



Australian Government  
Department of Innovation  
Industry, Science and Research

## **BHERT Academic Workforce Roundtable**

**23 November 2009**

***Supply, demand and characteristics of the Higher Degree by Research population in Australia – challenges and opportunities for Australia’s future research workforce***

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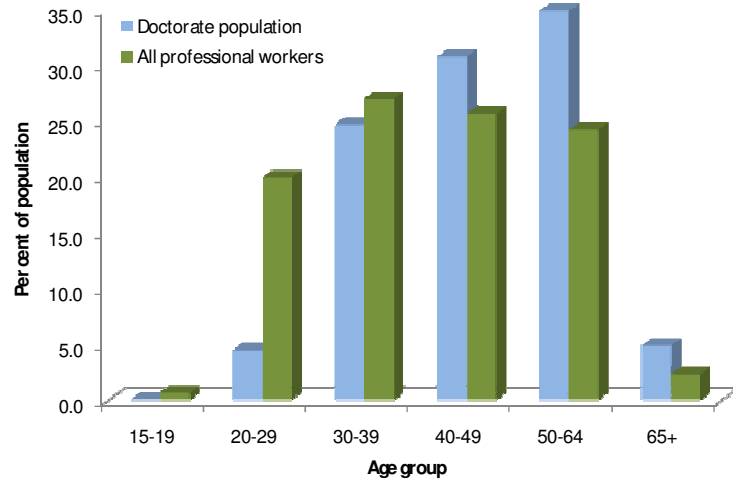
## Overview

- **How are we tracking in meeting our research workforce needs?**
  - Supply, demand and characteristics of Australia's higher degree by research population – ACER report for DIISR
- **What challenges and opportunities will influence supply and demand in the future?**
  - Post-Bradley undergraduate participation targets
  - Implications of an increasingly innovation-driven economy
- **How can we prepare ourselves to meet these challenges and capture these opportunities?**
  - Research Workforce Strategy

## ACER report for DIISR – background

- **A number of 2008 reviews and inquiries identifying research training and research workforce issues:**
  - Review of the National Innovation System
  - Review of Australian Higher Education
  - House of Representatives Inquiry into Research Training and Research Workforce Issues in Australian Universities
- > **May 2009 - *Powering Ideas: An Innovation Agenda for the 21<sup>st</sup> Century***
  - Outlines the Australian Government's intention to develop a Research Workforce Strategy
- **ACER study commissioned by the Department in early 2009 to:**
  - Identify and map the available primary, secondary and international data sources required to predict current and future demand for researcher training;
  - Identify the current levels of supply and demand for higher degree by research (HDR) qualifications, from both the public and private sector, and map the current work placement of people with HDR qualifications;
  - Develop predictions for the future levels of supply and demand for HDR qualifications;
  - Estimate whether future supply (in 2020) will meet demand, and if not, what factors will need to be adjusted to ensure that it will; and
  - Identify gaps in the available data that are critical for informing a long-term research workforce strategy

## ACER report for DIISR - some characteristics of Australia's doctorate population - 1

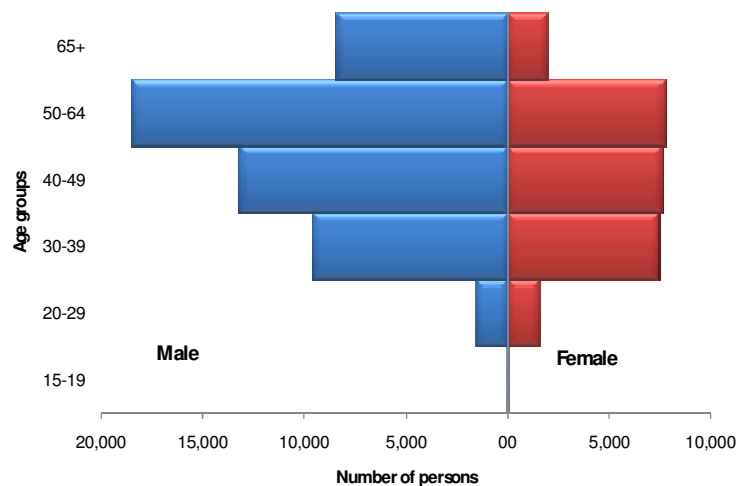


### Key Points (2006 Census data):

- Australia's doctorate population is older than the professional workforce as a whole

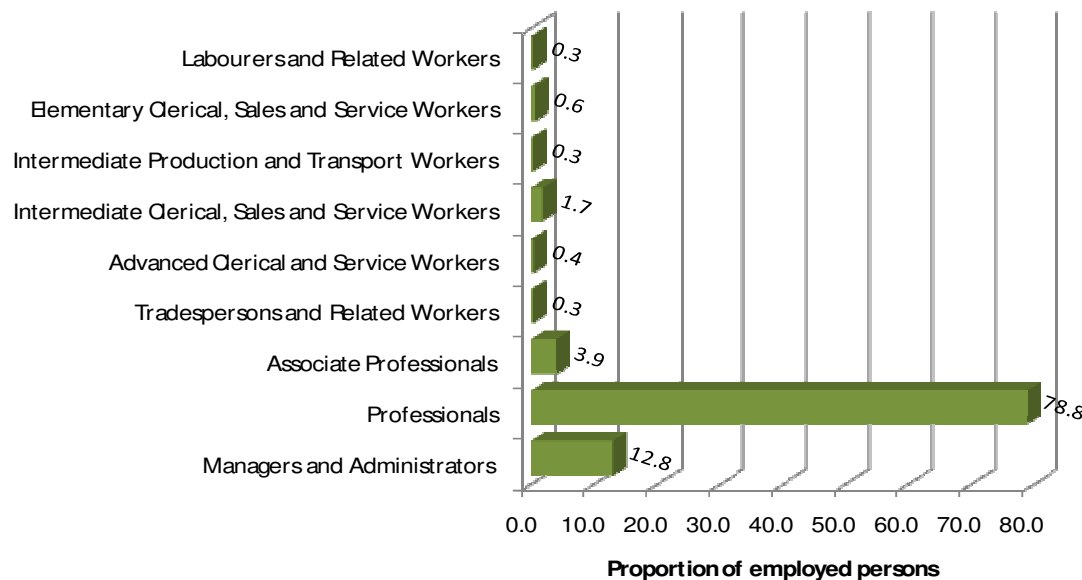
- 66% of doctoral holders are male and 34% female, with more equitable distribution of males/females in the younger age brackets

- 52% of doctoral holders were born in Australia. Of the overseas-born population, the majority came from an English-speaking country



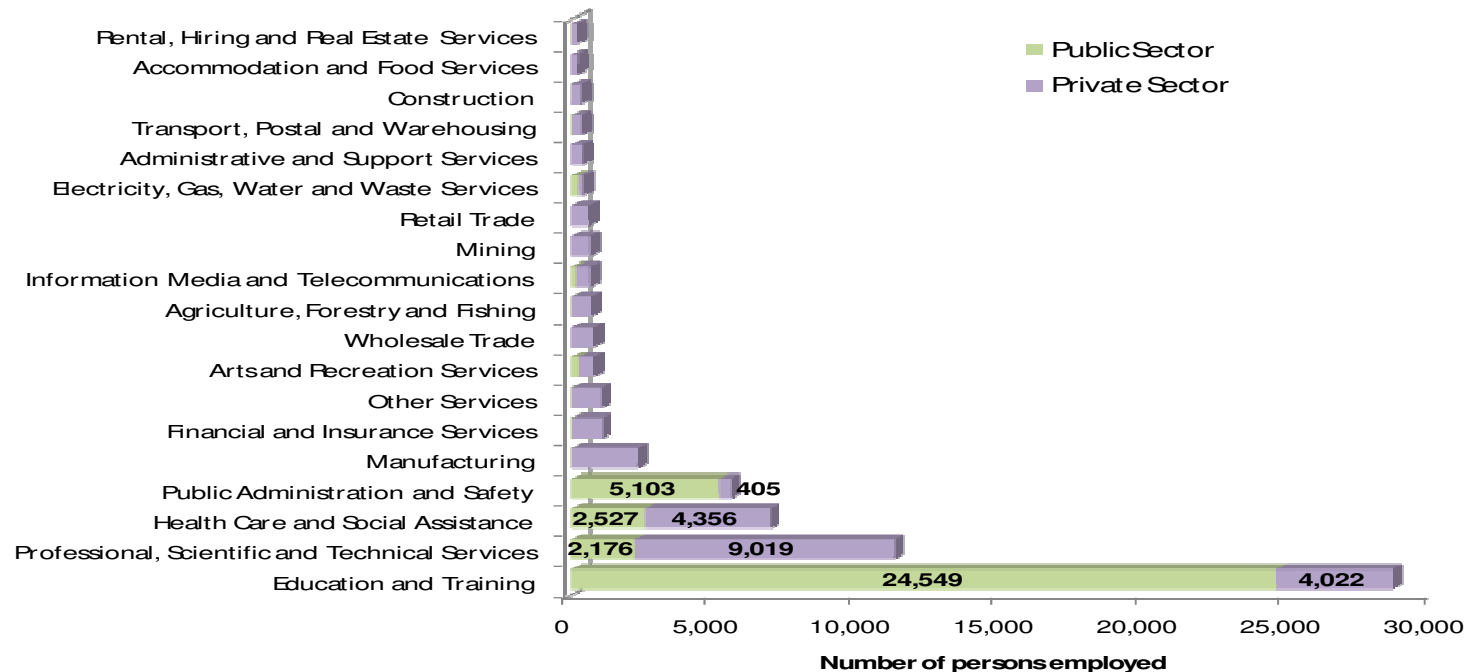
## ACER report for DIISR - some characteristics of Australia's doctorate population - 2

- **Employed Doctorate Population by Broad Occupation Category, 2006 (Per Cent):**
  - Majority (78.8%) of those with doctorate qualification who are employed are working in occupations classified as “professional”
  - Most common occupations “university and vocational education teachers” and “natural and physical sciences professionals”
  - Employment prospects for those with doctorate qualifications are relatively good



## ACER report for DIISR - some characteristics of Australia's doctorate population - 3

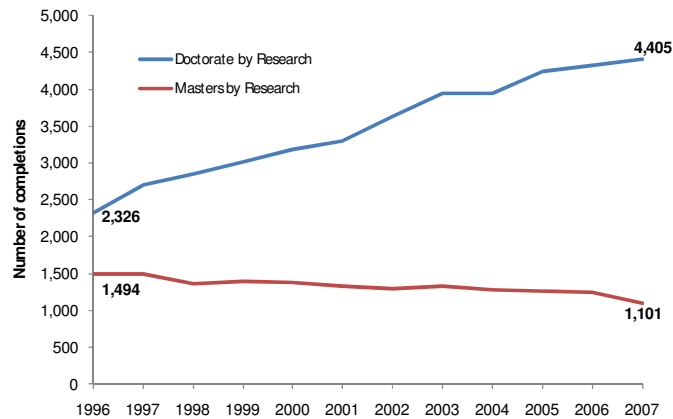
- **Employed Doctorate Population by Industry of Occupation (ANZSIC) and Sector, 2006:**
  - Education and Training industry is the largest industry employing doctorate qualified people, followed by Professional Scientific and Technical Services and Health Care and Social Assistance
  - The majority of doctorates are employed in the public sector



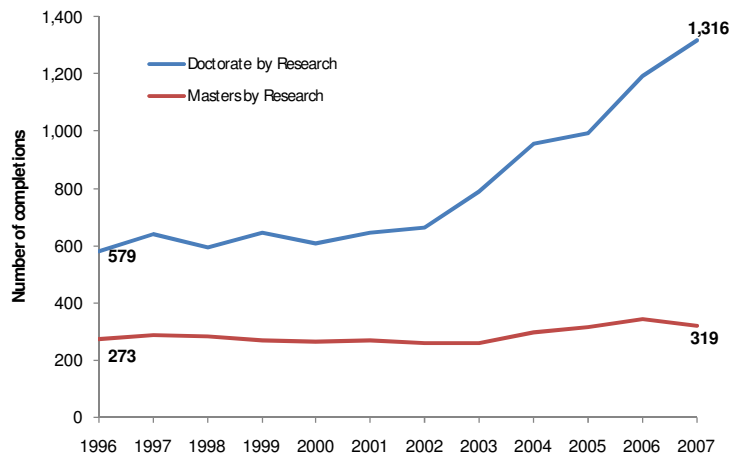
Source: ACER, Supply, Demand and Characteristics of the Higher Degree by Research Population in Australia, June 2009

# ACER report for DIISR - estimating Australia's supply of doctorates

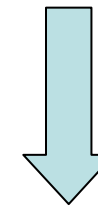
## 1: Supply from domestic doctorate completions



## + 2: Supply from international doctorate completions (completions – proportion departing Australia)



## + 3: Migration supply (average annual estimated arrivals with doctorate)



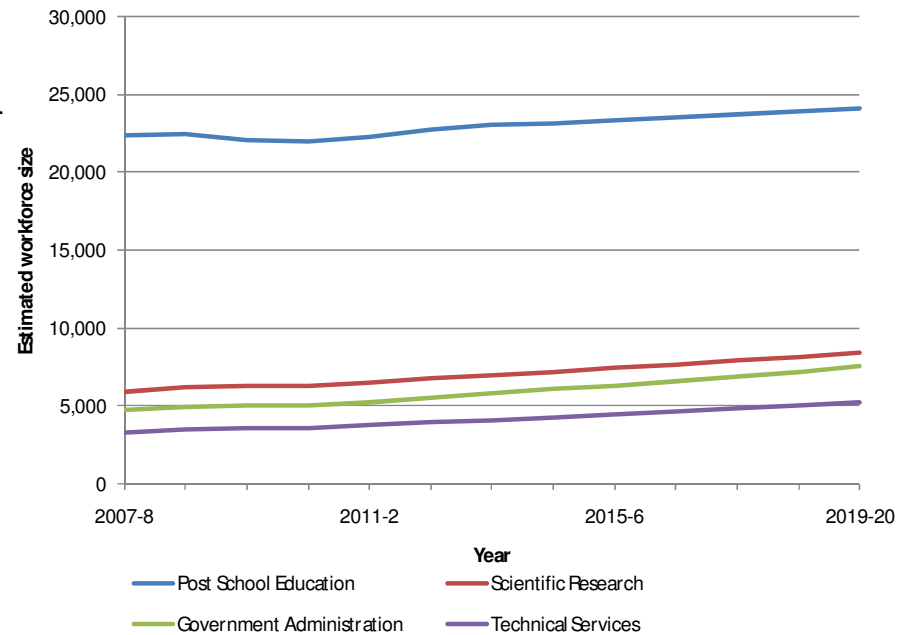
Supply components	Annual estimated supply numbers	Share of supply (%)
Domestic student supply	4,405	78.0
International student supply*	658	11.6
Migrant supply^	587	10.4
<b>Total estimated annual doctorate supply</b>	<b>5,650</b>	<b>100.0</b>

Source for charts: ACER, Supply, Demand, and Characteristics of the Higher Degree by Research Population in Australia, June 2009

## ACER report for DIISR - estimating Australia's future demand for doctorates

### Estimating future *demand*:

- CoPS-MONASH model used to estimate workforce demand for doctorates to 2019-2020
- Incorporates population-based assumptions and a range of imputed macro- and micro-economic details about the Australian and global economy to produce estimates
- Predicts 47.9% increase in doctoral employment between 2007-08 and 2019-2020 compared to 16.6% growth of Australian workforce as a whole
- Largest growth in government administration, scientific research and technical services and in science, environmental science and social science fields of education

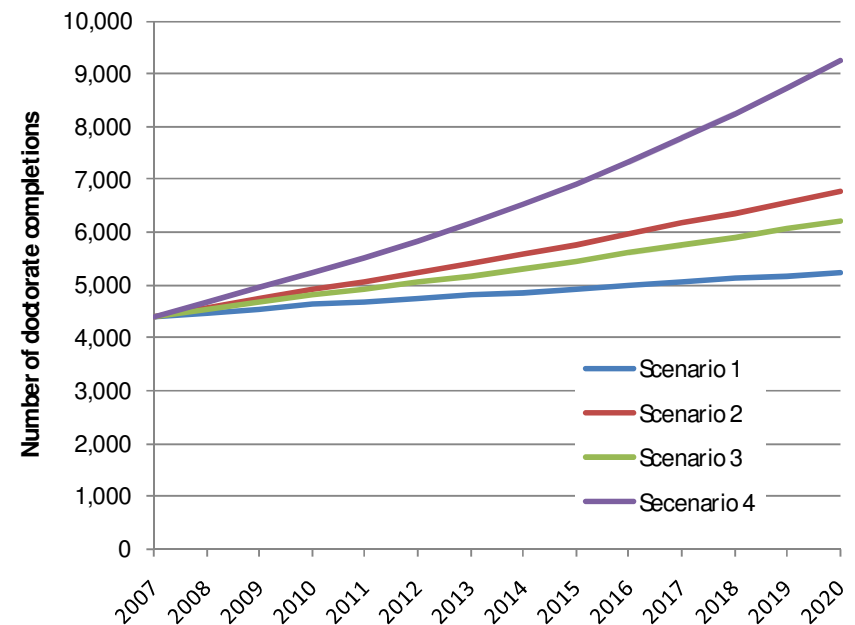


- △ Post School Education 2007-08 to 2019-20 = 7.7%
- △ Scientific Research 2007-08 to 2019-20 = 42.0%
- △ Government Administration 2007-08 to 2019-20 = 58.9%
- △ Technical Services 2007-08 to 2019-20 = 58.5%

## ACER report for DIISR - estimating Australia's future supply of doctorates

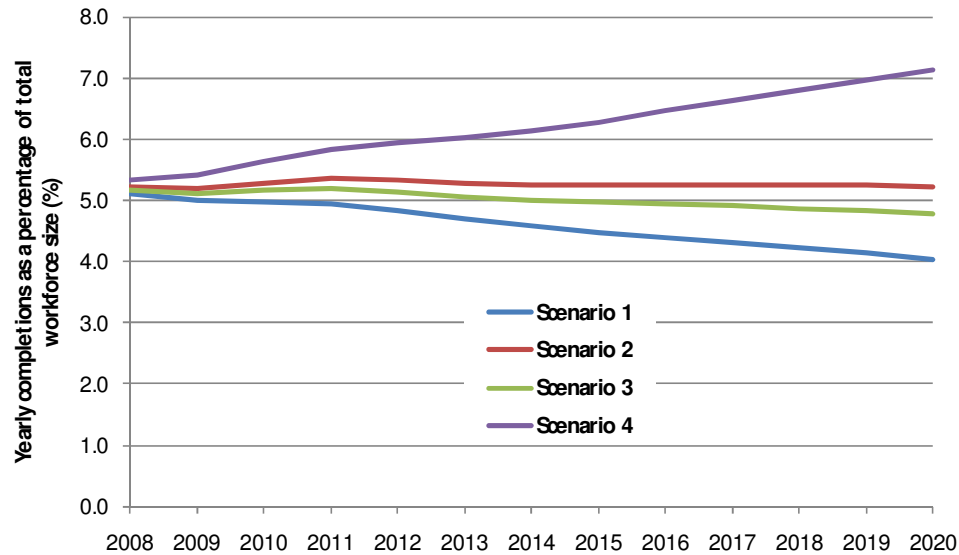
### Estimating future *supply*:

- Projections based on 2007 student completion data, MoDEM 2.0 population projections by age, and assumptions of age-based completion rates
- 4 scenarios explored:
  - Aged-based completion rates remain same
  - Age-based completion rates increase by 2% for each age group
  - Age-based completion rates for 25-29 and 30-39 year age groups increase annually by 2% but other groups remain steady
  - Previous decade growth in completions is sustained (i.e. completions double over next decade)



Scenario 1  $\Delta$  2007-08 to 2019-20 = 18.7%  
 Scenario 2  $\Delta$  2007-08 to 2019-20 = 53.6%  
 Scenario 3  $\Delta$  2007-08 to 2019-20 = 40.8%  
 Scenario 4  $\Delta$  2007-08 to 2019-20 = 110.0%

## ACER report to DIISR - will supply be sufficient to meet demand?



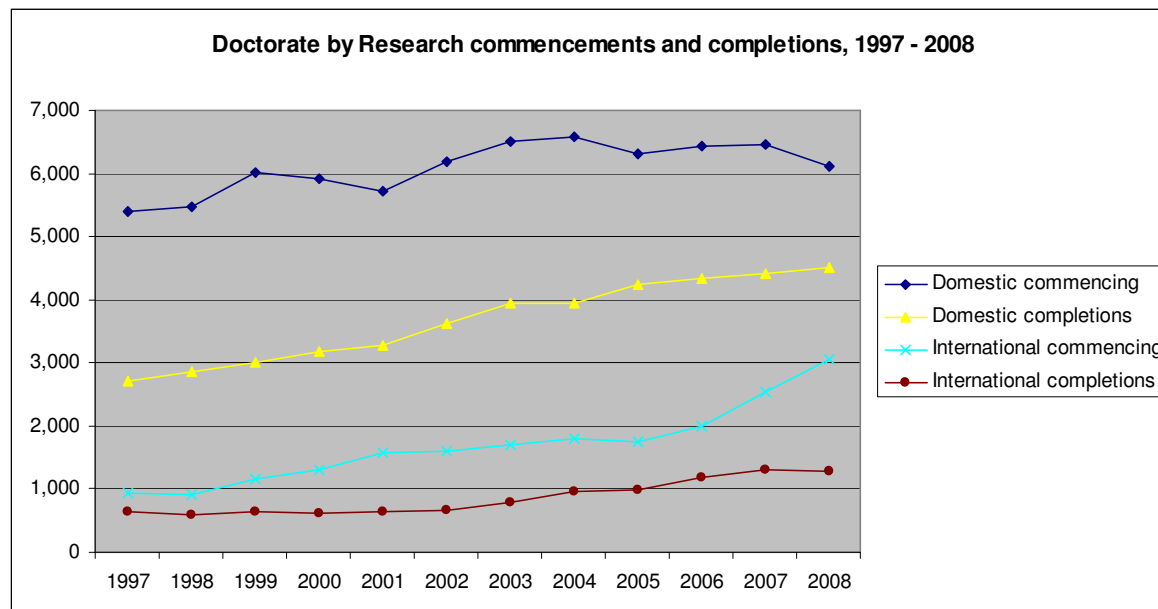
Source for charts: ACER, Supply, Demand, and Characteristics of the Higher Degree by Research Population in Australia, June 2009

### Estimating match between *supply* and *demand*:

- Assume demand met if supply keeps pace with growth in the workforce (i.e. in 2008 estimated domestic doctorate completions was 5.2% of total projected doctoral workforce size – assume demand met if maintained)
- Scenarios 4 would see a potential over supply of doctorates, while scenarios 1 and 3 would see a potential under supply.
- Supply would be met with a modest increase in age-based completions across all age-groups (scenario 2)

## But is this the full story?

- Impact of recent policy and wider economic developments:
  - post Bradley participation targets; and
  - impact of expansion of R&D across economy in response to new drivers such as climate change
- Stalled growth in domestic doctorate commencements since 2003
- Concerns regarding a perceived lack of clear career paths for graduates, attractiveness of academic profession, and the adequacy of the research training system in preparing students for varied career outcomes



Source: DEEWR University Statistics – published and unpublished data

## Where to from here? - Research Workforce Strategy

- **Background:**

- *Powering Ideas* – Government commitment to develop a research workforce strategy to underpin its research reform agenda.

- **Scope:**

- The strategy will examine issues impacting on Australia's capacity to build and maintain a research workforce that meets its future needs

- Examination will include all employers of researchers in Australia – universities, businesses, not-for-profit organisations etc

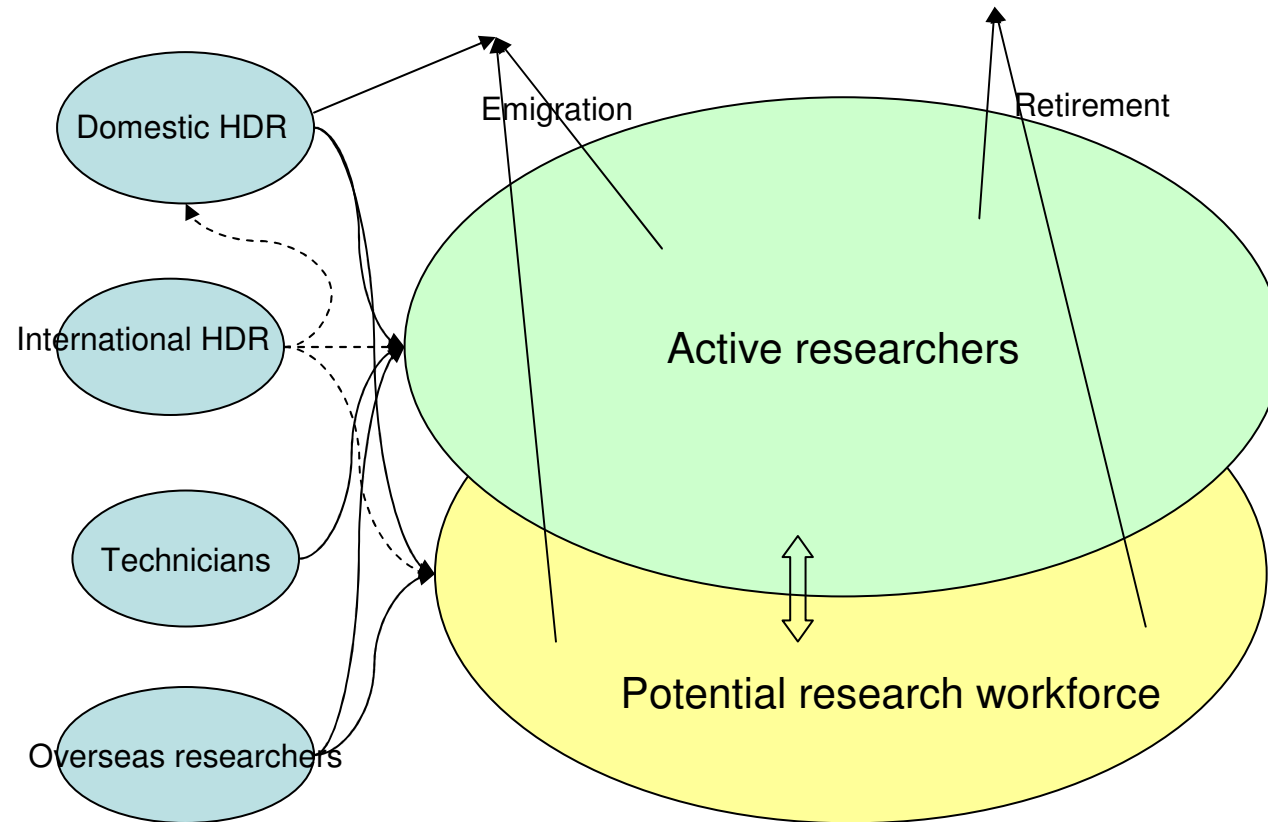
- The strategy will specifically examine key issues raised in the House of Representatives Inquiry into Research Training and Research Workforce Issues

- The strategy will look ahead to 2020

## Research Workforce Strategy – Some key challenges

- **Data issues:**
  - Lack of information in key areas e.g. research career paths
  - Difficulty in capturing relevant groups e.g. masters by research graduates
- **Supply issues:**
  - Attrition evident but story behind it not clear
  - Research training quality and support mechanisms require further examination
- **Demand issues:**
  - Need to better understand demand for research qualified individuals and extent to which supply is matching workforce needs
  - Need to better understand the relationship between Australia's active research workforce and its potential research workforce

## Research Workforce Strategy – Some key challenges



- Need to better understand the relationship between:
  - Australia's *potential* research workforce (higher degree by research qualified individuals); and
  - Australia's *active* research workforce (researchers and technical staff actively engaged in research activities)

## Research Workforce Strategy – Some specific challenges for the academic workforce

- **Supply issues:**
  - Understanding the role of *high quality research training environments* in attracting students to academic careers and building required competencies
- **Demand issues:**
  - Understanding the combined impact of *new undergraduate participation targets* and the *ageing profile of the academic workforce* on both supply and demand (both gross and at disciplinary level)
- **Career pathway issues:**
  - Understanding how to best support progression through the various stages of an academic career
    - Accommodating family and other responsibilities
    - Providing appropriate professional development opportunities
  - Maintaining the intellectual and physical environments conducive to high quality research and retention of research staff

## Research Workforce Strategy - Progress

- **Progress:**

- Establishment of Reference Group to support the strategy's development
- Establishment of Subgroups: *Employer Demand, Research Training Experience, Research Career Paths*

- **Next steps:**

- In-house and commissioned analysis (two studies recently released for open tender)
- Consultation with stakeholders

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**Web:**

<http://www.innovation.gov.au/Section/Research/Pages/ResearchWorkforceIssues.aspx>