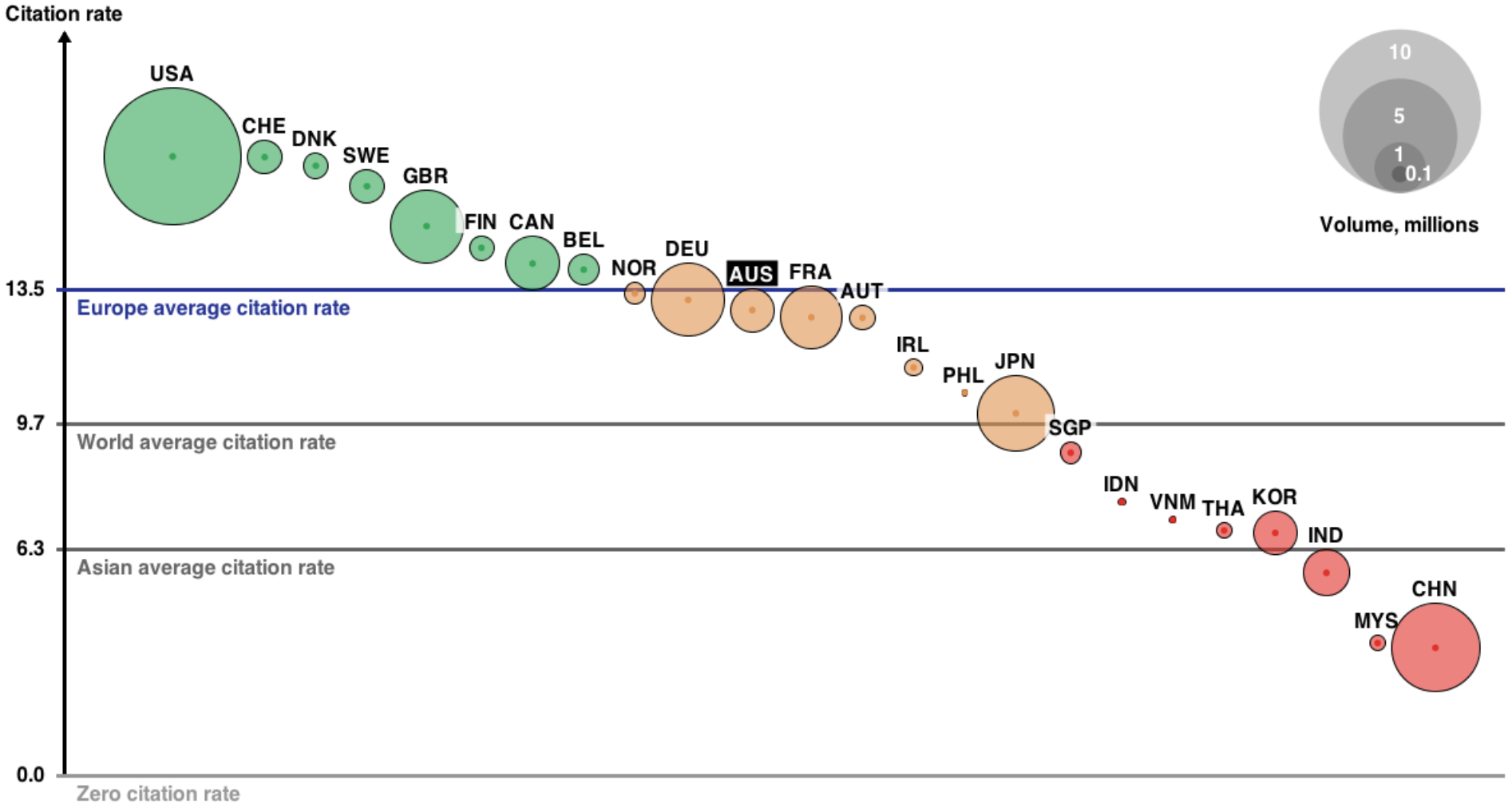
Australian Government

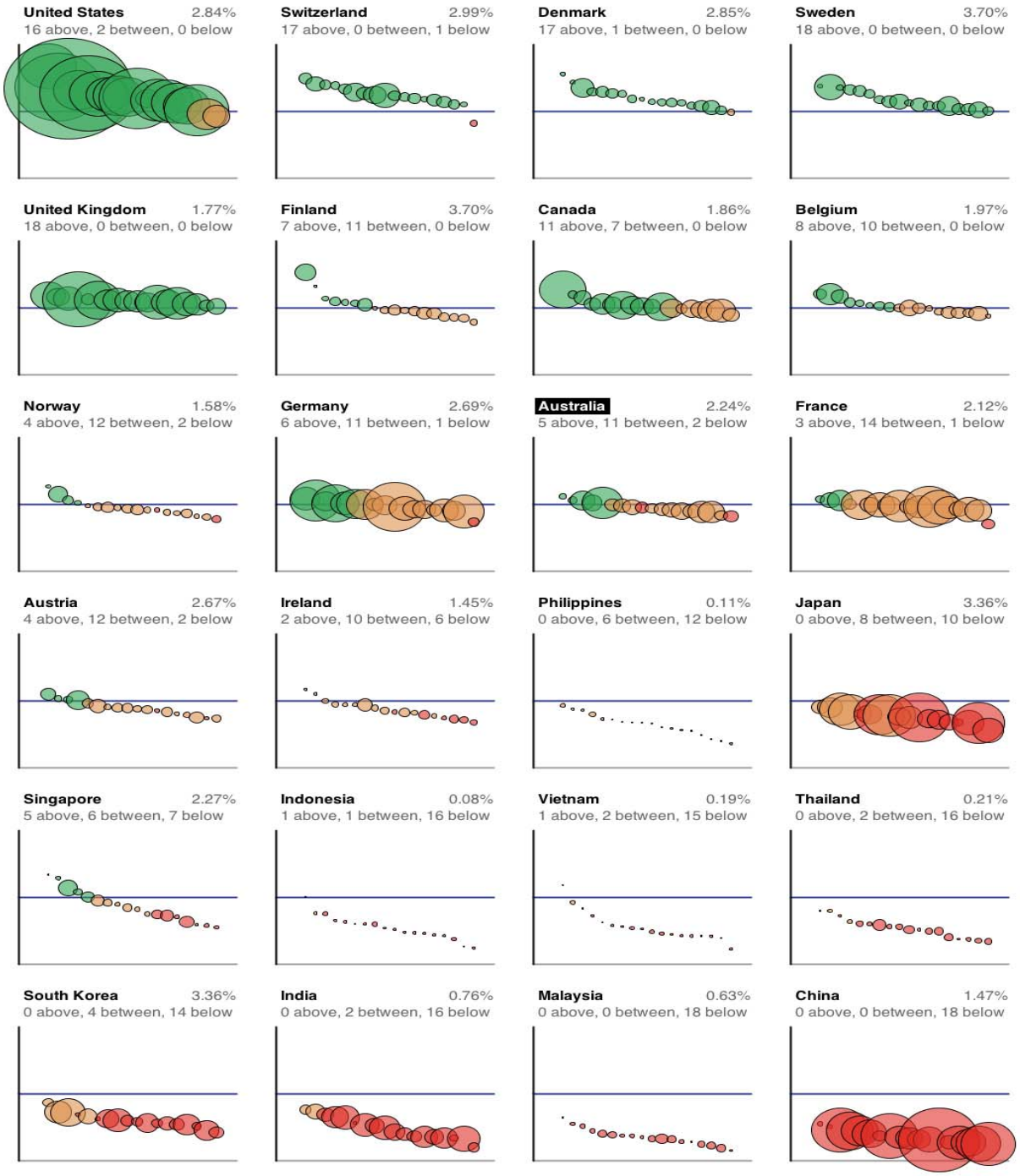
OFFICE OF THE
CHIEF SCIENTIST

Ian Chubb

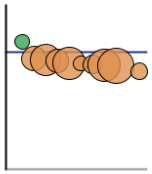
Chief Scientist

Percentages of researchers in the Business sector versus the Higher Education sector in 2008

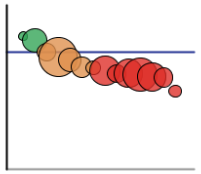

Citation rate
USA
CHE
DNK
SWE
GBR
FIN
CAN
BEL
NOR
DEU
AUS
FRA
AUT
IRL
PHL
JPN
SGP
IDN
VNM
THA
KOR
IND
CHN
MYS
10
5
1
0.1
Volume, millions
13.5
Europe average citation rate
9.7
World average citation rate
6.3
Asian average citation rate
0.0
Zero citation rate


United States 2.84%
16 above, 2 between, 0 below
Switzerland 2.99%
17 above, 0 between, 1 below
Denmark 2.85%
17 above, 1 between, 0 below
Sweden 3.70%
18 above, 0 between, 0 below
United Kingdom 1.77%
18 above, 0 between, 0 below
Finland 3.70%
7 above, 11 between, 0 below
Canada 1.86%
11 above, 7 between, 0 below
Belgium 1.97%
8 above, 10 between, 0 below
Norway 1.58%
4 above, 12 between, 2 below
Germany 2.69%
6 above, 11 between, 1 below
Australia 2.24%
5 above, 11 between, 2 below
France 2.12%
3 above, 14 between, 1 below
Austria 2.67%
4 above, 12 between, 2 below
Ireland 1.45%
2 above, 10 between, 6 below
Philippines 0.11%
0 above, 6 between, 12 below
Japan 3.36%
0 above, 8 between, 10 below
Singapore 2.27%
5 above, 6 between, 7 below
Indonesia 0.08%
1 above, 1 between, 16 below
Vietnam 0.19%
1 above, 2 between, 15 below
Thailand 0.21%
0 above, 2 between, 16 below
South Korea 3.36%
0 above, 4 between, 14 below
India 0.76%
0 above, 2 between, 16 below
Malaysia 0.63%
0 above, 0 between, 18 below
China 1.47%
0 above, 0 between, 18 below

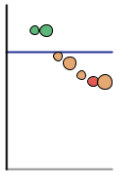
Agricultural and Biological Sciences
1 above, 9 between, 0 below



Biochemistry, Genetics and Molecular Biology
2 above, 5 between, 7 below



Chemical Engineering
2 above, 4 between, 1 below



Chemistry
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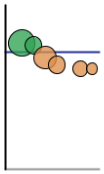
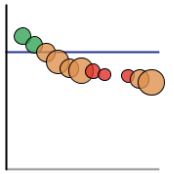
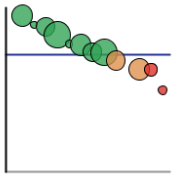


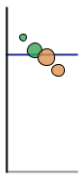
Computer Science
2 above, 6 between, 3 below



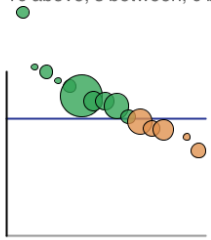
Earth and Planetary Sciences
8 above, 2 between, 2 below



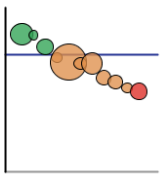
Energy
2 above, 2 between, 0 below



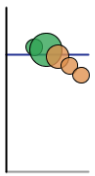
Engineering
10 above, 5 between, 0 below



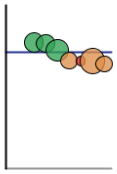
Environmental Science
3 above, 7 between, 1 below



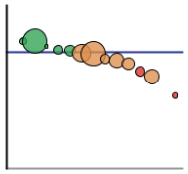
Immunology and Microbiology
2 above, 3 between, 0 below



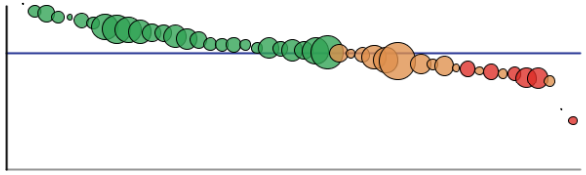
Materials Science
3 above, 3 between, 1 below



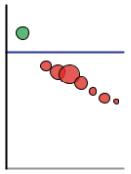
Mathematics
5 above, 6 between, 2 below



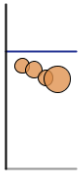
Medicine
27 above, 13 between, 7 below



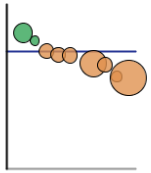
Neuroscience
1 above, 0 between, 7 below



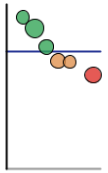
Pharmacology, Toxicology and Pharmaceutics
0 above, 4 between, 0 below



Physics and Astronomy
2 above, 7 between, 0 below



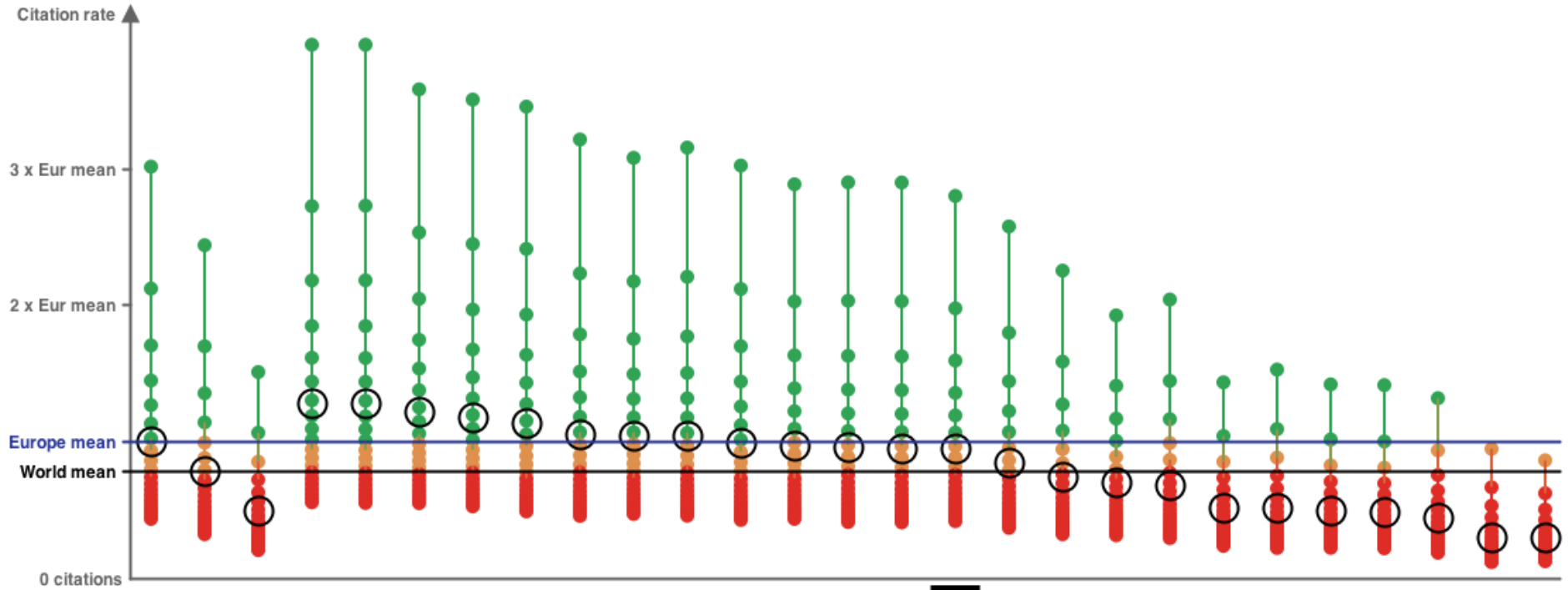
Psychology
3 above, 2 between, 1 below



Veterinary
3 above, 0 between, 0 below

All countries, all fields, 1996-2010

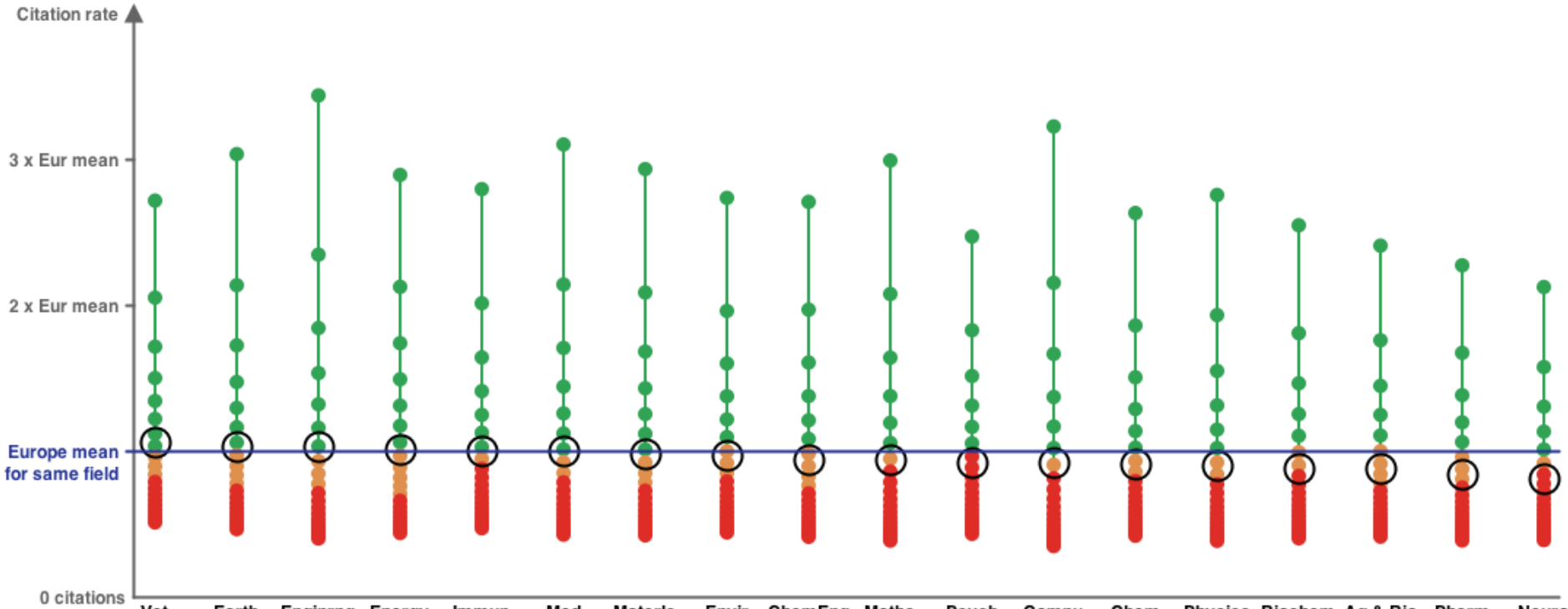
Each dot shows the average of 5% of the country/region's publications, with the 5% groups chosen by number of citations. Black circles show means for the country/region.



	EURO	WRLD	ASIA	CHE	USA	DNK	SWE	GBR	BEL	FIN	CAN	DEU	NOR	AUT	FRA	AUS	IRL	JPN	PHL	SGP	IDN	KOR	THA	VNM	IND	CHN	MYS
Above	35%	20%	10%	50%	50%	45%	45%	40%	35%	35%	35%	35%	30%	30%	30%	30%	25%	20%	20%	15%	10%	10%	10%	10%	5%	0%	0%
Between	15%	15%	5%	15%	15%	20%	15%	20%	15%	20%	15%	15%	20%	15%	15%	15%	15%	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%
Below	50%	65%	85%	35%	35%	35%	40%	40%	50%	45%	50%	50%	50%	55%	55%	55%	60%	70%	70%	75%	85%	85%	85%	85%	90%	95%	95%

Australia, all fields, 1996-2010

Each dot shows the average of 5% of Australia's publications in the field, with the 5% groups chosen by number of citations. Black circles show means for the field.



	Vet	Earth	Enginrng	Energy	Immun	Med	Materls	Envir	ChemEng	Maths	Psych	Compu	Chem	Physics	Biochem	Ag & Bio	Pharm	Neuro
Aus/Eur ratio:	**1.05**	**1.03**	**1.03**	**1.01**	**1.00**	**0.99**	**0.98**	**0.96**	**0.94**	**0.93**	**0.92**	**0.92**	**0.91**	**0.90**	**0.88**	**0.88**	**0.83**	**0.80**
Above	40%	35%	35%	35%	35%	35%	35%	30%	30%	30%	30%	30%	30%	30%	25%	25%	25%	25%
Between	15%	20%	15%	25%	5%	10%	15%	15%	20%	5%	0%	5%	10%	10%	10%	20%	15%	5%
Below	45%	45%	50%	40%	60%	55%	50%	55%	50%	65%	70%	65%	60%	60%	65%	55%	60%	70%

Australian Government

OFFICE OF THE CHIEF SCIENTIST

STRATEGIC RESEARCH PRIORITY SETTING

KEY MESSAGES

PURPOSE

To ensure that Government support for research is adequate in areas that are of immediate and critical importance to Australia and its place in the world.

OUTCOME

A requirement that Government Departments and Agencies ensure that a proportion of their research support, consistent with their broad mission, is focussed on the priority areas.

BALANCE

- **Investment in research contributes to a secure, healthy, socially and economically prosperous future for Australia and all Australians.**

- **Investment in the priority areas for research may support the full spectrum of research – 'basic' to 'applied'.**

- **Investment in fundamental research contributes to an understanding of the very nature of things - driven by curiosity about us and our world – and provides the bank of knowledge upon which society will draw to meet challenges in the future.**

- **Balance means that *not all* research funding will be tied to priority areas.**

THE UNDERLYING PHILOSOPHY

- **High-quality research is essential to Australia's productivity, innovation and national wellbeing, and to our place in (and our contribution to) the world.**
- **Doubtful that there will ever be enough funding to support everything that everybody could do – there never has been.**
- **Research funding will continue to be rationed, therefore.**
- **Rationing means that we need to ensure that priorities can be met.**

...

- **Merit will prevail, but the Government needs to be sure that areas of particular importance are not missed or diminished because of a ranking process inside a rationed system.**

- **In other words, it is important that the Government ensures that there is adequate investment in areas of research that are simply more important than others to national wellbeing - right now.**

- **Research areas not selected in the prioritisation process, will continue to have available, through current mechanisms, the proportion of funding not supporting the priorities.**

WE ARE:

- **Prioritising research to deliver outcomes to Australian society.**
- **Trying to find out what we do, what we should be doing, how well we are doing it, and what to do about it if we do not do it well – or if it is at risk.**
- **Encouraging inter-department/agency co-operation and interdisciplinary approaches whenever sensible.**
- **Encouraging better data sets and documentation on investments and outcomes that are open and accessible while consistent with privacy, security and confidentiality.**

WE ARE NOT:

- **Simply trying to search out what we don’t do.**
- **Getting down to a level of fine detail – e.g. research projects.**
- **Prioritising research simply to improve research excellence in a particular discipline.**

EXPECTATIONS

- **There will be a maximum of fifteen priority areas which will be largely defined by current policy imperatives linked to the needs of the societal challenges.**
- **There will be some overlap in research priorities between challenges.**
- **Some will be multidisciplinary.**
- **We will find that we already invest in some (or maybe many) priority areas.**
- **We may find that we underinvest in some key areas.**

...

- The process when complete will reveal a profile of our research activity and funding in each priority area, its quality and its sustainability.

- Setting research priorities will be a ‘rolling’ process. They will be evaluated and may be adjusted every two years.

WE KNOW

- Research institutions will have their own priorities: a product of their culture and their capacity in various areas.

- It is expected (anticipated) some will align with the priority areas - even if over time.

Australian Government

OFFICE OF THE CHIEF SCIENTIST

STRATEGIC RESEARCH PRIORITY SETTING

PRIORITY SETTING – THE PROCESS

THE PROCESS

- **Five societal challenges, identified by Government as the most critical challenges facing us as a nation.**
- **These challenges are not, themselves, research priorities. They drive the identification of priority areas for research.**
- **Understanding and meeting these challenges will be the outcome of research - on a scale to make a difference.**
- **Addressing the societal challenges will require effort that bridges disciplines and encourages collaboration between researchers, government and industry.**
- **The challenges will evolve – as will the priority areas.**

1. SOCIETAL CHALLENGES

- **Five societal challenges have been identified as immediately critical for Australia and its place in the world.**

They are:

1. **Living with a changing environment**
2. **Promoting population health and wellbeing**
3. **Managing our food and water assets**
4. **Securing Australia's place in a changing world**
5. **Lifting productivity and economic growth**

2. IDENTIFYING RESEARCH PRIORITIES

- **Expert Working Groups established comprising government officials, leading experts and researchers.**
- **The Groups will be asked to identify the three most important research areas within each Societal Challenge.**
- **The Groups will convene in a Plenary Session to acknowledge the priority areas and to rationalise any overlaps.**
- **Government is expected to consider the priorities in April 2013.**

3. CAPABILITY AND CAPACITY MAPPING

- **The ARCom Secretariat will analyse the existing capability and capacity available to address each research priority in accordance with the research fabric articulated in the National Research Investment Plan.**

- **The map will be comprehensive (as data allows): funding data, performance data, personnel data, student data.**

4. ADVICE TO DEPARTMENTS AND AGENCIES

- **ARCom will provide advice to Government.**
- **The process is expected to conclude with a formal letter to relevant Commonwealth Departments and Agencies requiring that a proportion of their budget (consistent with their mission) be committed to the priorities.**
- **Measures/metrics/…in advance.**
- **The impact of the advice would take effect no later than the financial year 2014-15.**

5. REPORTING ON THE OUTCOMES: THE PRIORITIES

- **ARCom will coordinate a whole-of-government response for the Government, identifying the extent to which priorities are funded by Departments and Agencies, and the impact of research conducted.**

- **This is expected to form part of future impact assessment mechanisms.**

REVIEWING THE SOCIETAL CHALLENGES AND PRIORITIES

- **The societal challenges will be reviewed as and when required by Government.**
- **The research priorities will be reviewed every two years as part of the process for developing the next National Research Investment Plan (ie. in 2015).**
- **A review does not mean *out with the old and in with the new.***
- **It means that a rolling process will embrace some of the old – as long as they continue to be important to the nation's interest - and introduce new ones as they emerge.**

CHALLENGE 1:

LIVING IN A CHANGING ENVIRONMENT

- **Research outcomes will identify strategies to develop resilient natural (ecosystems) and built environments (people, communities and their utilities, and industry) that can all thrive in a changing climate.**

- ***Changing environment does not mean a changing economic, political or security environment which is covered in Challenge 4.***

CHALLENGE 2:

PROMOTING POPULATION HEALTH & WELLBEING

- **Research outcomes will show how to build resilient communities and achieve a state of complete physical, mental and social well-being, and not merely the absence of disease, or infirmity*, for all Australians in whichever part of Australia they live.**

* WHO

CHALLENGE 3:

MANAGING OUR FOOD & WATER ASSETS

- **Research outcomes will identify water and land management practices that can accommodate competing demands for water supply to urban and regional communities, while growing Australia's capacity to contribute to the growing global need for food.**

CHALLENGE 4:

SECURING AUSTRALIA'S PLACE IN A CHANGING WORLD

- **Research outcomes will improve Australia's capacity to deliver national security in the context of broader global uncertainty, while identifying the means to safeguard personal security of all Australians.**

- ***This challenge does not refer to climate or environmental change, which is covered in Challenge 1.***

CHALLENGE 5:

LIFTING PRODUCTIVITY & ECONOMIC GROWTH

- **Research outcomes will help to build a resilient new economy so that Australia can thrive, while identifying the means to enhance access to improved living standards for all Australians.**