Please note: the substantive content of the 2026 NRI Roadmap Survey begins at Question 20 (with prior questions dealing with administrative and other information).

As such all submissions that are published include the responses submitted from Question 20 onwards only.

Q20.

Part 2: Research themes

2.1 NRI comprises the assets, facilities and associated expertise to support leading-edge research and innovation in Australia and is accessible to publicly and privately funded users across Australia and internationally. We are seeking your input on possible directions for future national-level investment - i.e., where the requirements are of such scale and importance that national-level collaboration and coordination are essential.

The 2021 Roadmap used a challenge framework to support NRI planning and investment. With this in mind, consider likely future research trends in the next 5 - 10 years, and with respect to one or more of the 8 challenge areas identified in the 2021 Roadmap as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or not at sufficient scale and
- describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities.

Q21.

Resources Technology and Critical Minerals Processing

Q22.

Food and Beverage

Q23.
Medical Products

Q24.
Defence

Q25.
Recycling and Clean Energy

Q26.
Space

Q27.
Environment and Climate

Q28.
Frontier Technologies and Modern Manufacturing

Quantum Device Testbed Network UWA strongly supports the establishment of a new NCRIS facility to strengthen and support the growth of quantum technologies research, development and translation in Australia. This opportunity aligns with UWA's Research Strengths in Frontier technologies, and our commitment to the UN's Sustainable Development Goals. UWA is a university partner member of Quantum Australia, which is dedicated to developing Australia's quantum industry, as well as hosting an ANFF node whose aim is to overcome hurdles to R&D success by providing open access to micro and nanofabrication equipment, and Microscopy Australia and National Imaging Facility nodes who provide imaging and analytical solutions for R&D, failure analysis, patent support, non-destructive analysis, and persuasive promotional images. In addition, UWA hosts nodes of multiple ARC Centres of Excellence, including Engineered Quantum Systems (EQUS), Dark Matter Particle Physics (CDMPP), Transformative Meta-Optical Systems (TMOS) and OzGrav, as well as the Quantum Information, Simulation and Algorithms Research Hub (QUISA), each of which has a strong commitment to producing world-class research with real-world impacts. There exists a strong relationship with Pawsey through the UWA & Pawsey Quantum Computing Centre (UP-QCC), which has goals of solving the greatest challenges through innovative science and technology. Through these various programs, UWA has assembled a critical mass of infrastructure and expertise that would both contribute to and greatly benefit from a Quantum Device Testbed Network. Nationally, Australia has always punched above its weight in quantum research outputs: ranked 11th among OECD countries across 2018 to 2022 for number of scholarly papers in quantum physics and ranked 6th for citation impact. Despite this, we rank lower in sources of patent applications across each of the key quantum technology areas: sensing, communication and computing, and worse still for new ventures. Clearly the talent and skill to support a quantum industry are present in abundance, but transforming this potential into a thriving ecosystem is a key challenge that UWA is dedicated to tackling. A national Quantum Device Testbed Network would provide access to the infrastructure, expertise and fabrication necessary to unlock this nascent industry. Without such access, Australia's quantum industry faces a large hurdle for taking intellectual property out of the universities and providing technologies for industry and consumers. The experimental testing environments, fabrication facilities and design/engineering expertise required to translate academic research outputs up the "Technology Readiness Level" scale are non-trivial, and most certainly not readily available to all. It is therefore logical for Australian institutions to pool their resources to optimise this process, thereby ensuring the whole is greater than the sum of the parts.

Q29.

2.2 The 2024 statement of National Science and Research Priorities (NSRPs) includes outcomes linked to each priority to assist in identifying critical research needed in the next 5 to 10 years.

Consider the priority statements and, with respect to one or more of the 5 priority areas as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or
- not at sufficient scale and describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities, and where relevant, refer to the underpinning outcomes and research identified in the NSRPs document.

Q30.

Transitioning to a net zero future

Quantum algorithms and quantum computing will pave the way for new material discovery by optimising and simulating performance in ways we cannot achieve using classical compute. These materials will find use in carbon sequestration, battery technology and solar cells. Both the hardware (quantum transistors or qubits, memories and transducers for distributed quantum computing) and the software are the types of technologies Australia has great strengths in but requires infrastructure support to fully develop in the case of the former, and quantum compute hardware in the case of the latter to test and run.

Q31.

Supporting healthy and thriving communities

Quantum sensors will enable new and better forms of medical diagnostics. Quantum computers will have the potential for new drug discovery.

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia's environment

Q34.

Building a secure and resilient nation

Quantum communication will build inherently secure information systems.

Q35.

2.3 The case for a new NRI capability, or enhancements to existing capabilities, typically emerges through advocacy from research communities clustering around rigorously identified needs and goals. Such a concept could respond to a requirement for novel or expanded capacity within a domain, or across domains, and must be such that it could only be made available with national-level investment.
If you have identified such a requirement, briefly describe the need, the proposed infrastructure capability, the medium-term goals, impacted research communities, and the timeframe over which you advocate its establishment. Your response can include links to relevant existing reports.

Research communities would benefit from a National Quantum Device Testbed both in the short- and long-terms. Quantum sensing devices and startups already exist, and communications are coming online. Quantum computing is looking more and more like a medium-term reality. For Australian researchers to capitalise on this emerging sector, we must fast track the testing and proofing required to take products out of the labs and into the market. Easing access for researchers to translate their work into commercial products will also open new avenues and career pathways for young researchers, enhancing the reputation of the field and creating a feedback mechanism whereby observed success leads to stronger talent pipelines. It should be the dream of any STEM undergraduate or PhD student that their research can change the world and have a positive impact on the daily lives of Australians.

Q36.

Part 3: Industry perspectives

This section is seeking input specifically from industry-based respondents. Other respondents can skip this section.

Recommendation 6 of the 2021 Roadmap related to improvements in industry engagement with NRI. To complement work on this topic that has occurred since then, we are seeking additional advice on NRI requirements as perceived by current or potential industry-based users.

Q37.

3.1 Have you (or your organisation) interreacted with or used Australia's NRI?

- ◯ Yes
- ◯ No

Q38.

3.2 If so, please briefly outline the NRI capabilities you (or your organisation) have interacted with or used. Do not limit your response to NCRIS capabilities.

This question was not displayed to the respondent.

Q39.

3.3 Please indicate your (one or more) primary reasons for interacting with NRI:

This question was not displayed to the respondent.

Q40.

3.4 If you answered no, please indicate your (one or more) primary reasons:

This question was not displayed to the respondent.

Q41.

Part 4: Other comments

4.1 Please elaborate on any of your above responses or add any other comments relevant to the development of the 2026 Roadmap. Your response can include reference or links to existing reports that you recommend be considered during the 2026 Roadmap development process.

Q49.

4.2 Optional Document Attachment.
Note: Our strong preference is that answers are provided against the relevant questions in the survey. However, this file upload option is available for submissions in file format, where needed. Please ensure the document includes your name or organisation.