

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?

Omics technologies should be combined to get a greater picture of the research question. It is mainly being conducted on an ad-hoc basis. Future capability should have it built in, what can the other areas of BPA contribute to the research question. Perhaps a liason who actively looks at projects coming in, and seeing how they can connect to other areas of BPA. Other capability areas that might be useful to future proofing science in Australia is providing CRISPR technologies as a service, and promoting automation within the lab environment to improve throughput of samples and analyses. From a research perspective, Australia wide access to literature from a central repository rather than individual institutions applying for access to papers from a journal would be a great idea. I've seen it work in England and I'm surprised Australian institutions don't do it here.

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

BPA is an excellent platform that seems to replicate what I've seen in England and the USA. However, it needs to broaden its outreach to areas that are not normally covered, probably because it is thought the research is not sufficiently advanced enough for BPA capabilities.

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

Only if those international facilities have capabilities that are not yet here in Australia.

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

They shouldn't. There is much to be gained from having facilities in an Australasian region. In the end, BPA facilities are a service to provide state of the art technologies in the hands of scientists who otherwise couldn't afford the capability at their own institution. That being said there should be international collaboration between Australia and

other countries as we have for the Square Kilometre Array - Australia Telescope National Facility.

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

No.

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

Only in training up people to use the infrastructure.

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

It should be a collaboration between BPA and the institution.

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

All research institutions should have access including universities, government research and industry.

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

Once the technologies provided by BPA are standard across the country, then there should be a process of decommissioning.

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

A percentage of GDP, as is being done in Europe.

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

Always. The BPA infrastructure is the state of the art in Australia. As such, it should represent the best standards and accreditation that are available globally.

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

United States of America's Department of Energy national laboratories

Germany's Max Planck institutes

Japan's RIKEN centres

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?

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

Private-public models of funding used in South Korea for applied research goals.

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?

Question 16: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in 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?

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?

Precision agricultural tools are needed. Current research is lagging in Australia behind other countries. In particular, the need to be able to package multiple tools into a single package that could be accessed by a user friendly interface for agricultural producers and service providers to at least create data on their farms, forests, etc., would revolutionise agriculture.

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

Materials chemistry infrastructure is needed to turn our natural resources into products that can be value added rather than just exporting our raw materials overseas.

World Soil Information (<http://www.isric.org/projects>). Australia appears to have little presence in this arena.

Nano-sat and Cube-sat facilities to kickstart public and private space exploration research in Australia.

Increase in World Heritage Areas

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?

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?

Materials chemistry infrastructure is needed to turn our natural resources into products that can be value added rather than just exporting our raw materials overseas. In particular, the need for a nanoparticle research facility, both as a means of creating them for advanced technologies and to study their effects on human, animal and environmental health.

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

We should engage regional space powers (India, China, Japan, South Korea) and industry (e.g. Virgin) about using Australia as a space port. The SKA should be expanded if possible.

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?

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?

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

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?

National Security

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

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

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

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?

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?

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?

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

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?

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.