

Chemical Engineer	New South Wales (NSW)
ANZSCO Code: 2331-11	April 2009
Labour market rating	No shortage
Comment: <i>Positions for chemical engineers were generally filled with few problems in process engineering, consulting and research and development in various sectors including manufacturing, heavy engineering, biomedical and waste water.</i>	

Occupational demand

Census data indicate that employment of chemical engineers grew by about one per cent per annum over the five years to 2006. More recently, demand for the occupation has been subdued. The AIG-PricewaterhouseCoopers *Performance of Manufacturing Index* for March indicates that activity in chemicals, petroleum and coal manufacturing in Australia fell for the seventh consecutive month, while activity for manufacturing as a whole in NSW fell for the eleventh consecutive month. Raw coal production in NSW grew by 7.0 per cent in 2008 but declined in January and February 2009 to its lowest level in almost three years.

Occupational supply

DEEWR estimates that supply to the occupation from completions in entry-level university courses in NSW was about 70 persons in 2008, which was below the average of 82 for the previous five years. The annual training rate for the occupation (university completions as a percentage of employed chemical engineers) is 9.7 per cent, which is significantly above the average for all engineering professionals. There are no separate data on immigration of chemical engineers. No quantifiable data on wastage of chemical engineers was available for this report.

Employer and industry comments/current labour market

A DEEWR survey of employers who had recently advertised for chemical engineers found that 75 per cent of vacancies were filled within six weeks of advertising, which was an improvement on the figure of 64 per cent in 2007. The consensus of employers and recruitment agencies was that the supply of chemical engineers had increased considerably in recent months as a number of NSW employers had cut back their chemical engineering workforce and frozen recruitment. This view was supported by the results of the survey, which found an average of 2.5 suitable applicants per vacancy. Advertisers reported a significant increase in the number of applications from interstate, particularly from those with experience in the resources sector in Western Australia. Recruitment agencies noted that vacancies for chemical engineers still attracted many applicants from overseas who were seeking sponsorship but that most employers preferred to recruit engineers with recent Australian experience given the increased supply on the market. Positions for experienced chemical engineers were filled with few problems in process engineering, consulting and research and development in various sectors including manufacturing, heavy engineering, biomedical and waste water. Graduate positions proved particularly easy to fill, with anecdotal evidence of significant cutbacks in graduate recruitment. Unfilled vacancies were mainly confined to senior positions requiring highly specialised experience and were scattered across various industry sectors including petrochemicals, food and beverage manufacturing and personal products manufacturing.

Labour market outlook

While demand for the occupation in areas such as water management and environmental protection should continue to be solid over the short term, this will be offset by subdued activity in mining and manufacturing. Coal mining activity will be adversely affected by the much lower contract coal prices being negotiated for 2009-10 while the global recession and weak consumer spending will continue to have a negative impact on manufacturing production in 2009. As a result, no general shortage of chemical engineers is expected over the short term.

Chemical Engineer	Victoria
ANZSCO Code: 2331-11	April 2009
Labour market rating:	Recruitment Difficulty
Comment: Positions requiring a high degree of specialisation were difficult to fill	

Occupational demand

Chemical engineers design and prepare specifications for chemical process systems and the construction and operation of commercial-scale chemical plants, and supervise industrial processing and fabrication of products undergoing physical and chemical changes. The Australian Bureau of Statistics (ABS) 2006 census data indicate the labour market in Victoria is small, with approximately 432 people employed in this profession. Chemical engineers in Victoria work across a diverse range of industries but nearly half are employed in manufacturing (primarily basic chemical and chemical product manufacturing) and nearly a third work in the professional, scientific and technical services sector. The Australian Industry Group *Performance of Manufacturing Index* (PMI) for April 2009, indicates manufacturing activity as a whole decreased in Victoria for the eleventh successive month. A February 2009 report from Engineers Australia indicates that nationally the property and business services sector also contracted in the latter half of 2008. Recent allocated funding by the State Government towards a number of water projects across Victoria (including the desalination plant at Wonthaggi) may see demand for chemical engineers increase in this sector. The Victorian Manufacturing Plan (November 2008) is providing \$122.7million in initiatives to support the whole manufacturing sector.

Occupational supply

The most common university engineering qualification is a four year bachelor degree which meets the requirements for professional engineer status. DEEWR estimates about 166 people completed an entry level degree in chemical engineering in Victoria in 2007, representing an increase of 43 per cent over 2006. According to the Graduate Careers Council of Australia December 2008 survey, 91 per cent of chemical engineering graduates nationally are in full-time employment. There are no separate data on net immigration of chemical engineers to Victoria from overseas.

Employer and industry comments/current labour market

Few vacancies for chemical engineers were advertised in the six months leading to this report, so a number of employers were cold canvassed for their experiences. Contacts were from different industry sectors including water; petrochemical; and consultancy services; as well as recruitment agencies. A small sample of recently advertised positions revealed that approximately 40 per cent of chemical engineer vacancies were filled. On average, there were 28 applicants per vacancy, of which just over 1 was considered suitable for each position. Consultancy firms surveyed did not have any difficulty filling their vacancies (possibly as they work on projects across a number of different areas) and did not believe there was a shortage. In addition, anecdotal evidence suggests some large consultancy firms have retrenched chemical engineers, particularly those with less experience. Some contacts indicated that the water industry in Victoria is reasonably small and that employers were specifically seeking people with Victorian water industry experience. In addition, the salaries offered by some employers (eg. water authorities) are not as attractive as those available in other settings. These factors may have reduced the number of suitable applicants. Contacts suggested while there may appear to be sufficient number of chemical engineers, positions are hard to fill as employers are now seeking applicants with very industry-specific skill sets and experience. Some employers stated there was no shortage of junior engineers but that those with 10-20 years experience were in short supply.

Labour market outlook

Government initiatives may increase demand for chemical engineers – particularly in the water and waste treatment industries. However recruitment difficulties are expected to continue for the next six months.

Chemical Engineer	Queensland
ANZSCO Code: 2331-11	March 2009
Labour market rating	Shortage
Comment:	

Occupational demand

Chemical engineers design, implement and manage the construction and operation of industrial-scale plant and processes that produce chemical changes in materials, thus producing everyday products such as petrol, plastics and pharmaceuticals. In Queensland, most chemical engineers work in consultancy firms, directly in the manufacturing industry (particularly in oil, gas and mineral processing) or in water supply and treatment in the public sector. In recent years, demand for chemical engineers in Queensland has been driven by extensive government investment in water infrastructure projects to cater for strong State population growth and high levels of activity in the resources sector. Growth in the mineral resource sector can be seen in a report from Queensland's Department of Mines and Energy (DME) which shows oil production in Queensland increasing by 15 per cent to 532 megalitres over the year to June 2008, and 600 new coal seam gas wells drilled during this same period.

Occupational supply

Entry into the profession requires the completion of a four year degree in chemical engineering. Specific commencement figures for chemical engineers are difficult to ascertain as some universities offer a year of generic engineering subjects prior to students choosing a discipline. However, available data from the Department of Education, Employment and Workplace Relations show that between 2004 (26) and 2007 (42), commencements in chemical engineering courses increased by 61 per cent. The number of students completing their studies over the same time has grown accordingly with 65 chemical engineers graduating at the end of 2006. To work in Queensland, it is a mandatory requirement that chemical engineers be registered with the Board of Professional Engineers (Qld). Arrivals and departures data from the Department of Immigration and Citizenship suggest that overseas immigration may have supported supply to this profession as 190 self-identified other building and engineering professionals (which includes chemical engineers) migrated to Queensland in 2007-08.

Employer and industry comments/current labour market

None of the employers surveyed during this year's study were successful in filling vacancies for chemical engineers within six weeks of advertising. Employers in this sample group were seeking professionals with extensive experience and although respondents reported an increasing number of applicants to their advertisements over the last six months, only 15 per cent of the applicants were considered suitable. Applicants who were considered unsuitable typically lacked the depth of experience sought by the employer, or the specific skills required for the position. Applicants with more than five years experience in the oil and gas industry were especially difficult to recruit. Recruitment specialists advised that, contrary to previous years, employers are more likely to insist that shortlisted applicants possess specific skill sets and industry experience. A number of respondents reported that they had received a moderate level of interest from overseas. However, they did not give these candidates serious consideration because they were unable to demonstrate specific industry or Australian regulations experience.

Labour market outlook

The current State-wide shortage of chemical engineers is expected to continue throughout 2009 in line with ongoing developments in water management initiatives and the mineral resources projects. Despite the recent downturn, resource companies in Queensland are pushing ahead with expansions and the DME predicts that coal seam gas production will exceed 130 petajoules by 2009-10. Although graduate supply appears to be increasing, the present demand is for experienced chemical engineers, and immigration is not meeting the shortfall.

Chemical Engineer		South Australia
ANZSCO Code: 2331-11	February 2009	
Labour market rating	No Shortage	
Comment		

Occupational demand

ABS Census data show a twelve per cent decline in the number of chemical engineers employed in South Australia over the five years to 2006. There were less than 100 chemical engineers working in the state according to the last Census count. The main employing industries are manufacturing, mining and water supply. A number also work in organisations providing engineering design and consultancy services. Employment opportunities are therefore influenced by activity levels in these industry sectors. Conditions in both the manufacturing and mining industries have been adversely affected by the global economic downturn and therefore demand conditions have deteriorated in these sectors. Engineering construction activity related to water storage and supply, sewerage and drainage grew solidly through the year to September 2008, although this does not appear to have translated into any significant increase in demand for chemical engineers. DEEWR's Skilled Vacancies Index data show that the number of advertised vacancies for chemical engineers remained low and stable over the past year.

Occupational supply

Entry into the profession usually requires completion of a university degree in chemical engineering. A four-year bachelor degree is available through the University of Adelaide. Over the five years to 2007, the number of students commencing a degree in chemical engineering at this institution averaged 37 per annum. Over the same period, completions averaged 29 per annum. DEEWR projections suggest graduate numbers will be at a similar level in both 2008 and 2009. An additional potential source of supply is skilled migration, although in the case of chemical engineers this is not significant.

Employer and industry comments/current labour market

Few vacancies for chemical engineers were advertised in the previous six months. Of the small number of vacancies identified for this report, one position was filled without difficulty, while the other was withdrawn due to the economic downturn. Both vacancies attracted large numbers of applicants, including people from interstate and from the mining industry. Feedback from employers cold-canvassed for this report suggest that current demand for chemical engineers is low and there were no reports of either recruitment difficulties or unfilled vacancies amongst these additional contacts. Moreover, there was anecdotal evidence that some chemical engineers had recently been laid-off as a result of the worsening economic conditions. Overall, the research findings indicate that underlying demand for chemical engineers is relatively low and there was no evidence that the occupation is currently in shortage.

Labour market outlook

Demand for chemical engineers is expected to remain weak over the short term given the unfavourable outlook for industries which are major employers. At the same time, supply levels are projected to remain stable and therefore a shortage of chemical engineers is unlikely to emerge during the next twelve months.

Chemical Engineer		Western Australia
ANZSCO Code: 2331-11		March 2009
Labour market rating:	No Shortage	
Comment		

Occupational demand

Australian Bureau of Statistics (ABS) census data of 2006 shows that over 40 per cent of chemical engineers in Western Australia (WA) work in the manufacturing sector. Chemical engineers are employed in engineering design and engineering consultancy services, alumina and aluminium production and water supply. There is commitment in place for expenditure of \$2.5 billion for an alumina refinery in the south of WA, with an investment of a further \$1.5 billion under consideration at a separate location. ABS reports indicate that in the December quarter 2008 there was a rise in petroleum exploration expenditure of 48 per cent to \$540 million. Industry sources also indicate that gold mining continues to be strong in WA. All these industries are employers of chemical engineers. ABS data show the number of chemical engineers in WA has increased by 29 per cent between 2001 and 2006, to 331. The ABS Labour Force Survey shows that between November 2007 and November 2008, employment in this occupation has increased at a similar rate.

Occupational supply

A four-year Bachelor of Engineering degree majoring in Chemical Engineering is available at Curtin University and the University of Western Australia (UWA). Chemical and Process Engineering has been offered at UWA since 2006. The first cohort of the UWA graduates will complete their degree at the end of 2009 for single degree and 2010 for double degree. Chemical engineering graduates often obtain employment in alternative fields after acquiring a double degree. Domestic graduate numbers from Curtin were 85 in 2007 and 72 in 2006. No immigration data is available on Chemical Engineers.

Employer and industry comments/current labour market

A DEEWR survey of employers who had recently advertised for chemical engineers showed 86 per cent of vacancies were filled within six weeks of advertising. There were five applicants per vacancy of whom two per vacancy were considered by employers to be suitable. Several employers reported that chemical engineer positions could usually be filled by a person with a BSc. in chemistry or metallurgy as well as a chemical engineer. Large employers reported that the slow down in new projects and exploration activity is starting to flow through to employment which requires the skills of a chemical engineer. Many of the large employers of chemical engineers report they are now starting to shed or rationalise their staffing. Employers in specialist mining sector supply, and companies who provide contract services to the resource industry report scaling back of demand as the major employers cut into future expenditure. Several employers said that internal recruitment was becoming very important as they try to maintain their specialist staff. They were then able to fill the gaps in their workplace plans with highly qualified people who were now coming on to the labour market as a result of the slow down. Employers report a general expectation that the workload will contract rapidly but the contraction will be deeper in certain sections of industry. The slow down in new projects and exploration activity is also starting to flow through to the smaller and specialist suppliers of chemical engineering services and consulting companies and many are also starting to shed or rationalise staff. Employers said that oil and gas projects in WA are continuing to develop and they are factoring this into their workforce development planning for the employment of chemical engineers.

Labour market outlook

In the medium term employment outlook is expected to remain stable with no shortages expected in this area of specialisation.