

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

combination of high through-put and high sensitivity chemical analysis techniques in one analytical instrument - needed for characterisation of low concentration elements in mineral ore bodies or in waste (mine waste, industrial waste intended for recycling) high speed characterisation of minerals / robotisation of the sample preparation - to increase the material volume analysed per unit time and speed up the processing technology development

Q22.

Food and Beverage

clean water technologies and desalination, increase of production capacity of these technologies drought-tolerant edible plants and their nutrition value

Q23.

Medical Products

vaccines biocompatible materials for implants healthy lifestyle propaganda

Q24.

Defence

satellites and information processing sensors drones and other robots for water, ground, and air application strong lightweight materials personal protection in the field modelling of the strategy

Q25.

Recycling and Clean Energy

waste management, energy generation from waste solar, wind power, ocean wave power generation batteries

Q26.

Space

automatization and control rocket manufacturing alternative methods of propulsion waste collection

Q27.

Environment and Climate

waste management whether prediction

Q28.

Frontier Technologies and Modern Manufacturing

automatization of manufacturing technologies energy saving and decrease of waste technologies with minimum operations between the raw material and the final product

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

needs new mineral processing technologies

Q31.

Supporting healthy and thriving communities

needs better communication to public about what is healthy work - life balance

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia’s environment

Q34.

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.

In my current area of responsibility at the Centre for Microscopy and Microanalysis, the University of Queensland, we are working on new work flows for mineral phase characterisation, in particular approaches to increase the analysis speed and throughput, and accuracy of detection of economically valuable metallic elements in ore bodies and waste. This can be achieved through application of various chemical analysis techniques to the same sample and robotisation of sample preparation and sample loading-unloading to an analytical instrument. This work requires interdisciplinary collaboration from geology, material science, mechatronics, and software technology. Some work has already been done. But it would go faster if there was a direct support to staff hours and prototype manufacturing. Timeframe - 1-2 years. Potential impact - collaboration with an instrument manufacturing company may result in a significantly improved characterisation technique and a machine which will utilise this technique. Research community will be able to generate more of characterisation data of a higher accuracy during a shorter time frame.

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.

Australia has two historically strong economic areas: mining and agriculture, however manufacturing can be improved. This may mean, for example, not only ore body processing and primary metal extraction, but manufacturing of the final metal product, this can be machinery or their parts, electronic components, medical devices, energy generation and storage units, measuring instruments, tools, and what not.