Australian Government

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National Research Infrastructure

Maximising the Benefits

Dr Miles Apperley

Head of Research Infrastructure

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Science. Ingenuity. Sustainability.

Acknowledgement

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

Australian Government
Department of Education and Training

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Australian Government
Department of Industry, Innovation and Science

+ other Publicly Funded Research Agencies

Colleagues from NCRIS funded facilities

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ANSTO | Home to landmark and national research infrastructure

Operating safely for over 60 years

Leaders in nuclear science and technology

Lucas Heights | NSW

Main campus

Clayton | VIC

Australian Synchrotron

Camperdown | NSW

Cyclotron

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Business solutions

Nuclear medicine production

Minerals consulting

Irradiation services

Nuclear waste solutions

Radiation protection services

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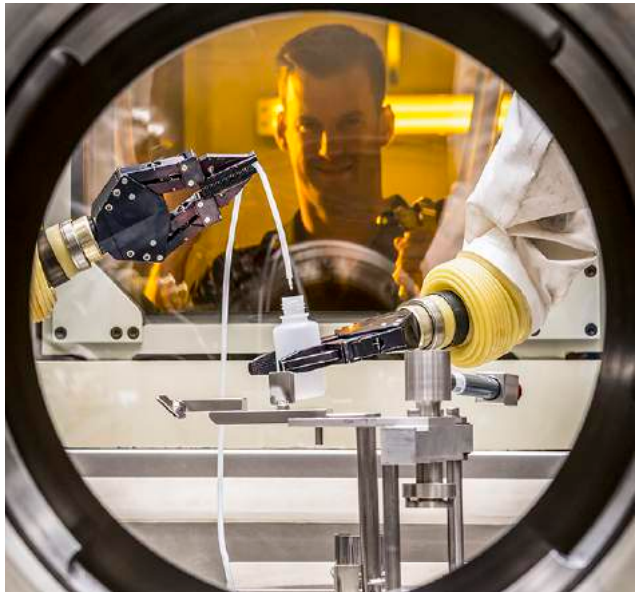
World class research and user facilities



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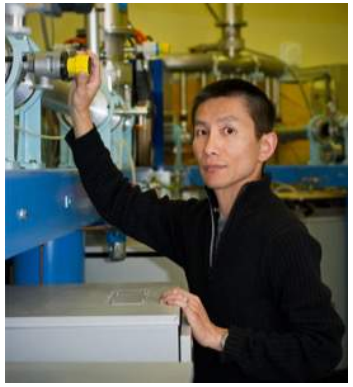
Equipment and people

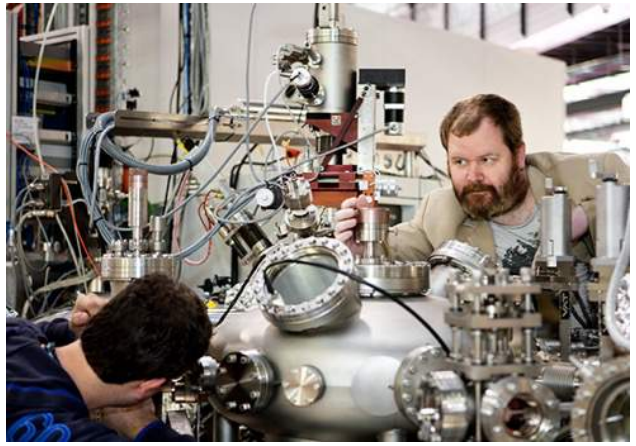






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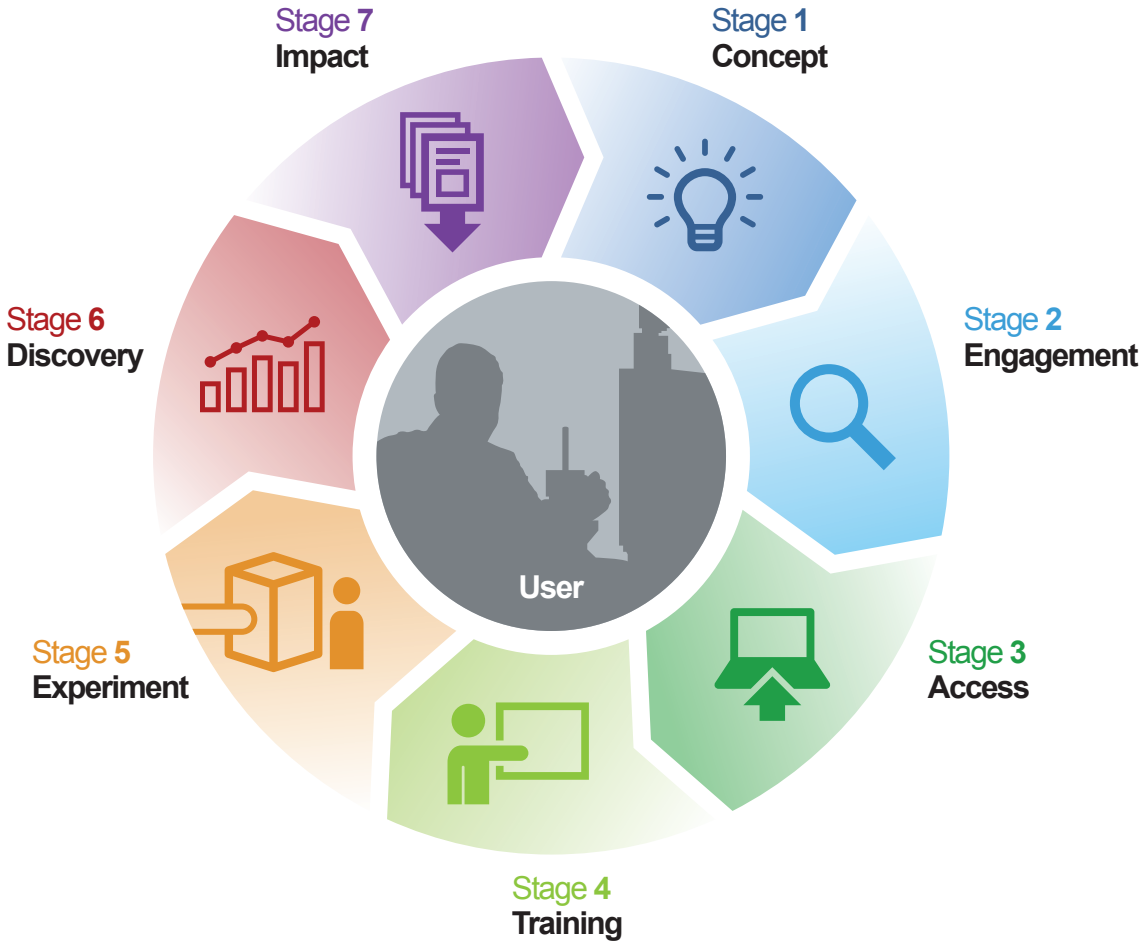
User centric experience

World-class infrastructure enabling world-class research



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ANSTO research infrastructure

Landmark

OPAL
Multipurpose Reactor

Australian Centre for
Neutron Scattering

Australian
Synchrotron

National

National
Deuteration Facility

Centre for
Accelerator Science

Medical research cyclotron
and node of National
Imaging Facility (NIF)

Institutional

Local but national impact

Isotope Tracing and Dating

Nuclear Forensics

Activity Standards

Neutron Activation and
irradiations

Radiotracers,
Radiochemistry and
Bioimaging

Materials Characterisation

Merit based and commercial access | **Solutions to industry** | **Researcher focused**

Supporting research priorities

Australia's national science and research priorities

Cyber security

Advanced manufacturing

Transport

Energy

Soil and water

Environmental change and health

Food

Resources

ANSTO's platforms

Isotope tracing in natural systems

Nuclear stewardship

National Deuteration Facility

Nuclear materials development and characterisation

Radiobiology and bioimaging

Radioisotopes and radiotracers

Minerals processing

Landmark research infrastructure

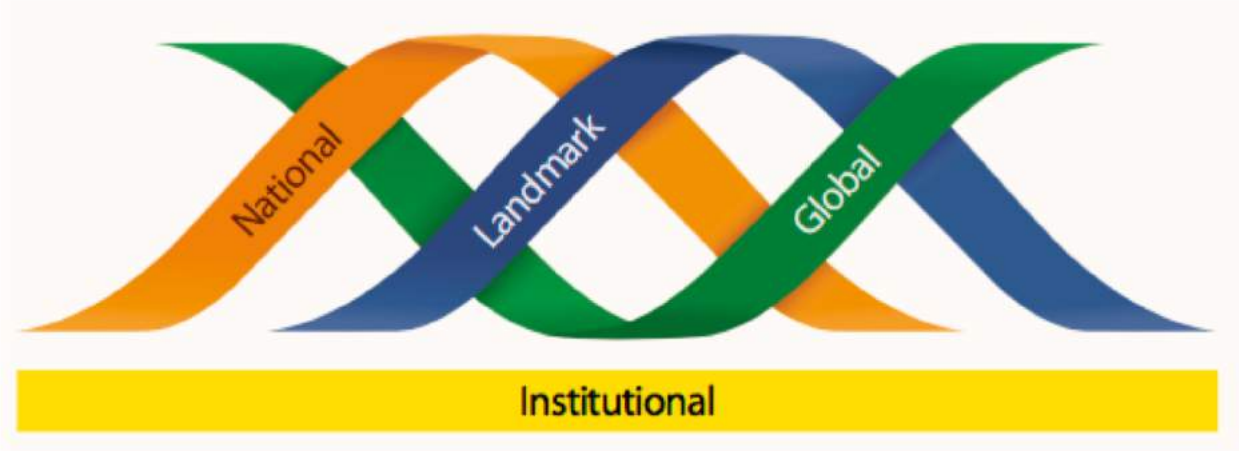
OPAL multi-purpose reactor

Australian Centre for Neutron Scattering

Australian Synchrotron

Centre for Accelerator Science

Australias's Research Infrastructure System



- **Institutional**– foundation layer
- **National** – facilities at scale
- **Landmark** – single sited
- **Global**– multinational

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National Research Infrastructure Goals

- Enable world-class research
- Enable access to global and international research infrastructure
- Establish nationally significant data streams
- Ensure merit access is prioritized
- Target infrastructure investments to research strengths

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Strategic Planning

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Categories of Research Infrastructure

$0.5 - $20M annually at institution

$30M p.a. national competitive process

~$150M p.a. + leverage national strategic

>$100M capital exceptional landmark facilities

Strategic Roadmap for Australian Research Infrastructure
DIISR, August 2008

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National Collaborative Research Infrastructure Strategy (NCRIS) *ca 2004*

- embrace a new, **strategic and planned** approach to funding research infrastructure intended to link infrastructure to Australia's National Research Priorities;
- encourage **greater collaboration** in research and in the development of research infrastructure;
- establish **priorities** for government investment in world class research facilities, networks and infrastructure;
- be **driven by principles** to allow a focus on outcomes and to accommodate and value the diversity of the research infrastructure landscape; and
- incorporate a **process of consultation** in the development of the mechanisms for establishing priorities and investment strategies.

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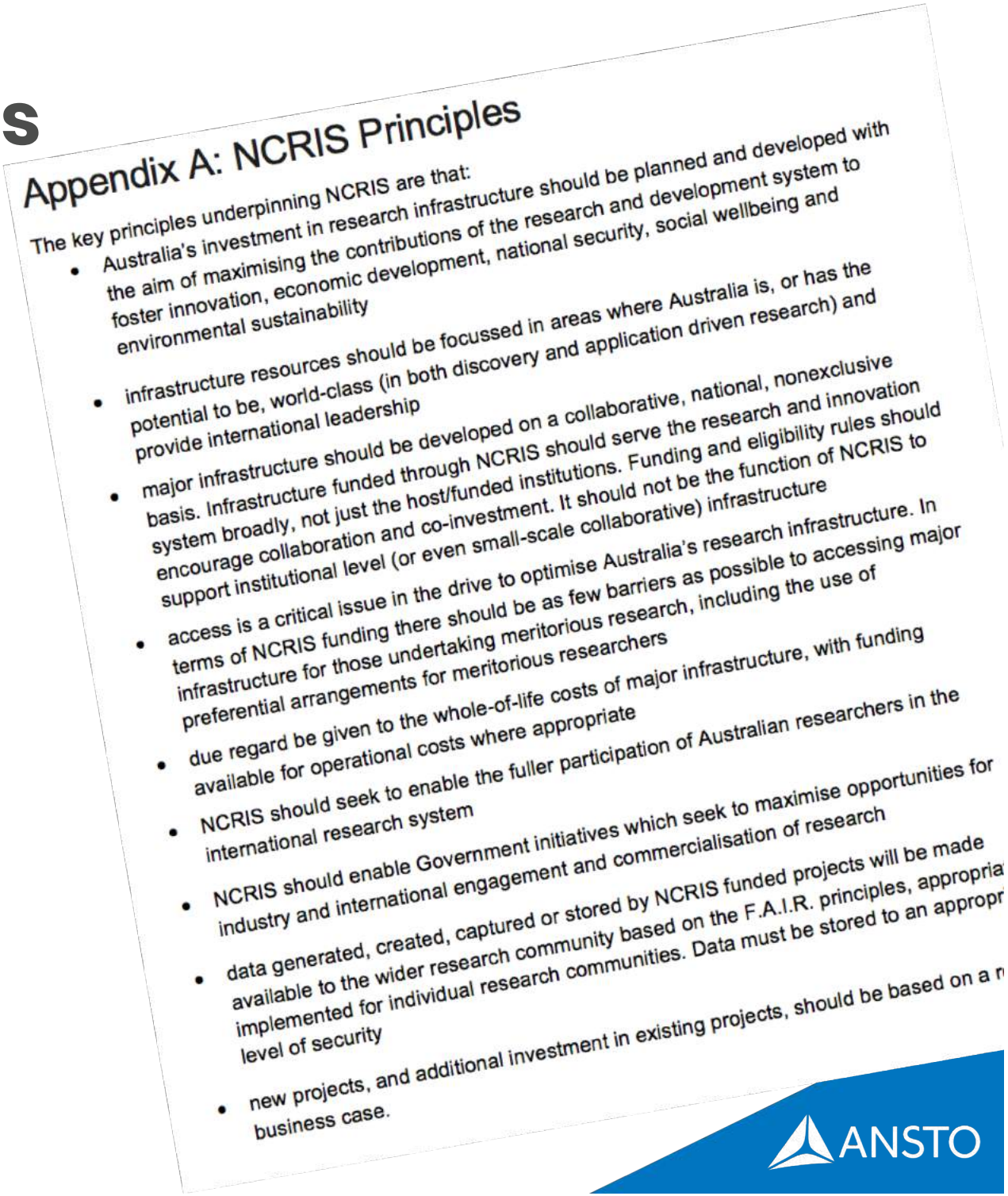
NCRIS Principles

- Who benefits
- Planning
- Investment
- Operations
- World-class
- Industry and innovation
- Data



Appendix A: NCRIS Principles

The key principles underpinning NCRIS are that:

- Australia's investment in research infrastructure should be planned and developed with the aim of maximising the contributions of the research and development system to foster innovation, economic development, national security, social wellbeing and environmental sustainability
- infrastructure resources should be focussed in areas where Australia is, or has the potential to be, world-class (in both discovery and application driven research) and provide international leadership
- major infrastructure should be developed on a collaborative, national, nonexclusive basis. Infrastructure funded through NCRIS should serve the research and innovation system broadly, not just the host/funded institutions. Funding and eligibility rules should encourage collaboration and co-investment. It should not be the function of NCRIS to support institutional level (or even small-scale collaborative) infrastructure
- access is a critical issue in the drive to optimise Australia's research infrastructure. In terms of NCRIS funding there should be as few barriers as possible to accessing major infrastructure for those undertaking meritorious research, including the use of preferential arrangements for meritorious researchers
- due regard be given to the whole-of-life costs of major infrastructure, with funding available for operational costs where appropriate
- NCRIS should seek to enable the fuller participation of Australian researchers in the international research system
- NCRIS should enable Government initiatives which seek to maximise opportunities for industry and international engagement and commercialisation of research
- data generated, created, captured or stored by NCRIS funded projects will be made available to the wider research community based on the F.A.I.R. principles, appropria implemented for individual research communities. Data must be stored to an appropr level of security
- new projects, and additional investment in existing projects, should be based on a r business case.

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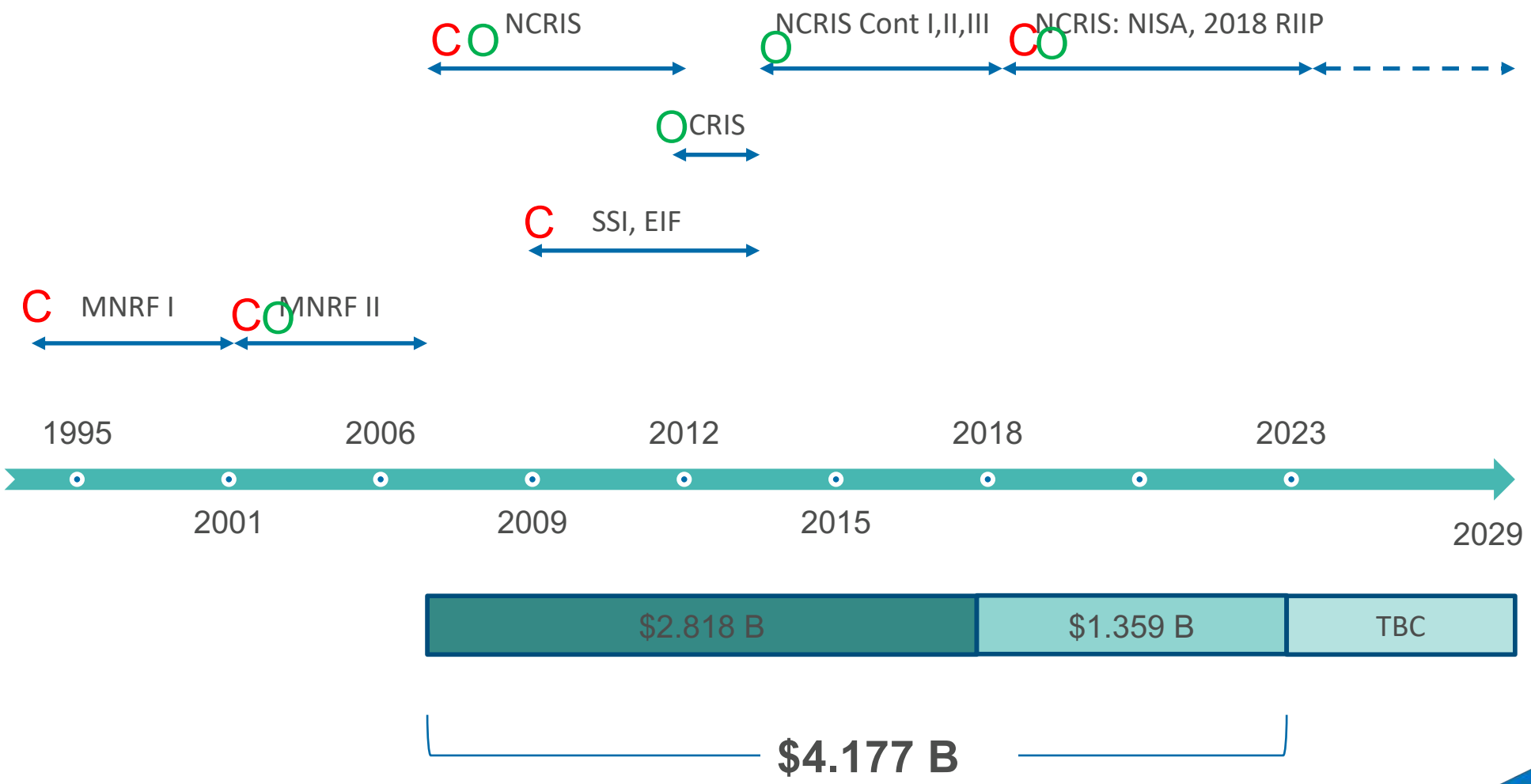
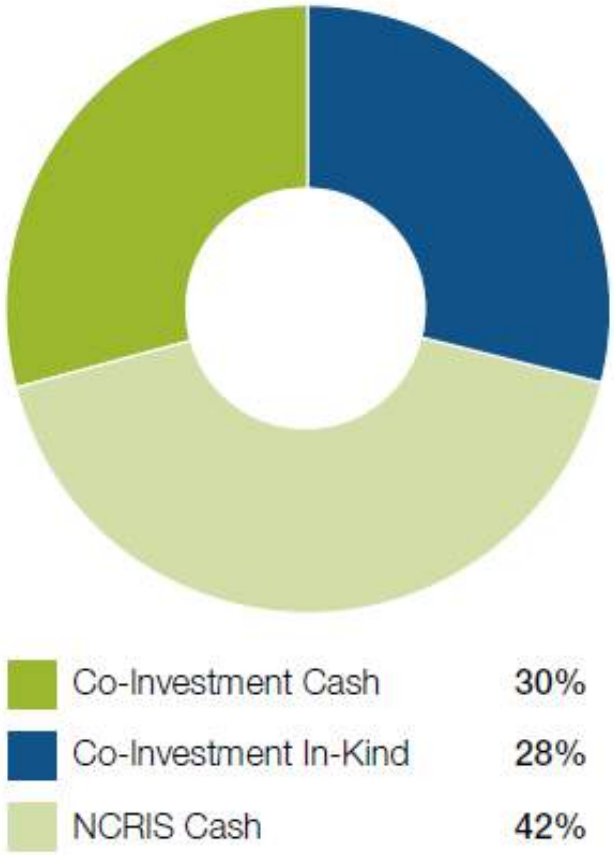
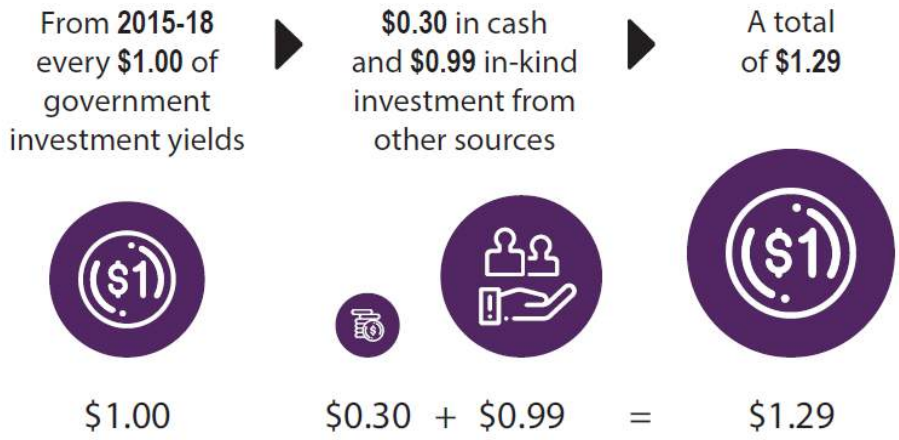
Strategic National Investment



Leveraging Co-investment



National Collaborative Research Infrastructure Strategy
Evaluation Report June 2010



National Research Infrastructure Census 2019

NCRIS Today – National facilities

- Collaborative networks (universities, PFRA's)
- Equipment and instruments
- Data streams and networked collections
- Digital infrastructure – storage, HPC, tools, access
- People
- Access (national and global)

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23 Research infrastructure projects

8 Scoping studies (planning new RI projects)

1 Membership of a global research organisation

https://docs.education.gov.au/system/files/doc/other/ed18-0069_-_he_-_research_infrastructure_investment_plan_-_public_versio.pdf

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NCRIS Today – focus areas

Complement the National Science and Research Priorities and the Industry Growth Centres, MRFF & BTF

Role of Government

- Digital Data and eResearch Platforms
- Platforms for Humanities, Arts and Social Science
- Characterisation
- Advanced Fabrication and Manufacturing
- Advanced Physics and Astronomy
- Earth and Environmental Systems
- Biosecurity
- Complex Biology
- Therapeutic Development.

MICROSCOPY AUSTRALIA

ARDC Australian Research Data Commons

BIOPLATFORMS AUSTRALIA

IMOS

AuScope

TERN

AURIN aurin.org.au

appf Australian Plant Phenomics Facility

ATLAS OF LIVING AUSTRALIA sharing biodiversity knowledge www.ala.org.au

Astronomy Australia Ltd.

NCI AUSTRALIA

ANFF

National Imaging Facility

PHRN Population Health Research Network

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Realising return on investment

- Extending research impact
- Boosting productivity
- Human capital
- Integration into global networks
- Impact and Benefit Frameworks

What the NRIP is delivering – Return on Investment to Australia

Australia's NRIP has matured to the point that it is now generating significant dividends, including world-class research performance and a steady stream of triple bottom line benefits to Australia. At the highest level, these include:

- *Extending the impact of research* by expanding the scale and scope on which research can be conducted and enabling 'big science' on a collaborative scale to address complex national (and global) challenges.
- *Boosting productivity* by delivering an increasingly greater research output from investment and supporting industry and other end-users to implement more efficient and value-adding operations.
- *Developing human capital* by attracting and training research and technical talent essential for optimising the NRIP investment.
- *Integrating Australia into global knowledge networks* by attracting and supporting collaborative partnerships and knowledge exchange across national and regional boundaries.

Submission by PFRA's to Research Infrastructure Review May 2015

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Key Findings FY2016 to FY2018

- Program level data collected from individual facilities
- Metrics collection processing evolving – annual census
- Impact and Benefit also being addressed

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Wallis | strategic market & social research

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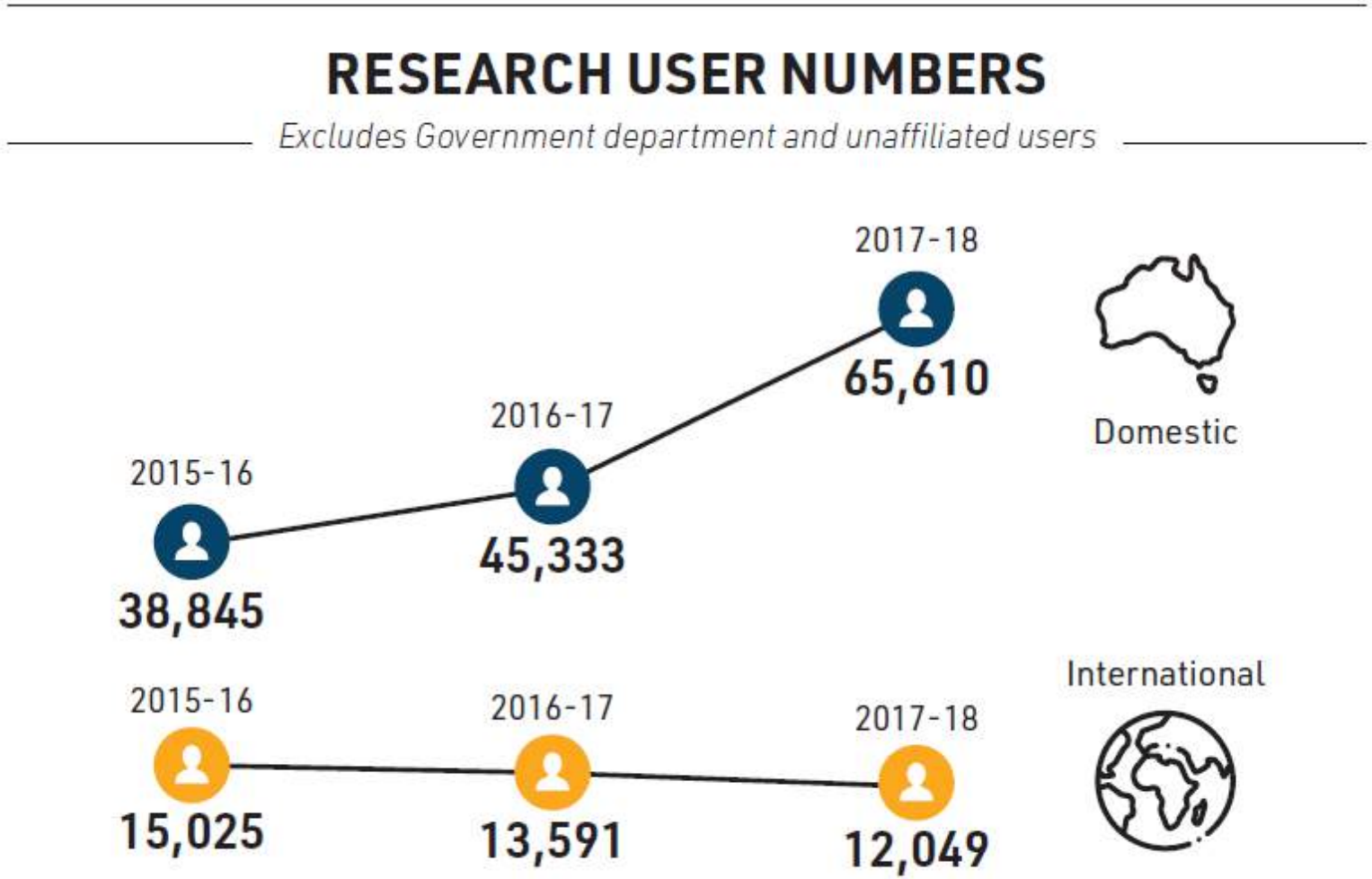
Access – Total Users



Access – User categories

Largest category is University

User Source	Domestic	International
Researchers from within Universities	45,763	10,710
Researchers from within Publicly Funded Research Agencies (PFRA)	2,113	257
Researchers from within Medical Research Institutes (MRI)	1,418	73
Researchers from International organisations	268	330
Researchers from industry / commercial organisations	14,440	661
Researchers from within other organisations (please specify)	1,608	18
Users from government departments (incl. local government)	20,222	1,228
Unaffiliated users	174,039	87,463
Other (specify) / (further) disaggregation unavailable	25,307	22,326
Total Users	**285,178**	**123,066**

Most unaffiliated users are using *Atlas of Living Australia*

ATLAS OF LIVING AUSTRALIA
sharing biodiversity knowledge
www.ala.org.au

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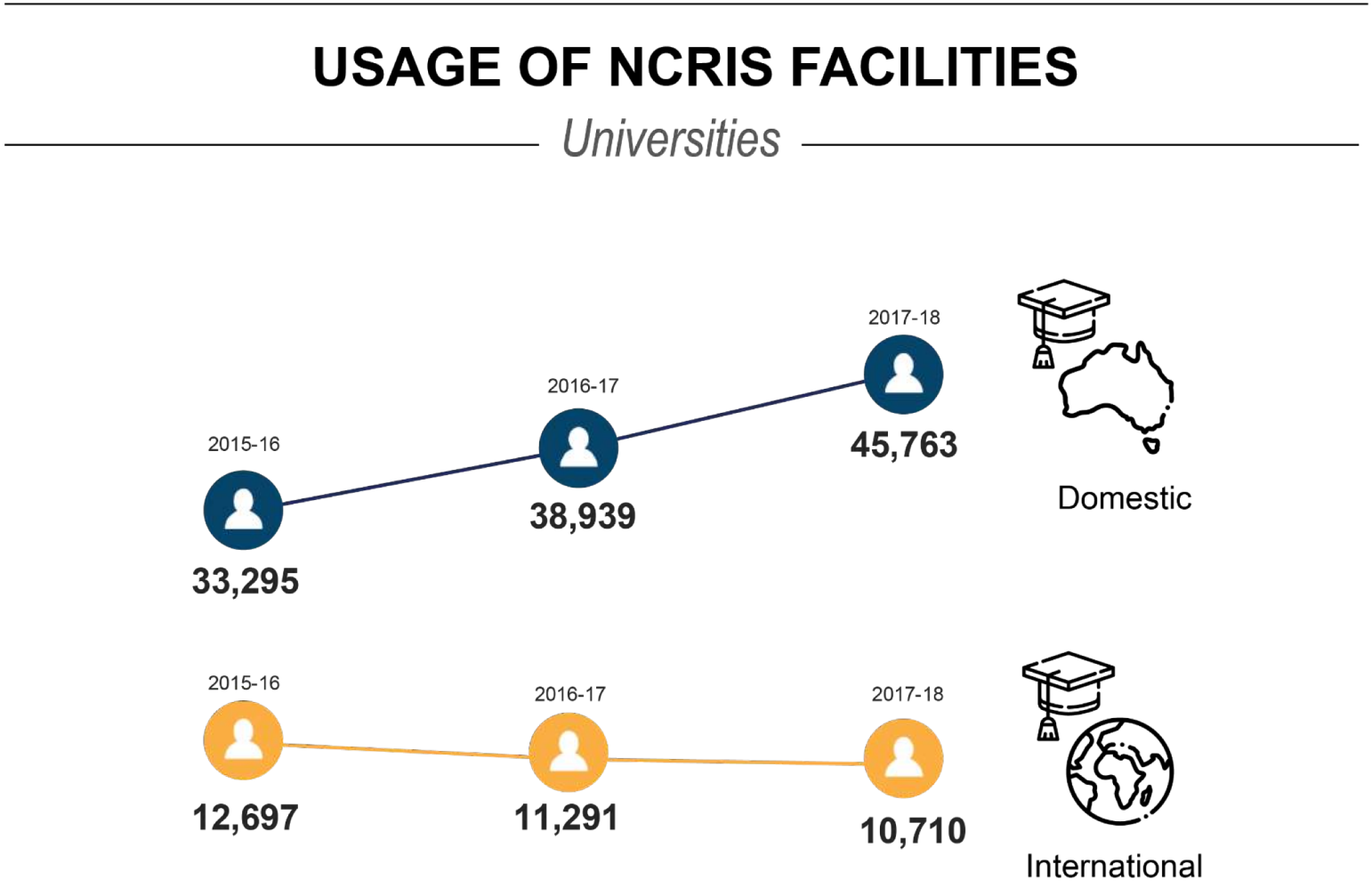
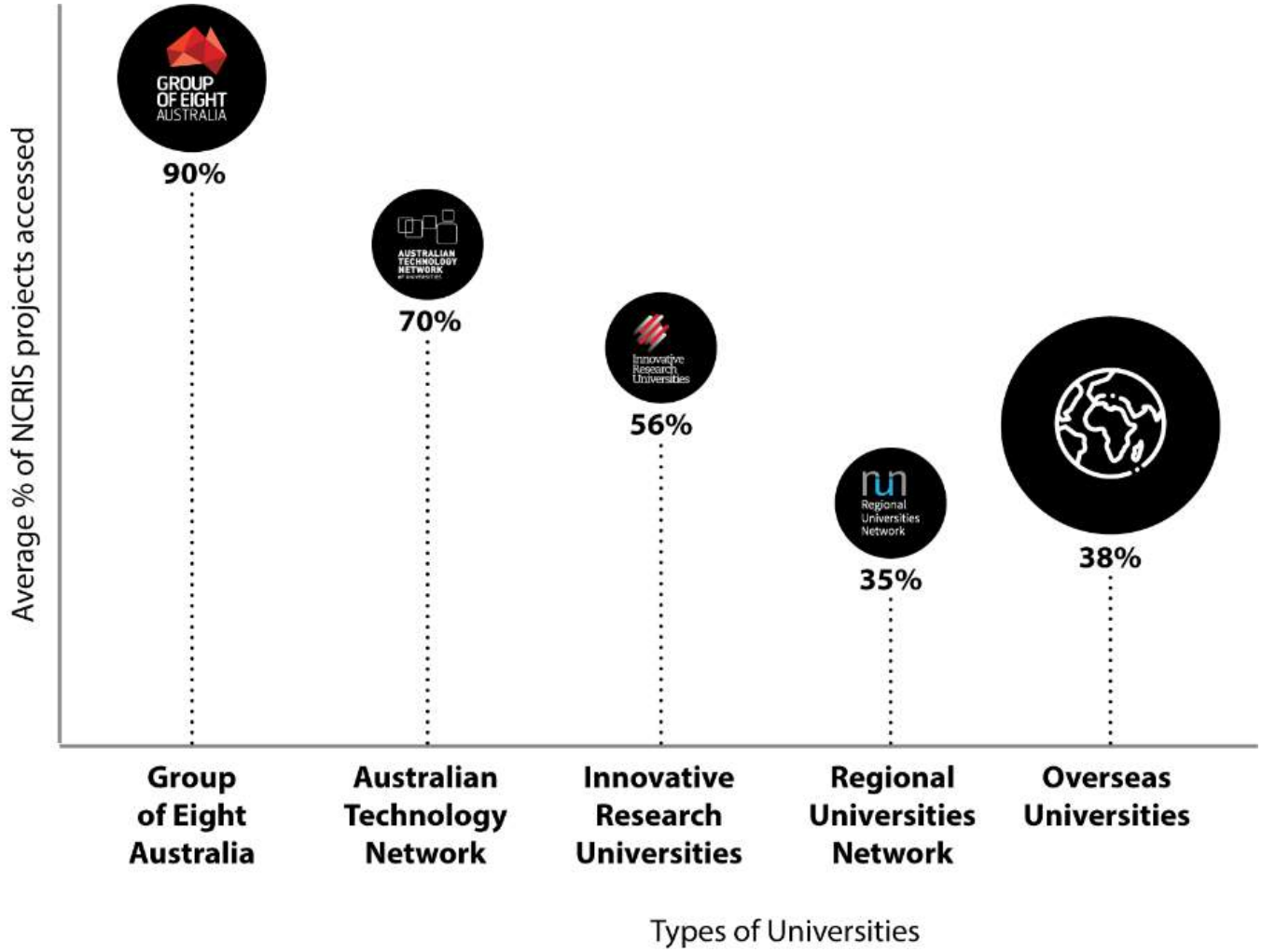
Access – University Users



Types of university users



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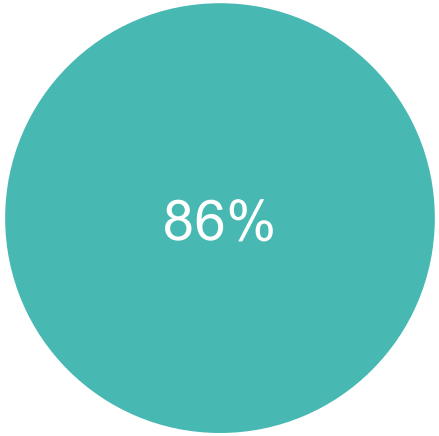
Enabling research

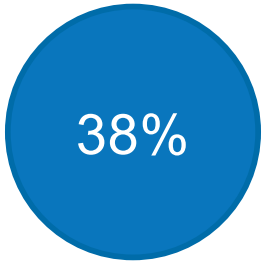
Australian Government
Australian Research Council

Proportion of NCRIS facilities supporting an ARC Project



Australian Government
National Health and Medical Research Council

Proportion of NCRIS facilities supporting an NHMRC Project



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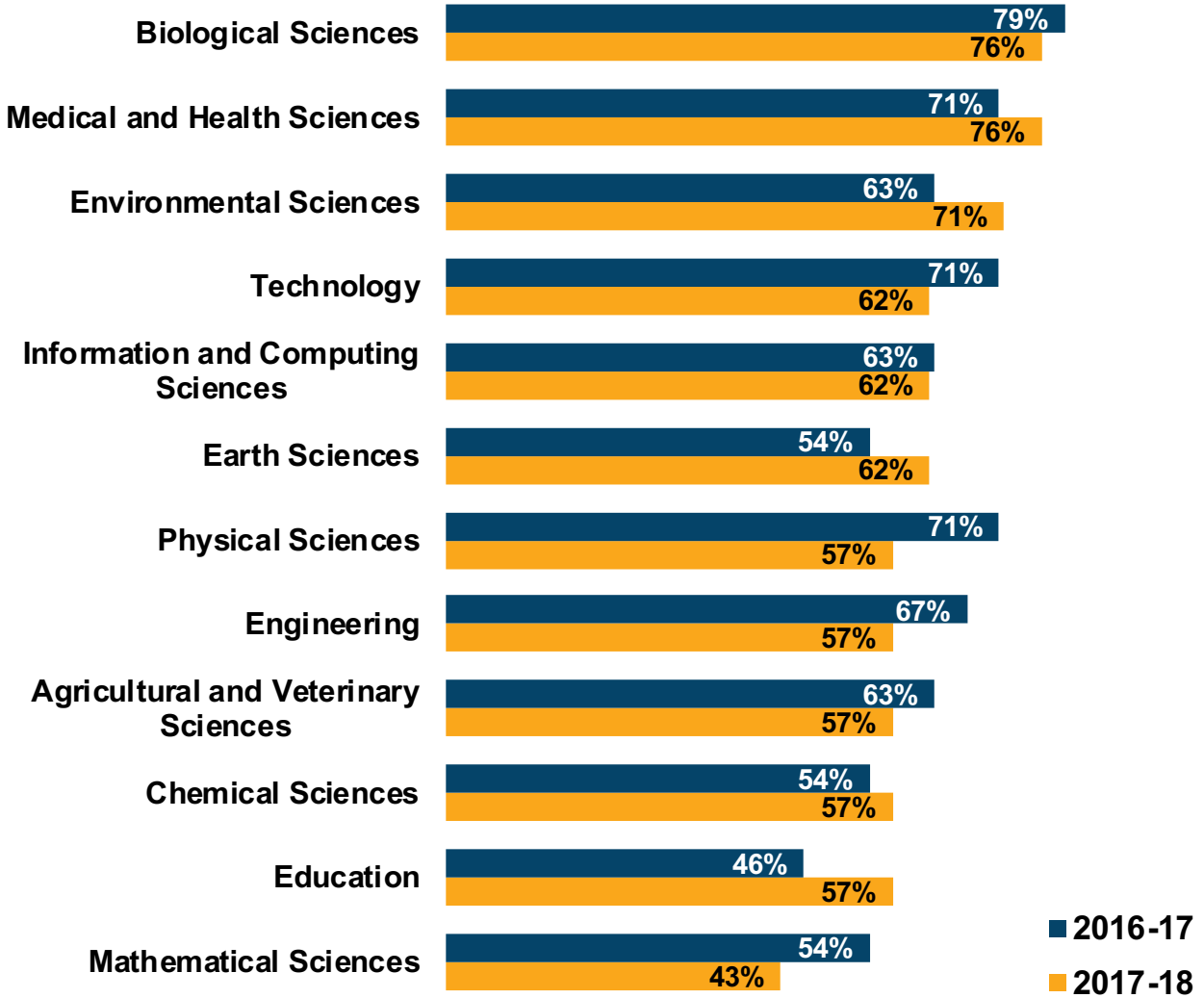
Fields of Research

Proportion of facilities providing services to key fields of research



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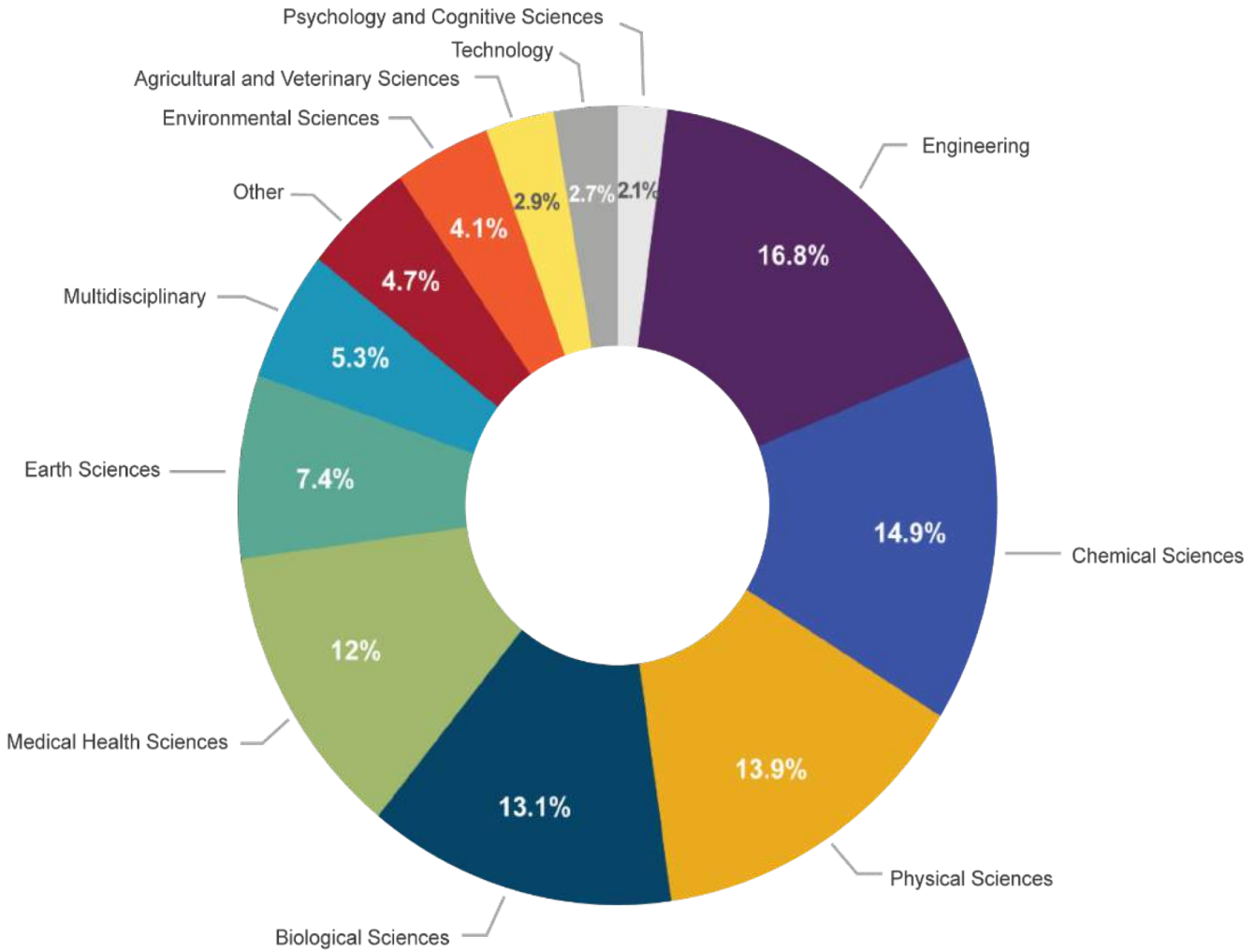
Enabling publications

Engineering was the most common field for NCRIS enabled publications, followed by Chemical Sciences and Physical Sciences.



Enabling publications

NCRIS-enabled publications are twice as likely to be cited as similar publications

Field-weighted citation impact, by year

All projects reported Field-Weighted Citation Impacts above 1.0.

On average, NCRIS projects >25 % of outputs rating in the top 10 citation percentile.

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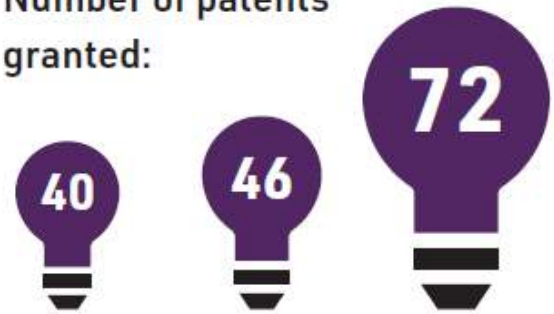
Commercial Outputs

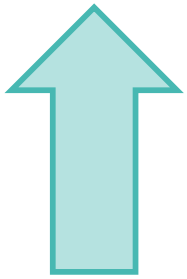
IMPACT

Number of patents granted:



Products introduced to markets in 2015-18

- Process Improvements
- Invention disclosure
- New enterprises



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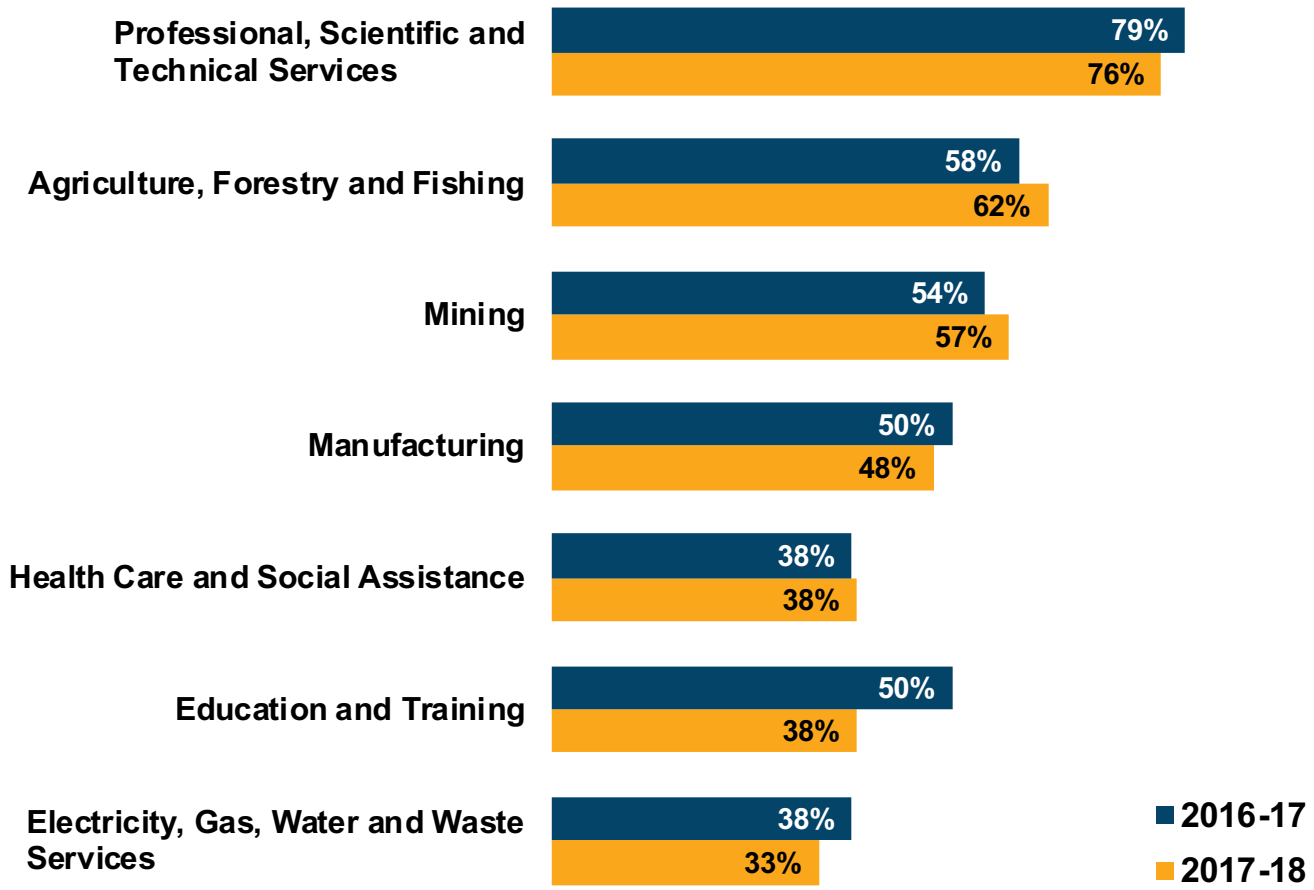
Industry Sectors

Proportion of facilities providing services to key industries



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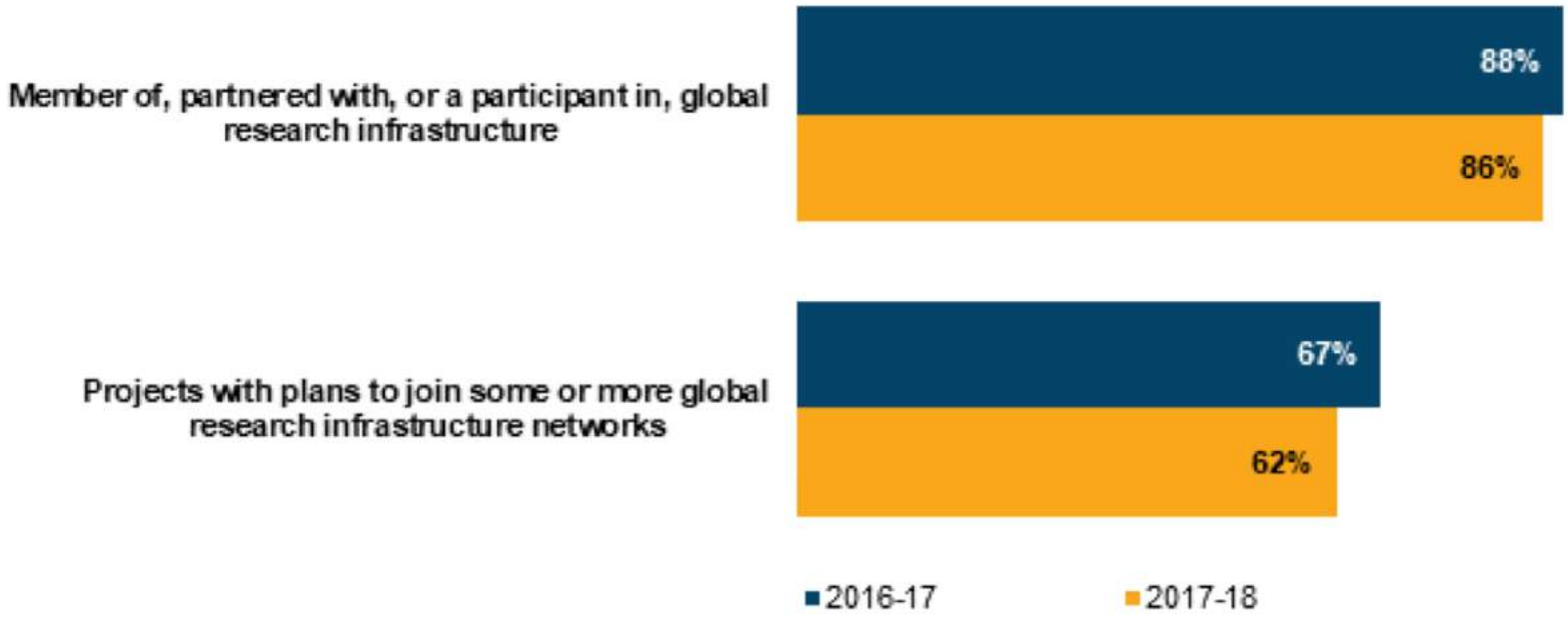
Global Research Infrastructure



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Global Rese ture

1
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2.G
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3.Nat
interna

Framework for Global Research Infrastructures

Group of Senior Officials on Global Research Infrastructures

Framework for a coherent and coordin development and operation of global rese

Context

Research infrastructures (RI) are recognised as key elements in re boosting scientific knowledge generation, for accelerating technolo technological and social innovation, and for providing advanced s of scientists and science managers. Furthermore, it provides an researchers to improve their performance and knowledge and inno

In some cases, their complexity as well as high development, co the global nature of the scientific challenge addressed makes alone to build and operate these facilities. In such cases it bec **the international level** for the realisation of "**global resea** "global research infrastructure" relies on its capacity to a scientific communities by combining the best available kno specific scientific area with multi-source funding.

The potential for increased international cooperation on is has been recognised during international high-level mee since 2007. At the first G8 Ministerial meeting, held in form a **Group of Senior Officials (GSO)**[1] to take sto infrastructures. This document reflects the main obser provides a framework for the GSO's continued conside

The GSO recognises the vital role of global res S&T challenges and the benefits of coordinating use the available resources and fully r

Group of Senior Officials on Global Research Infrastructures Progress Report 2015

Meeting of the G7 Science Ministers
8-9 October 2015

LAN

G7 GERMANY 2015

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Integrating Globally

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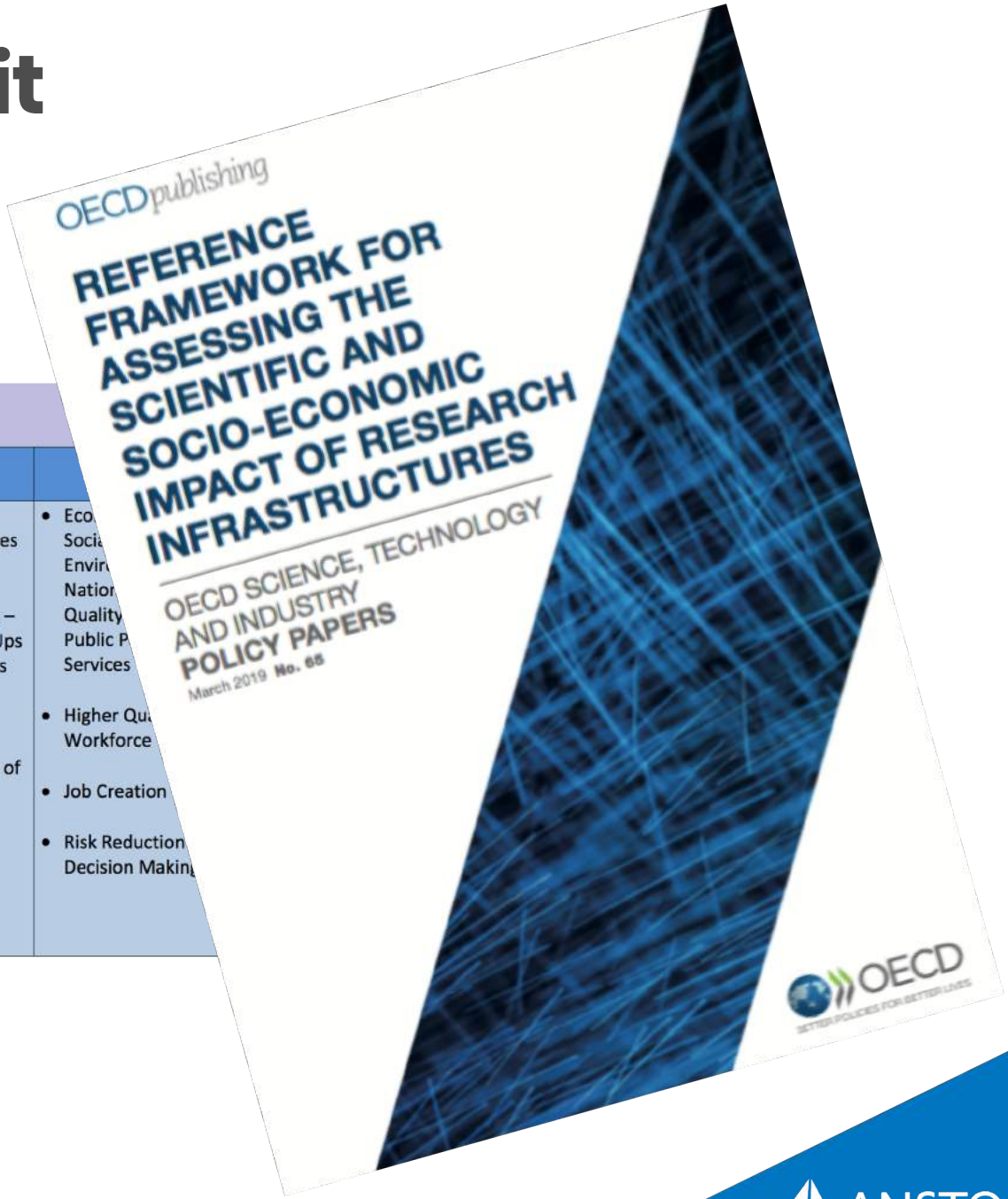
Impact and Benefit

Research Impact Pathway				
Inputs	**Activities**	**Outputs**	**Outcomes**	
• Research income • Staff • Background IP • Infrastructure • Collections	• Research Work and Training • Workshop/Conference Organising • Facility Use • Membership of Learned Societies and Academies • Community and Stakeholder Engagement	• Publications including E-Publications • Additions to National Collections • New IP: Patents and Inventions • Policy Briefings • Media	• Commercial Products, Licences and Revenue • New Companies – Spin offs, Start Ups or Joint Ventures • Job Creation • Implementation of Programs and Policy • Citations • Integration into Policy	• Eco Soci Envir Natio Quality Public P Services • Higher Qu Workforce • Job Creation • Risk Reduction Decision Makin



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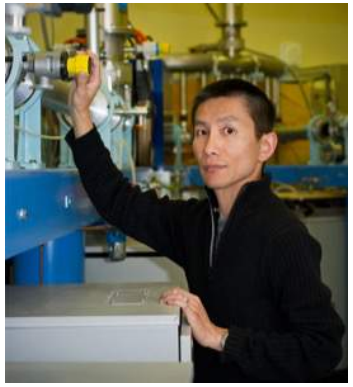
People

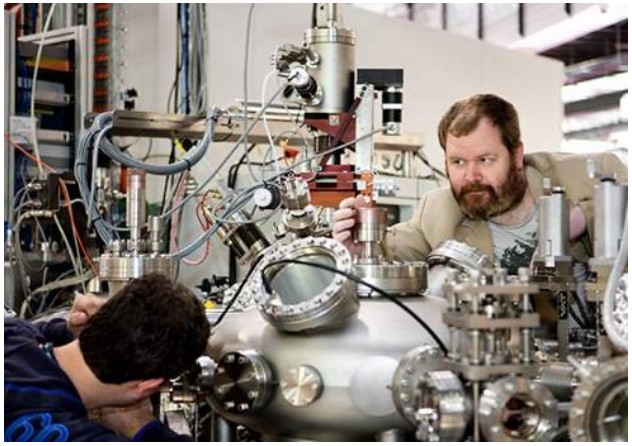






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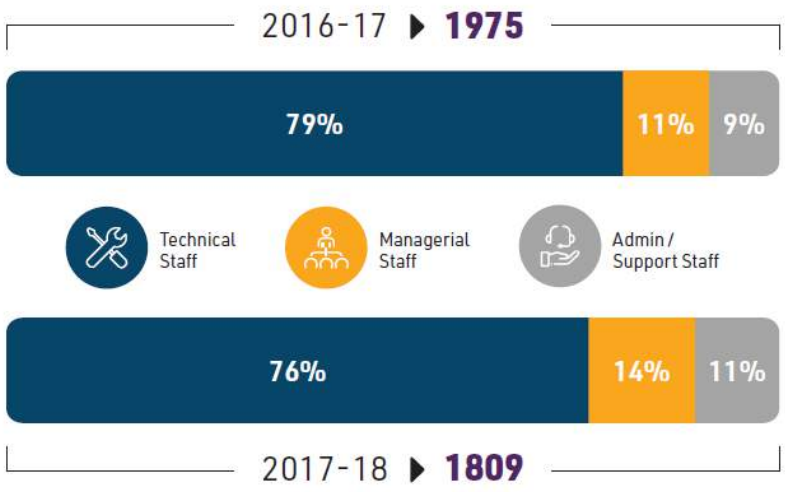
People

- Developing human capital – research and technical competencies
- Maximising (optimizing) utilisation
- Raising outcomes and impact
- Training
- Career pathways

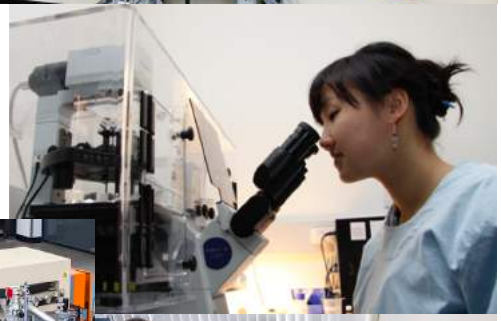


Summary and Outlook

- Have a National Research Infrastructure system
- NCRIS is a part (niche) national and merit based
  - Networks of RI at scale
  - Institutional – National - Global
- Planning and collaboration within NCRIS DNA
- Opportunities to enter or change position
- Impact and Benefit

- Outlook - TBC
  - 2018 RIIP Deliver capital and opex plans (now)
  - 2018 RIIP Scoping Studies
  - 2020 RIIP validated previous plan (now)
  - 2021 next version of NRIR
  - 2022 new RIIP capital and opex







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Thank you.

Questions

www.ansto.gov.au