Chief Scientist

SCIENCE, RESEARCH AND POLICY

(ANOTHER *CHANCE TO CHANGE**)

…the story continues

* Chief Scientist Robin Batterham, 2000

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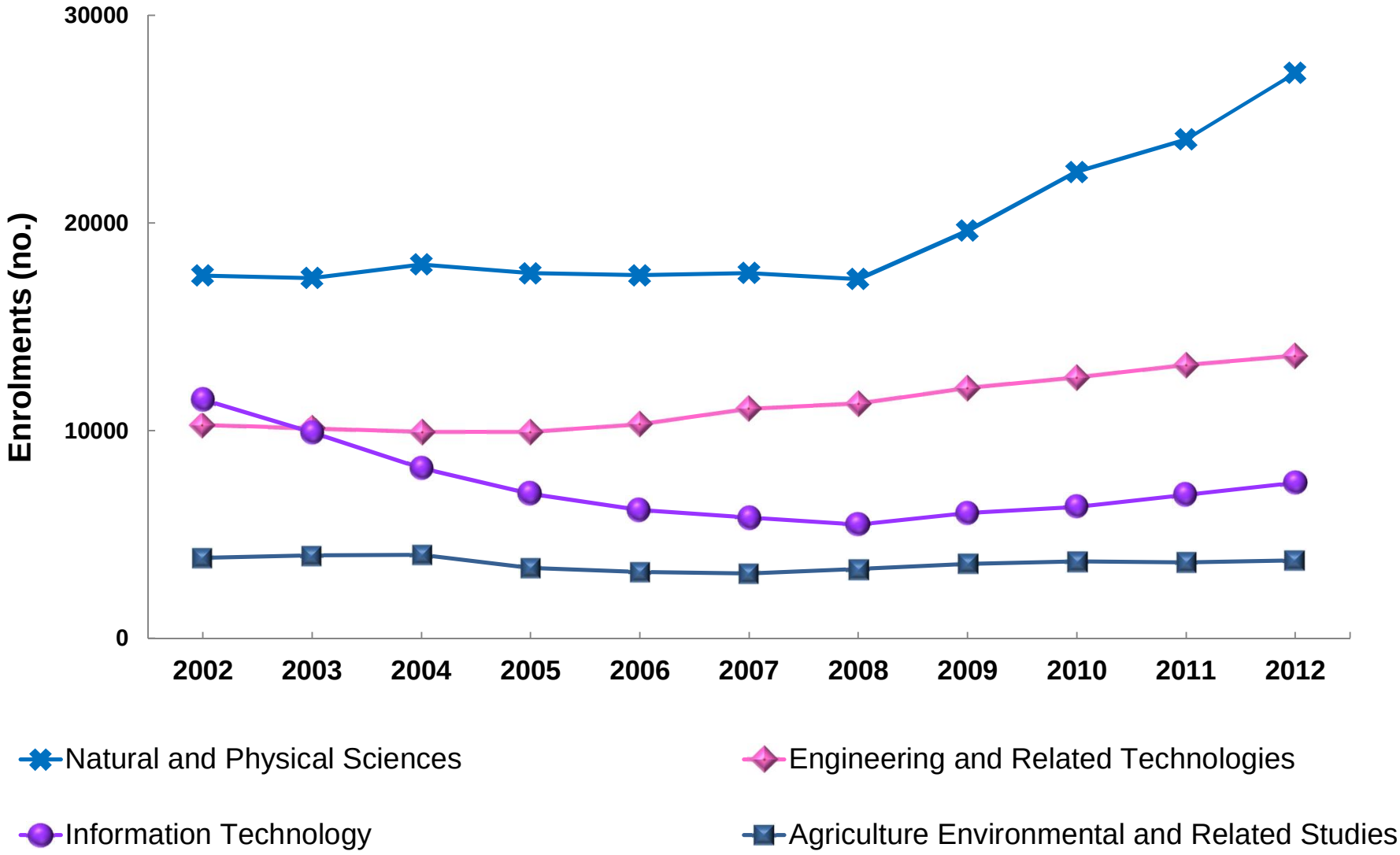
COMMENCING BACHELOR ENROLMENTS



SOURCE: Department of Education

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OFFERS TO YEAR 12 APPLICANTS: 2013

	ATAR Band						
	0–50	**50.05–60**	**60.05–70**	**70.05–80**	**80.05–90**	**≥ 90.05**	**Total**
Natural & Physical Sciences	297	763	1676	2958	4208	6996	**16,898**
Information Technology	237	617	810	882	553	398	**3,497**
Engineering	151	371	911	1,839	3,012	4,297	**10,581**
Agriculture & Environment	84	185	421	574	808	473	**2,545**
Education	636	1,370	2,248	2,271	1,342	445	**8,312**
Total Offers	**5,074**	**11,511**	**18,981**	**25,608**	**29,258**	**34,109**	**124,541**

SOURCE: Department of Education

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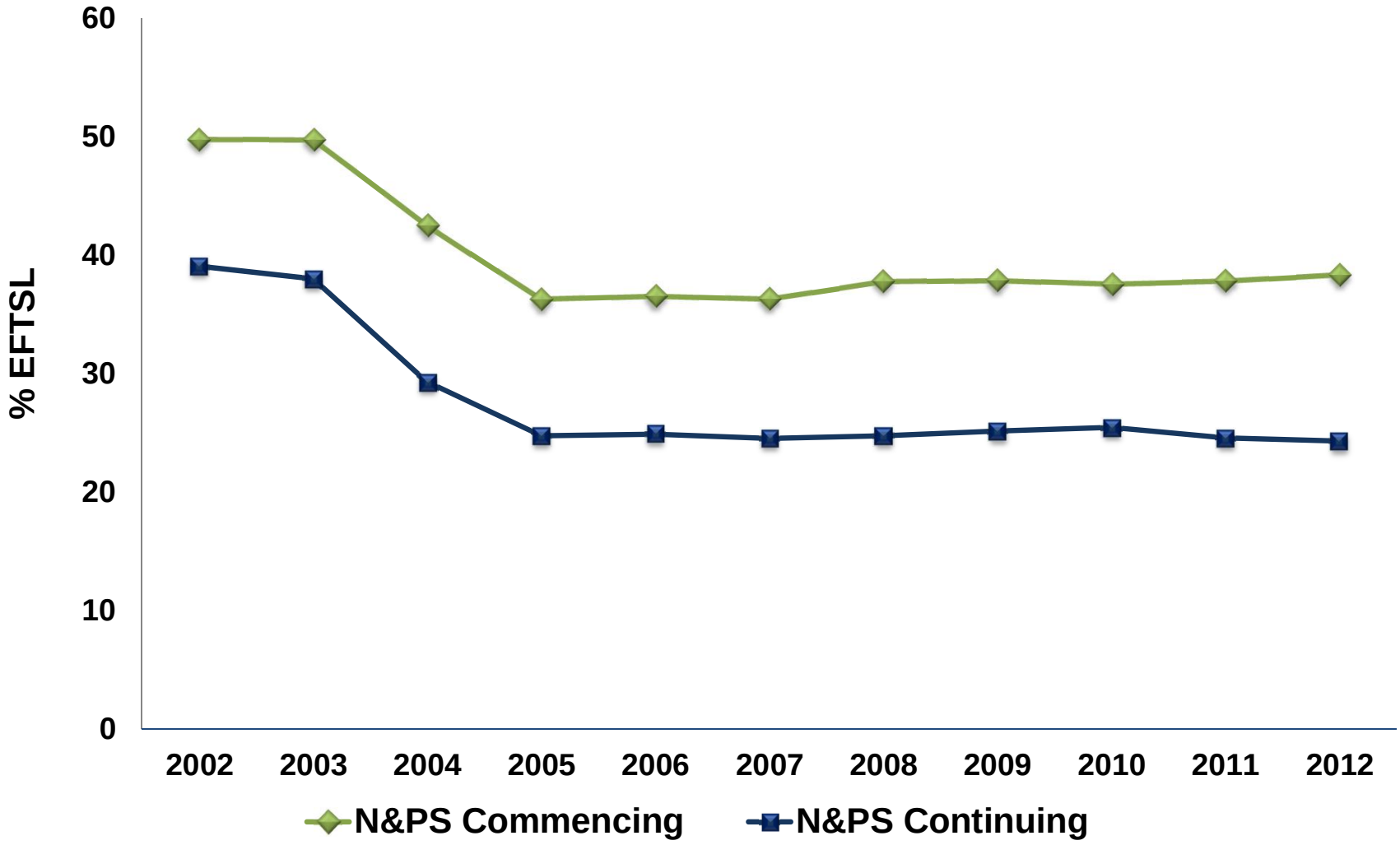
NATURAL & PHYSICAL SCIENCES
- UNCLASSIFIED -



SOURCE: Department of Education

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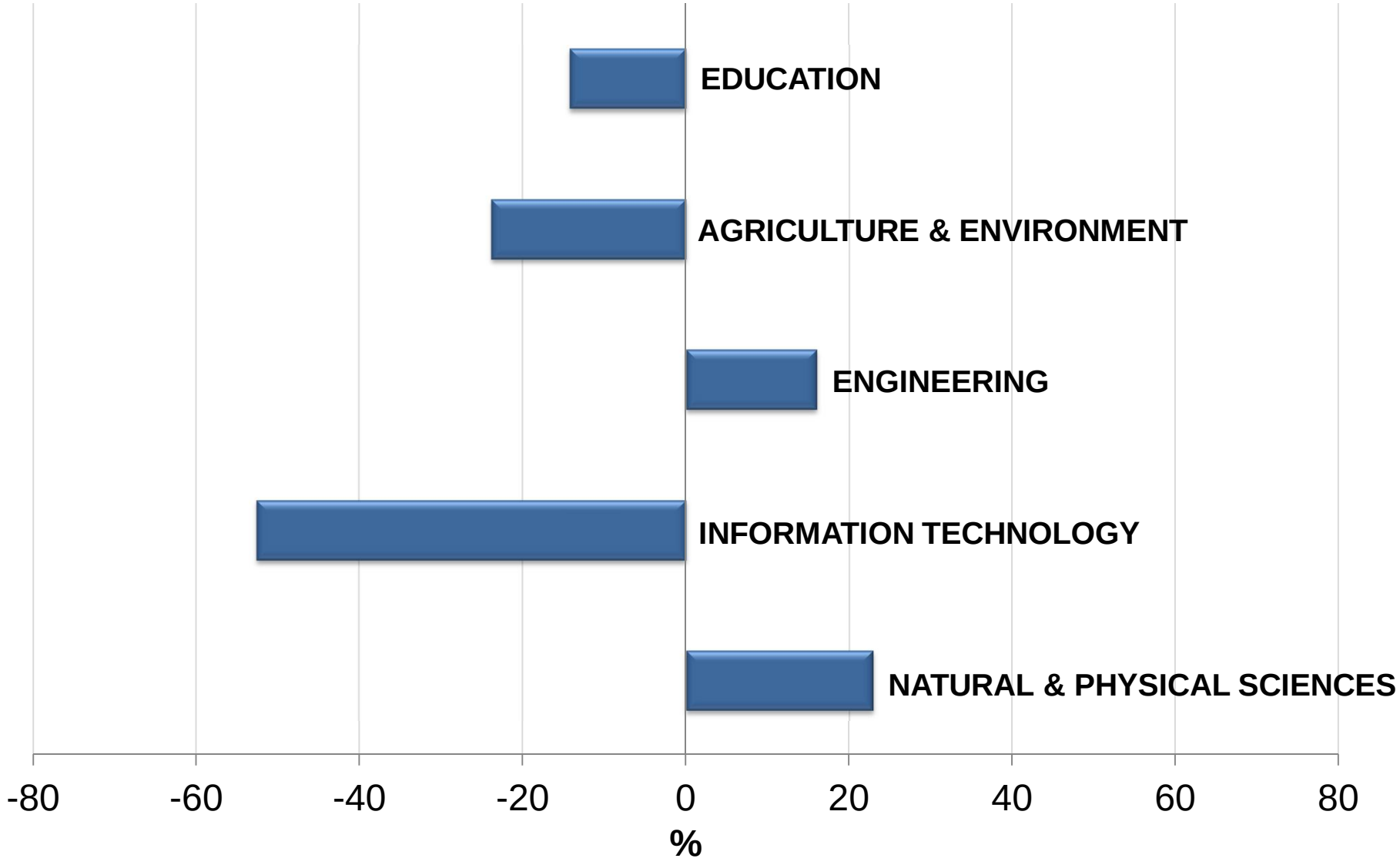
CHANGES in GRADUATIONS: Between 2003 and 2012



SOURCE: Department of Education

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WORKFORCE PARTICIPATION
ABS CENSUS DATA 2006 to 2011

- ***…Number of people in jobs commonly held by workers with STEM qualifications grew by 14% …compared with 9% growth for other jobs…*****(now amounts to)…**
- ***…18% of the workforce or ~2.1 million have a STEM qualification in 2010-11…***
- ***…75% with university-level qualifications work as professionals or managers.***
- ***Highest Growth***
  - ***ICT: +19%***
  - ***Engineering & Science (predominantly): +23%***

SOURCE: ABS. ***Qualifications paying off in science, technology, engineering and maths, 24 February 2014***

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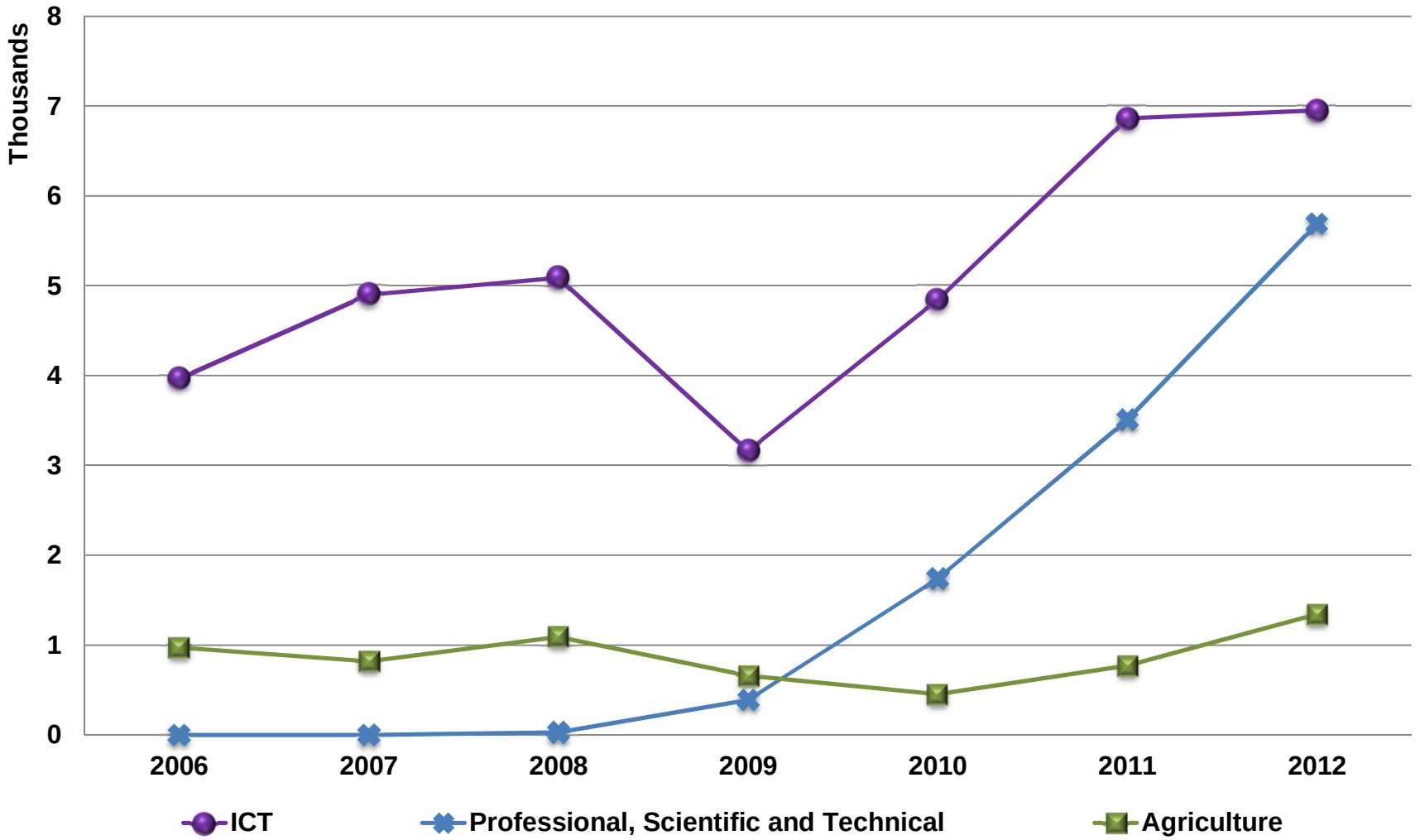
WORKFORCE PARTICIPATION : 2006 to 2012
IMMIGRATION DATA – 457 VISA



SOURCE: Department of Immigration and Citizenship, Subclass 457 Visa Statistics

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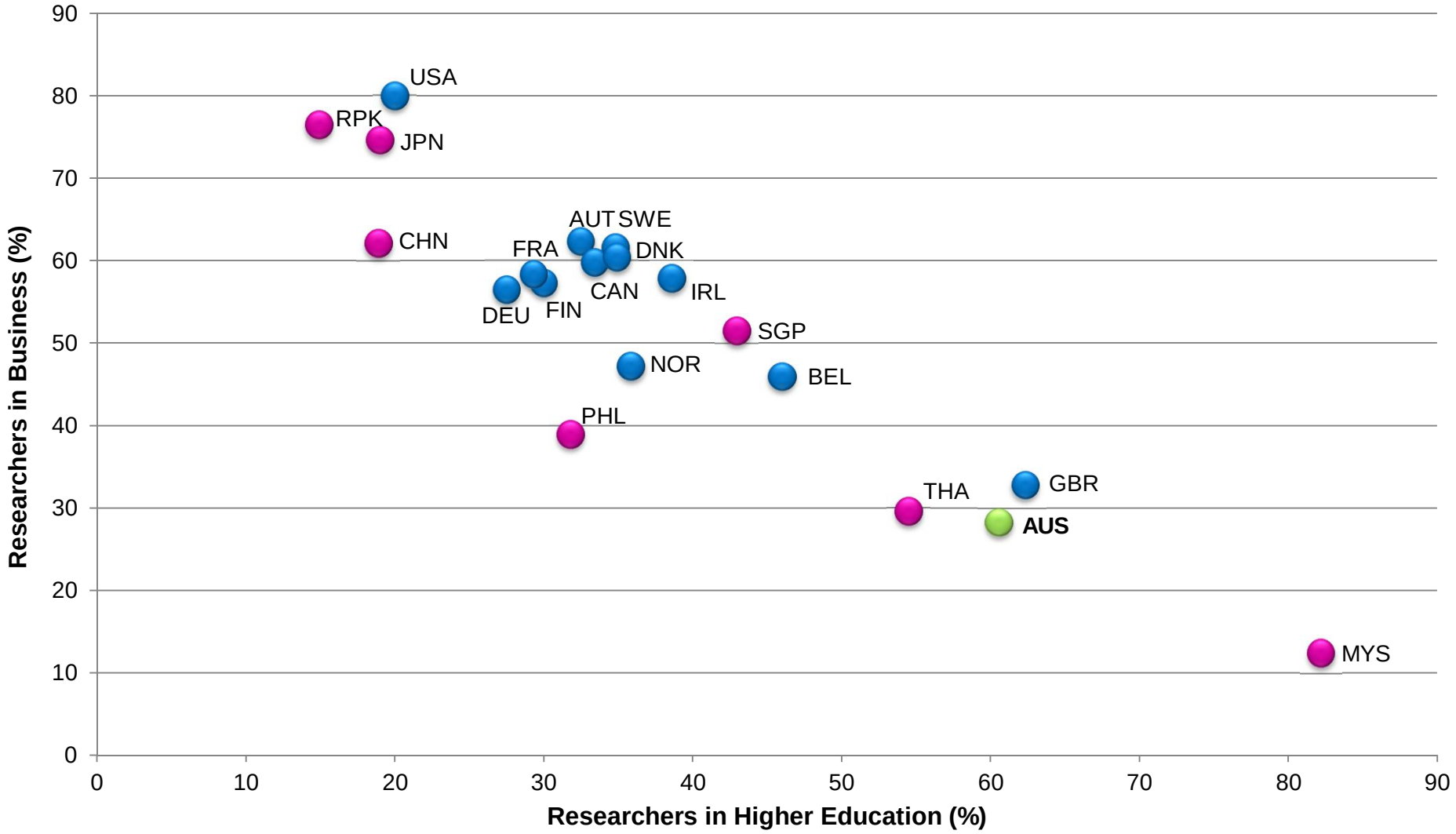
RESEARCHERS in BUSINESS and HIGHER ED.



SOURCE: UNESCO Institute of Statistics & OECD Main Science & Technology Indicators - Latest available country data (AUS 2010).

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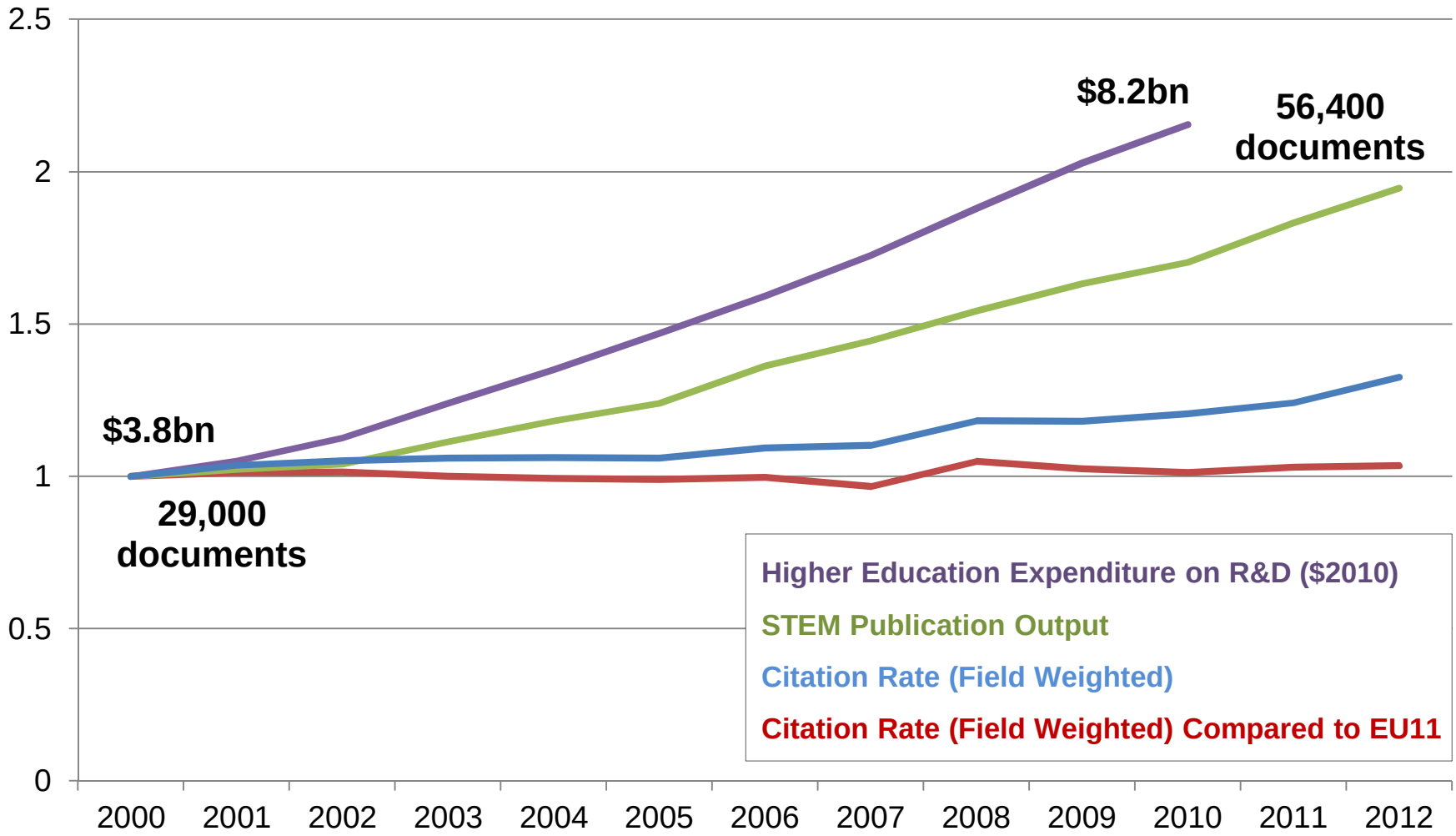
HIGHER EDUCATION EXPENDITURE on R&D



SOURCE:

1. Based on data from InCites™ Thomson Reuters

2. ABS 8111.0 - Research and Experimental Development, Higher Education Organisations, Australia, 2010, HERD by fields of research, 2010.

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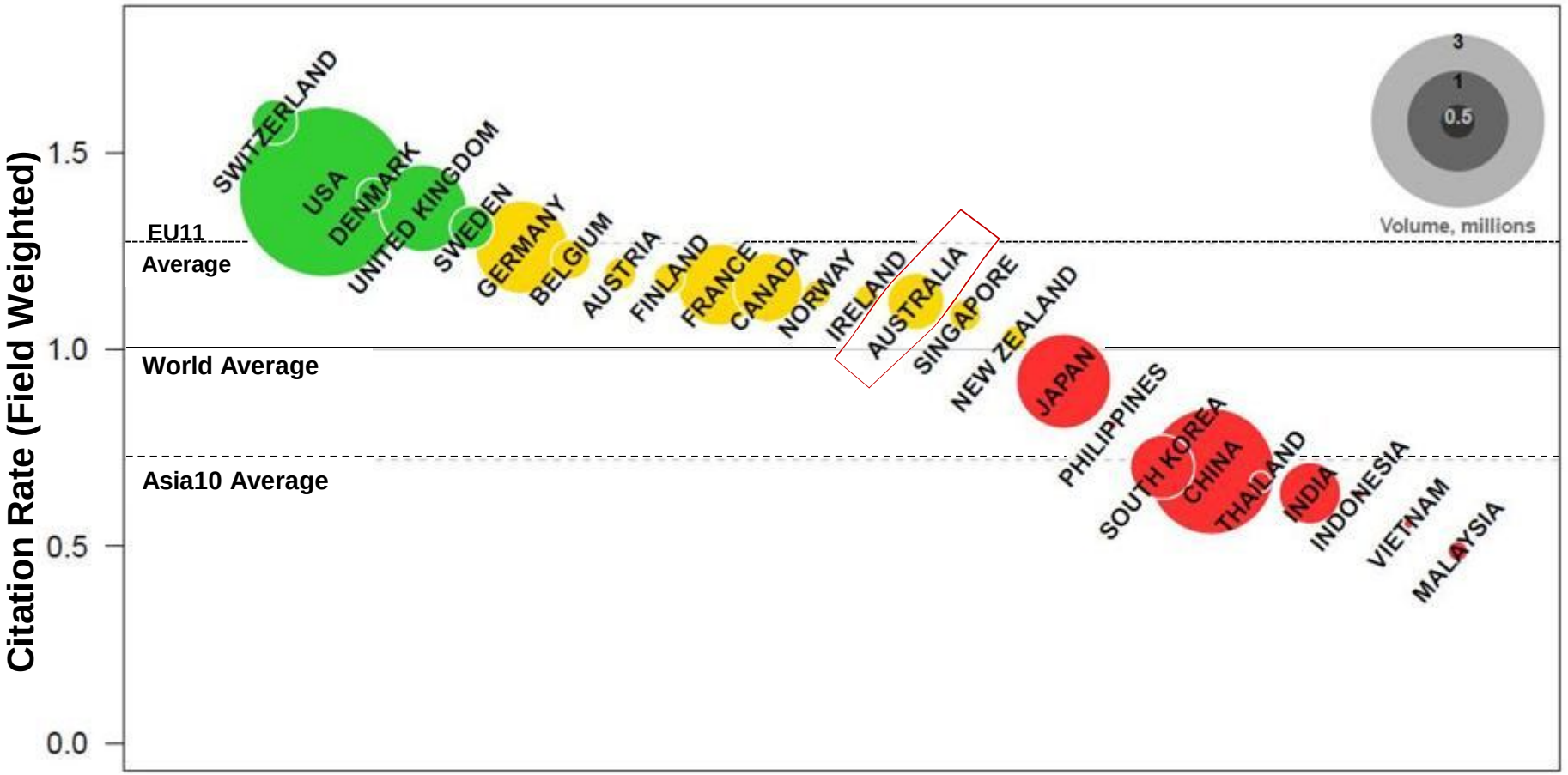
RESEARCH PERFORMANCE : STEM



SOURCE: Based on 2002-12 data from InCites™,Thomson Reuters

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RESEARCH PERFORMANCE : STEM

SOURCE: Based on 2002-12 data from InCites™, Thomson Reuters

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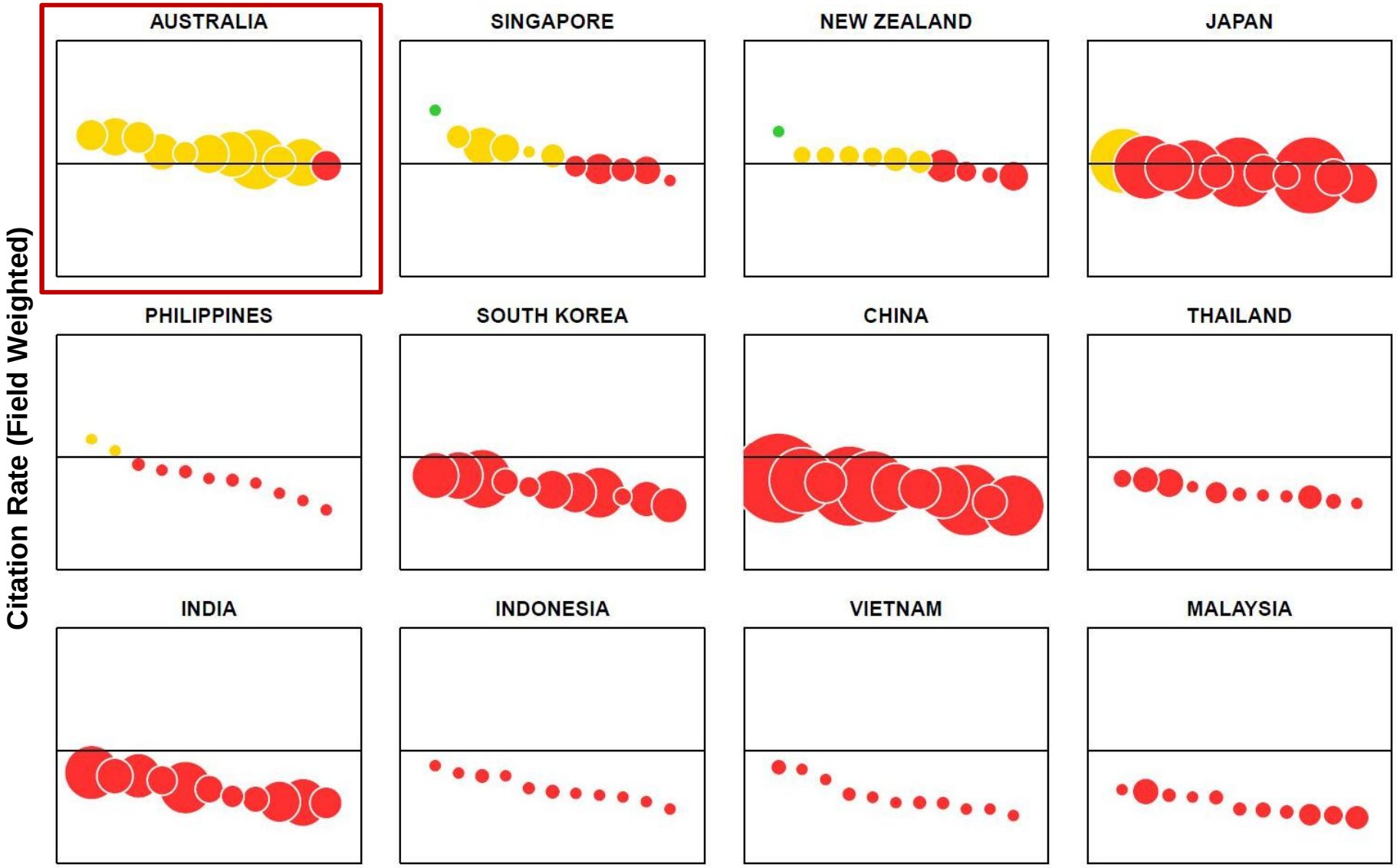
RESEARCH PERFORMANCE : STEM



SOURCE: Based on 2002-12 data from InCites™, Thomson Reuters

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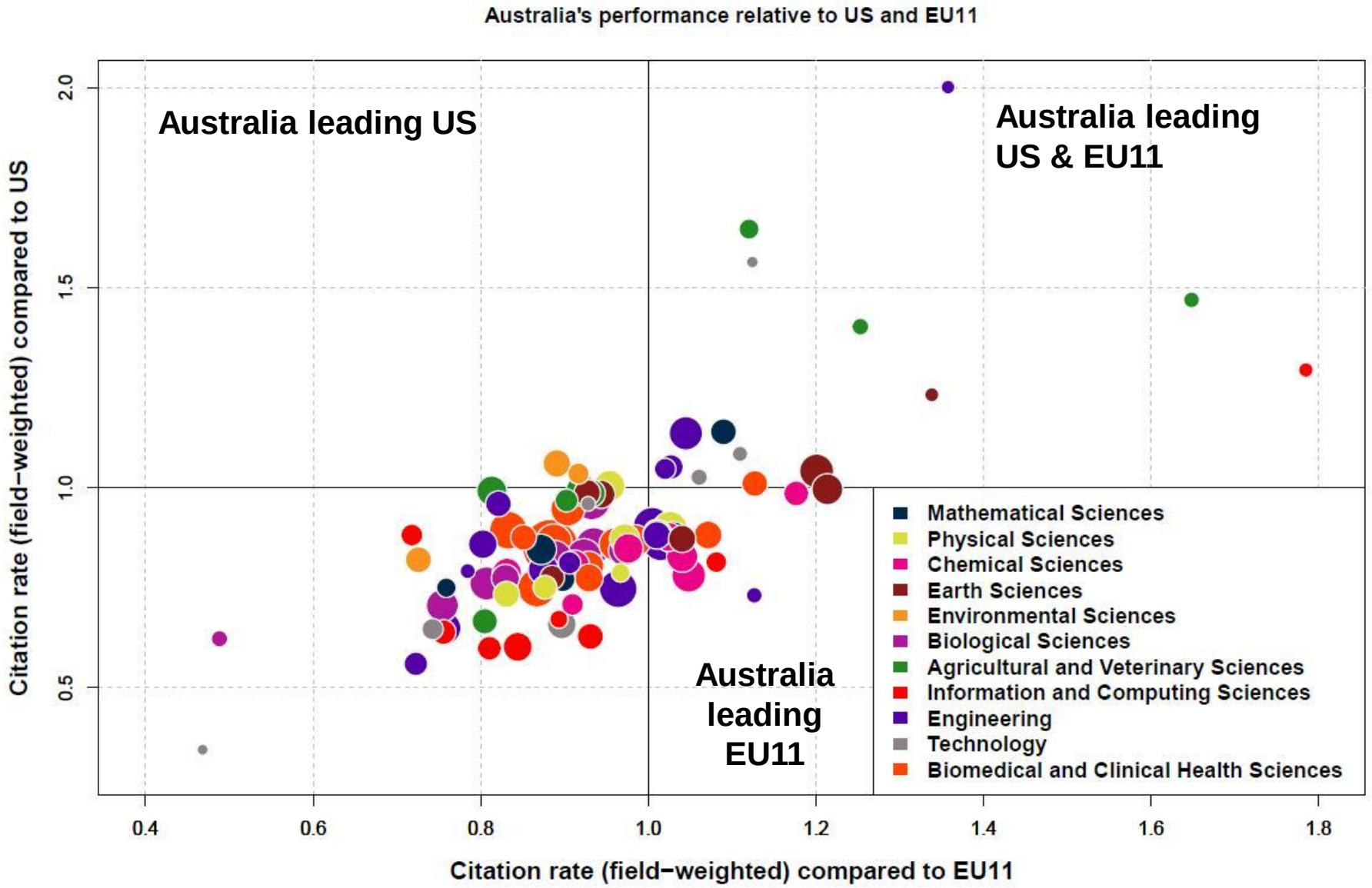
RESEARCH PERFORMANCE : STEM



SOURCE: Based on 2002-12 data from InCites™,Thomson Reuters

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RESEARCH EXPENDITURE:
HIGHER EDUCATION & BUSINESS

	HERD		BERD	
	$ million	%	$ million	%
STEM	5,865	71.5	17,427	96.8
STEM ex. Medical & Health Sciences	3,514	42.8	16,498	91.6
Humanities & Social Sciences	2,338	28.5	493	2.7
STEM:				
Agricultural & Veterinary Sciences	308	3.8	493	2.7
Biological Sciences	751	9.2	87	0.5
Chemical Sciences	293	3.6	275	1.5
Earth Sciences	207	2.5	200	1.1
Engineering	772	9.4	9,283	51.6
Environmental Sciences	252	3.1	193	1.1
Information & Computing Sciences	359	4.4	5,001	27.8
Mathematical Sciences	150	1.8	21	0.1
Medical and Health Sciences	2,351	28.7	928	5.2
Physical Sciences	264	3.2	28	0.2
Technology	157	1.9	917	5.1

SOURCE:

1. ABS 8104.0 - Research and Experimental Development, Businesses, Australia, BERD by fields of research, 2010-11.

2. ABS 8111.0 - Research and Experimental Development, Higher Education Organisations, Australia, 2010, HERD by fields of research, 2010.

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BUSINESS and HIGHER EDUCATION

…While the private sector has a key role to play in making innovation happen, government must provide three key public-good inputs that allow innovation to blossom: investments in human capital, infrastructure, and research.

Agreed.

And it also needs appropriate levels of co-operation to be the norm - not unusual. Particularly given our research profile.

SOURCE: Center for American Progress, The High Return on Investment for Publicly Funded Research, December 2012

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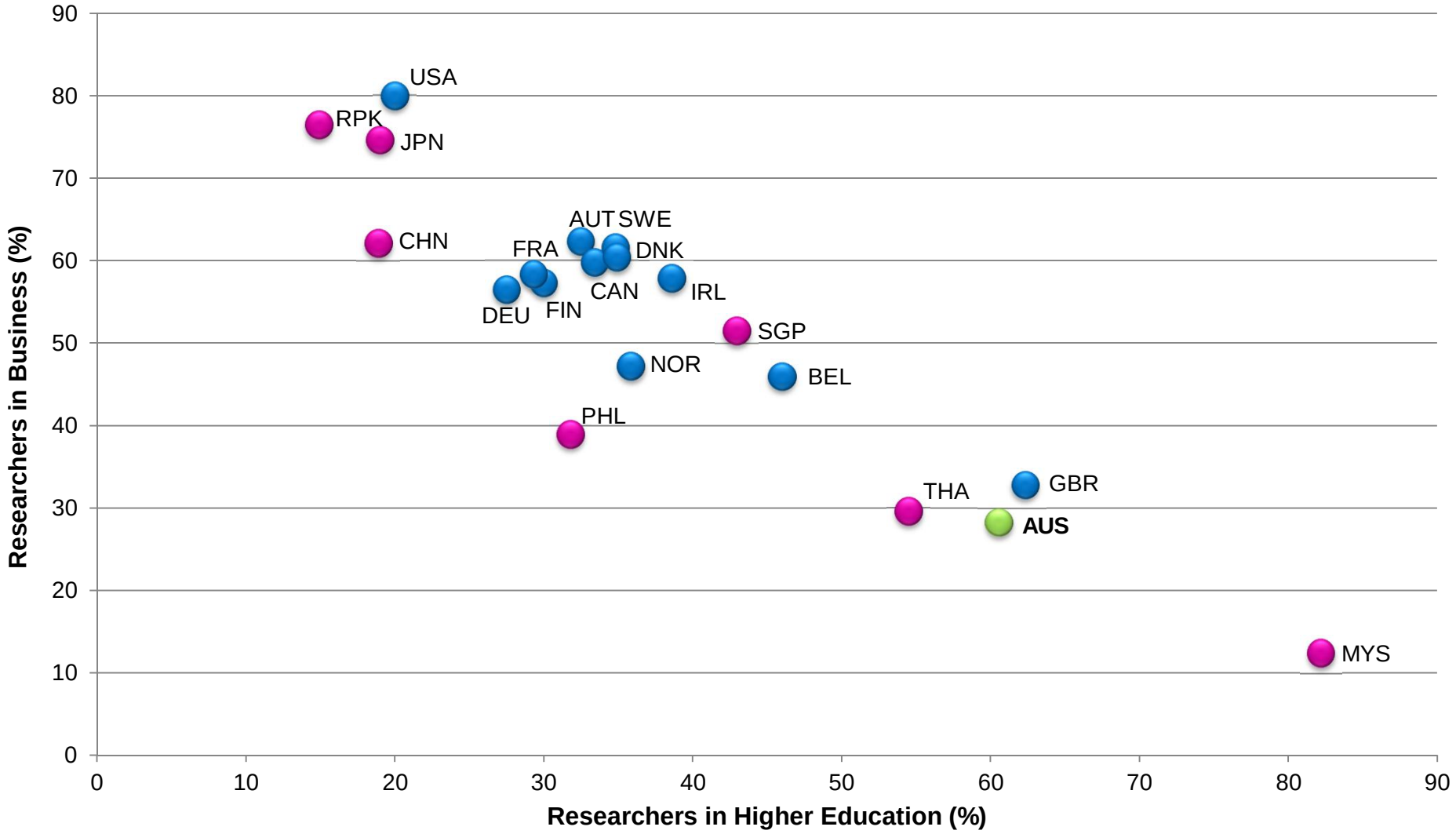
RESEARCHERS in BUSINESS and HIGHER ED.



SOURCE: UNESCO Institute of Statistics & OECD Main Science & Technology Indicators - Latest available country data (AUS 2010).

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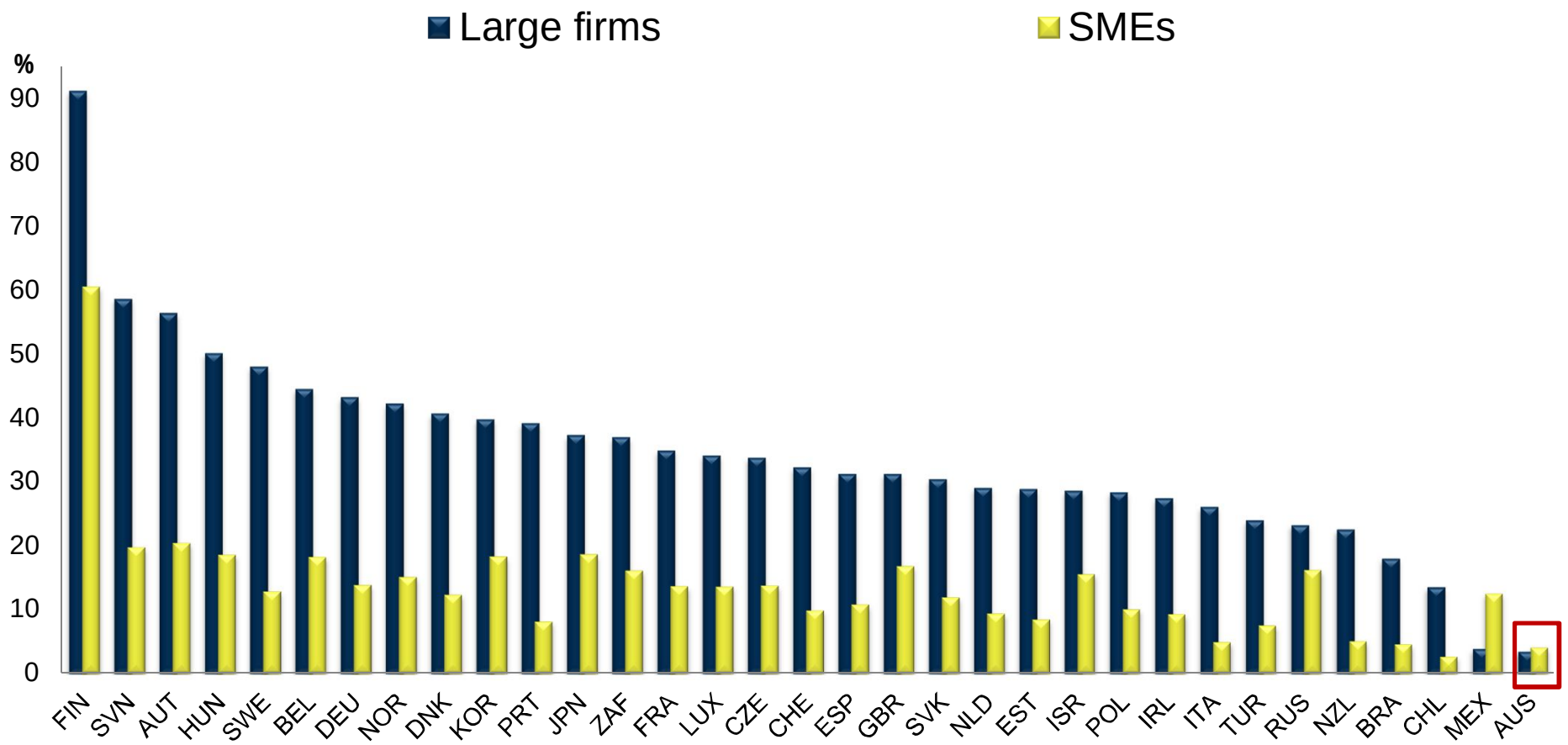
BUSINESS COLLABORATION with HIGHER EDUCATION or PUBLIC RESEARCH AGENCIES



SOURCE: OECD, based on Eurostat (CIS-2010) and national data sources, June 2013.

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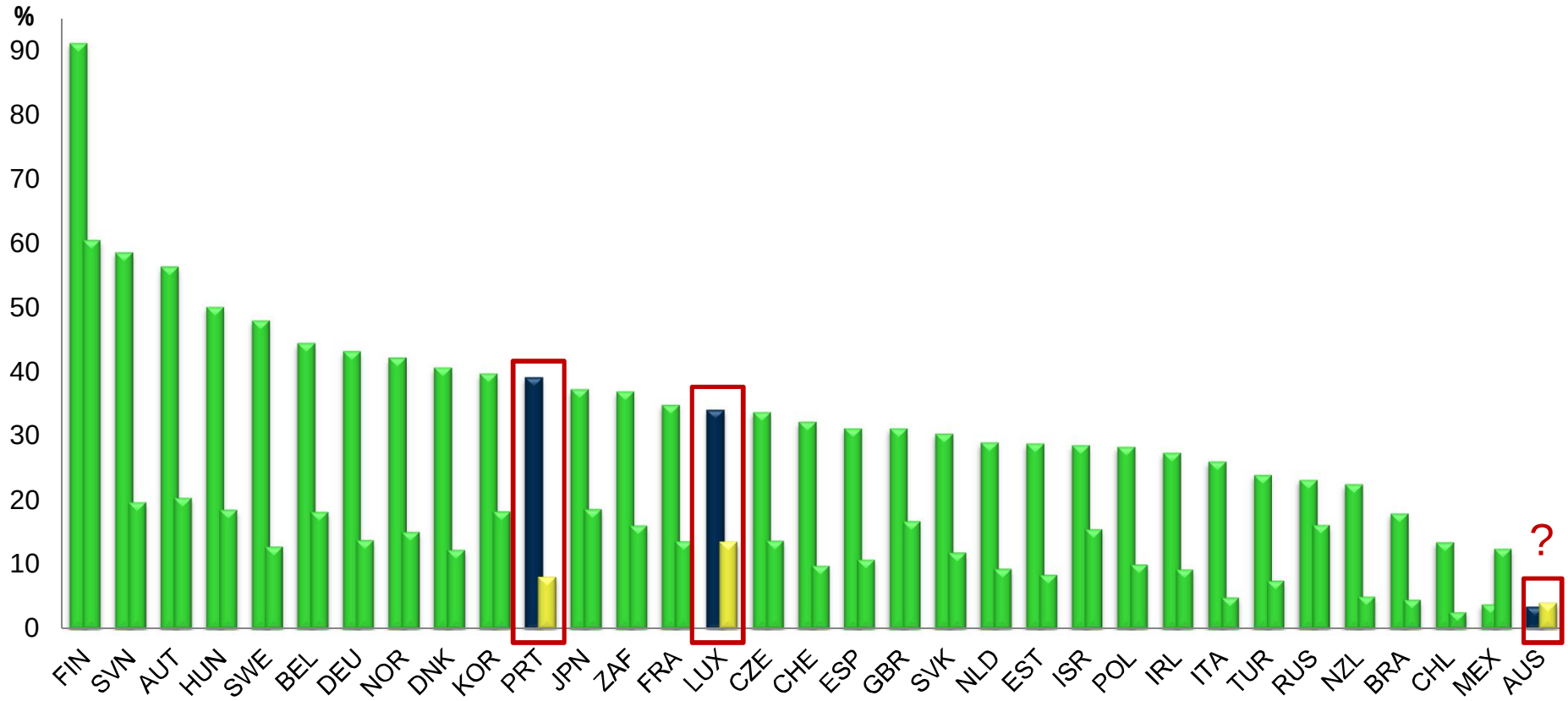
BUSINESS COLLABORATION with HIGHER EDUCATION or PUBLIC RESEARCH AGENCIES



SOURCE: OECD, based on Eurostat (CIS-2010) and national data sources, June 2013.

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A STRATEGY for STEM?

Were we to develop a strategy, we would not be alone, just late:

The STEM enterprise is much like any other massive, complex system. It has tremendous inertia and can keep functioning in the absence of any apparent direction… No entity as vast, interconnected and diverse as the science and engineering enterprise can successfully operate on autopilot perpetually.

SOURCE: Committee on Science, US House of Representatives, September 1998. Unlocking our future: toward a national science policy.

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WHAT DO WE WANT?

What type of Australia do we want?

For example*:* Australia in 2025 will be strong, prosperous, healthy and secure and positioned to benefit all Australians in a rapidly changing world.

But…*Australia lacks the national urgency found in the United States, East Asia and much of Western Europe, and runs the risk of being left behind.*

How do we change? And what do we change?

Source: STEM country comparisons. ACOLA, 2013

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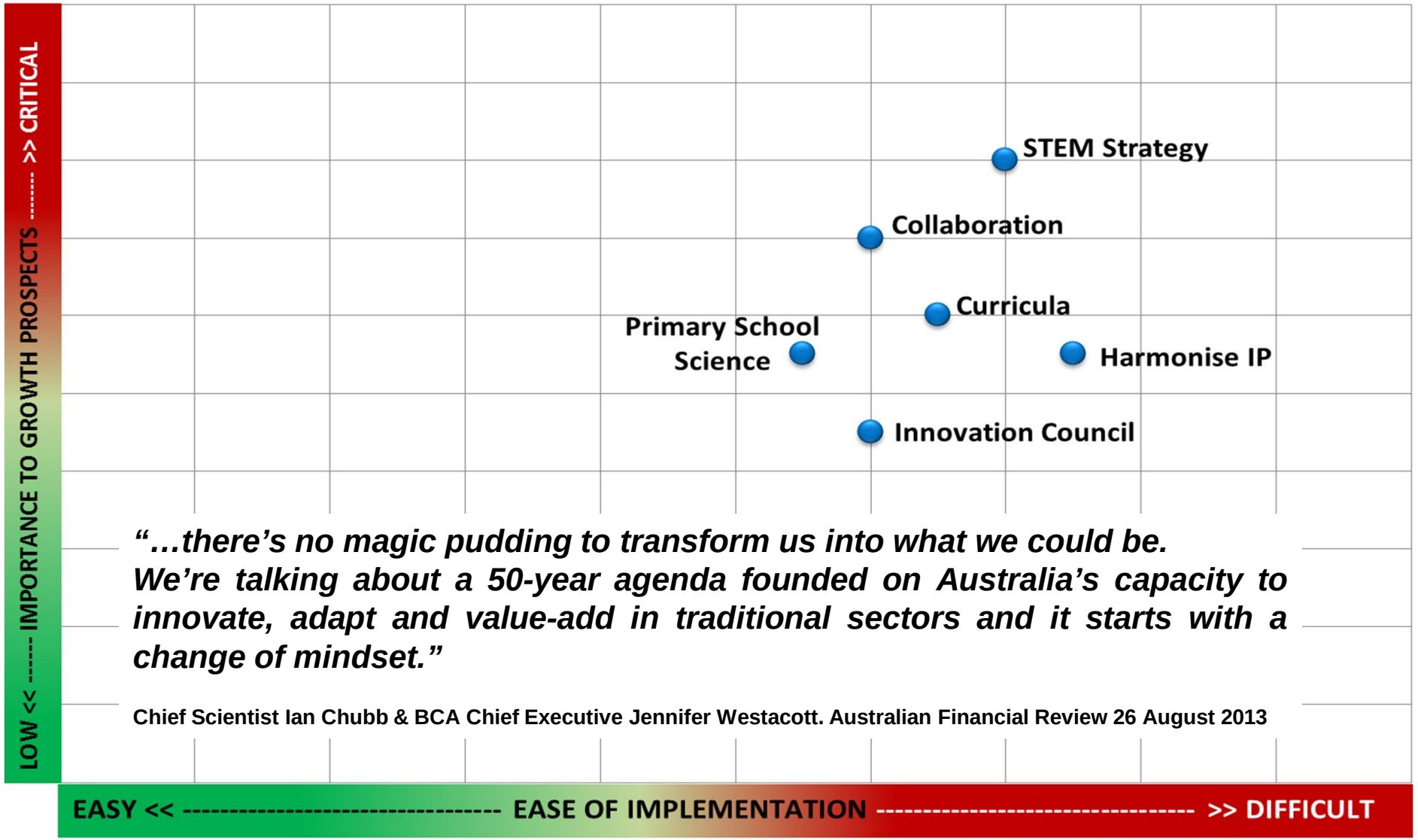
PREPARING the WAY



"…there's no magic pudding to transform us into what we could be. We're talking about a 50-year agenda founded on Australia's capacity to innovate, adapt and value-add in traditional sectors and it starts with a change of mindset."

Chief Scientist Ian Chubb & BCA Chief Executive Jennifer Westacott. Australian Financial Review 26 August 2013

SOURCE: Adapted from – BCA 2013, Action Plan for Enduring Prosperity.

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AN ACTION PLAN for STEM