Australian Council of Engineering Deans

10 May 2013

Professor Aidan Byrne
CEO, Australian Research Council
Overview

- ARC
- Current landscape
  » Programs
  » ERA
  » Near to long-term issues
Government Investment in R&D 2012-13

Multi-sector
$2060.3m

Higher Education Sector
$2845.1m

Australian Government Research Activities
$1775.6m

Business Enterprise Sector
$2253.8m

Source: 2012-13 Science, Research and Innovation Budget Tables
Detail of Government Investment in R&D 2012-13

- NHMRC: 9.3%
- ARC: 9.8%
- Industry R&D Tax Measures (estimated): 20.5%
- Block Funding to Higher Ed.: 21.3%
- Other R&D Support: 4.8%
- DSTO: 4.9%
- CSIRO: 8.2%
- Govt R&D Activities: 6.7%
- Higher Ed R&D Support: 0.7%
- Other Business R&D Support: 0.7%
- Other Innovation Support: 4.6%
- Rural: 2.9%
- Energy and the Environment: 3.0%
- CRCs: 1.7%
- Other Health: 1.3%
Trends of Government Investment in R&D 2003-13 ($m)

(source: budget tables)
Selected Streams Funding $m 2003-2013

- NHMRC
- CRCs
- ARC: Future Fellowships
- ARC

Web: arc.gov.au  |  Email: info@arc.gov.au
ARC funding awarded by program – last 5 years

Futures ...

- Discovery - Projects: 41%
- Linkage - Projects: 18%
- ARC Future Fellowships: 16%
- Centres of Excellence: 7%
- Australian Laureate/Fed Fellowships: 5%
- Linkage - Infrastructure Equipment and Facilities: 4%
- Discovery Early Career Researcher Award: 3%
- Other: 2%
- Special Research Initiatives: 4%
Total number of proposals received by the ARC by (expected) commencement year

- Technology
- Studies in Human Society
- Studies in Creative Arts and Writing
- Psychology and Cognitive Sciences
- Physical Sciences
- Philosophy and Religious Studies
- Medical and Health Sciences
- Mathematical Sciences
- Law and Legal Studies
- Language, Communication and Culture
- Information and Computing Sciences
- History and Archaeology
- Environmental Sciences
- Engineering
- Education
- Economics
- Earth Sciences
- Commerce, Management, Tourism and Services
- Chemical Sciences
- Built Environment and Design
- Biological Sciences
- Agricultural and Veterinary Sciences
STEM Vs HASS (roughly) (ARC $ awarded)

- Technology
- Studies in Human Society
- Studies in Creative Arts and Writing
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- Chemical Sciences
- Built Environment and Design
- Biological Sciences
- Agricultural and Veterinary Sciences
Average Grant Size - DP11 to DP13 - By 2 digit FOR showing awarded amount as part of requested amount
The Industrial Transformation Research Program

Overall objectives:

- foster important partnerships between business and universities;
- support researchers (higher degree by research & post doctoral fellows) to gain ‘hands-on’, practical skills and experience in important priority areas.

Consists of two schemes:

Research Hubs
Training Centres
First-time awardees on DECRA and DP

- # DECRA first-timers
- # DP first-timers
- % first-timers


Values: 350, 400, 450, 500, 550, 600

Percentage Range: 0% to 40%
DP13 - Submission and success rate by gender and career age

- Male proportion
- Female proportion
- Male success rate
- Female success rate

- 0-5 Yrs
- 5-10 Yrs
- 10-15 Yrs
- 15-20 Yrs
- 20-25 Yrs
- 25 Yrs plus

Web: arc.gov.au | Email: info@arc.gov.au
Leveraging the Benefits: Open Access

- Starting in January 2013, it is mandated by ARC funding rules that completed projects must make their publications available on an open access repository.
- Details: [http://www.arc.gov.au/applicants/open_access.htm](http://www.arc.gov.au/applicants/open_access.htm)
- Questions remain –
  - How open is open?
  - Timeframes, ‘loopholes’, is it fast enough?
  - Green or Gold? Green and gold? Colourblind?

- An open future: Open Data and Open Innovation
ERA 2012

- A larger and more productive research sector than in 2010
  - research publications/outputs (up 24%)
  - researchers and related staff (up 9%)
  - patents (up 16%) and esteem measures (up 11%)
  - Competitive grant ($3.75 billion, up 18%) and other public sector income ($2.39 billion, up 25%)
Income and quality

HERDC income Cat 1-3 by rating - 2010
Income and quality

HERDC income Cat 1-3 by rating - 2012
ERA 2012 ARC/NHMRC research funding by discipline

- ARC
- NHMRC

2-digit group

$0

$500

$1,000

$1,500

$2,000

$2,500

$3,000

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22
ERA 2012 ARC/NHMRC research funding by rating

$ Millions

ERA 2012 Rating (4-digit)

ARC

NHMRC
ERA 2012: Two Digit FoR codes
No. of Universities rated at world standard or higher

01 Mathematical Sciences
02 Physical Sciences
03 Chemical Sciences
04 Earth Sciences
05 Environmental Sciences
06 Biological Sciences
07 Agricultural and Veterinary Sciences
08 Information and Computing Sciences
09 Engineering
10 Technology
11 Medical and Health Sciences
12 Built Environment and Design
13 Education
14 Economics
15 Commerce, Management, Tourism and Services
16 Studies In Human Society
17 Psychology and Cognitive Sciences
18 Law and Legal Studies
19 Studies In Creative Arts and Writing
20 Language, Communication and Culture
21 History and Archaeology
22 Philosophy and Religious Studies

Legend:
- World standard
- Above world standard
- Well above world standard
Mathematical Studies (01) and Language, Communication and Culture (20)

Number of Universities Rated at World Standard or Higher

- **0101-Pure Mathematics** - 2012
  - At World Standard: 6
  - Above World Standard: 6
  - Well Above World Standard: 2

- **0102-Applied Mathematics** - 2012
  - At World Standard: 7
  - Above World Standard: 11
  - Well Above World Standard: 2

- **0103-Numerical and Computational Mathematics** - 2012
  - At World Standard: 3
  - Above World Standard: 1

- **0104-Statistics** - 2012
  - At World Standard: 2
  - Above World Standard: 6
  - Well Above World Standard: 1

- **0105-Mathematical Physics** - 2012
  - At World Standard: 3
  - Above World Standard: 3

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- **2001-Communication and Media Studies** - 2012
  - At World Standard: 5
  - Above World Standard: 6
  - Well Above World Standard: 2

- **2002-Cultural Studies** - 2012
  - At World Standard: 10
  - Above World Standard: 7
  - Well Above World Standard: 4

- **2003-Language Studies** - 2012
  - At World Standard: 1
  - Above World Standard: 2

- **2004-Linguistics** - 2012
  - At World Standard: 7
  - Above World Standard: 5
  - Well Above World Standard: 2

- **2005-Literary Studies** - 2012
  - At World Standard: 9
  - Above World Standard: 3
  - Well Above World Standard: 5
Collaboration – ERA 2012

Research Output patterns - all output types
# Interdisciplinary activity

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- 20-29%  
- 30-39%  
- > 40%
## Interdisciplinary activity

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Legend:
- 20-29%
- 30-39%
- > 40%
**ERA 2012:**

### 09 Engineering

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### 114 out of 126 assessed UoEs were rated at or above world standard

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<td>Total</td>
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ERA 2012:

Number of UoEs per rating scale score

- 0901 Aerospace Engineering
- 0902 Automotive Engineering
- 0903 Biomedical Engineering
- 0904 Chemical Engineering
- 0905 Civil Engineering
- 0906 Electrical and Electronic Engineering
- 0907 Environmental Engineering
- 0908 Food Sciences
- 0909 Geomatic Engineering
- 0910 Manufacturing Engineering
- 0911 Maritime Engineering
- 0912 Materials Engineering
- 0913 Mechanical Engineering
- 0914 Resources Engineering and Extractive Metallurgy
- 0915 Interdisciplinary Engineering
- 0999 Other Engineering

Number of UoEs
Where does the impact begin?

- Salaries researchers technicians
- Buy equipment, books, ICT
- Papers
- Patents
- New Government Policy
- New Research Paradigm
- Spin-off Company

Academic activity → Impact
Case 1:

Case 2:

Case 3:
Effect of measurement & feedback

- **$\$**
  - Salaries
    - researchers
    - technicians
  - Buy
    - equipment, books, ICT

- **Papers**
  - New
    - Government Policy
  - New Research Paradigm

- **Patents**
  - Spin-off Company

ERA ?
Effect of measurement & feedback

$\$ 
Salaries researchers technicians 
Buy equipment, books, ICT 
Papers 
Patents 
New Government Policy 
New Research Paradigm 
Spin-off Company 
IMPACT ?
Universities are multi-dimensional

We need a better and more complete description of activity.