

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

See following response for the need for a Quantum Device Testbed Network for quantum technologies (a Frontier Technology)

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

See previous and following responses - quantum technologies will aid in a transition to a net zero future by, for example, providing new quantum computing solutions that would prohibitively costly using conventional computers, and designing new energy materials and catalysts for clean fuels.

Q31.

Supporting healthy and thriving communities

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia’s environment

Q34.

Building a secure and resilient nation

See previous and following responses - Quantum information technologies will provide intrinsically secure communications for Australia.

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.

Monash University is strongly supportive of a new NCRIS capability centred on the characterization of materials and devices for quantum information technologies, in order to support the growth of research and development in quantum technologies in Australia. We envision an extensive network of facilities which would include Monash University as well as synergistic capabilities at other universities as well as ANSTO and ANFF laboratories. Such a facility would complement the existing NCRIS capability in nanofabrication (ANFF) and imaging (Microscopy Australia). The Quantum Device Testbed Network would address a gap in quantum science in Australia: novel quantum materials and devices require novel characterization tools to verify and benchmark their quantum properties, often using specialized advanced techniques currently not available in a user facility environment in Australia. We envision that the Quantum Device Testbed Network would include advanced quantum characterization tools available at Monash University such as ultra-low-temperature, high magnetic field scanning tunnelling microscopy, ultra-low temperature cryogenic electrical measurements, and broadband (THz to visible) ultrafast pump-probe spectroscopy, to probe quantum properties at the atomic scale and extreme conditions (temperatures as low as 100 mK, magnetic field up to 14 T). The Quantum Device Testbed Network would leverage substantial investment in quantum research infrastructure at Monash and the surrounding precinct, including the \$175M New Horizons Centre which includes laboratory space with exquisite control of vibration and temperature, and >\$6M investment in equipment including three ultra-high-vacuum STMs, ultra-low temperature cryostats, ultra-fast optical probes from THz to visible, and van der Waals heterostructure fabrication. The Integrated Quantum Materials Foundry would also take advantage of the existing integration of Monash facilities with each other and with ANSTO Australian Synchrotron. For example, samples may be exchanged in ultra-high vacuum to integrate MBE growth, scanning tunnelling microscopy, and angle-resolved photoemission spectroscopy on the same sample without exposing to ambient. Such a facility would allow Australian quantum industry access to state-of-the-art custom quantum characterization tools which form the basis of new quantum technologies. This aligns well with the 2021 roadmap goals of providing research translation infrastructure and the National Research Infrastructure Workforce, under the theme of Frontier Technologies and Modern Manufacturing.

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.

Q39.

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

- ☒ For expertise or advice
- ☒ Access to research resources or products
- ☒ Access to equipment for research
- ☒ Access to equipment for operational reasons
- ☒ Help in translating research
- ☒ Access to data
- ☒ Support for clinical trials

☐ Other (please specify)

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.