



Australian Government  
Australian Research Council

# An ARC Perspective on Research Careers in Materials

Materials Australia and Australian Ceramics Society  
Biennial Conference

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RESEARCH *in the national interest - enabling the future*



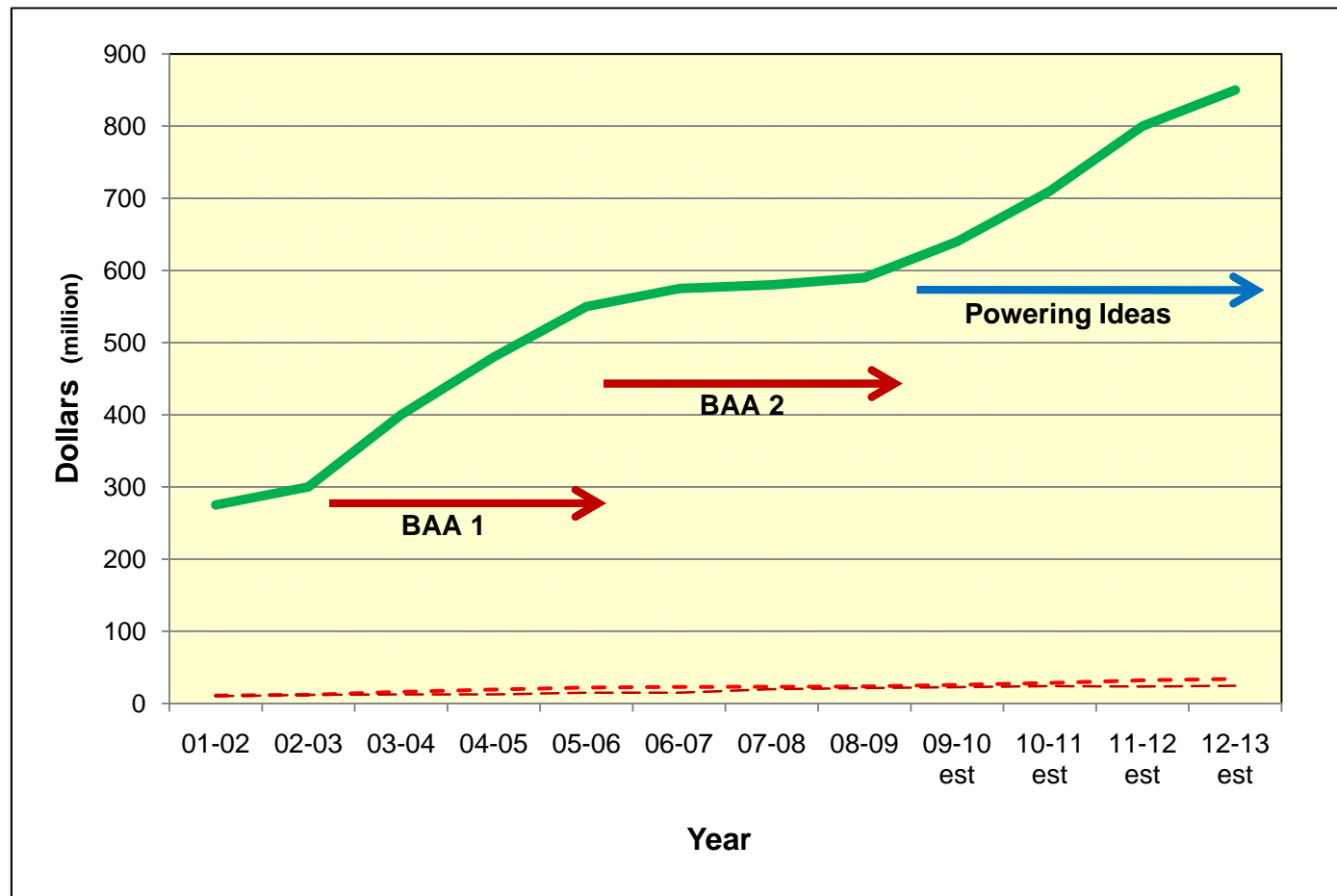
# Australian Research Council Overview

- Federal Government agency supporting all R&D
  - except medical and dental research
  - competitive, peer-reviewed proposals by investigators
  - limited strategic direction in specific fields
- Annual funding to University sector ~\$600m (FY08/09)
  - about 10% of total Federal spend on R&D
  - assess >5,500 proposals per year
  - 35 Centres of Excellence, Special or Co-funded Centres
  - 25 Research Networks
- Mission
  - to advance Australia's research excellence to be globally competitive and to deliver benefits – public good and commercial – to the community





# NCGP Competitive Funding All Schemes

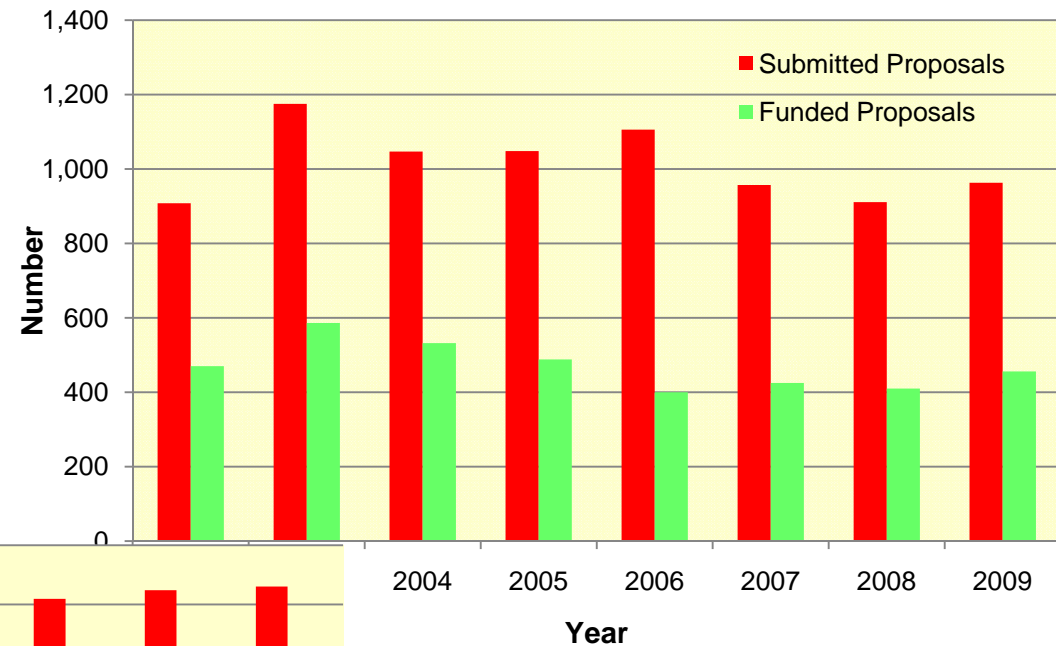




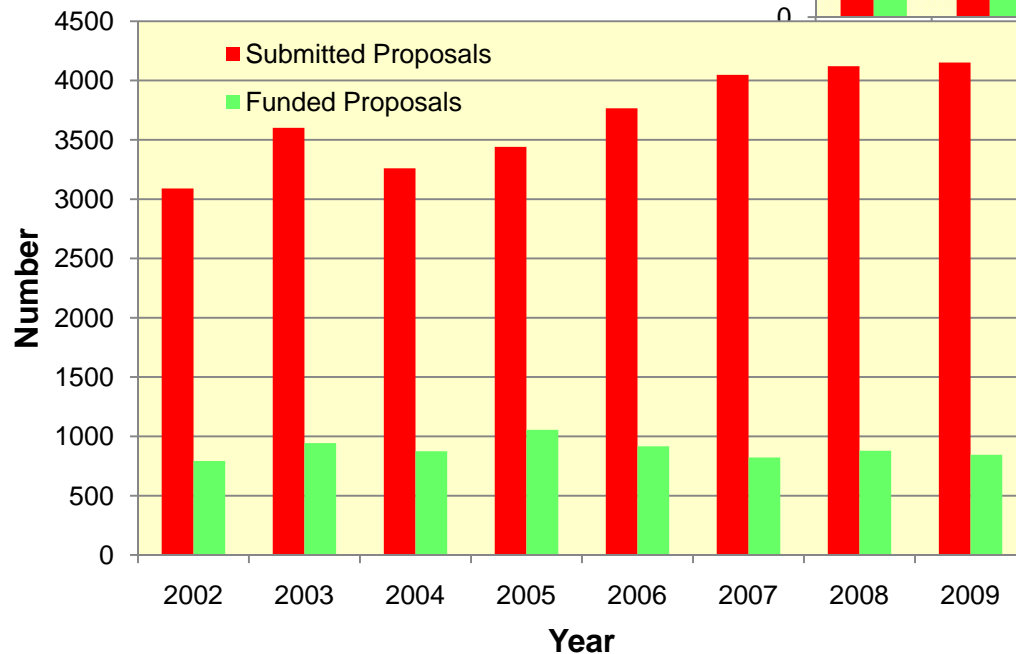
# ARC Project-based Schemes

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Steady increase in numbers and competitiveness



## Discovery Projects



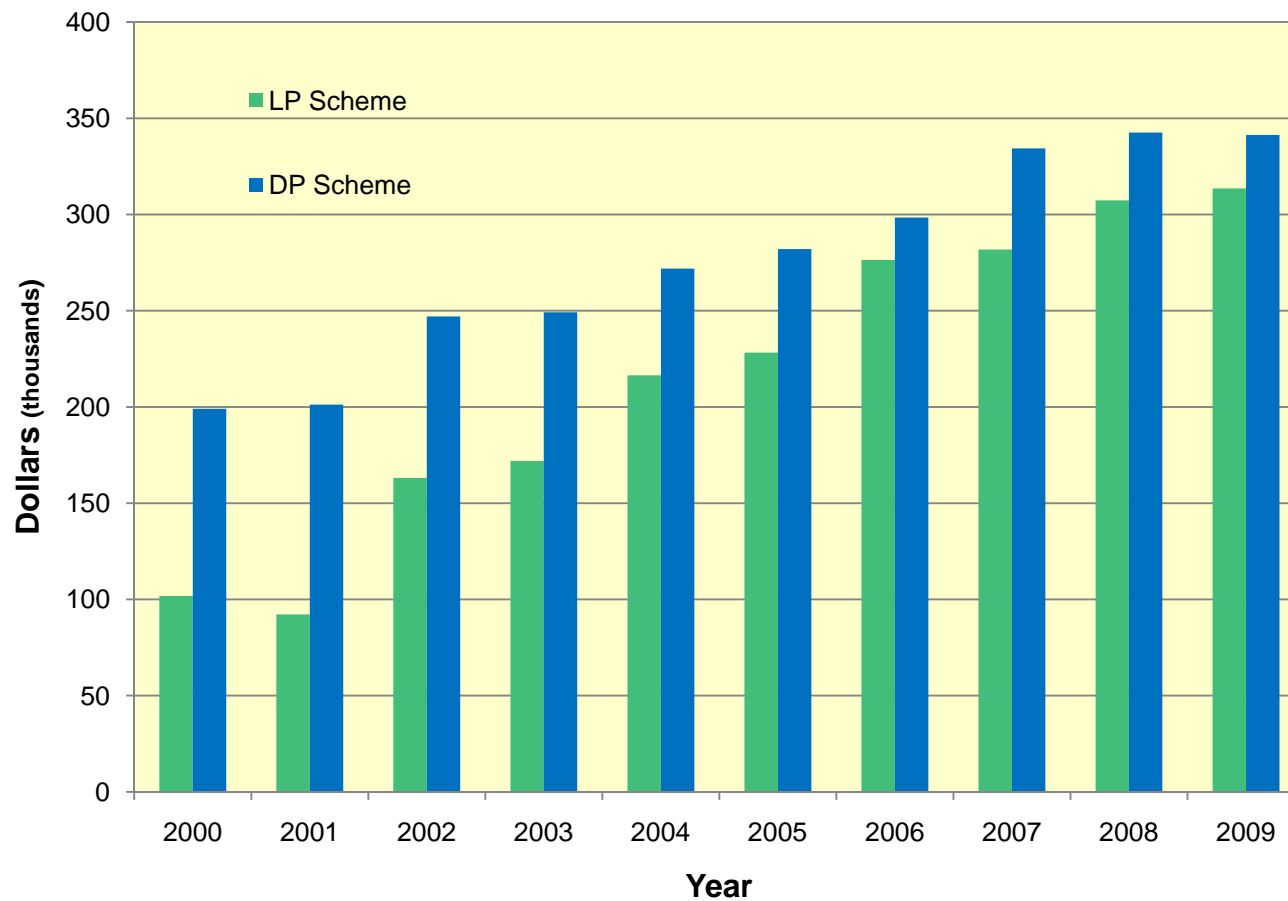
## Linkage Projects





# ARC Project-based Schemes

## Average Grant Size

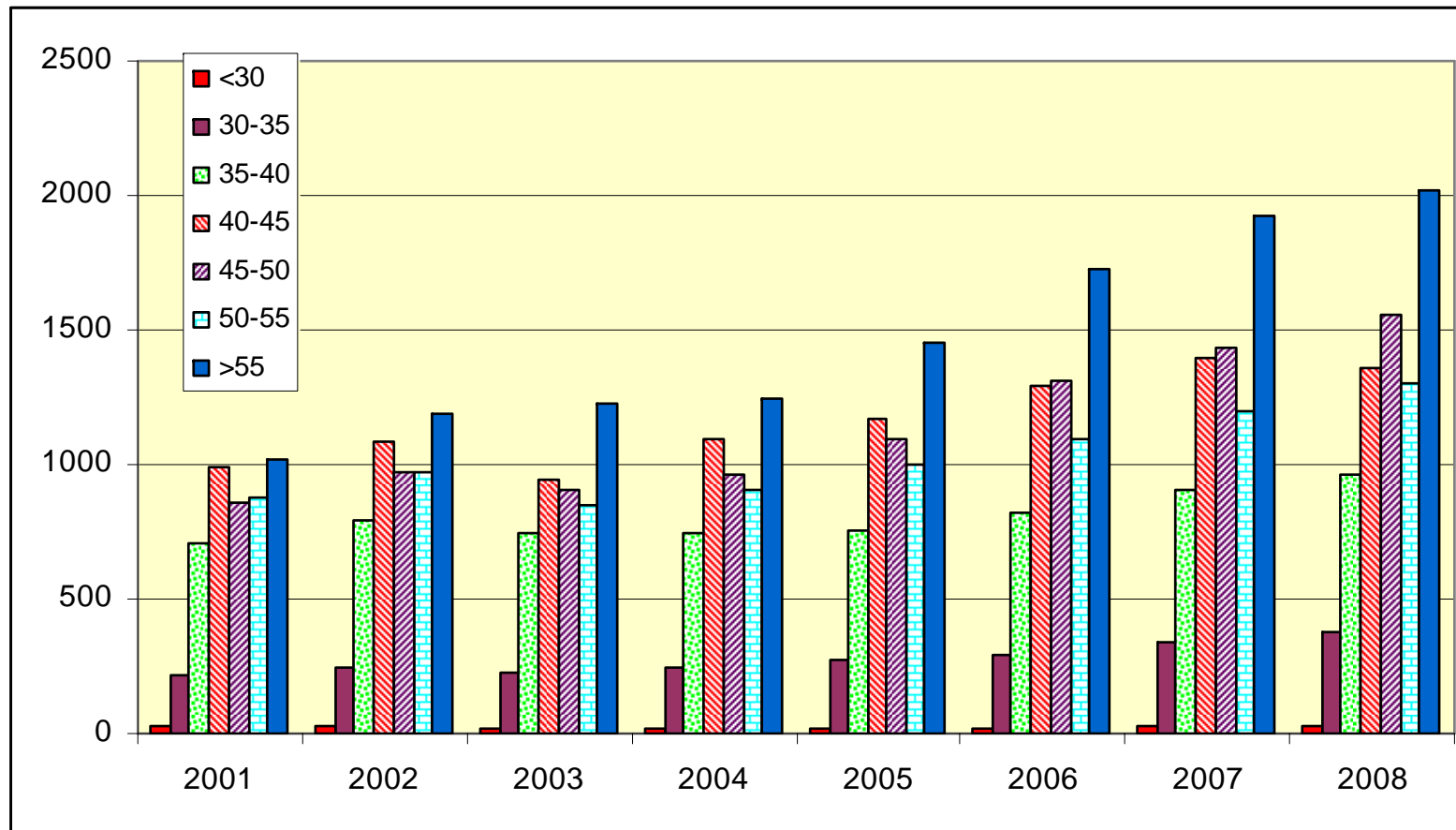




# ARC Discovery Projects Scheme

## Applicant Demographics

### 2001-2008

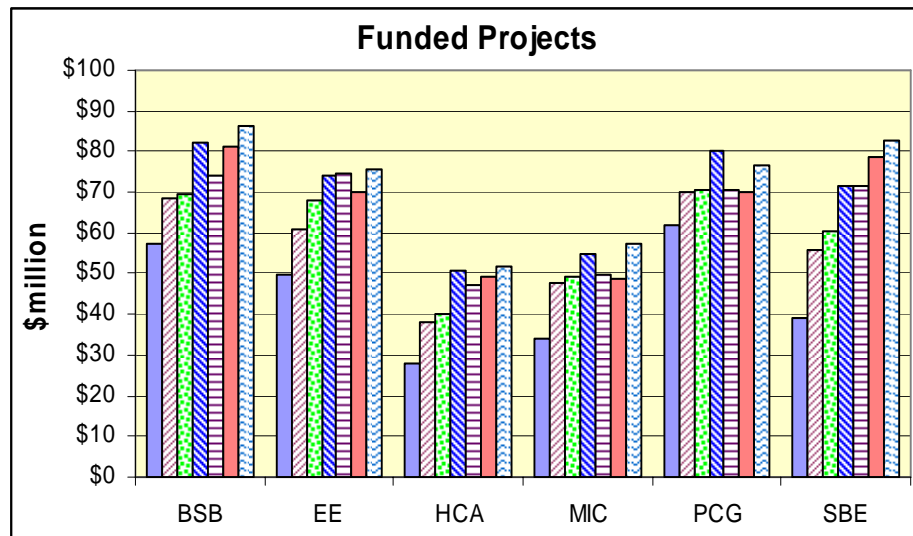
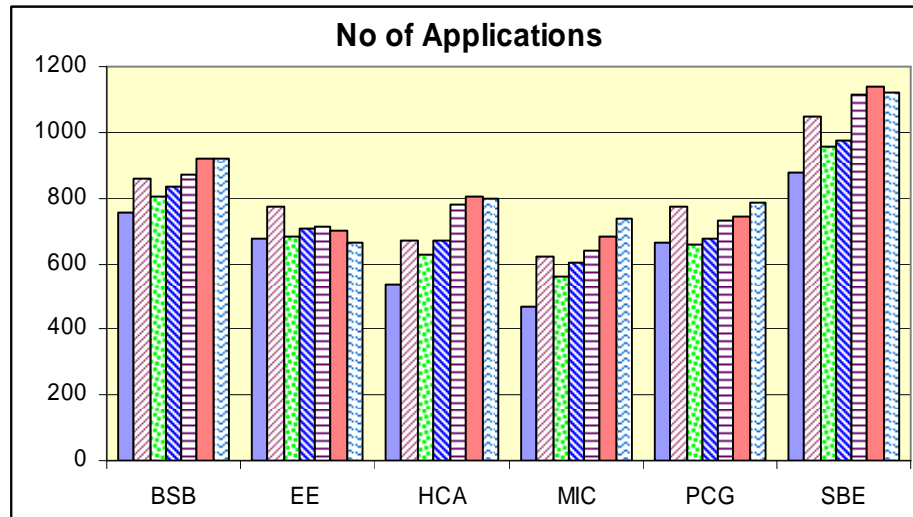




# Research Performance

## ARC DP and LP Schemes

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### ARC Schemes 2001 to 2007

- Proxy for quality and sector
- EE, PCG and MIC – materials related panels

### Relativities

- steady trend for EE numbers
- steady increase for MIC & PCG





# Research Performance

## ARC DP and LP Schemes

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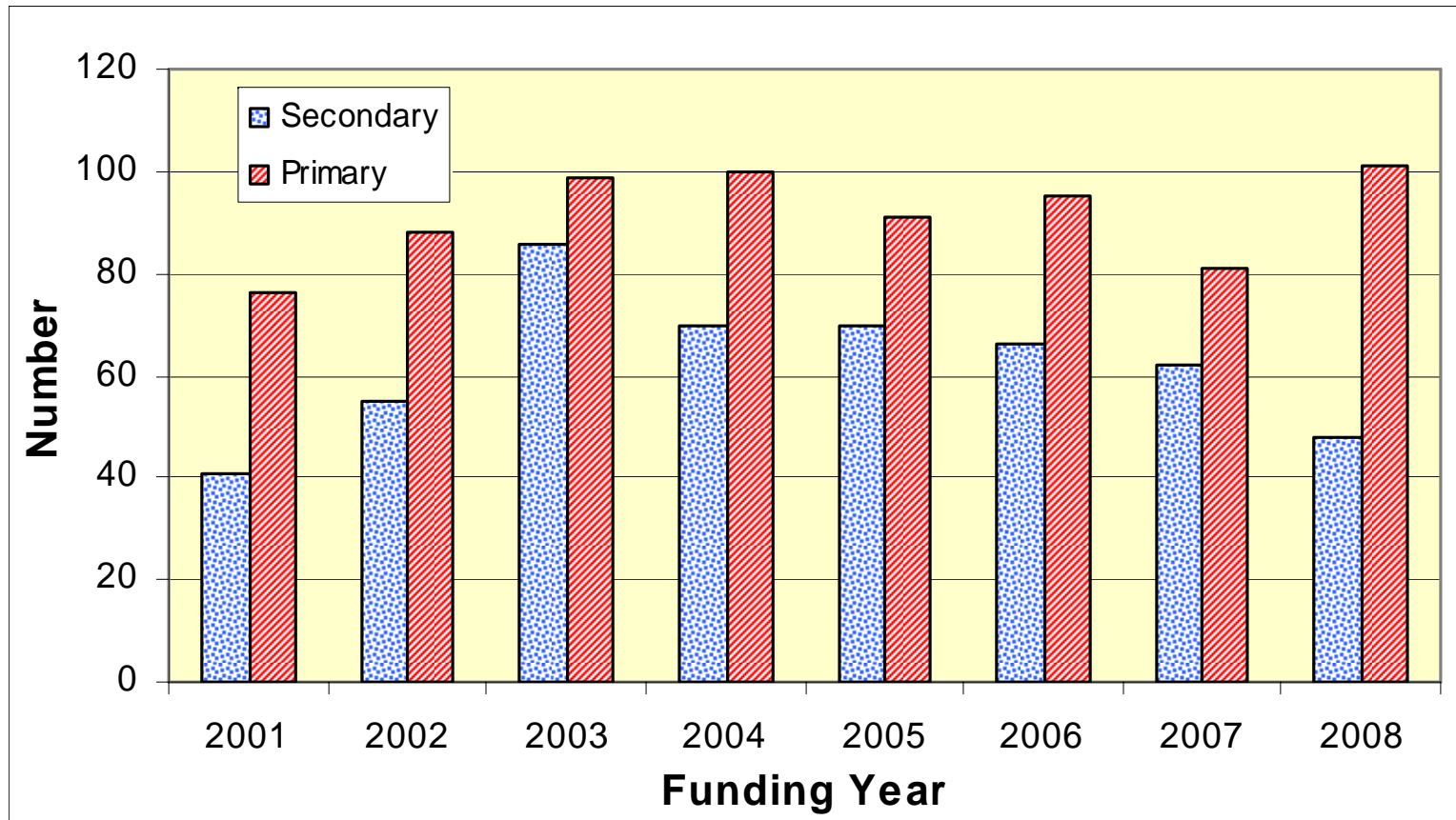
	Funded Dollars			No of Applications		
	\$million 2001	\$million 2007	Change	No 2001	No 2007	Change
<b>BSB</b>	57.6	86.5	50.2%	758	918	21.1%
<b>EE</b>	49.8	75.4	51.2%	676	663	-1.9%
<b>HCA</b>	27.9	51.8	85.7%	537	795	48.0%
<b>MIC</b>	33.9	57.4	69.7%	472	740	56.8%
<b>PCG</b>	61.7	76.6	24.1%	663	788	18.9%
<b>SBE</b>	39.2	83.0	111.6%	879	1119	27.3%
<b>Total</b>	<b>270.1</b>	<b>430.7</b>	<b>59.5%</b>	<b>3985</b>	<b>5023</b>	<b>26.0%</b>

Totals  
 \$2.6 billion  
 36,948 proposals





## ARC Funded Materials Research



Primary = 731

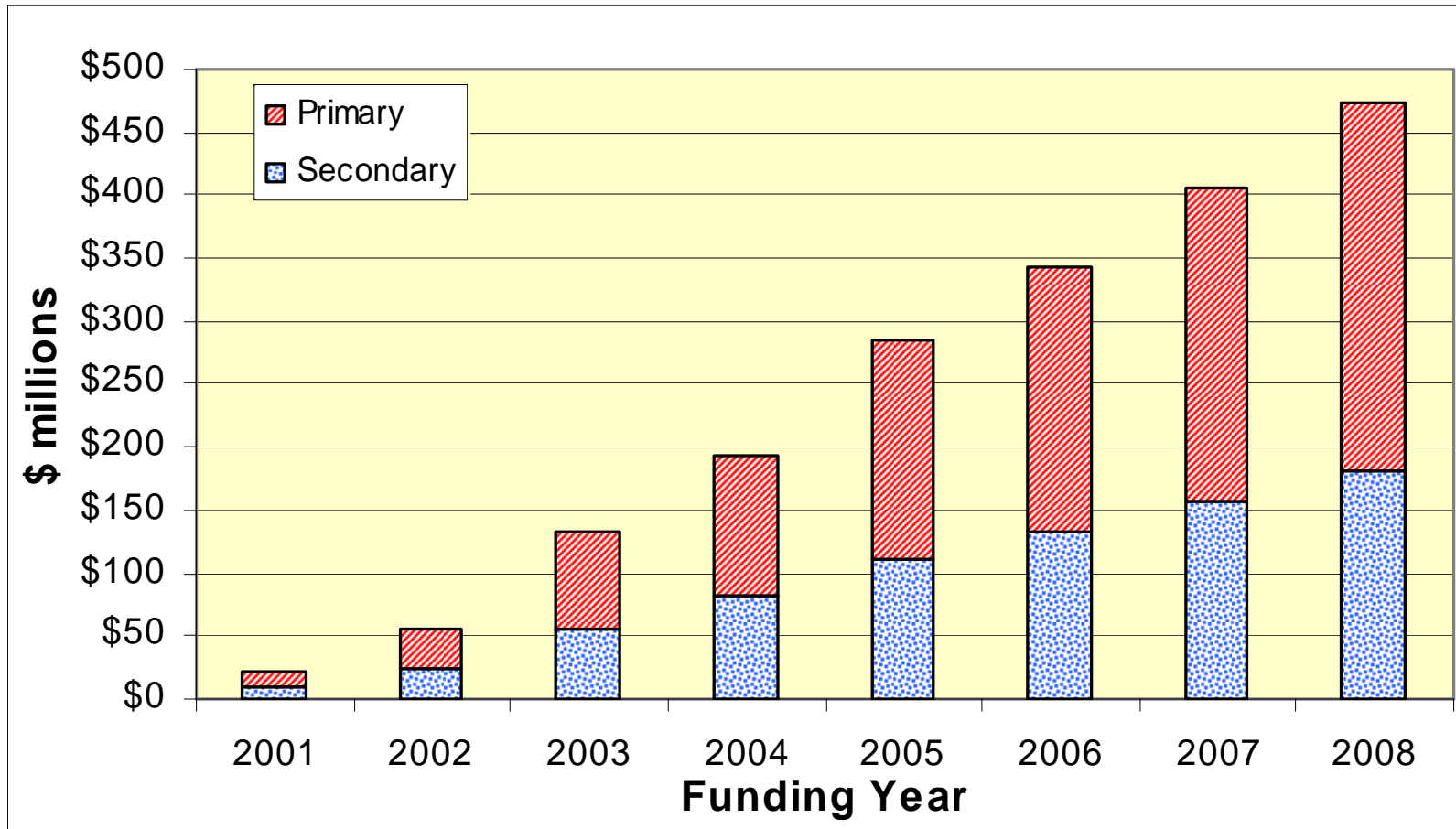
Secondary = 498

(Materials only ~41%)



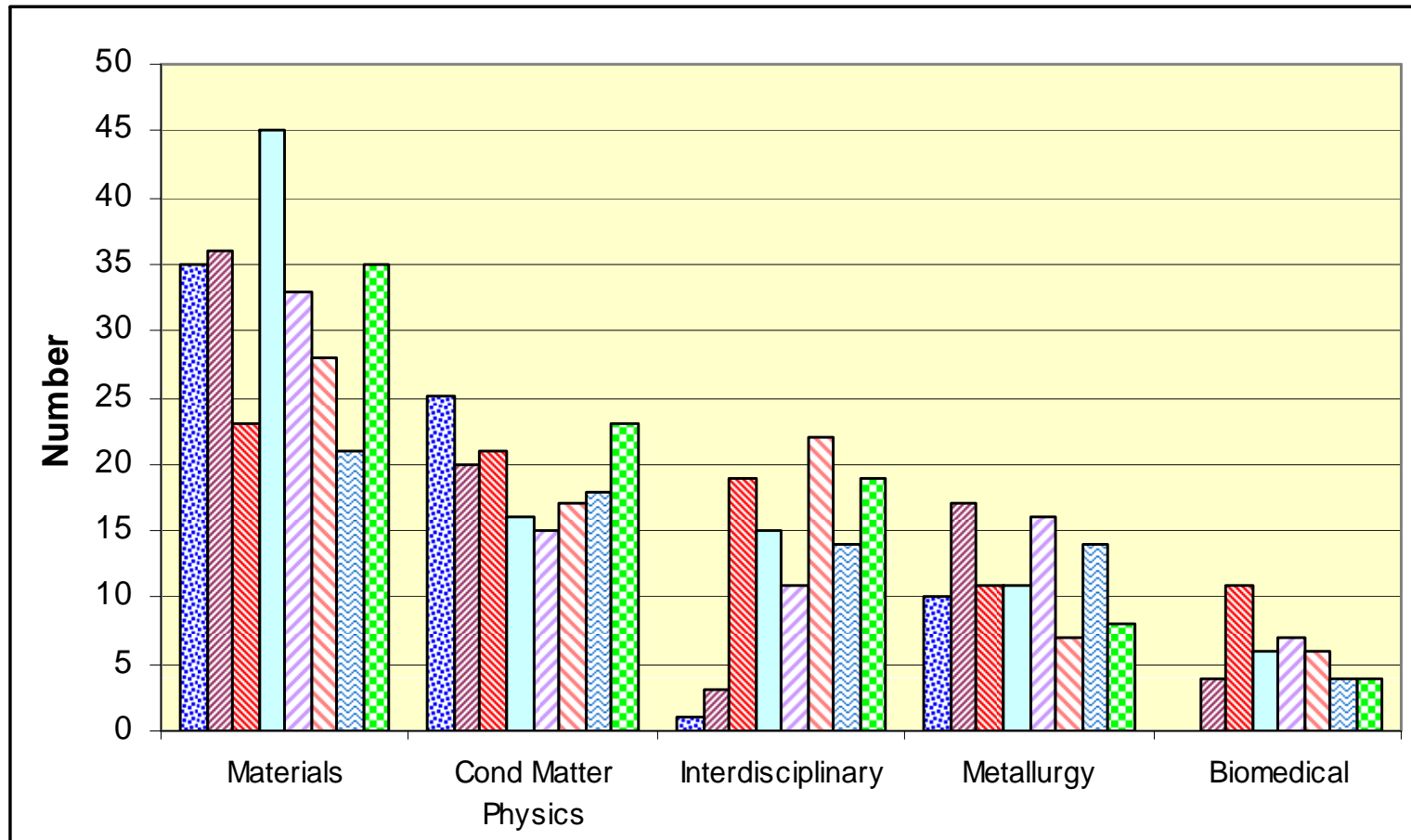


## ARC Funded Materials Research



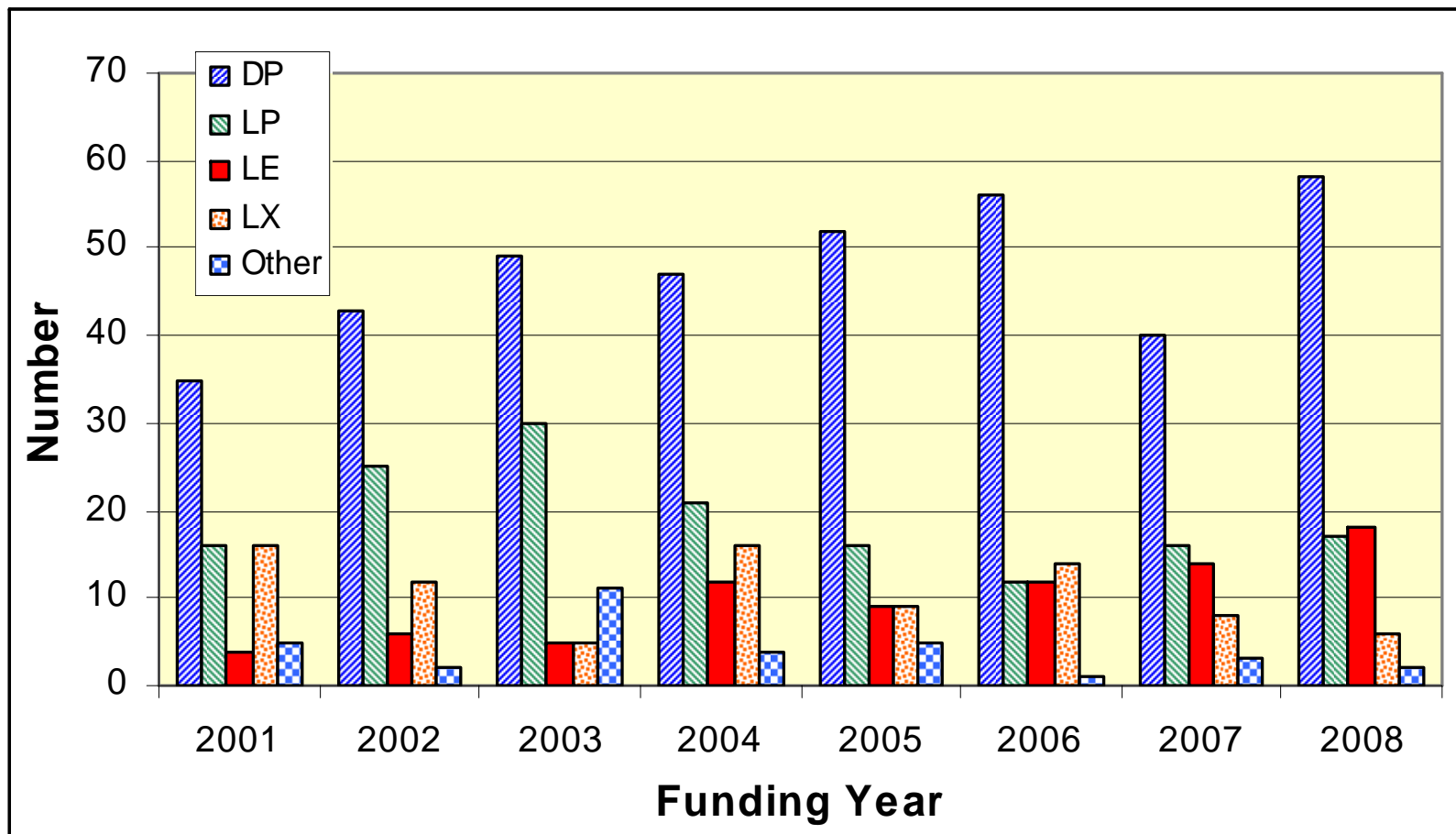


# ARC Funded Materials Research





# ARC Funded Materials Research





# ARC Research Centres

## Materials Oriented

1997

**Subatomic Structure of Matter** (UAdel, Flind, UMelb, UTas, UNSW, ANU)

2000

Green Chemistry (Monash, UNewcastle, UWA)

**Particle and Material Interfaces** (UniSA)

**Particulate Fluids Processing** (UMelb)

2003

**Advanced Silicon Photovoltaics & Photonics** (UNSW)

**Quantum Computer Technology** (UNSW, UQld, UMelb, ANU)

**Solar Energy Systems** (ANU)

**Functional Nanomaterials** (UQld, UNSW, ANU, UWSyd)

Ultra-high Bandwidth Devices (USyd, ANU, UTS, MacquarieU, Swinburne, RMIT)

2005

**Anti-Matter Matter Studies** (ANU, Murdoch, Flind, UAdel, UWA, CDU, JCU, Open)

**Design in Light Metals** (Monash, Deakin, UQld, UNSW, USyd, UMelb)

**Electromaterials Science** (UWollongong, Monash)

Networks: Advanced Materials (ARNAM) and Nanotechnology (ARCNN)





# Early Career Researchers

- **Discovery Projects**
  - limit to number of projects held concurrently (<2)
  - highly competitive but consideration given
- **Future Fellows**
  - developed for early to mid career researchers
  - expanded cohort of applicants
- **Linkage Projects**
  - higher limit on number of concurrent projects (up to 4)
  - additional selection criteria
- **Centres Scheme**
  - potential for support
  - may not be suited to your area

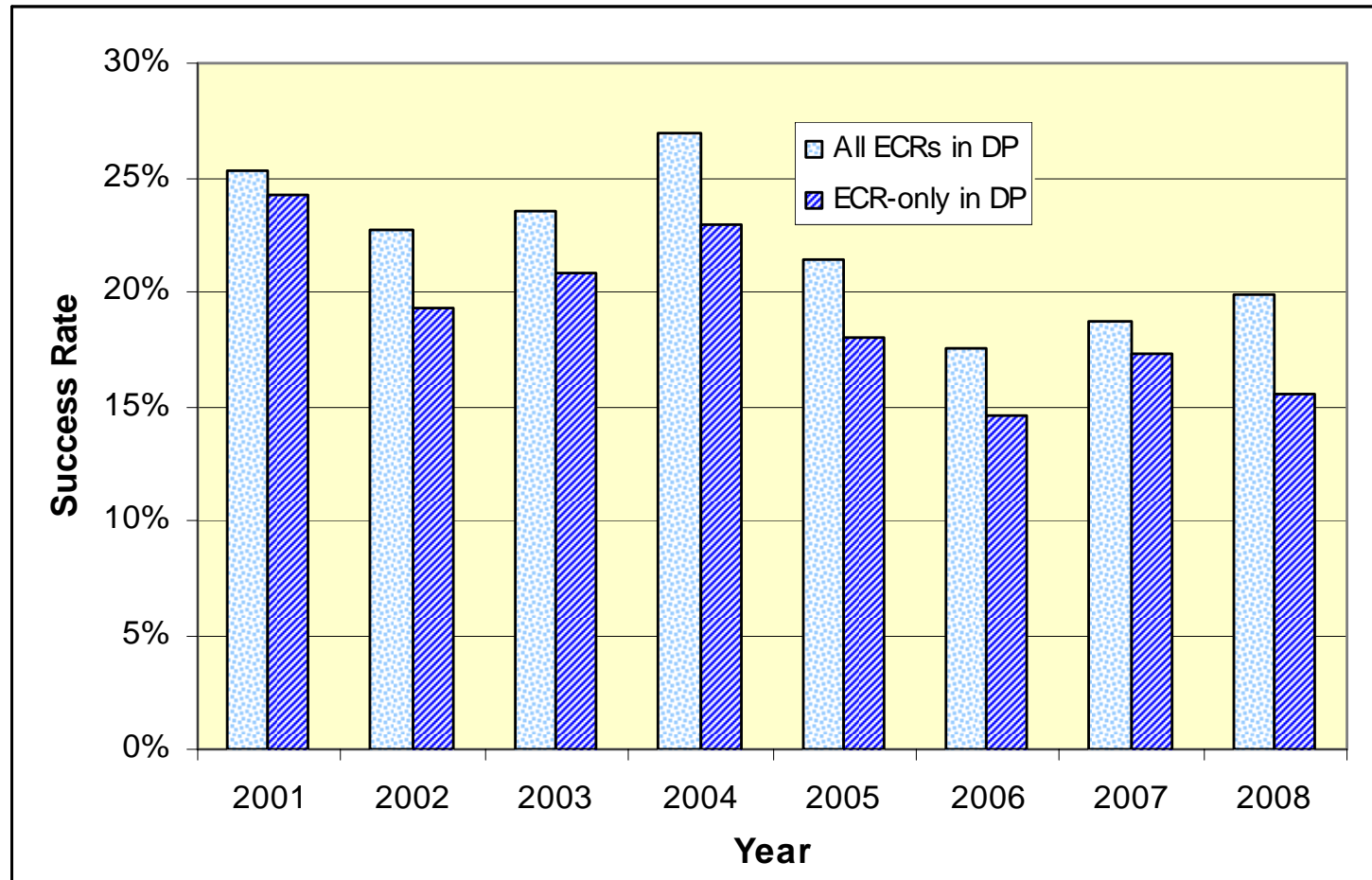




# ARC Discovery Projects Scheme

## Early Career Researchers 2001-08

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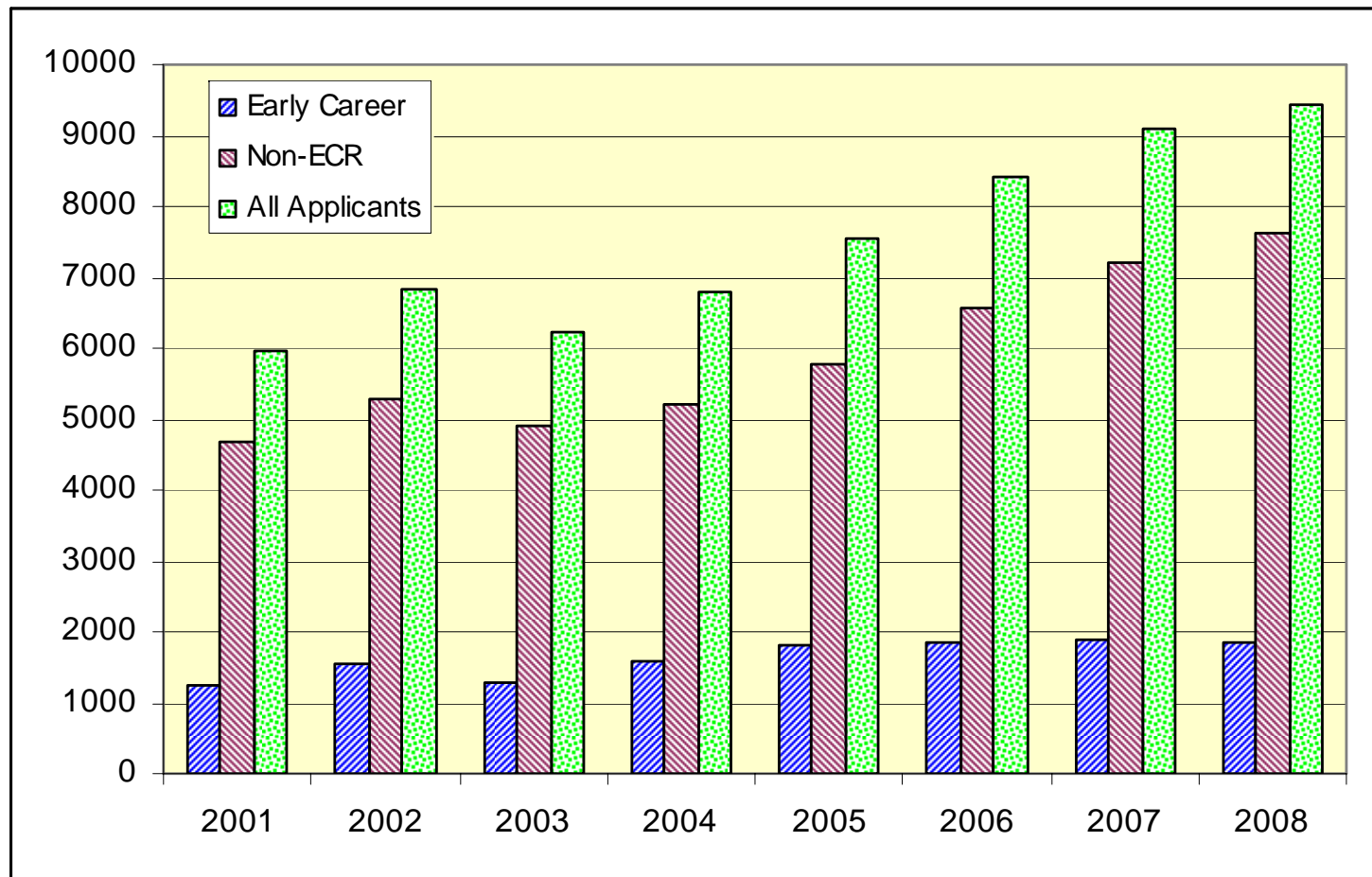




# ARC Discovery Projects Scheme

## Number of Applicants

### 2001-2008

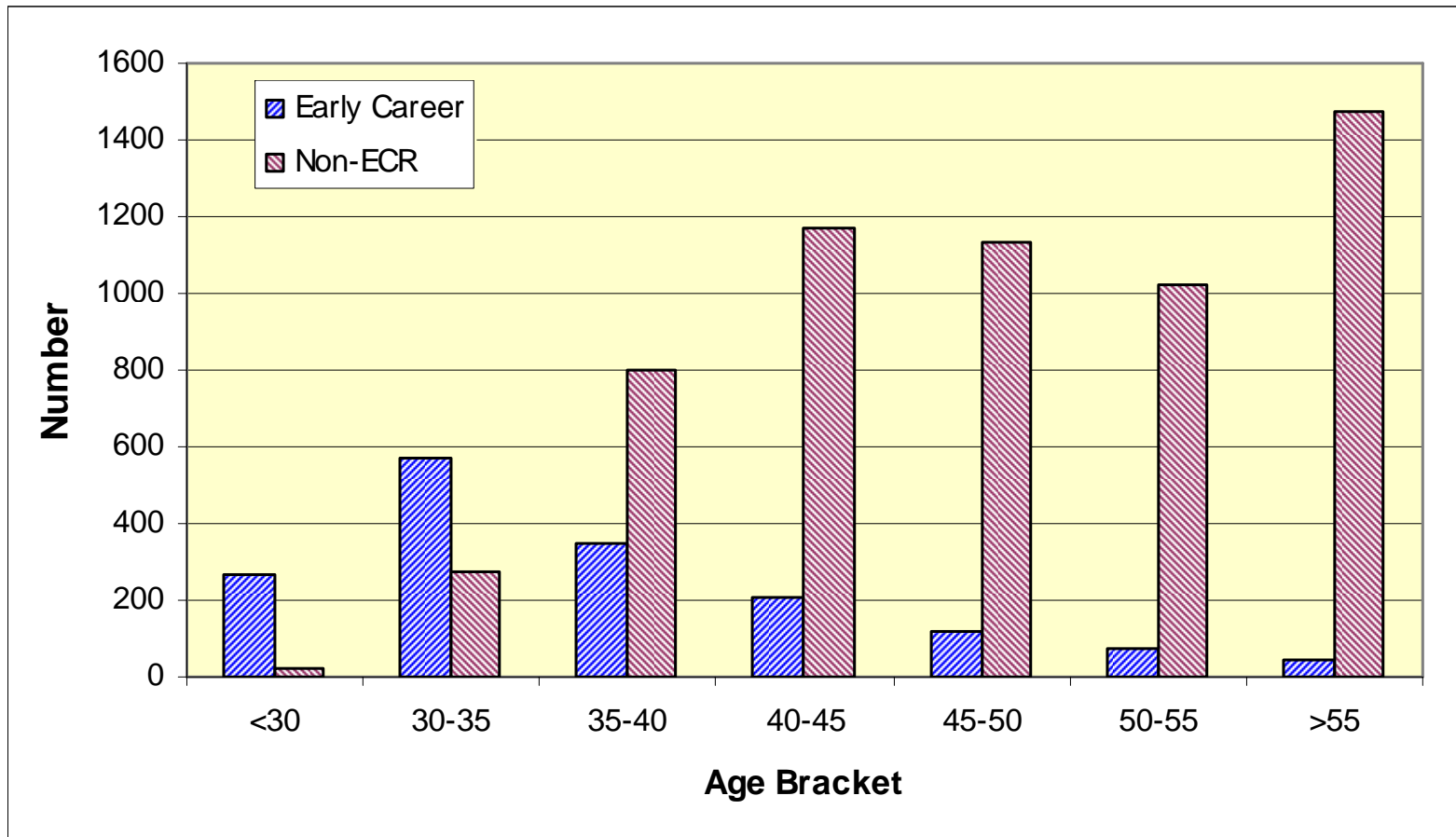




# ARC Discovery Projects Scheme

## Applicant Demographics

### 2001-2008





# Early Career Researchers

- Discovery Projects
  - overall success rates low (~20%)
  - ECR-only success rates decreasing
  - collaborate with experienced researcher(s)
- Future Fellows
  - good opportunity but may be a limited window
    - Only two “bites”
    - What level to pitch ?
  - align with strategic interests of institution
- Linkage Projects
  - success rates high (>40%)
  - collaborate with others; may generate DP projects
  - international opportunities
- Centres Scheme
  - potential for longer term commitment
  - infrequent calls but good scale and focus





# Professional Issues

## Maintaining a Balance

### Communicate across/beyond “boundaries”

- materials implies multi-disciplinary (techniques; applications)
- across professions (accountants; lawyers)
- across cultures (politicians; journalists)

### Develop an understanding

- good/effective personnel management
- decision-making processes (within an organisation/community)
- organisational behaviour
- leadership

### Life-long Learning/Professional development

- professional societies
- corporate and/or government
- tertiary sector – local and overseas





## Key Skills/Attributes Lifetime

- Observation and Analysis
  - Experimental design
  - Reproducible results
- Distillation/Conversion to Principles/Model
- Predict outcomes
  - Communication of results/predictions
  - Draw logical inferences - changed conditions
- Technical/Scientific Writing
  - Thesis + Publications
  - Proposals
- Peer Assessment/Judgement
  - your work/self analysis
  - others in field; similar fields
- Plan and Prosecute to achieve an outcome

**Critical Thinking**  
**(and communicating)**





# Thank You

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