Submission

Senate Education, Employment and Workplace Relations Committee

Inquiry into the shortage of engineering and related employment skills

February 2012

About the Australian Industry Group

The Australian Industry Group (Ai Group) is a peak industry association in Australia which along with its affiliates represents the interests of more than 60,000 businesses in an expanding range of sectors including: manufacturing; engineering; construction; automotive; food; transport; information technology; telecommunications; call centres; labour hire; printing; defence; mining equipment and supplies; airlines; and other industries. The businesses which we represent employ more than 1 million people.

In preparing this submission Ai Group has drawn on the expertise of its Education and Training Policy team and also its member advisors located in Queensland, New South Wales, Victoria and South Australia who are dealing directly with member companies on a day-to-day basis on skilling issues.

OPENING STATEMENT

The Australian Industry Group (Ai Group) welcomes the opportunity to respond to the Senate Education, Employment and Workplace Relations Committee enquiry into the shortage of engineering and related employment skills. This inquiry is timely given the rapid recent growth of infrastructure activity within the resources sector and the consequent attraction of engineering based labour into this area. At the same time, the manufacturing sector, the largest employer of engineering related occupations, is experiencing contraction and structural adjustment. Whilst this submission is in response to the specific enquiry into the shortage of engineering and related employment skills, the issues faced impact on industry generally and so a broad approach has been adopted in recommendations to address skill shortages.

The manufacturing sector is the largest employer of engineering apprentices and technicians accounting for 9.3% of all apprentice commencements in 2010.[1] The resources sector is a significant user of a wide range of engineering skills. Recent data indicates that the resources sector employed over 5% of all trades people but only 3.6% of apprentices – significantly less than the manufacturing sector. The National Resources Sector Employment Taskforce has reported that the sector prefers to employ experienced tradepersons.[2] This establishes the scenario where the manufacturing sector trains apprentices who are subsequently attracted to the resources sector. This places enormous strain on the manufacturing sector to retain a highly skilled workforce at the very time the sector is under considerable competitive pressure from overseas and is in a period of structural adjustment. The resultant reluctance by manufacturing enterprises to engage apprentices who subsequently depart to the resources sector contributes to the existing skills shortage of engineering trades.

$86 billion worth of non mining/resource projects are detailed in the Commonwealth's 2011 Infrastructure Priority List, $19.2 billion worth of projects are r*eady to proceed,* $13 billion of projects require *some project development* before they are r*eady to proceed* with the remaining projects in the *early stages* and *real potential* categories.[3] The scenario is now one where infrastructure projects can be seen as belonging to one of two clearly defined subcategories, resources/mining related and other. The resource/mining category will demand a large rapid injection of skills to address a number of significant projects over a relatively short period, perhaps 4 - 5 years, whilst the "other" category will require a steady supply of skilled workers for a much longer sustained period to design, maintain and expand items such as road, rail, water and energy networks. Each category will require different skilling strategies due to the nature of their project demands and lifecycles.

The engineering professions and related trades have been experiencing skill shortages for some time, now on top of this comes an additional surge in demand for skills from infrastructure, resource and mining projects that will collectively target an already depleted pool of skilled workers. Companies are facing the significant risk of skill shortages negatively impacting on their businesses and they expect this risk to significantly increase by 2015. These predictions are well documented with a projected massive increase in the number of skilled employees required for the resource sector between now and 2015-16[4].

[1] Apprentices and Trainees 2010, National Centre for Vocational Education Research, 2011.
[2] Resourcing the Future report, National Resources Sector Employment taskforce, 2010.
[3] Infrastructure Australia, Communicating the Imperative for Action, A report to the Council of Australian Governments, June 2011.
[4] Skills Australia - Employment Growth Projection in Mining Operations (less oil and gas), 2010-2016.
Skills Australia – Major projects schedule of resource projects Construction Workforce Estimates Sept 2011.
Resources Industry Training Council - Western Australian Mining Industry: Workforce Development Plan, Nov 2010
Construction Skills Queensland CSG/LNG Industry Construction Workforce Plan.

Sectors of Australian business are still finding it increasingly difficult to attract and retain the skilled workers needed to survive and prosper in the current economic climate. This is especially the case with regards to engineers and the associated engineering trades. A coinciding resource, energy and infrastructure boom is ramping up in a period where industry is still feeling the effects of a prolonged skill shortage and the downturn in training that resulted from the global financial crisis. Skills shortages in engineering and the related trades have remained despite low unemployment and continue to restrict productivity and innovation and place the future competitiveness of many companies at risk. A lack of adequate existing infrastructure, particularly road and rail networks, exacerbates these issues and have also been shown to have an adverse affect on productivity gains. It is therefore vital that infrastructure development and the development of supporting skills be assigned a high priority to allow for unhindered progress.

The complex nature of skill shortages in the engineering and related trades ensure that a range of solutions will need to be explored to accommodate short , medium and long term requirements. Strategies should include effective skilling pathways, recruiting and retention strategies, and workforce skills development strategies in order for businesses to remain competitive and prosper. The resources sector and companies in allied industries that supply the resources sector are experiencing skills shortages now which are expected to deepen over time.

Elsewhere, manufacturing companies are reporting that they are largely able to find the skills they need now but are anticipating an increase in the flow of their skilled workers to the resource sector in the short to medium term. This will inevitably result in an increase of skill shortages for the manufacturing sector for the duration the current demand cycle. The end of the cycle may potentially result in an easing of the shortages for the sectors as a range of large projects are completed and the demand for skills that they originally created dissipates.

Any skilling strategy must carefully consider demand and project lifecycles and take into account the often significant time period required to achieve the required skills. It makes little sense to adopt strategies that result in large numbers of graduates entering an industry sector in a projected period of contraction of demand.

RESPONSE TO DISCUSSION QUESTIONS

Ai Group's particular concern is with the central issue of skills shortages, the effectiveness of current policies and effective strategies to address this issue. Accordingly, this submission will specifically address the following two terms of reference in an integrated manner.

(c) Options to address the skill shortage for engineers and related trades, and the effectiveness and efficiency of relevant policies, both past and present

(e) Effective strategies to develop and retain engineering talent in the private and public sectors through industry training and development, at enterprise, project and whole-of sector levels

Skills Shortages

Skills shortages for engineers and related trades remain a major issue for the Australian economy. In July 2010, Ai Group conducted a specific survey on Skill Shortages which highlighted the issues facing industry.[5] Skill shortages in the engineering professions and associated trades were of particular concern given the time needed to develop the skills, in the majority of cases a number of years, and the centrality of those skills to effective business operations. Some of the greatest difficulties in filling vacancies were reported in the primary areas of concern: Engineering professionals (51.7% of all vacancies were unfilled): Fitters and machinists (58% of all vacancies unfilled), Structural steel and welding trades (32.9% unfilled vacancies). These figures are also similar to Ai Group's 2008 survey results and show an established pattern of shortages.[6]

According to the 2010 survey the major reasons why vacancies could not be filled were: the lack of specialised skills required for the job (59.3%); the lack of applicant skills and experience (54.1%); and the absence of local training options (32.6%). A further major difficulty reported was simply a lack of applicants (48.5%). By far the most popular response where a vacancy could not be filled was to upskill existing staff, with 37% of companies pursuing this course. The next most frequent response was to outsource or subcontract work (31.2%) followed by redesigning jobs around available skills (18.3%). Overall 12.6% of companies confirmed that unfilled vacancies were a major constraint on productivity.

Company expectations for recruiting skilled labour for 2011 followed a similar trend: 39.7% of companies expected not to be able to find people with the specialised skills needed for their workplace; 36.9% of companies expected to receive applicants that lack the broad skills and experience that are required; 19.3% of firms expect positions to remain unfilled because they require skills that cannot be developed locally; and 32.3% of companies expected that there will not be enough applicants to fill all their positions. The impact of the aging workforce also comes into play with some employers expecting significant numbers of skilled employees retiring between now and 2015.

The domestic supply of new engineering graduates is not keeping pace with demand. The main reason for the weak domestic supply is that student demand is not strong enough to fill the available places in engineering courses, mainly due to fewer senior students doing mathematics and physics as preparation, as well as a decline in youth interest in science, education and technology study and careers. The national graduation rate from Bachelor of Engineering degrees is well below that of all undergraduates, mainly because students find the mathematics and the workload difficult, and the salaries are not as favourable as some other occupations.

[5] Australian Industry Group and Deloitte National CEO Survey: Skill shortages: A high risk business, July 2010.
[6] Australian Industry Group and Deloitte National CEO Survey: Skilling for Innovation, April 2008.

Literacy and Numeracy Issues

Skills Australia have emphasised the impact on Australia of the lack of foundation skills in language, literacy and numeracy (LLN).[7] Data from the Adult Literacy and Life Skills (ALLS) Survey[8] shows 46% of adult Australians (15-64) had prose literacy skills at Levels 1 and 2, which is below the level considered necessary to function at work and in society. Fifty-three per cent of adult Australians have numeracy skills at Levels 1 and 2, which is below the level considered necessary to function at work and in society. Seventy per cent of Australians had problem solving skills at Levels 1 and 2, again below the level considered necessary to function at work and in society. Level 3 on the ALLS survey is considered to be the minimum required for successful completion of a vocational Certificate III which is generally held to be a trade level qualification. The results for employees in the manufacturing sector are particularly poor.

Ai Group's recent workforce literacy project[9] found that 75% of employers reported that their business was affected by low levels of literacy and numeracy. Any strategies designed to develop and retain employees in engineering and related occupations needs to address this issue. The Australian Government funds two adult language, literacy and numeracy programs; the Workforce English Language and Literacy program (WELL) which targets existing workers , and the National Language, Literacy and Numeracy Program which is focused on assisting jobseekers by addressing their language, literacy and numeracy skills needs. An ongoing commitment to continue and expand government funding for these initiatives is necessary to contribute to addressing skill shortages including those currently being experienced in the engineering sector.

Effective Strategies

There is no short term solution to the ongoing shortage of skilled engineering professionals and associated trades being experienced by industry across Australia. Whilst shortages vary across qualification levels, specialisations and timeframes, it is clear that shortages are chronic rather than cyclical. Employer responses to Ai Group skill shortage surveys highlight how important it is for governments to take active steps to address skills shortages now and by 2015. The majority of those surveyed responded that it was extremely or highly important for governments to take *more* active steps to address skill shortages now and into the future.[10]

The *Bradley Review* notes that Australia is currently lagging behind other countries in performance and investment in higher education and its implication for the country's competitiveness.[11] There are strong links between economic productivity and the proportion of the population with high-level skills; hence in vesting in education is essential not only to encourage an increase in the numbers of degree level qualifications, but also to improve the quality of graduates.

The Australian National Engineering Taskforce identified a number of areas to build the capacity of the engineering workforce through education and training.[12] This includes initiatives to improve and

[7] Skills Australia, Australian Workforce Futures, 2010.
[8] The 2006 Adult Literacy and Life Skills Survey measured literacy competence in four domains: prose literacy, document literacy, numeracy and problem solving. The results were ranked on a scale of Level 1 (lowest) to Level 5 (highest). Level 3 was considered the minimum level required to meet the increasingly complex demands of a knowledge society.
[9] Report on Employers Views on Workplace Literacy and Numeracy Skills, Australian Industry Group, May 2010.
[10] Australian Industry Group and University of Technology Sydney, *A More Competitive Manufacturing Industry - Management and Workforce Skills and Talent*, February, 2012.
[11] Review of Australian Higher Education (the 'Bradley Review'), Commonwealth of Australia, 2008.
[12] Building Engineering Capacity through Education and Training, Executive Summary and Recommendations, ANET, May 2011.

facilitate the use of pathways between VET and higher education qualifications. The report makes the point that only 6% of students commencing engineering degrees have articulated from VET study. This is compared to an average of 10% for all higher education courses.[13] In addition to this the completion rates of such students are low and they require additional support to the make the successful transition. The Taskforce recommends early intervention, mentoring and career advice.

There are continuing difficulties associated with attracting young women to an engineering career.[14] There is a need to provide increased support for the participation of women in engineering and related occupations. Available research indicates that only 6% of professional engineers are women and that fewer than 2% of VET qualification completions are by women.[15] The national Industry Skills Council, Manufacturing Skills Australia, has commenced an initiative to promote careers within manufacturing to women. This initiative is known as 'Women at Work– Making a Difference study award'.

There is also concern regarding the low numbers of people graduating from both the higher education and VET sectors in this area.[16] The estimated qualification completion rate for students in the Engineering and related technologies field between 2005 and 2007 was 25% or less for qualifications at Certificate I and above.[17]

In addition to these the Australian National Engineering Taskforce advocated the need to increasing the number of people completing Advanced Diploma or Associate Degree qualifications and raising the profile of engineering cadetships.

Continuing Need for Skilled Migration

There is a continuing need to access skilled migration as an option to address skills shortages. The current impact of skills shortages is such that needs cannot be met by the training of the domestic workforce alone. Skilled migration has been a feature of labour market policy and is expected to continue to play a role in supplementing domestic training efforts. Recent changes to migration policy have impacted upon the capacity and responsiveness of the skilled migration program to deliver skills in occupations that are domestically not available in the short term.[18]

Changes to the General Skilled Migration Program/Independent Skilled Migration Program will make it more difficult for applicants with trade skills – including those in demand in the manufacturing sector – to successfully apply as independent skilled migrants. The biggest barrier is the higher language requirements introduced from 1 July 2011 which set the threshold at International English Language Testing Score (IELTS) 6.

The 457 Visa program is uncapped so this program has the capacity to deliver the skills needed assuming that there are sufficient numbers of people with the requisite skills interested in coming to Australia. There is evidence to suggest that this program is working efficiently e.g. in Victoria the

[13] Ibid, page 9.
[14] Australian Industry Group and University of Technology Sydney, *A More Competitive Manufacturing Industry - Management and Workforce Skills and Talent*, February, 2012.
[15] VOCSTATS, National Centre for Vocational Education Research.
[16] Australian National Engineering Taskforce, 2010*, Scoping Our Future Addressing Australia's Engineering Skills Shortage,* http://www.anet.org.au/wp-content/uploads/2010/12/Scoping-our-futureWEB.pdf
[17] National Centre for Vocational Education Research, 2011, *The likelihood of completing a VET qualification 2005-07*, Adelaide
[18] Australian Industry Group and University of Technology Sydney, *A More Competitive Manufacturing Industry - Management and Workforce Skills and Talent*, February, 2012.

Department of Immigration and Citizenship advises (May 2011)that 90% of 457 applications are granted and that the national median processing time for a 457 business visa is 22 calendar days, meaning industry demands for labour is being actioned quickly. The 457 visa requires an International English Language Testing Score of 5 – considerably more achievable than the requirement for permanent migrants of 6.

Increasing young people in engineering

While there is general public goodwill towards careers in engineering some sectors of the trades continues to be perceived by many as 'dirty, dark and dangerous' with an uncertain future. These perceptions negatively impact on the attractiveness of the sector to potential entrants. Within the tertiary sector the enrolments in engineering and related occupation course are low. Only 16.7% of VET students and 7.4% of higher education students are participating in these courses.[19] Industry needs to be innovative in making career pathways attractive to young people. There are a number of successful programs that have addressed the issue. The Manufacturing and Engineering Skills Advisory Board (MESAB) in Victoria has promoted manufacturing as a career option to young people through various programs such as 'Careers in Manufacturing', 'Young Industry Ambassadors' and 'Girls Make It Go!' The Queensland government's Gateway Schools initiative also encourages young people to take up careers in engineering.

Another factor contributing to engineering skill shortages is the current situation in the secondary school sector. Year 12 enrolments in maths and science have been declining in Australian schools since the mid 1990s.[20] There is a need to improve the mathematical and science skills of secondary school students if they are to advance to tertiary study in the engineering and related skills of study. This has been confirmed by Universities Australia which has reported that 40% of students did not feel encouraged to perform well in maths and science.[21] A new Australian Curriculum for English, mathematics and science for Prep to Year 10 students may address this downward trend. In addition, the Chief Scientist has been asked to explore ways of turning around the decline in students enrolling in Science, Technology, Engineering, and Mathematics (STEM) subjects.

Recent skilling initiatives

The *Building Australia's Future Workforce* policy position was announced in the 2011 Federal budget.[22] A major focus is to increase the capacity of Australia's existing workforce through the development of high level skills which are necessary if Australia is to continue to make the most of opportunities and maximise the benefits of the resources boom and match industry's needs. A variety of measures were announced, some of which are relevant to efforts to address the engineering skills shortage.

A range of measures were introduced to strengthen the Australian Apprenticeship system. The Australian government undertook a review of the system and has initiated some implementation of proposed reforms.[23] These include the introduction of Australian Apprenticeship Advisers and Mentors to support existing apprentices and young people considering a career as an apprentice. Ai Group support this initiative and will be active in the arena of manufacturing apprentices. In addition, an initiative related to Accelerated Apprenticeships has been advanced which has the potential for

[19] Tertiary education and Training in Australia 2009, National centre for Vocational education and Training, 2011.
[20] Acer Research Monograph No. 63.
[21] STEM and non-STEM First Year Students, Universities Australia, 2012.
[22] Australian Government, 2011, *Building Australia's Future Workforce: trained up and ready to work* http://cache.treasury.gov.au/budget/2011-12/content/download/glossy_skills.pdf
[23] Department of Education, Employment and Workplace Relations, 2011, *Australian Apprenticeships Reform* http://www.australianapprenticeships.gov.au/documents/AustralianApprenticeshipsReform.pdf

apprentices to complete their apprenticeship when competency has been achieved rather than relying on a more time-based approach. Once again, Ai Group will pursue this initiative in relation to apprentices covered through the Metal Trades Award.

As well as these new measures there were some pre-existing measures that have been very useful. In The Apprentice Kickstart program was introduced to counteract the impact of the global financial crisis on Australian Apprenticeships commencements and retention.[24] The data indicates that the number of apprentices commencing engineering trades apprenticeships decreased from 10,546 to 6,882 in 2008. By 2010 the number of commencements had increased to 8,414 in part due to the Apprentice Kickstart program.[25]

As indicated there is a need to address the literacy and numeracy skills of the existing workforce. The proposed National Foundation Skills Strategy for Adults (NFSS) will be an essential policy instrument in this area. The Strategy was endorsed by the Ministerial Council for Tertiary Education, Skills and Employment on 25 November 2011 but the strategy has not been made public as yet. It is essential that measures to address workforce literacy and numeracy are central to this initiative as foundation skills are required at all levels of the workforce.[26]

Workforce Development Programs

There has been a series of initiatives concerning workplace development programs with the potential to address skill shortage issues in industry including engineering and related occupations. The Productivity Places Program (PPP) was introduced in 2008 to provide targeted training to support the development of skills to meet existing and future industry demands.[27] An independent review found that the program failed to adequately target its training to skills shortage levels. The training was also skewed to low level qualifications rather than addressing skills shortages and emerging needs.

The Enterprise Based Productivity Places Program (EBPPP) was introduced in 2010 to provide opportunities for employees in participating enterprises to increase their skill levels and gain further qualifications. The program is expected to assist enterprises to increase productivity and meet the demand of today's economy for higher level skills. The program is a partnership between enterprises, Industry Skills Councils (ISCs) and the Australian Government.[28] A review by the Industry Skills Councils was more positive about program outcomes.[29]

The Critical Skills Investment Fund (CSIF) commenced in 2011 with the goal of helping to increase the supply of skilled labour to enterprises in the resources, construction, renewable energy and infrastructure sectors.[30] This fund specifically targets the industries in which engineers and related

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[24] Department of Education, Employment and Workplace Relations *Apprentice Kickstart,* http://www.deewr.gov.au/Skills/Programs/SkillTraining/AustralianApprenticeships/Pages/AAKickstart.aspx

[25] VOCSTATS, National Centre for Vocational education Research.

[26] Industry Skills Councils, 2011, *No more excuses: An industry response to the language, literacy and numeracy challenge,* http://www.isc.org.au/pdf/NoMoreExcuses_FINAL%20FINAL%20single%20page.pdf and Report on Employers Views on Workplace Literacy and Numeracy Skills, Australian Industry Group, May 2010.

[27] Department of Education, Employment and Workplace Relations, *Productivity Places Program Overview,* http://www.deewr.gov.au/Skills/Programs/SkillTraining/ProductivityPlaces/Pages/Overview.aspx

[28] Department of Education, Employment and Workplace Relations, *Enterprise Based Productivity Places Program* http://www.deewr.gov.au/Skills/Programs/SkillTraining/ProductivityPlaces/Pages/EBPPP.aspx

[29] ACIL Tasman 2011 *An economic review of the Enterprise Based productivity Places Program* Industry Skills Councils, http://www.isc.org.au/pdf/REPORT%20-%20EBPPP%20report%20FINAL.pdf

[30] Department of Education, Employment and Workplace Relations, *Critical Skills Investment Fund,* http://www.deewr.gov.au/Skills/Programs/SkillTraining/CSIFund/Pages/Home.aspx

occupations are especially in short supply. Despite the potential of this initiative it is too early to determine the degree of success of this program.

The most recent funding program to support training and workforce development is the National Workforce Development Fund (NWDF) program.[31] Like the previous EBPPP, the program is a partnership between enterprises, ISCs and the Australian Government. Ai Group supports this emphasis on workforce development but the significant churn of initiatives makes it difficult for employers to develop an approach and apply for funding.

It is the view of the Ai Group that consideration and implementation of this wide range of strategies is required to make progress in addressing skills shortages in engineering and related occupations.

[31] Department of Education, Employment and Workplace Relations, *National Workforce Development Fund,* http://www.deewr.gov.au/Skills/Programs/SkillTraining/nwdf/Pages/default.aspx