



ENGINEERS
AUSTRALIA

Jobs and Skills Australia
Labour Market and Migration
E: CoreSkillsList@jobsandskills.gov.au

10 May 2024

Core Skills Occupation List consultation

Engineers Australia welcomes the opportunity to provide feedback to Jobs and Skills Australia regarding the draft Core Skills Occupations List (CSOL). Engineers Australia supports many of the recommendations made in the Migration Strategy released in 2023. Understanding the dynamics of Australia's engineering skills challenge has long been a focus of Engineers Australia.

As Australia's national peak body for engineering, we are the voice and champion of our 120,000-plus members. We provide them with the resources, connections, and growth they need to do ethical, competent and high-value work in our communities. A mission-based, not-for-profit professional association, Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

Engineers Australia maintains national professional standards, benchmarked against international norms. As Australia's signatory to the International Engineering Alliance (IEA), this includes accreditation of undergraduate university engineering programs.

Under the Migration Regulations 1994, Engineers Australia is the designated assessing authority to perform the assessment of potential migrant engineering professionals' skills, qualifications, and/or work experience to ensure they meet the occupational standards needed for employment in Australia.

Due to this and to avoid any real or perceived conflict of interest, Engineers Australia does not provide advice to government on the composition or number of engineers which should be targeted through Australia's migration program. However, this submission highlights key data which should be considered for the occupations targeted for consultation.

Supply of engineers via migration

Engineers born overseas who migrate to Australia, via the skilled, temporary or humanitarian migration programs, are essential to the supply of engineering capability in Australia. The total number of permanent settlements in Australia through the skilled migration program¹ is shown in Table 10 below, filtered to professional engineering unit groups within ANZSCO². We note the recovery in levels of permanent skilled migration since the COVID-19 pandemic occurred, with a 70.8 per cent increase in 2023.

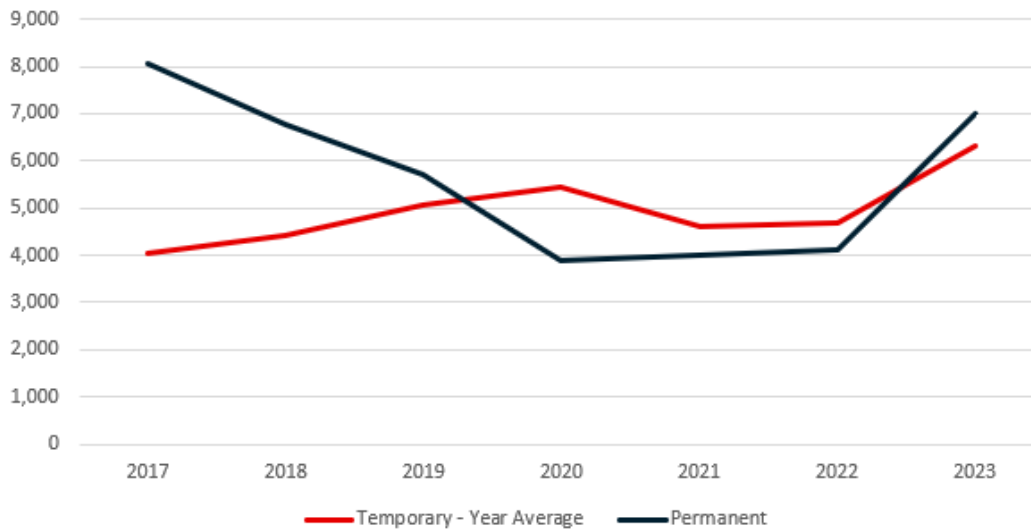
¹ Department of Home Affairs - Permanent Migration Program (Skilled & Family) Outcomes Snapshot – Annual Statistics, BP0068L Permanent Migration Program (Skilled & Family) Outcomes Snapshot – Annual Statistics 2013-14 to 2022-23 v100, 22 March 2024 <https://data.gov.au/data/dataset/096fd157-807c-4ba0-8c63-0754cae4ba35/resource/f0d43822-512e-4687-8bc3-fa59926306a7/download/bp0068-migration-and-child-outcome-since-2013-14-to-2023-06-30-masked-v100.xlsx>

² Engineers Australia analysis yet to be published based on data from Department of Home Affairs (May 2024)

Table 10 permanent settlements - skilled migration scheme – engineers

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total	5,916	7,066	7,743	8,074	6,755	5,694	3,896	4,013	4,107	7,016
% change year on year	-	19.4%	9.6%	4.3%	-16.3%	-15.7%	-31.6%	3.0%	2.3%	70.8%

Figure 11 numbers of permanent and temporary engineer migrants in Australia



There are engineers born overseas working in Australia who are here under different visa types not examined, including temporary graduate visas, partner visas and others. The figures presented here provide an indication in the overall dynamics of the supply of skilled migrant engineers to Australia.

Engineering skills challenge

Engineers Australia would like to emphasise the challenges facing the engineering profession. Australia has experienced a structural shortage of engineers exacerbated by cyclical shortage of engineering skills every decade since the 1980s. This topic has been the focus of both a parliamentary inquiry and other government supported papers.

Analysis of the 2021 census data shows there was an increase of over 93,000 engineers in Australia’s labour force between 2016 and 2021. With just 7,500 on average domestic entry-to-practice Professional Engineers graduating each year, overseas-born engineers make up over 70 per cent of this total³. Australia continues to face a challenge in its engineering workforce supply, making migration an essential part of the pipeline to meet the demands of current and future projects over the short and medium term.

The engineering skills challenge in Australia has been highlighted by numerous reports by reputable organisations across various sectors competing for engineering skills. Infrastructure Australia notes that labour remains the top capacity constraint for infrastructure delivery, with engineers and scientists continuing to experience the largest shortfalls⁴. Similarly, Jobs and Skills Australia includes Engineering Managers, Chemical and Materials Engineers, Civil Engineering Professionals, Electrical Engineers, Industrial, Mechanical and Production Engineers, Mining Engineers and other Engineering Professionals in the list of those which will be critical to at least one segment of the workforce required to achieve the

³ Briggs, P. ‘The Engineering Profession: A Statistical Overview Fifteenth Edition’ *Engineers Australia* (November 2023) <https://www.engineersaustralia.org.au/publications/engineering-profession-statistical-overview-15th-edition>

⁴ Infrastructure Australia ‘Infrastructure Market Capacity 2023 Report’ *Infrastructure Australia* (November 2023) <https://www.infrastructureaustralia.gov.au/publications/2023-infrastructure-market-capacity-report> Jobs

Australian Government's net-zero emissions target by 2050⁵. The Australian Government's Jobs and Skills Councils (JSCs) have also highlighted the skills challenges in engineering across the diverse portfolio of workforce plans. The JSCs bring together employers, unions and governments in a tripartite arrangement to find solutions to skills and workforce challenges. The Manufacturing Industry Skills Alliance highlight the demand growth for skills in core manufacturing occupations electrical engineering, systems engineering and mechanical engineering⁶. Likewise, the Industry Skills Australia Maritime⁷, Rail⁸ and Aviation⁹ industries' workforce plans all include engineering among the occupations required to deliver on major projects and cite shortages across many engineering disciplines required for these workforces.

Furthermore, these industries also compete with the likes of major projects in Defence, such as the AUKUS agreement, which will require a significant engineering workforce to deliver over the coming decades. The impacts of engineering disciplines not being included in the CSOL could range from affecting delivery of major infrastructure, to achieving a clean energy transition.

Underemployment of migrant engineers

Ensuring the correct skills are targeted through Australia's migration program is essential to not exacerbate the current issue of underemployed migrant engineers who are already in Australia. Engineers Australia's 'Barriers to Employment for Migrant Engineers' research report¹⁰ identified seven barriers to employment, leading to recommendations such as positioning migrant engineers as a collective talent pool and providing credible information on employment pathways, aimed at ensuring a sufficient supply of skilled engineers for future projects.

To address this issue, governments bear dual responsibilities: targeting the correct skills through the migration program, and supporting migrants to transition into employment in critical industries. The Global Engineering Talent Program¹¹, developed by Engineers Australia and currently being piloted with the Northern Territory (NT) Government, exemplifies this approach. This initiative assists overseas-qualified engineers struggling to secure employment despite possessing valuable skills. It offers a 6-week preparatory course followed by a 12-week paid work placement at an engineering firm. The success of the NT pilot program has now seen the Queensland Government also funding places in the program for engineers with skills relevant to clean energy roles. Such efforts, as referenced in the Pathway to Diversity in STEM Review¹², highlight a concerted push to create sustainable pathways to meaningful employment for migrant engineers. Continued collaboration among Engineers Australia, employers, and government partners is vital for the success of these endeavours.

Benefits of retaining international students

International students who graduate locally are a good cohort of engineers who should also be supported to facilitate an easier transition to a permanent migration visa. This cohort of engineers in Australia don't face as many barriers as migrant engineers, as they will already have some Australian experience (through work integrated learning) and would have started building local networks through their university course.

⁵ Jobs and Skills Australia 'The Clean Energy Generation: Workforce needs for a net zero economy' *Jobs and Skills Australia* (October 2023) <https://www.jobsandskills.gov.au/publications/the-clean-energy-generation>

⁶ Manufacturing Industry Skills Alliance '2023 Initial Workforce Plan' *Manufacturing Industry Skills Alliance* (Accessed 8 May 2024) <https://manufacturingalliance.org.au/wp-content/uploads/2024/02/Initial-Workforce-Plan-2023-excerpt.pdf>

⁷ Industry Skills Australia Limited, Maritime Industry 'Maritime Industry 2023 Initial Workforce Plan' *Industry Skills Australia* (Accessed 8 May 2024) <https://www.industryskillsaustralia.org.au/initial-workforce-plans>

⁸ Industry Skills Australia Limited, Rail Industry 'Rail Industry 2023 Initial Workforce Plan' *Industry Skills Australia* (Accessed 8 May 2024) <https://www.industryskillsaustralia.org.au/initial-workforce-plans>

⁹ Industry Skills Australia Limited, Aviation Industry 'Aviation Industry 2023 Initial Workforce Plan' *Industry Skills Australia* (Accessed 8 May 2024) <https://www.industryskillsaustralia.org.au/initial-workforce-plans>

¹⁰ Romanis, J. 'Barriers to Employment for Migrant Engineers; Research Report' *Engineers Australia* (October 2021) <https://www.engineersaustralia.org.au/publications/barriers-employment-migrant-engineers>

¹¹ Engineers Australia 'Global Engineering Talent Program' *Engineers Australia* (Accessed 8 May 2024) <https://eea.org.au/global-engineering-talent-program>

¹² Department of Industry, Science and Resources, Australian Government 'Pathway to Diversity in STEM Review final recommendations report' *Department of Industry, Science and Resources, Australian Government* (13 February 2024) <https://www.industry.gov.au/publications/pathway-diversity-stem-review-final-recommendations-report>

Despite this, there are unconscious biases which will still go against them, however programs such as *Professional Year* can support them entering the Australian workforce.

The Multidisciplinary Nature of Engineering

Engineering is a multidisciplinary profession, so a prescriptive focus on individual disciplines or sectors may not resolve workforce issues; a more holistic approach should be taken to address these challenges.

Today's engineering challenges require a blend of knowledge that cuts across traditional disciplinary boundaries. For instance, the implementation of renewable energy solutions requires electrical engineers, environmental engineers, geotechnical engineers, control systems engineers and others to create effective, sustainable systems.

An engineer's qualification discipline does not always align to the area of practice they gain competence in, and the discipline does not restrict them to any one particular sector. Some engineers may progress their careers in the same industry they started in after graduating but many move to other industries or sectors and can develop competencies in one or more areas of practice.

For example, an engineer working in the biomedical field may have a background in mechanical engineering but apply those skills towards developing medical devices.

There are also many engineers leading multi-disciplinary teams. They will not have the technical expertise of all disciplines represented on the project and so will rely on their broad knowledge across the sector, and the discipline experts in the team to achieve the project objectives.

The Need for Experienced Engineers

Ensuring the correct skills are targeted that enable experienced engineers to migrate to Australia can alleviate workforce challenges. Supplementing domestic talent pools with seasoned professionals who possess honed expertise and can mentor younger engineers can help to address skills challenges and foster innovation within the industry. Experienced engineers can also contribute to the timely delivery of critical infrastructure projects, bolstering economic growth and sustainability.

In the engineering profession, gaining experience through practice is critical to an engineer's ability to practice competently. An engineer's value is not only in the deep understanding of theoretical principles but relies on their ability to draw on practical insights and tacit knowledge gained through years of hands-on work on diverse projects and with different teams. Seasoned professionals bring a nuanced perspective to problem-solving, risk assessment, and innovation that would not be present in inexperienced engineers.

To mitigate the risk of adverse outcomes in engineering projects, it is standard practice that experienced engineering professionals have oversight of projects undertaken by more junior engineers. This is because engineering often involves making decisions with long-term implications under conditions of uncertainty and in the absence of complete information. Attempts to substitute experienced capability with headcount is likely to lead to inefficiencies and potentially increase the risk of not meeting project objectives including timeframes, health and safety outcomes and costs.

Engineers Australia values the opportunity to contribute to the consultation on the draft Core Skills Occupation List (CSOL). Our commitment to addressing the complex challenges facing the engineering profession, particularly regarding workforce shortages and skills development, remains steadfast. [REDACTED]

Regards,

[REDACTED]

[REDACTED]