Australian Government

Office of the Chief Scientist

AUSTRALIA'S STEM WORKFORCE

Science, Technology, Engineering and Mathematics

MARCH 2016

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FOREWORD

As time moves on it becomes increasingly difficult to decide who is and isn't a 'STEM worker'. After all, how many of us rely on new technologies to manage all the tasks we've got to fit in a working day? How many of these technologies had we imagined when we made our year 12 subject choices? How might technologies we can't imagine now be part of our daily experience tomorrow?

There's no opting out from the forces of change. They're too powerful, too widely dispersed, too slippery to catch. But even if I had the choice, I wouldn't take it. I hope all Australians would say the same.

When I look to that future I see a world of opportunity for Australians with STEM training. I see a STEM-powered economy that Australians can forge, if we have the confidence and the capability combined.

So I look to this report as one important measure of the national potential.

Much of the analysis is based on the 2011 Census, which is the most comprehensive and detailed data set of this type available to date. It also establishes a valuable benchmark for comparison with Census data that will be collected in 2016. Once these data are available and analysed (in late 2018), the impact of reforms in the years from 2011 to 2016, such as the demand-driven higher education system, can be investigated.

For today, this STEM skills index will be a valuable resource for students, as well as an important evidence base for public policy.

The most striking finding in my mind is the range of occupations that people with STEM qualifications have pursued. We have people with physics doctorates working as financial analysts. We have chemistry graduates running farms and making wine. We have ICT graduates planning cities. There are no limits on

what a STEM graduate can do, and we shouldn't impose them.

Do we impose them? I suspect we do, perhaps particularly on women with the talent and passion for STEM. The pay gap between men and women revealed in this report is significant, it is longstanding and it is unacceptable. No clever country under-serves half its people.

And no clever country would encourage its most STEM-literate people to pursue only traditional research paths, in universities or public sector research agencies.

I know from my own experience that the opportunities rarely lie in the expected places. Our STEM community, and most of all our young people, should be given every encouragement to find new applications for their skills across the economy.

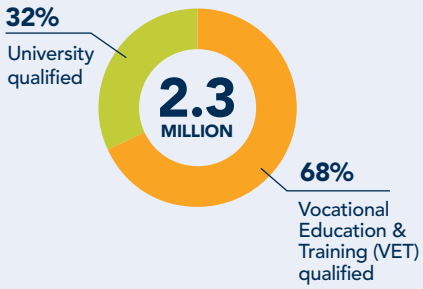
Our best future is a future that builds on technology, innovation, ideas and imagination. It is a future with STEM. And it is a future that is ours to build.

Alan Finkel AO
Australia's Chief Scientist

KEY FACTS

TOTAL STEM WORKFORCE

STEM qualified population



16% of STEM qualified people are female

29% University qualified

9% VET qualified

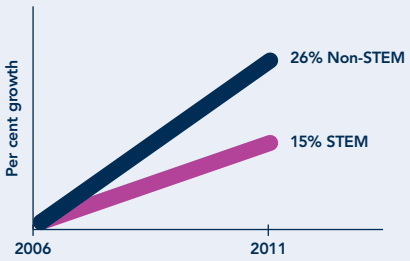
Unemployment rate

STEM = 3.7%

Non-STEM = 4.1%

Growth of STEM vs non-STEM qualified population

Between 2006 and 2011:



STEM UNIVERSITY GRADUATES

Industries and occupations

STEM graduates work across the economy in a wide variety of industries and largely as professionals (55%) and managers (18%).

Top six industries
(65% of STEM graduates)

% of STEM graduates earning in the top income bracket ($104 000 or above)

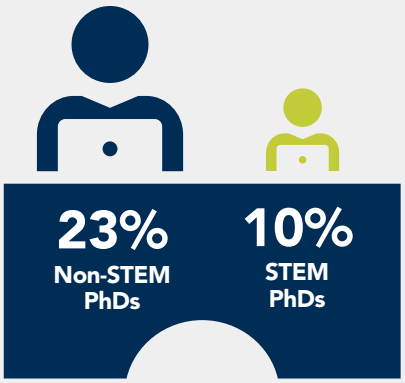
32% male **12% female**

% of employed STEM graduates in the private sector

All STEM graduates **STEM PhDs**

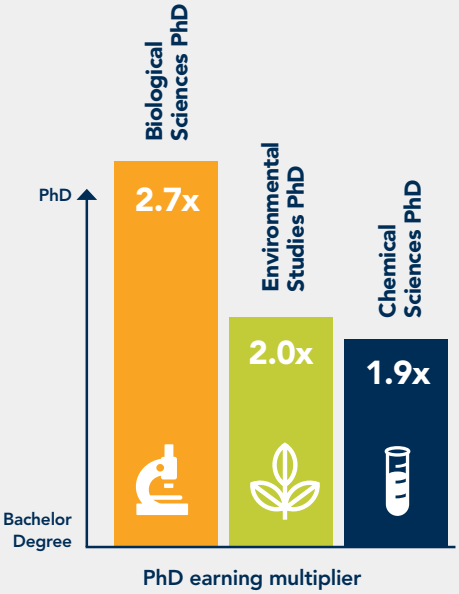
STEM PhD GRADUATES

Business ownership



10% of STEM PhDs owned a business compared to 23% of non-STEM PhDs.

A PhD can provide an earning premium



In every STEM field, higher proportions of PhDs earned in the top income bracket compared to bachelor graduates.

Source: Australian Bureau of Statistics, Australian Census of Population and Housing, 2006 and 2011.

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