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

Improvements in preservation during storage of monoclonal antibodies

Q24.
Defence

Q25.
Recycling and Clean Energy

Improvements in membrane technology for desalination plants.

Q26.
Space

Q27.
Environment and Climate

Improvements in battery technology. Radiation resistant materials for fusion energy technology.

Q28.
Frontier Technologies and Modern Manufacturing

New novel topological magnetic materials needed for quantum computing

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

Improvements in hydrogen fuel cell technology regarding both hydrogen gas storage and and Nafion stability for long term performance

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

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.

The ACNS currently provides world class performance at several neutron scattering instruments. Recent use of the ACNS scattering facilities show them as comparable or better in performance and their support facilities than the best in Europe and the USA. There is also room for cost effective expansion of these facilities by the addition of a second guide hall. Currently other important neutron scattering facilities (FRM-II, NCNR) are offline or planned closures causing a serious world-wide neutron scattering shortage. I used three of the ACNS scattering instruments in the last year, have worked with ACNS staff regarding instrument design over many years, and kept apprised of past, present and future instrument ACNS instrument designs through the published literature. I am very impressed by the performance of the facility as a whole. The instruments I personally used are of the best, two (Quokka and Bilby) I would say are world class and one (Kookaburra) is far superior and is by far the best in the world, with ten times the brightness of second best which I designed. I was also impressed by the professional performance of support facilities such as the user chemical laboratories, sample environment, and neutron detectors group. It seems to be a very well run facility. The current neutron guide hall appears to be full with all possible guide positions taken by world class instruments. But addition of a second guildhall could relatively cheaply leverage expansion of neutron scattering facilities. Additions of second guide halls has been completed at other facilities: this was done many years ago at the ILL in Grenoble France, the current premier neutron scattering facility in the world where all others are compared, plans are at an advanced stage for a second guide hall addition to the facilities to FRM-II in Germany, and our NCNR facility in the USA have submitted plans to congress for building a new reactor with two guide halls.

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.