

# Meeting global challenges, collaboratively

Now more than ever, there is a strong need to support global, collaborative science and innovation to deliver social, economical and political impact. As the world, and Australia with it, is faced with increasingly complex challenges and opportunities, shrinking numbers of science students, and a public hungry to understand the rationale behind political decisions, the challenge of ensuring this impact should not be underestimated. The Prime Minister's Science, Engineering and Innovation Council (PMSEIC) has chosen to take on part of this challenge through the use of cross-disciplinary foresighting to develop its advice to the Prime Minister on knowledge generation, health, sustainability, and economic and social development.

In Australia we are faced with several severe long term challenges, each of them global:

- human-induced changes in the total earth system that are changing the global climate;
- the Global Financial Crisis, a sharp reminder that our economic family stretches around the world;
- world epidemics, increases in obesity, and the potential for changes in the geographical positioning of disease; and
- a reduction in students studying the basic sciences that underpin the supply of an evidence base for informed decisions taken by governments, industry and the public at large.

Within each of these challenges lie opportunities for Australia to play a major role in the development of solutions, whilst also yielding economic and social advantages. The explicit nomination of a foresighting process in the recent

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with a unique opportunity to provide long range advice on these and other issues of national importance, highlighting areas of research where an early and timely response can really make a difference. The foresighting teams will identify a set of plausible futures that lie 10 to 50 years ahead of us, draw a line between where we are now and each of those futures, and then ask: What are the problems and opportunities for Australia that intersect that line that involve science, and how can we overcome or embrace them?

Four themes for exploration have been agreed:

- Climate Change, Energy, Water and Environment;
- Science as an Engine for Innovation in Commerce, Industry and the Arts;
- National Health, Well-being and Security; and
- Knowledge Generation, Skills and Perception in a Global World.

These themes lie at the intersection of Government portfolios and across traditional disciplines of research, and in many cases involve social challenges resistant to conventional approaches to solving them. Two of the themes, *Science as an Engine for Innovation in Commerce, Industry and the Arts*, and *Knowledge Generation, Skills and Perception in a Global World*, are of particular importance to the R&D agenda in Australia.

Inter-disciplinary collaboration, across scientific boundaries and including the Social Sciences, the Arts and Industry, is a natural route to discovering breakthrough opportunities that can be embraced by a knowledgeable public.

We are accustomed to perceiving and dividing the world into sections

that may no longer be appropriate for effective collaboration in this new global environment: Business distinct from Customers; Humans distinct from the Biosphere; and Consumers distinct from Producers. Increasingly, however, the challenges that face us, and indeed the opportunities that await us, require collaboration. Meeting these challenges will require teams of people with enough imagination, talent and respect for one another to see this challenge as an opportunity. It will also require different skill sets in our workforce, as well as new approaches by industry and commerce.

Using a future view to aid the provision of possible solutions is



only one part of the challenge. Another is to ensure that Australia has a sufficiently broad and deep scientific base to develop the research that underpins most of these solutions, both now and in 50 years time. Given the importance of the basic sciences to long term innovation, the decline in student numbers in this area is a matter for particular concern. For example, in 1976, 27.5% of year 12 students studied physics. By 2007 this had reduced to 14.6%\*. One of my roles as Chief Scientist is to engage young people and promote careers in science. However, successful R&D in the future will not only require that a sufficient number of scientists is available to research potential solutions, but that this is coupled to an appropriately trained work force to develop services and manufacture technologies. In addition, Australia must foster enabling social skills such as working in teams and enhancing cross-disciplinary engagement.

Eventual success will require that the public is engaged, not only in understanding the benefits of new technology, but also any potential risks, so that personal decisions are based on firm scientific evidence. Through the exchange of knowledge with the wider public, science can also increase the understanding and appreciation society has for the world in which it lives, and enhance the skills required for a competitive modern workforce.

Foresight, global collaboration, breadth and depth in the national skill base, and societal engagement are the key to transforming the jewels of Australian research into a crown of commercial and public benefit.

\*Ainley, J; Kos, J; & Nicholas, M; *Participation in Science, Mathematics and Technology in Australian Education*; ACER Research Monograph No 63; August 2008; [www.acer.edu.au](http://www.acer.edu.au)