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

Australia has commitments to report its greenhouse gas (GHG) emissions and to meet its emissions reduction targets. At present, those emissions are calculated largely from estimates of the amount of activity for a given source category and an estimate of its GHG emissions intensity. This ('bottom-up') method has large uncertainties, lacks transparency and is vulnerable to misuse. An alternative and complementary ('top-down') method is to measure GHG concentrations in the atmosphere above Australia and use those observations to infer emissions. This method has been developed by the atmospheric science community, has been successfully demonstrated to work in many international settings and over many years already, and is increasingly being used around the world. It can be applied on a range of spatial scales from small (e.g. facility) to large (e.g. national) scales. A critical infrastructure component of an effective top-down observing system for Australia is a national network of ground-based observing stations. At present there are only 2-4 sites across the country that provide observations suitable for this task. This site density lags far behind key international peers such as Europe, UK, New Zealand and the USA. For national coverage the Australian network needs to be expanded by 12 or more new sites, each equipped with a range of analytical instruments to measure GHGs and related trace gases. An effective national observing network would provide independent, observation-based, transparent and defensible estimates of Australia's GHG emissions. It would also provide an important foundation for emissions determination at smaller spatial scales using related top-down techniques. Such information is critical for Australia to be able to track its GHG emissions and to effectively manage emissions mitigation measures.

Q28.

Frontier Technologies and Modern Manufacturing

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

The 2024 statement of National Science and Research Priorities (NSRPs) refers to achieving "a net zero economy by 2050, with emissions levels 43% below 2005 levels by 2030". Fundamental to this aim is knowledge of actual emissions, now and into the future. The bottom-up methods in use now cannot by themselves provide sufficiently reliable or accurate emissions data for many source categories. Better use of top-down methods, including a national observing network, in combination with bottom-up methods will provide more robust emissions estimates. The NSRPs also seek to create emissions reductions and develop new technologies to help the transition to net zero. Knowing where to direct investment to achieve these aims is again critically dependent on knowing actual emissions and how they change over time.

Q31.

Supporting healthy and thriving communities

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia’s environment

The NSRPs refer to "improved collection, interpretation and sharing of environmental monitoring data to help make environmental and climate-related decisions" and call for research that addresses "tools and techniques to collect and analyse environmental data" and "carbon sources and sinks in soils, vegetation, coasts and oceans in Australia and neighbouring regions". National research infrastructure that monitors atmospheric composition across Australia would directly address these points.

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 views expressed on an individual level in this submission relate to more detailed documents on similar subject matter prepared by 1) CSIRO - Atmospheric Composition and Chemistry Group for DISR's National Science Priorities Conversation Starter in April 2023; accessible at https://consult.industry.gov.au/sciencepriorities1/survey/list and 2) The Superpower Institute as a National Emissions Monitoring Roadmap (NEMR) in November 2023; accessible at https://www.superpowerinstitute.com.au/work/national-emissions-monitoring-roadmap The NEMR document, in particular, provides details of proposed national GHG observing system infrastructure.

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.