

Engineering a solution

There is a critical shortage of engineers and a new group aims to tackle the problem, writes Jo Studdert

IT'S all very well for the government to say it will spend billions on infrastructure projects, but who is going to build them? Where will the requisite thousands of engineers come from?

One thing's for sure: they aren't coming up through the Australian school system, which is dissuading pupils in droves from such a career, according to the engineering industry.

It is a mighty problem and one desperate for some solutions.

According to Peter Taylor, chief executive of the peak and accreditation body Engineers Australia, there was a 28,000-strong Australian shortage of engineers just before the global financial crisis and that figure is now about 20,000. "Projects used to be cancelled or delayed until vacancies could be filled, which cut deeply into Australia's productivity and therefore competitiveness," Taylor says.

And for every engineering position not filled, another 20 "para-professionals and tradie jobs go begging", says Megan Motto, chief executive of the Association of Consulting Engineers of Australia.

She says the basic problem in Australia is not a cyclical one, it is systemic, and its roots go right back through the education system, even as far as primary school.

Taylor says research has shown that secondary students are bored or unmoved by the idea of a career in engineering, as well as most other science or maths-based jobs, and that children are losing interest in maths and science in year four, as mere nine-year-olds.

Motto says all Organisation for Economic Co-operation and Development countries are experiencing engineering shortages, largely because rapid industrialisation across the world has drained the engineering work pool.

Taylor says although Australia can look overseas to fill positions, this is a short-term fix and the international shortage is only going to worsen as Asia develops further and the Western world recovers from recession, mainly by ramping up infrastructure projects.

All that's bad enough, but engineering also has the problem of being seen as blokey. Only 10 per cent of practitioners in Australia are women, says John Bright, public relations officer at Engineers Australia.

Recruiters agree that the situation is serious. James Grantham, manager, engineering, at Hays, says it is almost impossible to fill positions in some fields, such as geotechnical design, traffic and tunnel engineering, and on building sites it is hard to find hydraulic, senior electrical or environmentally sustainable design engineers.

Julien Lacave, senior consultant, energy and carbon, at Bradman Recruitment, says companies have experienced a fourfold increase in difficulty filling engineering positions between



Building blocks: Many projects face a shortage of engineers Picture: Ian Waldie/Bloomberg News

2001 and 2005. The global financial crisis, he says, eased matters for a while but demand has shot up again and, added to that, competition for candidates has stiffened further as more industries develop hi-tech elements that need engineering skills.

"Added to normal shortages, we now see strong demand for marine, aeronautical, sonar, and new-technology engineering, and for electrical engineers who can work on big projects and renewable energy," Lacave says.

But the number of university students

graduating in engineering is fairly static. The University of Sydney's Warren Centre, a think tank for advanced engineering, is trying to find solutions. Chief executive Michael Dureau says one of the problems at the tertiary level is that there are simply not enough engineering places in universities that are covered by the Higher Education Contribution Scheme.

His chief operating officer colleague Robert Mitchell says "we appear to be producing more engineers but we lose many straightaway into banking, because engineers are seen as

problem solvers". In addition, many graduates are foreign students who return to their own countries, taking their skills with them, Mitchell says.

All agree that this is not a problem, it is a crisis. The engineering industry has formed a partnership of five professional bodies to investigate the matter: Engineers Australia, the Council of Engineering Deans, the Academy of Technological Science and Engineering, the Association of Consulting Engineers of Australia and the Association of Professional Engineers, Scientists and Managers, Australia, which is the industrial body.

The group offers many programs to develop science and engineering skills and enthusiasm in students from primary level upwards, and has identified 10 factors it will examine to better generate solutions to the problem.

The group will:

- Collect data on engineering skills.
- Map demand against supply.
- Analyse the industry's response to the global financial crisis and its effect on graduates. This study will look at redundancy levels and the options available for retaining or retraining engineers.
- Combine this data and map a cost-benefit analysis of all outreach programs.
- Examine engineering pathways between technological training and universities to lift the number of those who upgrade to degree-level studies.
- Examine migration policy, although this is recognised as a short-term solution.
- Examine post-graduation training and development.
- Examine higher education policy and whether universities are sufficiently funded for engineering needs.
- Put the school curriculum under the microscope, to track each point at which students fall off the path that might lead to an engineering-science career. Among other things, this study will examine whether teachers understand what engineering is and how it differs from technology. It will test engineering vocabulary in schools to gauge true levels of comprehension.
- Examine recruitment and retention strategies for employers.

Having got the data, the partnership will target the problem, although the bodies already offer programs, such as model-car construction, or the Australian Icons publications, which introduce students to engineering marvels, such as the Cochlear ear implant or the Wandoo offshore oil platform.

There are examples from every field of engineering and more projects in the pipeline, all structured to most effectively move students.