

# Submission

## 2016 National Research Infrastructure Roadmap Capability Issues Paper

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### Questions

**Question 1: Are there other capability areas that should be considered?**

No response

**Question 2: Are these governance characteristics appropriate and are there other factors that should be considered for optimal governance for national research infrastructure.**

No response

**Question 3: Should national research infrastructure investment assist with access to international facilities?**

Yes. There will be a great deal of research infrastructure that for economic or practical reasons Australia cannot build but does require access to. Gaining access to and sharing such infrastructure located overseas requires Australia to have high quality research infrastructure it can make available in return to overseas researchers.

**Question 4: What are the conditions or scenarios where access to international facilities should be prioritised over developing national facilities?**

Australia relies on access to overseas world class international research infrastructure such as the European Molecular Biology Laboratory, CERN, and the International Cancer Genomics Consortium. It is important to consider how Australia gains access to such facilities as part of this roadmap. Accessing such world-class research infrastructure overseas, requires Australia to have a presence of world-class research infrastructure and for it to exist as part of an international network.

Access to the European Molecular Biology Laboratory through Australia's associate membership status has greatly assisted in helping to recruit to Australia, and also retain, talented research leaders.

**Question 5: Should research workforce skills be considered a research infrastructure issue?**

Research workforce skills should be considered a research infrastructure issue. Both the operational and technical support of infrastructure facilities need to be planned for during the commissioning and ongoing delivery of a research infrastructure capability. Just as important as maintaining and updating the technical capabilities of research infrastructure is ensuring facilities have the operational and technical support to help researchers get the most from facilities. Technical support

staff at research facilities can work with researchers to help them plan and understand how to get the most from equipment during their research.

**Question 6: How can national research infrastructure assist in training and skills development?**

National infrastructure facilities present opportunities for specialist research training at doctoral and postdoctoral levels. It will be important to ensure adequate access to facilities is made available to doctoral and postdoctoral researchers at these facilities.

Where practical, research infrastructure facilities should be integrated into broader research training programs.

**Question 7: What responsibility should research institutions have in supporting the development of infrastructure ready researchers and technical specialists?**

No response

**Question 8: What principles should be applied for access to national research infrastructure, and are there situations when these should not apply?**

A fair and transparent access structure should govern the access arrangements to national research infrastructure. Access costs should be kept as reasonable as possible to ensure researchers have access to the infrastructure they need to undertake their work.

Scientific excellence should be the primary determinant when making decisions over access arrangements.

**Question 9: What should the criteria and funding arrangements for defunding or decommissioning look like?**

The effective shelf life of research infrastructure will vary greatly, with some facilities becoming obsolete far more quickly than others. While at times it might be advantageous to develop brand new research infrastructure facilities, particularly in new fields, as far possible efforts should be taken to get the most from our existing investments. This can be achieved by incrementally upgrading facilities where this makes both good economic sense, and can deliver a world-class research capability.

There are examples of existing research infrastructure investment where the full benefits are not being realised. The Australian Synchrotron is reported to be working at less than one-third capacity, and there is a strong argument that the Roadmap should fund new beamlines to ensure greater utilisation of existing infrastructure.

**Question 10: What financing models should the Government consider to support investment in national research infrastructure?**

A financing model should be developed that provides stable and predictable funding. In recent years there has been a high degree of uncertainty surrounding the ongoing funding for existing national research facilities. This uncertainty impacts on ability to recruit and retain highly skilled technical staff at these facilities. Providing greater certainty allows research infrastructure to make investments in both the facility itself as well as in the individuals that operate it.

Question 11: When should capabilities be expected to address standard and accreditation requirements?

No response

Question 12: Are there international or global models that represent best practice for national research infrastructure that could be considered?

No response

Question 13: In considering whole of life investment including decommissioning or defunding for national research infrastructure are there examples domestic or international that should be examined?

No response

Question 14: Are there alternative financing options, including international models that the Government could consider to support investment in national research infrastructure?

No response

## **Health and Medical Sciences**

**Question 15: Are the identified emerging directions and research infrastructure capabilities for Health and Medical Sciences right? Are there any missing or additional needed?**

In addition to the focus on Big Health data, emphasis should also be placed on integrating and having access to data, and the workforce and infrastructure required to make this happen. There are opportunities for health research benefits through joining up data generated from large population health studies, electronic health records and from other systems, such as personal apps and devices. To achieve this consideration of the data linkage infrastructure needed to meet researcher and government demand is required. Consideration will also need to be given to the ethical and privacy concerns surrounding such developments.

The ability to make best use of 'big data' in health and medical research will be limited unless enough is sustained effort to ensure there are enough qualified people with the relevant skills needed.

**Question 16: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?**

Continued access to the European Molecular Biology Laboratory should be seen as a high priority, along with CERN, and the International Cancer Genomics Consortium. There are also opportunities for Australia to develop a relationship with the UK Regenerative Medicine Platform, as well as with the Canadian initiatives including the Medicine by Design Project and the Center for Commercialization of Regenerative Medicine. In addition to this the US Cancer Moonshot initiative could offer opportunities for collaborations over the next ten years and beyond.

**Question 17: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Health and Medical Sciences capability area?**

The increasingly multidisciplinary nature of health and medical research needs to be recognised. Health and medical research will increasingly draw on components from across a wide range of disciplines and consideration will need to be given to how health and medical researchers can also make best use of all research infrastructure. For example this includes ongoing access to super computers, data processing and storage, synchrotron facilities, as well as underlying infrastructure.

Research infrastructure offers great potential in terms of encouraging multidisciplinary approaches. Therefore it is important to think of how such facilities can be designed and utilised to facilitate different teams of researchers from different backgrounds, and how they can encourage collaboration.

The Medical Research Future Fund has the potential to transform health and medical research funding, including a potentially doubling of Australia's investment in health and medical research. Therefore it is necessary to consider how the Roadmap can best align with the work that is underway in developing the Medical Research Future Fund Strategy and Priorities. This will ensure both investments are being made in sync with one another, allowing a greater return on investment.

**Environment and Natural Resource Management**

Question 18: Are the identified emerging directions and research infrastructure capabilities for Environment and Natural Resource Management right? Are there any missing or additional needed?

No response

Question 19: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

No response

Question 20: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Environment and Natural Resource Management capability area?

No response

**Advanced Physics, Chemistry, Mathematics and Materials**

Question 21: Are the identified emerging directions and research infrastructure capabilities for Advanced Physics, Chemistry, Mathematics and Materials right? Are there any missing or additional needed?

No response

Question 22: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

No response

Question 23: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Advanced Physics, Chemistry, Mathematics and Materials capability area?

No response

### **Understanding Cultures and Communities**

Question 24: Are the identified emerging directions and research infrastructure capabilities for Understanding Cultures and Communities right? Are there any missing or additional needed?

No response

Question 25: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

No response

Question 26: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Understanding Cultures and Communities capability area?

No response

### **National Security**

Question 27: Are the identified emerging directions and research infrastructure capabilities for National Security right? Are there any missing or additional needed?

No response

Question 28: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

No response

Question 29: Is there anything else that needs to be included or considered in the 2016 Roadmap for the National Security capability area?

No response

### **Underpinning Research Infrastructure**

Question 30: Are the identified emerging directions and research infrastructure capabilities for Underpinning Research Infrastructure right? Are there any missing or additional needed?

No response

Question 31: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 32: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Underpinning Research Infrastructure capability area?

No response

### **Data for Research and Discoverability**

Question 33 Are the identified emerging directions and research infrastructure capabilities for Data for Research and Discoverability right? Are there any missing or additional needed?

No response

Question 34: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

No response

Question 35: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Data for Research and Discoverability capability area?

No response

### **Other comments**

If you believe that there are issues not addressed in this Issues Paper or the associated questions, please provide your comments under this heading noting the overall 20 page limit of submissions.