

Is Australian science ready for AI?

Regulation and law

December 2025



'Is Australian science ready for AI?' is a series of discussion papers that explore the preparedness of the Australian science sector for AI advances.

Can our regulations and laws governing science anticipate the adoption of AI?

The Australian science sector requires a strong policy framework to ensure it is prepared for AI. This framework is needed to guide the development of necessary infrastructure, establish ethical guidelines and support educational programs for Australian researchers to harness AI's potential responsibly and effectively.

Technological advances in AI and the rapid adoption in the conduct of research represent a fundamental shift rather than incremental progress in science, driven by an unprecedented pace of innovation that surpasses the capacity of existing regulatory frameworks to adapt. Rapid global investment in AI research is facilitating entirely novel capabilities while shaping market dynamics that could result in the concentration of power overseas, raising critical concerns for national sovereignty.

Consequently, AI regulation and law must outline clear parameters with enough flexibility to advance novel technologies for scientific, economic and social gains while understanding and managing risks. It is crucial that these regulations avoid imposing unnecessary and disproportionate burdens on Australia's research and development sector, which could hinder innovation and progress.

AI development will not pause while a policy framework is established, and as such, Australia must act quickly to build its sovereign AI capability and guide its adoption responsibly.

The role of anticipatory governance and regulation

Anticipatory governance and regulation are defined as a broad capacity within society to manage emerging knowledge-based technologies.

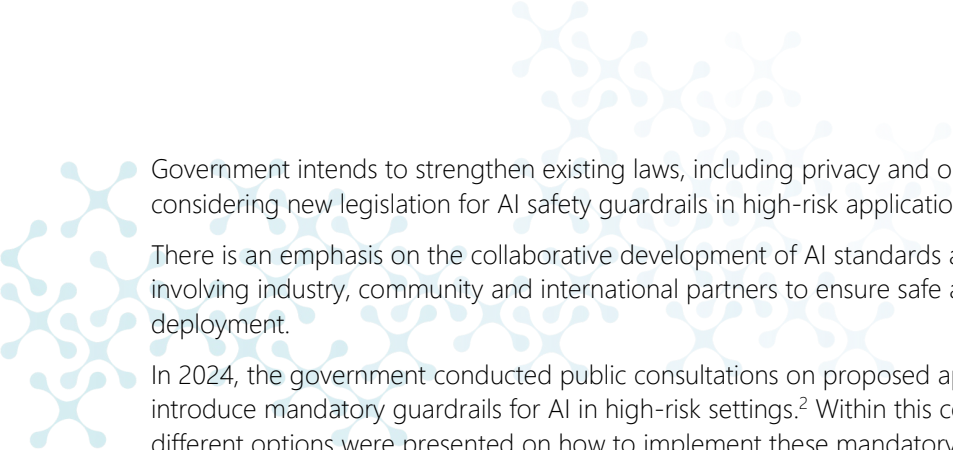
Anticipatory governance embraces non-linear, constructive approaches, flexibility in scientific R&D, linear policy decision-making processes, foresight and flexibility under uncertainty, public engagement, participatory technology assessment and responsible innovation.¹

Anticipatory regulation for policy design incorporates horizon scanning and foresighting methods to identify the potential impacts of change. It can also take a more future-facing approach to regulating technological impacts on the broader society. This approach recognises the need for adaptability, progressiveness and the ability to pivot in response to evolving industry and political dynamics.

Anticipatory governance and regulation help policymakers move beyond reactive decision-making by integrating foresight, public engagement and adaptable frameworks. This assists with delivering science and technology policy that can respond to uncertainty and align with societal values.

The Australian Government's approach to regulation

The Australian Government's interim response to 'Safe and responsible AI in Australia' focuses on identifying regulatory gaps for managing the risks associated with AI, particularly those in high-risk contexts where harm could be substantial and irreversible. The



Government intends to strengthen existing laws, including privacy and online safety, and is considering new legislation for AI safety guardrails in high-risk applications.

There is an emphasis on the collaborative development of AI standards and safeguards involving industry, community and international partners to ensure safe and responsible AI deployment.

In 2024, the government conducted public consultations on proposed approaches to introduce mandatory guardrails for AI in high-risk settings.² Within this consultation, three different options were presented on how to implement these mandatory guardrails. These were:

1. A domain-specific approach – adopting the guardrails within existing regulatory frameworks as needed.
2. A framework approach – introducing new framework legislation to adapt existing regulatory frameworks across the economy.
3. A whole-of-economy approach – introducing a new cross-economy AI-specific Act (for example, an Australian AI Act).

In its submission to this consultation, the Australian Academy of Science argued that the creation of an Australian AI Act would be the best option to provide necessary consistency across the economy. The proposed establishment of an independent AI regulator would help delineate key differences across various sectors of the economy.

While the government's interim response on AI and its proposed mandatory guardrails addresses the immediate risks, more work remains to anticipate future opportunities and harms, in addition to the work that will need to be done to build sovereign AI capability.

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Acknowledgements

The production of this discussion paper was supported by staff of the Australian Academy of Science, with Dr Sage Kelly, Dr Hayley Teasdale, Dr Ben Swinton-Bland, Alexandra Lucchetti, Dr Rakshanya Sekar, and Chris Anderson gratefully acknowledged. Edited by Lydia Hales.

References

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2. Department of Industry, Science and Resources. *Safe and responsible AI in Australia: Proposals paper for introducing mandatory guardrails for AI in high-risk settings*. (2024).