- Showcase the innovative capabilities that AI can unlock.
- Guide SMEs on how to adopt AI responsibly and efficiently.
- Give specialist training to SMEs to help them develop skills to effectively manage AI.

This network of centres will give businesses clear and direct advice on how to integrate AI into their work systems. Applications closed 29 January 2024; outcomes are not yet available.

## Next Generation Graduates Program

The **Next Generation Graduates Program**[35] aims to attract and train the next generation of job-ready AI and emerging technology specialists to drive growth of the Australian technology sector. The program is delivered by the CSIRO. Their latest round will fund 160+ postgraduate students, including a regional stream to build a pipeline of talent outside of major cities.

## NAIC Responsible AI Network

The **National AI Centre's Responsible AI Network** gathers experts, regulatory bodies, training organisations, and practitioners to focus on responsible AI solutions for Australian industry.

NAIC runs the AI Industry Connection forum to connect Australian businesses interested in emerging AI with AI solutions from Australia's AI Industry and cutting-edge research from CSIRO. Each connection event is centred around a theme, bringing together industry leaders and research teams to showcase the emerging technology and provide a forum to discuss how to apply this to current business. In 2024 a range of themes will be explored including:

- Generative AI for work.
- AI for NetZero.

## AI Sprint

**AI Sprint** is a three-month competitive program run by the NAIC, Stone & Chalk and Google Cloud. It aims to help startups and entrepreneurs quickly create AI solutions that can help solve national issues such as cost of living, governance, supply chain resilience, human and environmental well-being, and workforce transformation. Some of the participants will move on to the second stage where they will get more support and resources to get ready for a Demo Day, where they will showcase their prototypes to a group of industry stakeholders. Applications closed 21 March 2024, and Phase 1 is underway (commenced 3 April).

## Industry Growth Program

The **Industry Growth Program**[36] supports innovative SMEs undertaking commercialisation or growth projects that will build Australian capabilities in seven government identified priority areas. It aims to help businesses:

- Commercialise their ideas into new products, processes and services, and grow their operations.
- Improve their ability to engage in national and international markets.
- Better position themselves to seek future investment and scaling opportunities, including through the National Reconstruction Fund (NRF).

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[35] G Egan, *Building an emerging technology pipeline in regional Australia*, CSIRO, 24 January 2024
[36] Department of Industry, Science and Resources, *Industry Growth Program*, Australian Government

### Research and Development Tax Incentive

The **Research and Development Tax Incentive** is a key mechanism to encourage industry investment in research and development (R&D). It offers tax reductions for companies doing eligible R&D activities, helping support innovation that brings economic and social benefits for all Australians.

### National Reconstruction Fund

The **NRF** is investing $15 billion for the Australian Government to diversify and transform Australia's industry and economy. The NRF will provide finance (including debt and equity) to drive Australian-based investments in seven government identified priority areas of the Australian economy: value-add in resources, transport, medical science, defence capability, renewables and low emissions technologies, value-add in agriculture, forestry and fisheries, and enabling capabilities.[37]

The enabling capabilities priority area focuses on manufacturing technologies and products that support the advancement of Australia's industrial capability, including AI technologies. Enabling capabilities technologies underpin many opportunities in the other six priority areas.

Government is developing an enabling capabilities co-investment plan to set out the Australian Government's commitment in this priority area. The plan will identify investment opportunities that focus on Australia's strengths and align with the government's policy objectives. The plan will also outline potential broader actions for government and industry to build an ecosystem that supports the sustainable manufacturing of advanced technologies.

## Related work across Government

As DISR consults to develop a consolidated response to the opportunities and harms presented by AI, we are aware of activities across government. This includes:

### AI in Government Taskforce

In its commitment to being an exemplar in the safe and responsible adoption of AI the Australian Government established the AI in Government Taskforce[38], which is co-led by DISR and the Digital Transformation Agency.

The Taskforce is composed of secondees from 11 APS agencies who are working on whole-of-government AI application, policies, standards and guidance. This work will help the APS to harness the opportunities of AI technologies in a safe, ethical and responsible way.

### Copyright Reform

DISR engages with the Attorney General's Department (AGD) on the Copyright and AI Reference Group to address future copyright challenges emerging from AI.[39]

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[37] Information on the priority areas including definitions can be found in the *National Reconstruction Fund Corporation (Priority Areas) Declaration 2023*; https://www.legislation.gov.au/F2023L00716/latest/text

[38] Digital Transformation Agency, *The AI in Government Taskforce: examining use and governance of AI by the APS*, Australian Government, 20 September 2023

[39] https://www.ag.gov.au/rights-and-protections/copyright/copyright-and-artificial-intelligence-reference-group-cairg

### Privacy Act

DISR engages with AGD on the government's response to the implementation of the Privacy Act, in particular proposals relating to automated decision making and data flows.[40]

### Misinformation and online safety

DISR engages with the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) on intersections between safe and responsible AI, and proposed powers to combat misinformation and proposed amendments to the Online Safety Act.[41]

### Cyber security

DISR engages with the Department of Home Affairs on intersections between AI adoption and regulation, and national and cyber security threats from AI and other emerging technology.[42]

Under the 2023-30 Australian Cyber Security Strategy, government is identifying and protecting datasets of national significance and assessing whether existing data protections such as storage and governance settings are proportionate and effective.

### Digital regulation

DISR engages with the Digital Platform Regulators' Forum (DP-REG) on measures to regulate AI alongside other work on digital platforms.[43]

### Working with states and territories

Government is working with States and Territories to ensure cohesive, safe and transparent use of AI upholding public trust. At the February 2024 Data and Digital Ministers' Meeting, Ministers agreed an initial national framework for the assurance of AI used by governments. This initial framework aligns with the Australian AI Ethics Principles and includes common assurance processes.

## Leveraging international approaches

Many countries recognise AI as a shared challenge. The same AI systems can be designed, developed and deployed across multiple countries, all of whom are responding to a similar range of risks and challenges. The Australian Government's focus on transparency, testing and accountability measures for AI in high-risk contexts is aligned with international approaches.

Some jurisdictions have already introduced voluntary commitments they expect companies to implement. The United States (US) announced voluntary commitments from a group of 28 healthcare provider and payer organizations to help move toward safe, secure and trustworthy purchasing and use of AI technology. Singapore introduced standardised self-testing tools ('AI Verify') to enable businesses to check AI models against a set of principles.

Other jurisdictions, including Canada and the European Union (EU), are seeking to make commitments mandatory for higher risk AI systems through new legal frameworks. Both

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[40] https://www.ag.gov.au/rights-and-protections/publications/government-response-privacy-act-review-report
[41] https://www.infrastructure.gov.au/have-your-say/new-acma-powers-combat-misinformation-and-disinformation and https://www.infrastructure.gov.au/have-your-say/online-safety-basic-online-safety-expectations-amendment-determination-2023
[42] Department of Home Affairs, *2023-2030 Australian Cyber Security Strategy*, 21 December 2023
[43] eSafety Commissioner, *Digital Platform Regulators' Forum*, 23 November 2023

Canada and the EU have also sought voluntary commitments from companies ahead of the enactment and enforcement of these proposed legal frameworks.

This pace of advancements in AI was also a catalyst for the Bletchley Declaration, signed at the AI Safety Summit (November 2023, UK) which is to be followed by the AI Seoul Summit (May 2024, Korea); and the AI Action Summit (February 2025, France).

Australia recognises we cannot act alone. Responding to AI requires likeminded countries working in close partnership – international engagement is critical to Australia achieving our domestic objectives. Australia is an active player shaping these efforts, seeking to take forward our commitments under the Bletchley Declaration; promote and align regulatory approaches with likeminded countries; shape global AI governance consistent with our values and interests; showcase Australia's AI strengths to boost our local industry; and be a trusted partner on AI in the Indo-Pacific region.

Across our interactions, we will bring experience, knowledge and trusted perspectives. Our domestic industry and research communities are deploying AI in world-leading ways. We are a voice to support diversity and inclusion to ensure AI supports all communities. We share our particularly deep experience supporting SMEs in the safe use of these technologies.

At the AI Safety Summit in 2023, Australia joined the EU and 27 countries in signing the Bletchley Declaration, committing to international collaboration on AI safety testing and the building of risk-based frameworks across countries to ensure AI safety and transparency.

Australia, alongside 30 other countries, is participating in the development of the International Scientific Report on Advanced AI Safety. This Report, commissioned by the UK Government, will facilitate a shared science-based understanding on the risks and capabilities associated with advanced AI systems. Expected to be published later in 2024, it will support a more detailed understanding of the risks of AI.

As part of our comprehensive international engagement on AI, Australia participates in dialogues to shape and influence global standards. The government recently became an observer to Standards Australia's National Mirror Committee relating to AI: IT-043 (Artificial Intelligence). The Committee supports Australia's representatives on the AI standards working groups at international standards settings bodies, such as the International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC).

Australia supports AI standards that align with the values outlined in the Quad Principles on Critical and Emerging Technology Standards to:

- Support industry led, consensus-based multi-stakeholder approaches.
- Support technology standards that promote interoperability, competition, inclusiveness and innovation.
- Foster technology standards that support safety, security and resilience.

Increasing Australian influence on the design and use of technology standards supports the delivery of the government's technology and industry strategies and helps to:

- Create markets for Australia's technological innovations.
- Maximise our economic benefits in technology areas where Australia is investing and has competitive advantages.
- Support our social cohesion by ensuring security, safety, and privacy are embedded in international standards.

# Data considerations

Data is the backbone of AI systems. Government is engaging with industry and across government on measures to improve testing, transparency, and accountability including considerations around data collection and use on which AI models are trained, as well as the data they output. This engagement captures the broad range of harms and risks relating to training data and generated outputs, which will feed into targeted work on the introduction of AI voluntary safety standards, mandatory guardrails for high-risk settings, clarifying and strengthening existing laws, and government's work as an exemplar. Data is also a feature of Australia's bilateral and multilateral international engagement, including trade negotiations and commitments.

Existing government initiatives that relate to data and AI include release of the 2023 Data and Digital Government Strategy, the Data Availability and Transparency Act 2022 (DATA) Scheme, Privacy Act reforms, Consumer Data Right, competition reform, the Digital Platforms Services Inquiry, and interjurisdictional work on programs related to AI through the Data and Digital Ministers meeting.

The Australian Government aims to be an exemplar of the use of data and digital technologies. The Data and Digital Government Strategy outlines commitments that relate to government use of data including:

- Continuing investment in new enabling technologies and streamlining governance and data sharing processes to allow greater access to timely and accurate data.
- Harnessing analytical tools and techniques (including machine learning and AI) to predict service needs, improve user experience, support evidence-based decisions and gain efficiencies in agency operation.
- Being transparent in how government explores and uses new technologies, and to equip government entities to safely engage with emerging technologies including AI.
- Exploring opportunities and challenges of emerging technologies through legislative and regulatory frameworks to ensure Australians continue to have confidence in the government's use of data and digital technologies.

The Productivity Commission has also recognised in its five-year productivity inquiry that adoption of data-intensive digital technologies has substantial economic productivity benefits beyond AI. Importantly, many of these intensive technologies are not novel – rather, they are existing systems and products which are yet to be widely adopted by Australian businesses.

# Environmental considerations

AI can address some of the world's most pressing challenges, including climate change. IBM's 2022 Global AI Adoption Index reports that two-thirds of companies either use or plan to use AI to pursue their sustainability objectives.[44]

- Researchers have used AI to discover a new concrete formula that reduces the carbon footprint by 40%.[45]

[44] IBM and Morning Consult, *IBM Global AI Adoption Index 2022*, IBM, 2022.

[45] University of Illinois Urbana-Champaign, *Artificial intelligence produces a recipe for lower-carbon concrete,* 27 April 2022

- AI can be used for early detection of small forest fires within 30 minutes, and to prevent these forest fires to begin with by analysing data sets to decide where to make controlled burns.[46]
- AI can make mines safer and more energy efficient, this includes automated ore sorting, water and power monitoring, supply chain monitoring, environmental monitoring, and use of automated vehicles.
- The operator of Melbourne's rail network is using AI-driven predictive maintenance to improve the reliability and efficiency of its train fleet. By proactively identifying and addressing maintenance issues, energy consumption and emissions associated with train operations are reduced.[47]

AI is inextricably linked with data, which is the building block that powers machine learning and large language models. Training and using AI systems depends on massive amounts of computational resourcing, physical hardware and infrastructure. This means AI can be responsible for consuming large amounts of energy and emitting large amounts of greenhouse gases. Whilst exact numbers from AI are hard to quantify, we know data centres currently represent 1 – 1.5% of electricity use globally, and 0.6% of global greenhouse gas emissions, with estimates suggesting a single data centre may consume energy equivalent to heating 50,000 homes for a year.[48]

Demand on the energy network is only growing. Since 2012 the rate of data consumption from training large AI has doubled every 3.4 months on average.[49] Data scientist Alex de Vries from the Central Bank of the Netherlands has predicted that by 2027 the AI sector will use approximately the same amount of electricity as the Netherlands uses in a year.[50]

As AI adoption increases the challenge is to achieve balance between the sustainability benefits AI can provide, with its energy consumption and greenhouse gas emissions. A study analysing over sixty papers from top conferences demonstrates that this is not currently a priority for researchers with between 75% and 90% of papers prioritising accuracy over efficiency.[51]

The Australian Government is developing a Net Zero Plan, as outlined in the 2022 Annual Climate Statement to Parliament and consistent with the recommendations of the Climate Change Authority.

The Net Zero Plan will be supported by six sector plans that are being developed for electricity and energy, agriculture and land, infrastructure and transport, industry, resources, and the built environment sectors. The plans will consider ways to reduce emissions in each sector and between them the plans cover all major components of the economy.

Data centres as a commercial building are captured under the Built Environment Sector Plan, which will provide an emissions reduction pathway to 2050 for the built environment sector.

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[46] J Simon, *4 ways AI can help with climate change, from detecting methane to preventing fires*, NPR, 2 January 2024

[47] K Gutierrez, *The Future of Australia's Transport System Hinges on AI & Digital Transformation*, informaconnect, 10 July 2023.

[48] N Sundberg, *Tackling AI's Climate Change Problem*, MITSloan Management Review, 12 December 2023.

[49] K Chang and A Vaduva, *AI may develop a huge carbon footprint, but it could also be a critical ally in the fight against climate change*, The Conversation, 5 April 2024.

[50] C Naysmith, *Sam Altman Warns AI Development Needs An Energy 'Breakthrough' As Financial Pundit Says 'AI Data Centres Won't Run On Hopes And Dreams'*, Benzinga, 5 April 2024.

[51] R Schwartz, J Dodge, N A Smith, O Etzioni, *Green AI* [Pre-Print], July 2019, https://arxiv.org/abs/1907.10597.

# Glossary

- Artificial Intelligence (AI) system: a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.
- General purpose AI (GPAI): (or general AI) a type of AI system that addresses a broad range of tasks and uses, both intended and unintended by developers.
- Generative AI: a branch of AI that develops generative models with the capability of learning to generate content such as images, text, and other media with similar properties as their training data.
- Narrow AI: a type of AI system that is focused on defined tasks and uses to address a specific problem.