

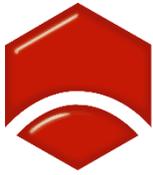


ENGINEERS
AUSTRALIA

Engineering Vacancies Report

2017 Update

February 2018



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Introduction

This policy report investigates the current state of engineering employment in Australia by analysing the direction of change in engineering vacancy numbers. The Australian Government Department of Employment has released its January 2018 Vacancies Report which covers trends in job vacancies to the end of December 2017, including revisions for previous months. The statistics presented are the Department's revised and preferred trend series. All the vacancy numbers and graphs presented in this report are in trend terms.

Job vacancies can provide a valuable gauge of the state of the labour market as vacancies are a key indicator of unmet demand for labour in the economy¹. When the demand for labour is strong, the levels of vacancies will also generally rise. Analysing movements in engineering vacancies can provide a broad indication of the direction of the engineering labour market. This report will investigate vacancy trends in Australia as well each state and territory. Further analysis of engineering occupations is also investigated, and this is to Australian and New Zealand Standard Classifications of Occupations (ANZSCO) four-digit unit group classifications.

This report will include trends in the engineering occupations of:

- *Engineering managers* (unit group 1332). This includes engineering managers only.
- *Chemical and materials engineers* (unit group 2331). This includes chemical engineers and materials engineers.
- *Civil engineering professionals* (unit group 2332). This includes civil engineers, geotechnical engineers, quantity surveyors, structural engineers and transport engineers.
- *Electrical engineers* (unit group 2333). This includes electrical engineers only.
- *Electronics engineers* (unit group 2334). This includes electronics engineers only.
- *Industrial, mechanical and production engineers* (unit group 2335). This includes industrial engineers, mechanical engineers and production or plant engineers.
- *Mining engineers* (unit group 2336). This includes mining engineers and petroleum engineers.
- *Other engineering professionals* (unit group 2339). This includes aeronautical engineers, agricultural engineers, biomedical engineers, engineering technologists, environmental engineers, naval architects and engineering professionals not elsewhere classified.
- *ICT support and test engineers* (unit group 2632). This includes ICT quality assurance engineers, ICT support engineers and ICT systems test engineers. It must be noted that for this occupation it can be hard to gauge how many of these occupations are engineering specific, so some caution should be taken with numbers for this occupation.
- *Telecommunications engineers* (unit group 2633). This includes telecommunications engineers and telecommunications network engineers.

¹ Edwards. K, and Gustafsson. L, 2013. Reserve Bank of Australia, Bulletin, September Quarter, *Indicators of Labour Demand*. www.rba.gov.au

Executive Summary

Engineering vacancies in Australia have been much more variable than general vacancies over the last decade. The engineering profession saw pronounced engineering job growth periods during the resources boom, and was able to recover strongly after the Global Financial Crisis. In 2013 engineering jobs deteriorated rapidly, and remained at low levels until signs of recovery in late 2016. Over the course of 2017 engineering vacancies grew consistently, and this growth has been at a more reasonable pace when compared to the previous booms.

Engineering job vacancy numbers are still being led by New South Wales, which has recorded over 1,300 vacancies in December 2017. Engineering vacancies in the state grew 6 per cent over 2017. New South Wales is followed in engineering vacancy numbers by Victoria with almost 950 vacancies recorded in December 2017. Victoria's growth in engineering vacancies has been strong, with growth of 28.6 per cent recorded for 2017.

2017 has also been an encouraging year for engineering vacancies in Queensland (788 in December 2017) and in Western Australia (667 in December 2017), with 36 per cent growth in Queensland and 49.5 per cent growth in Western Australia. South Australia has also continued to see strong growth in engineering vacancy numbers throughout 2017 (182 in December 2017) with growth of 33.5 per cent over the year.

The smaller jurisdictions of Tasmania, the Northern Territory and the Australian Capital Territory usually record much more variable growth rates than the other jurisdictions due to their smaller size, however there has been solid growth recorded over the course of 2017 for Tasmania (16.4 per cent) and the Northern Territory (53.6 per cent). The ACT has also seen growth (3.5 over 2017) but it has been minimal when compared to the other jurisdictions.

The majority of the engineering job vacancies recorded are for civil engineering occupations. Civil engineering vacancies dominate the vacancies for engineers in New South Wales, Victoria, South Australia, and Tasmania. In Queensland and the Northern Territory, civil engineering vacancies are also the largest engineering occupation vacancy, but there is also a high amount of mining engineering jobs recorded in those jurisdictions. In the ACT civil engineering occupations are fairly even with ICT support and test engineers. In Western Australia, the most engineering occupation vacancies are for mining engineers which has grown particularly strong throughout 2017.

Other engineering occupations such as industrial and mechanical engineering vacancies have grown over the course of 2017 and they are prominent in the major states. Electrical engineering occupation vacancies have also continued to grow over 2017 with particularly strong growth in Victoria and Queensland, with notable growth also in South Australia. Other occupations are also recording more vacancies and this is most likely a flow-on effect of major projects underway in some of the larger states.

Australia

Engineering vacancies in Australia have historically demonstrated a higher level of variance compared to job vacancies in Australia overall. Engineering job vacancies were heavily influenced by the construction phase of the resources boom and the Global Financial Crisis (GFC).

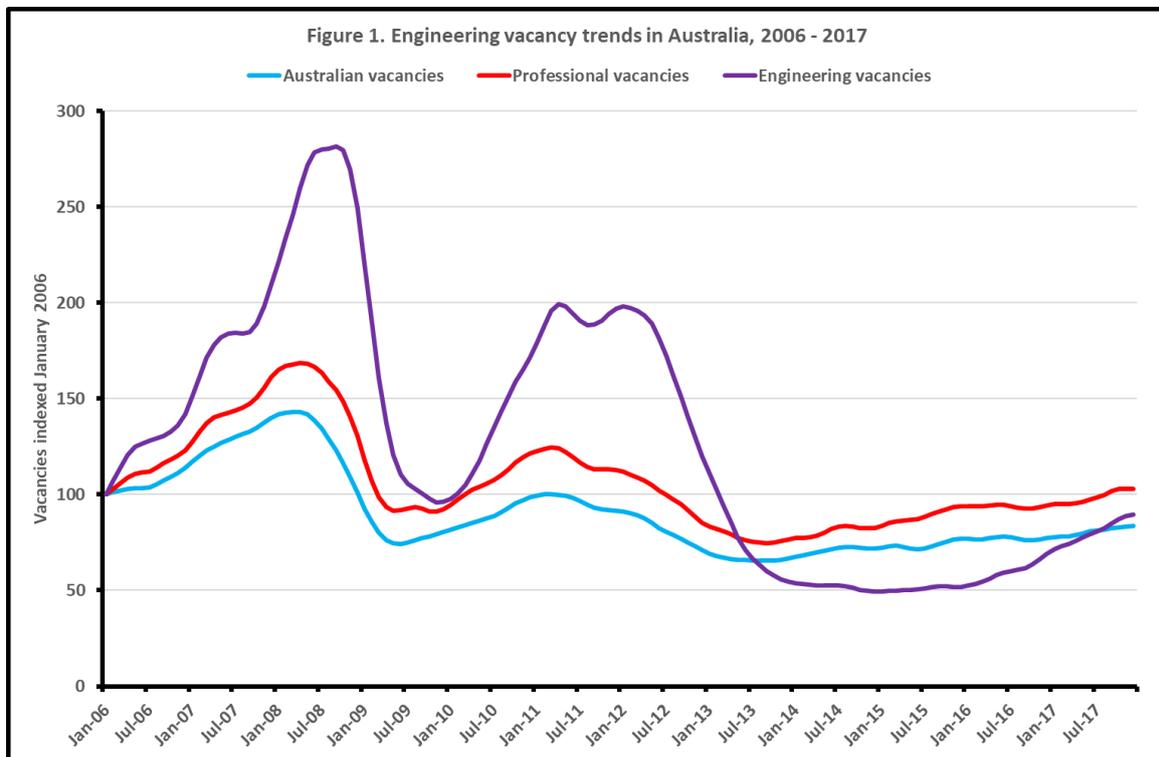


Figure 1 provides background information about the changes to the Australian labour force, the professional occupation labour force, and the engineering labour force over the last decade. As demonstrated above, engineering vacancies have been considerably more influenced by economic forces compared to the broader labour market. In 2006 Australia's engineering labour force grew significantly to meet the demand for engineers during the construction phase of the resources boom, peaking in 2008. The engineering labour force then weathered the GFC which soon followed, and a second period of strong job growth was seen in 2010 and 2011.

This recovery was short-lived and the engineering labour market began to deteriorate rapidly from December 2012 as engineering vacancies began a 30-month slide. This deterioration continued through to 2014 and engineering vacancies remained at low levels, until new signs of growth appeared again in 2016. The growth seen over the course of 2017 has been much slower, but is also more stable growth compared to the growth of the booms in earlier years. This indicates that the engineering job market may be slowly returning closer to the levels seen just before the resources boom. The recent growth trend as seen in Figure 1 is an encouraging sign of improvement in the engineering labour force.

Engineering vacancies grew from 2,419 in January 2016 to 4,134 in December 2017. In the last 12 months engineering vacancies have grown 25.5 per cent, compared to just 7.4 per cent for total Australian vacancies. At its peak in September 2008, there were 13,006 vacancies recorded for engineers, while at its lowest point in December 2014, there were only 2,274 vacancies recorded for engineers.

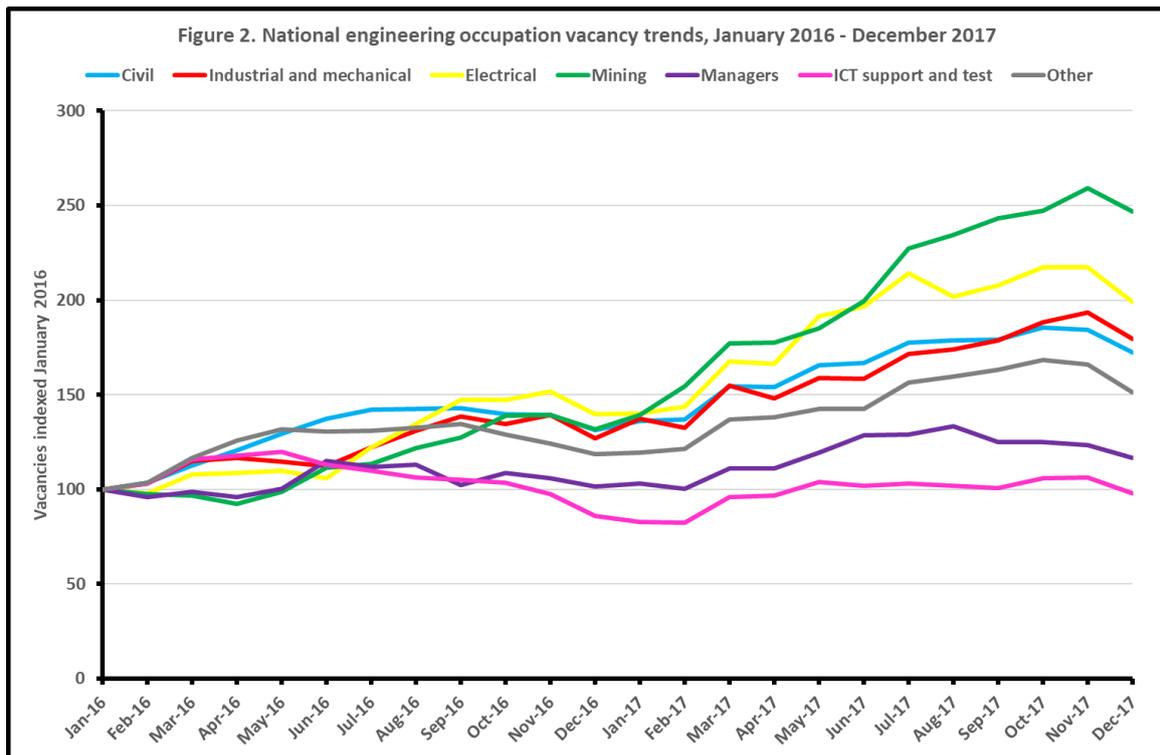


Figure 2 provides further insight to the growth trends of engineering occupations which have fuelled the overall growth in engineering vacancies over the last two-year period. Looking at figure 2:

- Civil engineering occupations have been driving the majority of growth in overall engineering vacancies over the past 12 months. Although the growth trend in this occupation is not the largest, it is the largest occupation and has the biggest influence on the overall trend. This is on the back of growth in New South Wales and Victoria. Civil engineering vacancies consistently record the highest number of all engineering vacancies with 2,133 vacancies recorded in December 2017, up from 1,685 recorded in January 2017.
- Vacancies for industrial and mechanical engineers has grown steadily over the last 12 months with 617 vacancies recorded in December 2017. This is up from 472 vacancies recorded a year ago in January 2017.
- Vacancy numbers for electrical engineers has seen consistent growth over the last 12 months. In January 2017 there were 212 vacancies recorded, growing to 301 in December 2017. Electrical engineering jobs are spread through the major states.
- Mining engineering occupations have grown over the last 12 months, with numbers growing strongly in the last six months of 2016. This comes off the back of strong growth in mining engineering vacancies in Western Australia, and to a lesser extent in Queensland. In January 2017 there was 298 vacancies recorded, which has quickly moved up to 528 recorded in December 2017.
- Engineering manager occupations have remained fairly consistent over the past two years, with a small spike in the second half of 2017. In January 2017 there were 124 vacancies recorded, growing to 160 in August 2017, dropping to 141 in December 2017.

- ICT support and Test engineer vacancies are not following the trend of other engineering occupations, and have been rising and falling over the last two-year period. In January 2017 there were 427 vacancies for this occupation, growing to 549 vacancies in November 2017, and dropping back to 507 recorded in December 2017.

There are other engineering occupations that are not shown in Figure 3 as they have consistently recorded much smaller numbers historically, and growth can be much more variable in these occupations. In December 2017 there was 91 vacancies for telecommunications engineers, 42 vacancies for electronics engineers and 26 vacancies for chemicals and materials engineers.

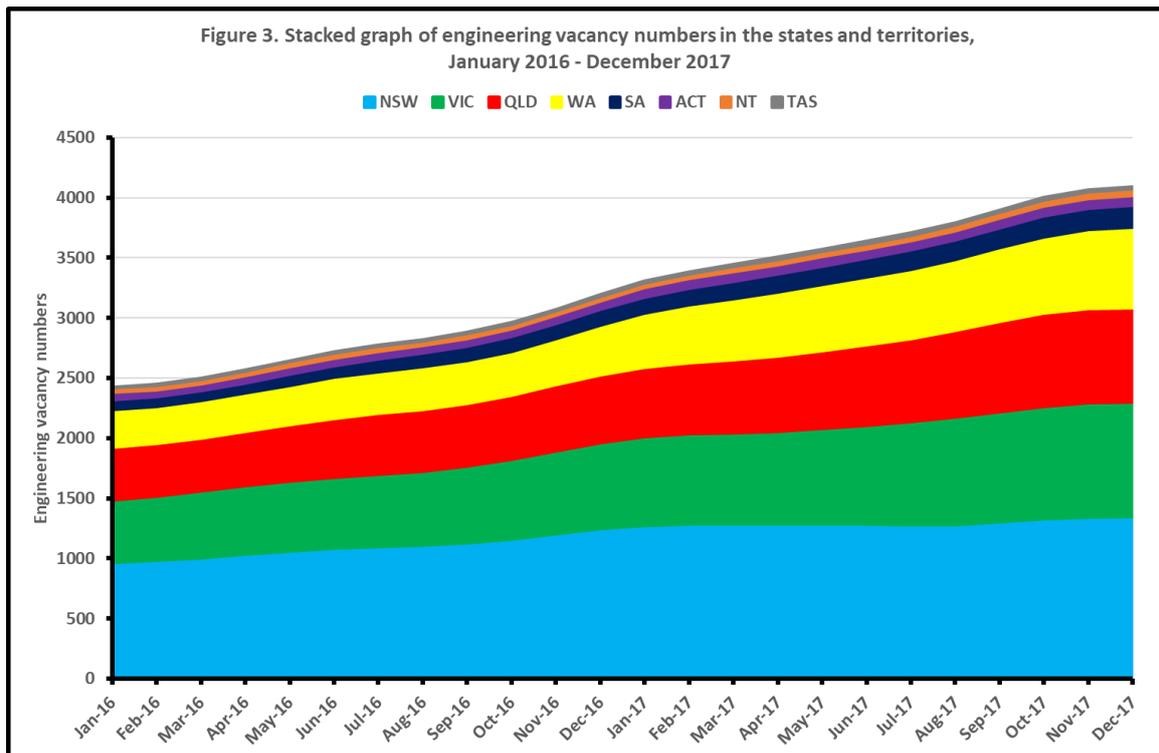


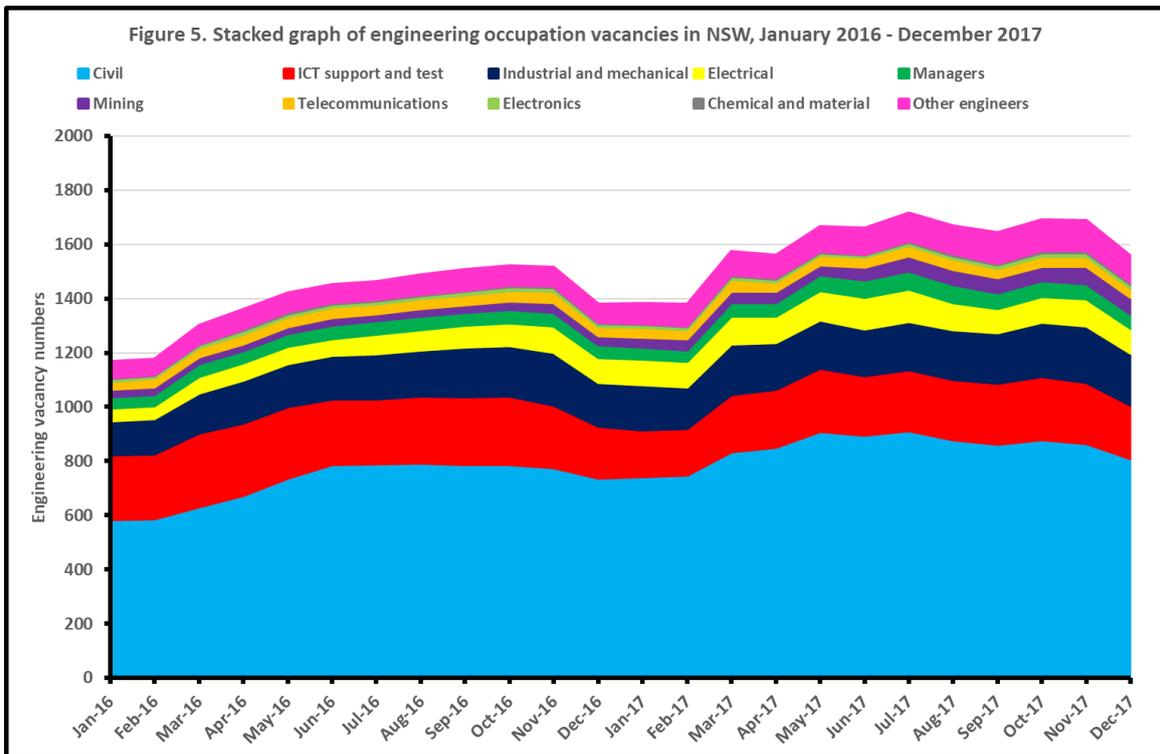
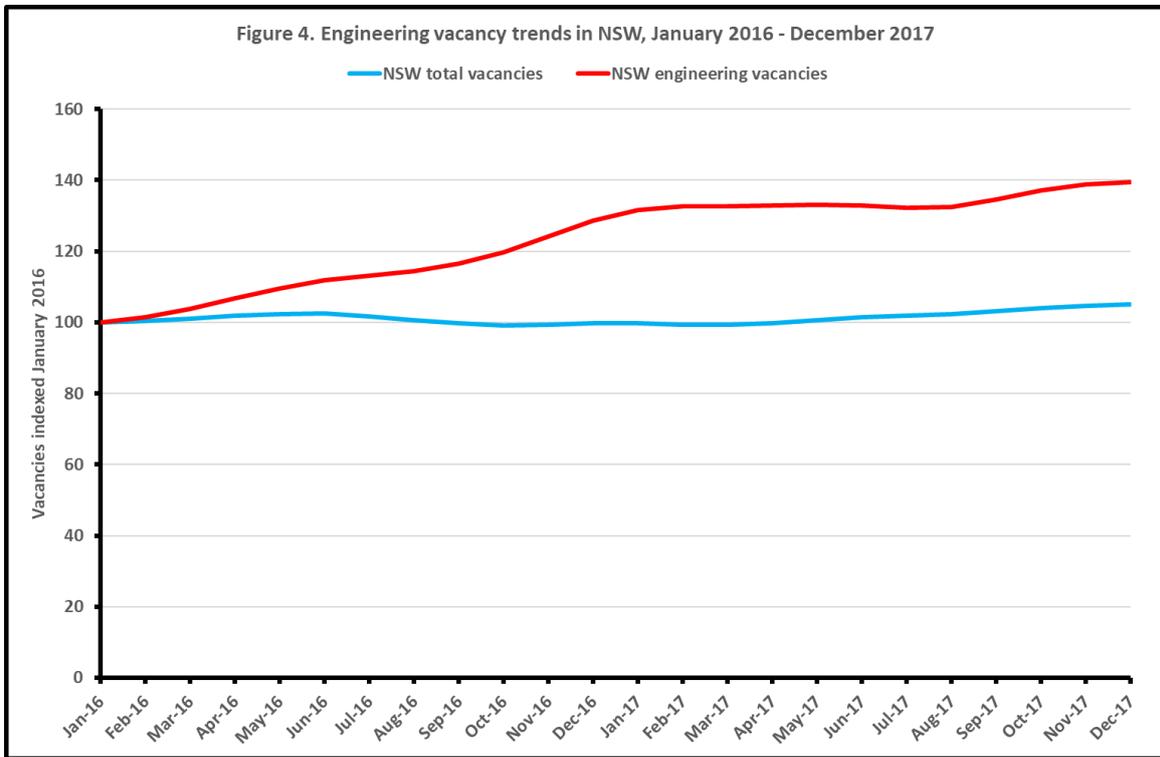
Figure 3 is a stacked graph which shows how engineering vacancies are shared throughout the states and territories. As seen in Figure 3 New South Wales is the state which has consistently recorded the largest amount of engineering vacancies, followed by Victoria, Queensland and Western Australia. Most of the growth seen in the Australian engineering labour market can be attributed to increasing vacancy numbers seen in these larger states. Growth which began in the second half of 2016 was the first real indication that a recovery may be underway in the engineering labour market, and this growth continued throughout 2017. This growth is much more of a slow consistent growth compared to the rapid growth of the booms in 2008 and 2011.

What Figure 3 also tells us is that growth isn't concentrated in only one jurisdiction, and is more in standing with job vacancies after a boom in a sector which was so strong it masked growth in other sectors. During the resources boom we also witnessed more significant growth in the states more dependent on resources. The pattern that we are seeing in the last few years may be more promising to see as we have moved away from a resources dependent pattern towards a more normal pattern where growth is more evenly distributed between the states and territories.

In the following chapters this report discusses each state and territory in more detail including the engineering occupations which are pushing up the number of vacancies in each state.

New South Wales

New South Wales has consistently recorded the highest number of engineering vacancies in Australia for the last two years. Figure 4 below shows engineering vacancy trends in NSW in comparison to overall vacancy trends in the state, while Figure 5 is a stacked graph of the engineering occupations in the state.



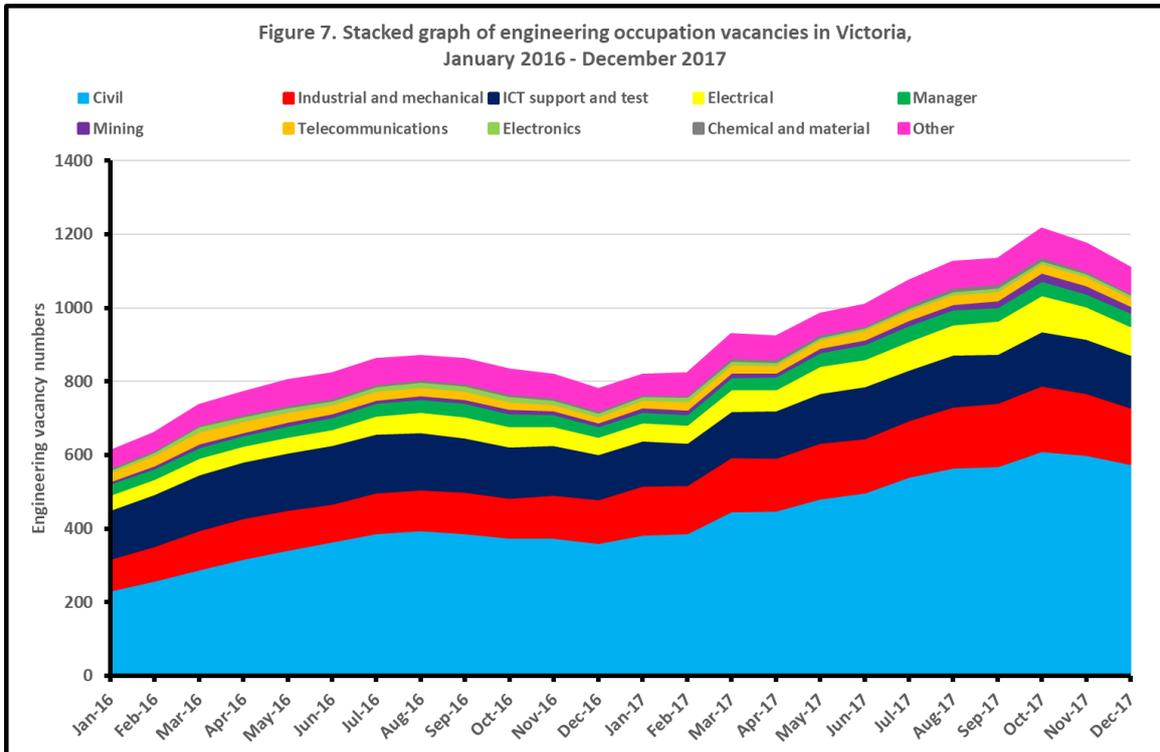
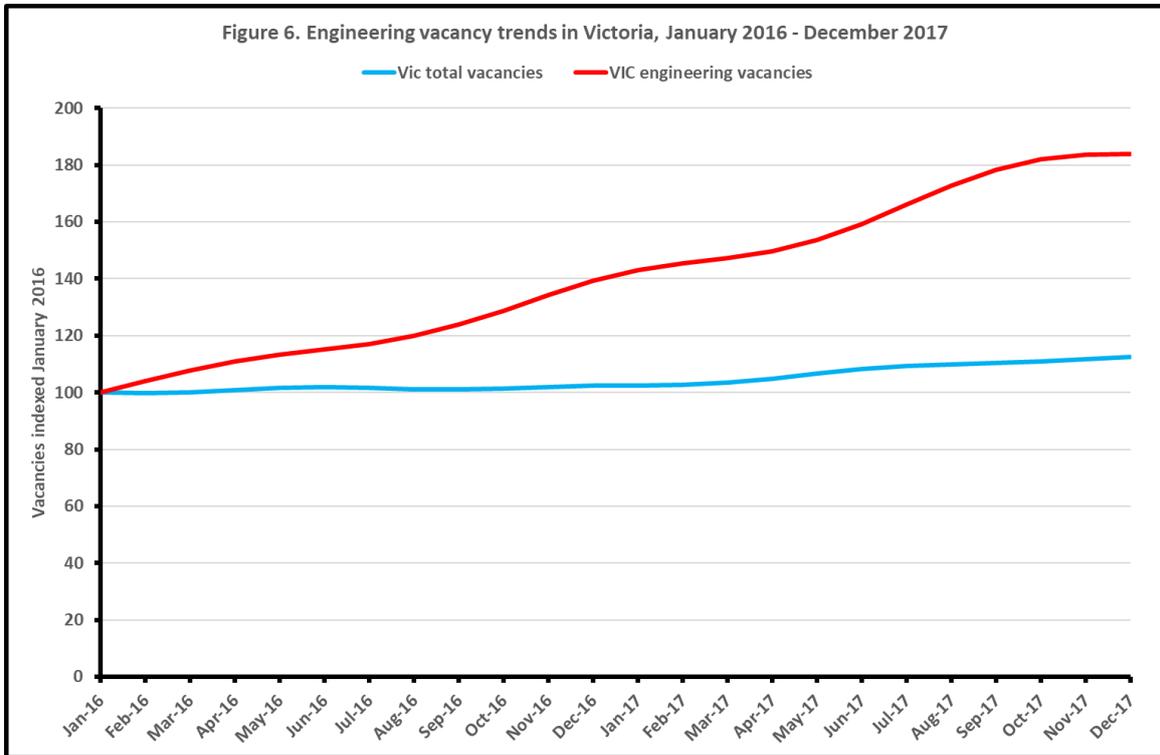
Engineering vacancy growth trends in NSW have consistently been higher than overall NSW vacancies for the last two years, and have grown slightly higher over the last 12 months. Over the last 12 months total NSW vacancy numbers have grown 5.3 per cent, compared to 6 per cent for NSW engineering vacancies over the same time period. In January 2017 there was 1,274 vacancies recorded for engineers, which grew to 1,349 vacancies recorded in December 2017.

Engineering vacancy numbers in NSW are dominated by vacancies recorded in Civil engineering occupations, which make up roughly 60 per cent of all engineering vacancies in the state. Some points of note in NSW are:

- Civil engineering occupations continue to drive the increasing numbers in NSW engineering vacancies. In January 2017 there was 583 vacancies recorded, which grew to 911 recorded in July 2017. In recent months this has dropped back down to 808 recorded in December 2017.
- Industrial and mechanical engineering occupations have grown over the course of 2017. In January 2017 there was 165 vacancies recorded which grew to 208 recorded in November 2017, dropping back slightly to 192 in December 2017.
- Electrical engineering occupations have remained reasonably flat over the course of 2017. In January 2017 there were 95 vacancies recorded, rising to 120 in July, falling back to 93 recorded in December 2017.
- Engineering manager occupation vacancies have remained reasonably steady in NSW. In January 2017 there were 46 vacancies recorded, with 66 recorded in July, dropping back to 50 recorded in December 2017.
- Vacancies for mining engineers in NSW have almost doubled over the course of 2017. In January there were 35 vacancies recorded, which has jumped to 62 recorded in December 2017.
- Vacancies for ICT support and test engineers have remained reasonably steady, growing from 173 vacancies recorded in January 2017, growing to 225 in July, and dropping back to 199 in December 2017.
- In December 2017 there were 34 vacancies recorded for telecommunications engineers, 15 for electronics engineers and eight for chemicals and materials engineers. All of these occupations increased over a 12-month period.

Victoria

Victoria has seen a rise in engineering vacancies over the past 12 months. Figure 6 below shows the vacancy trends for engineering vacancies in Victoria in comparison to trends for all Victorian vacancies. Figure 7 is a stacked graph of the engineering occupations in the state.

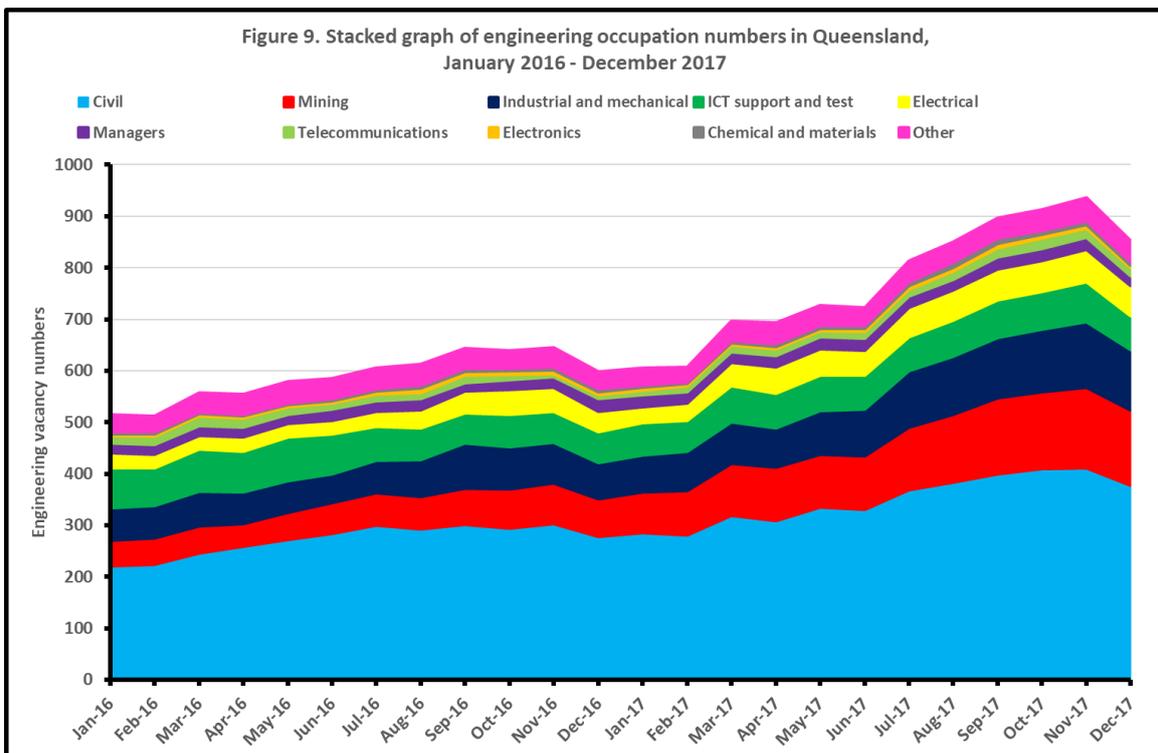
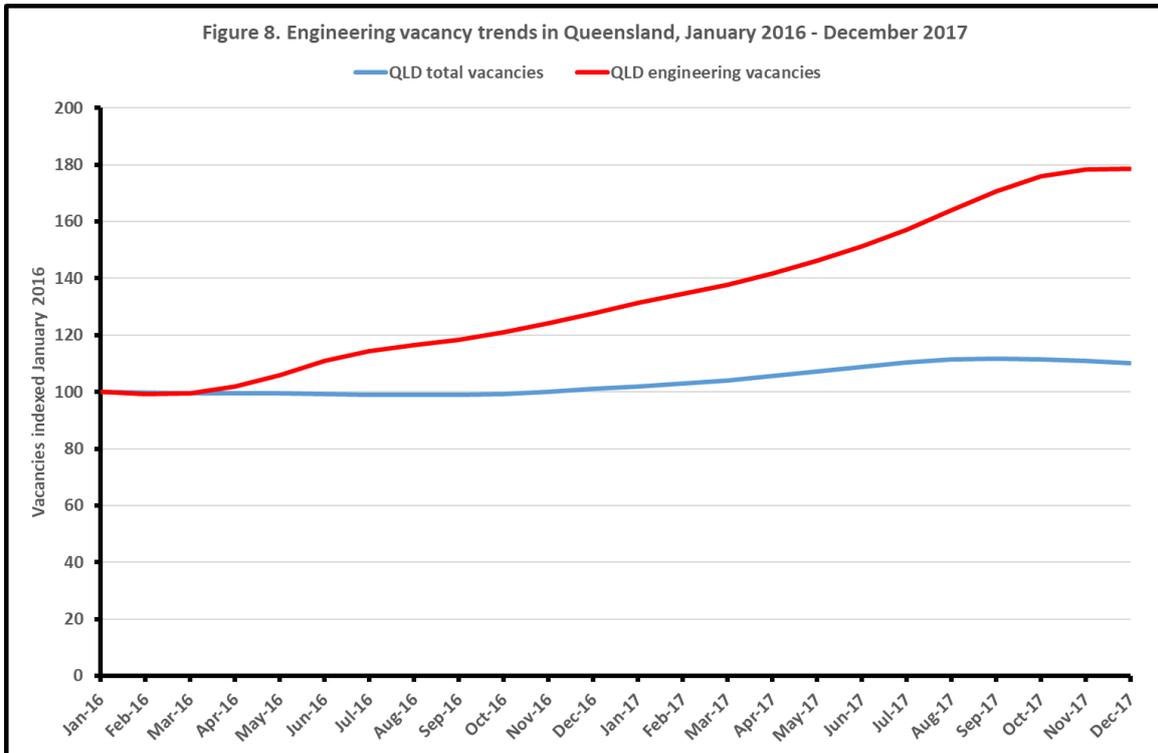


Engineering vacancy trends in Victoria have been growing at a higher rate compared to overall Victorian vacancies over the course of 2017 with growth in a number of engineering occupations in this time. Over the past year total Victorian vacancies have grown by 9.8 per cent, compared to 28.6 per cent for engineers. In January 2017 there was 738 vacancies recorded for engineers, which grew to 948 vacancies in December 2017. Engineering vacancies in Victoria are dominated by vacancies recorded in Civil engineering occupations in the state as seen in figure 7. Some points of note are:

- Civil engineering occupations have been the main driver in the growth of Victorian engineering vacancy numbers, pushing overall engineering vacancies for the state. In January 2017 there was 386 vacancies recorded for civil engineering professionals, which grew to 613 in October 2017, dropping back to 577 in December 2017.
- Industrial and mechanical engineering occupations have grown slightly over 2017, with the strong growth seen throughout the middle of 2017. In January there was 133 vacancies recorded for industrial and mechanical engineers, growing to 178 in October, dropping back to 155 in December 2017.
- Electrical engineering occupations have grown over the course of 2017. In January 2017 there were 49 vacancies recorded, growing to 99 vacancies recorded in October. As of December the number has dropped back down to 78.
- Engineering manager occupation vacancies have remained steady in Victoria. In January 2017 there was 28 vacancies recorded, growing to 42 vacancies in August, and dropping back to 38 in December.
- Vacancies for mining engineers in Victoria could be considered at low levels, especially when compared to Queensland and Western Australia, but also compared to NSW. In January 2017 there were 12 vacancies recorded, growing slowly to record 18 in December 2017.
- ICT Support and Test engineering vacancies have remained steady over 2017. In January 2017 there was 123 vacancies recorded, growing slightly to 142 recorded in December 2017.
- Vacancies for telecommunications engineers can remained steady over the course of 2017. In January there was 19 vacancies recorded, compared to 22 vacancies recorded in December. Electronics and chemical and materials have consistently remained the two occupations with the lowest vacancies, with both consistently recording lower vacancies per month over 2017.

Queensland

Queensland engineering vacancies increased during the second half of 2016 after a long period of low numbers. Figure 8 below shows engineering vacancy trends in Queensland over the past two years, in comparison to Queensland total vacancies. Figure 19 is a stacked graph of the engineering occupation vacancies in the state.

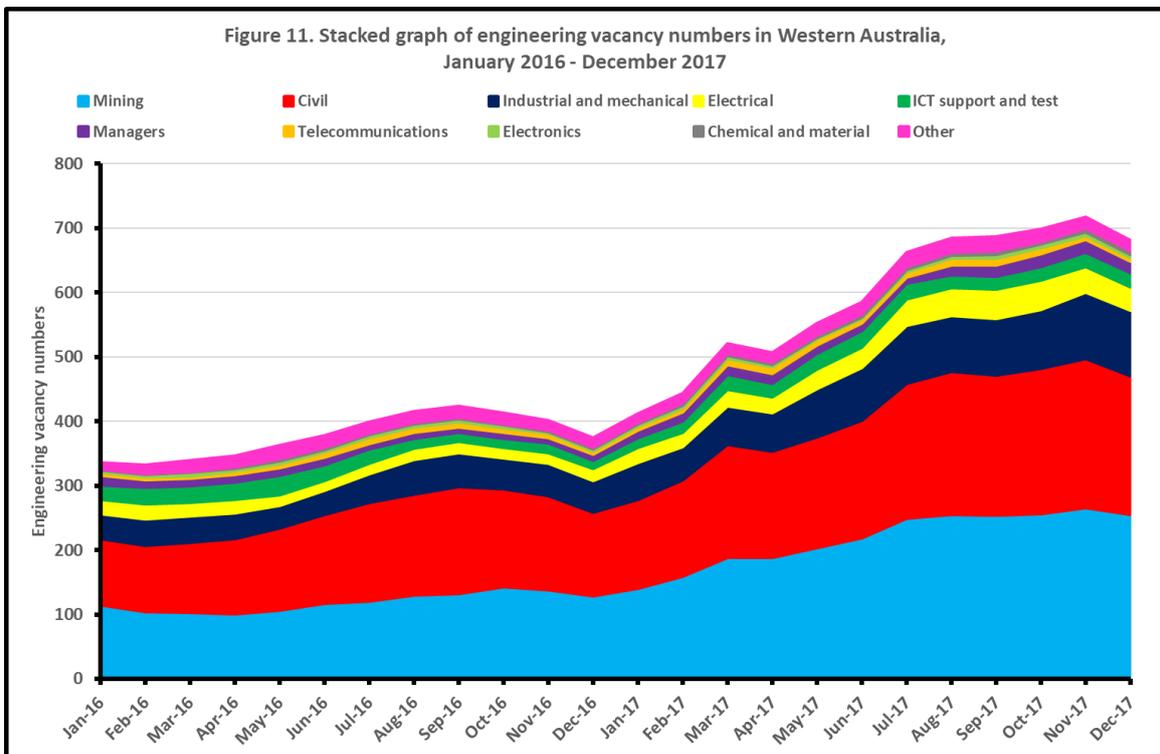
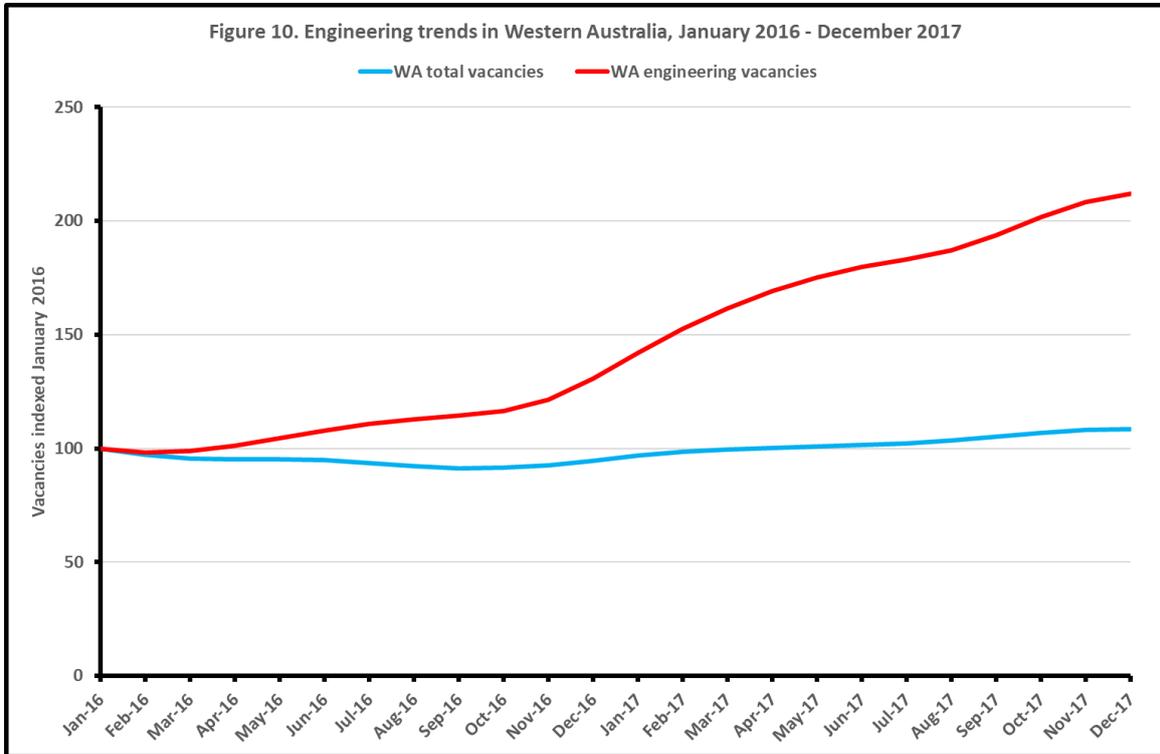


Engineering vacancy trends in Queensland grew consistently over the course of 2017, far outstripping the growth in overall Queensland vacancies. Over the course of 2017 Queensland overall vacancies grew at a rate of 8.1 per cent compared to 36 per cent for engineering vacancies in the state. In January 2017 there were 579 vacancies for engineers in Queensland, growing to 788 in December 2017. Engineering vacancies in Queensland comprise a large portion of civil engineering occupations, which is followed by mining engineering occupations, and industrial and mechanical occupations as seen in figure 9. Some points of note in Queensland are:

- Civil engineering occupations have recorded the highest number of engineering vacancies in Queensland. In January 2017 there was 285 vacancies recorded, which grew to 412 in November 2017, dropping back slightly in the last month of the year to 377.
- Vacancies for mining engineers in Queensland have almost doubled over the course of 2017. In January 2017 there was 79 vacancies recorded, which has grown to 147 vacancies in December 2017.
- Industrial and mechanical engineering have grown steadily over the course of 2017. In January 2017 there was 70 vacancies recorded, which grew to 127 in November, dropping back to 116 vacancies in December.
- Electrical engineering vacancy numbers have seen slow but consistent growth over the course of 2017. In January there was 30 vacancies recorded, jumping up to 63 in November, and dropping back to 59 in December.
- ICT Support and Test engineers and Engineering manager occupation vacancies have remained steady in Queensland. ICT support and test engineering vacancies have hovered each month between 60 to 80 vacancies, while engineering manager vacancies have lingered around the 20 vacancy mark each month during 2017.
- Telecommunications, electronics and chemical and materials have consistently remained the three occupations with the lowest vacancies, and each of these occupations has remained steady over the course of 2017.

Western Australia

Western Australia engineering vacancies increased during the second half of 2016 after a period of falling numbers in late 2015. Figure 10 below shows engineering vacancy trends in WA over the past two years, in comparison to WA total vacancies. Figure 11 is a stacked graph of the engineering occupation vacancies in the state.

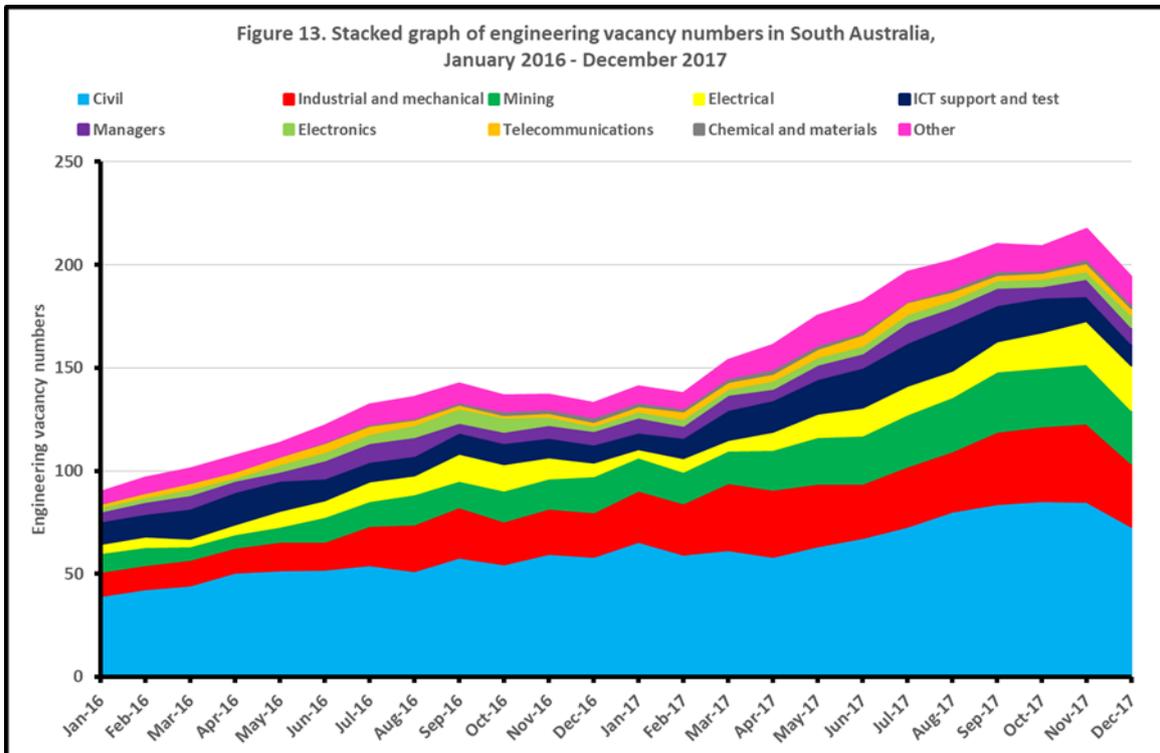
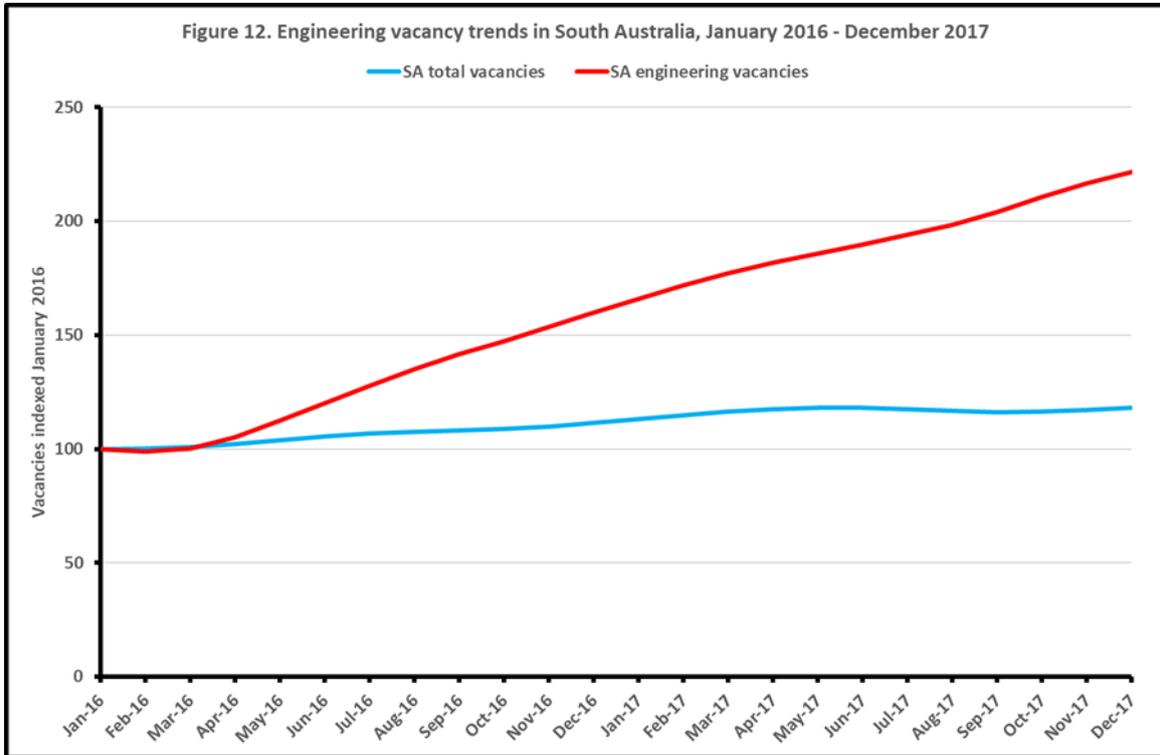


Engineering vacancy trends in WA have been growing strongly during 2017 after slower growth recorded in 2016. In January 2017 there was 446 engineering vacancies recorded, growing to 667 vacancies recorded in December 2017. This was growth of over 49 per cent over this time period, compared to growth of 12 per cent for overall WA vacancies. As seen in figure 11 Engineering vacancies in WA are predominately made up of mining and civil engineering occupations, followed by much smaller numbers in industrial and mechanical occupations, as well as electrical occupations. Some points of note in WA are:

- In January 2017 there were more vacancies recorded for mining engineers than any other engineering occupation in WA. Growth in these vacancies was seen in late 2016, but it was during 2017 where mining engineering occupations lifted, and became the largest in the state. In January 2017 there was 140 mining engineering vacancies growing to 255 recorded in December 2017. Mining engineering vacancies now make up almost 40 per cent of all engineering vacancies in Western Australia.
- Civil engineering occupations also really grew from mid-2016, continuing strong growth throughout 2017. In January 2017 there was 138 vacancies recorded, growing to 232 in November, before falling back to 215 vacancies in December 2017.
- Industrial and mechanical engineering have grown strongly throughout 2017. In January there was 58 vacancies recorded, growing consistently throughout the year to 102 recorded in December 2017.
- Electrical engineering vacancy numbers have slowly increased during 2017, peaking in September. In January 2017 there was 23 vacancies recorded, growing to 46 in September, and falling back to 36 recorded in December 2017.
- Engineering manager and ICT Test and Support engineering vacancies have remained reasonably steady in WA, with both occupations recording between 15 and 25 vacancies over the course of the year.
- Telecommunications, electronics and chemical and materials have consistently remained the three occupations with the lowest vacancies for engineers in the state with most months recorded under 10 engineering vacancies in each occupation.

South Australia

South Australia engineering vacancies have more than doubled over the past two years. Figure 12 shows the trend of engineering vacancies in SA in comparison to the trend of overall vacancies in the state. Figure 13 is a stacked graph of all of the engineering occupation vacancies in the state over the same time period.



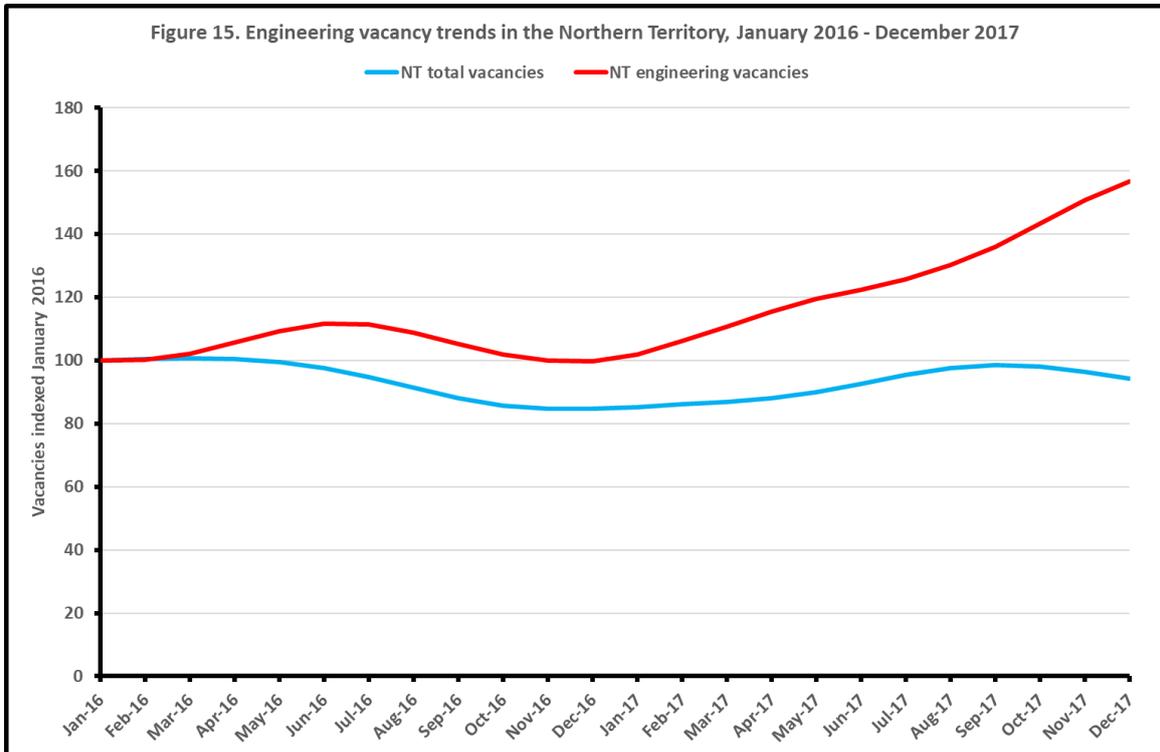
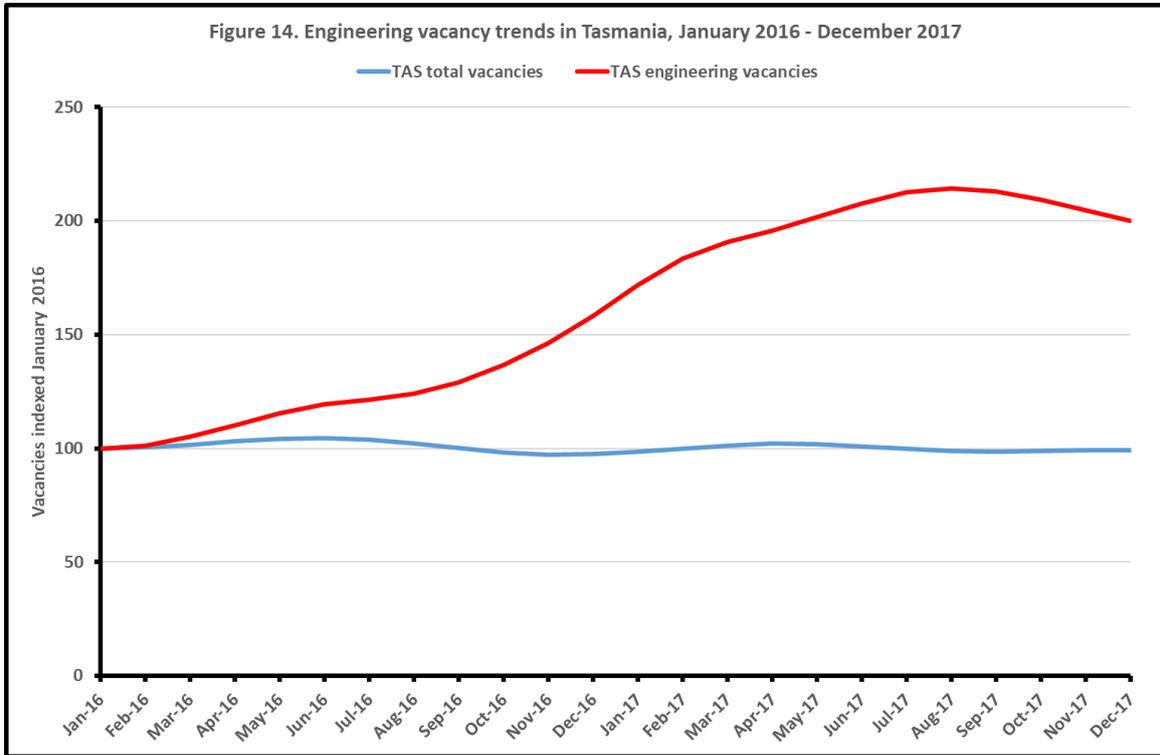
Engineering vacancy trends in SA grew strongly during 2017, outpacing the growth of total SA vacancies. Between January 2017 and December 2017 engineering vacancies grew 33.5 per cent compared to 4.4 per cent for the total state vacancies.

Engineering vacancies rises in SA have been on the back of rises in Civil, industrial and mechanical, and mining occupations. Some points of note in SA are:

- Civil engineering occupations have consistently recorded the highest number of engineering vacancies in SA. There has been growth in civil engineering vacancies, but not at the levels seen in 2016. In January 2017 there was 66 vacancies recorded, which grew to 86 vacancies recorded in October 2017, falling back to 73 recorded in December 2017.
- Vacancies for Industrial and mechanical engineering occupations have only grown slightly over the course of 2017. In January 2017 there was 25 vacancies recorded and this grew to 38 vacancies recorded in November, dropping back to 31 in December 2017.
- Mining engineering vacancy numbers have also grown over 2017, making it the third highest engineering occupation vacancy in the state. In January there was 16 vacancies recorded, growing to 29 vacancies recorded throughout each of the spring months. In December there was 26 vacancies recorded.
- Electrical engineering vacancies have seen a small growth spurt over 2017. In January 2017 there was only 4 vacancies recorded and this has steadily grown to 22 vacancies recorded in December 2017.
- ICT Support and Test engineering vacancies peaked in the middle of the year hitting 22 vacancies for the month of August, falling back to 11 vacancies in December.
- Engineering manager, telecommunications engineers, electronics engineers and chemical and materials engineering occupations have remained low in SA over 2017, with all occupations recording 6 or less vacancies per month.

Tasmania and the territories

Vacancy numbers for Tasmania, the Northern Territory and the Australian Capital Territory are notably smaller than the other states, which means the variability in the vacancy trends can be much greater than in the larger states. As occupation data in these jurisdictions is so small, only the two-year trend analyses is presented.



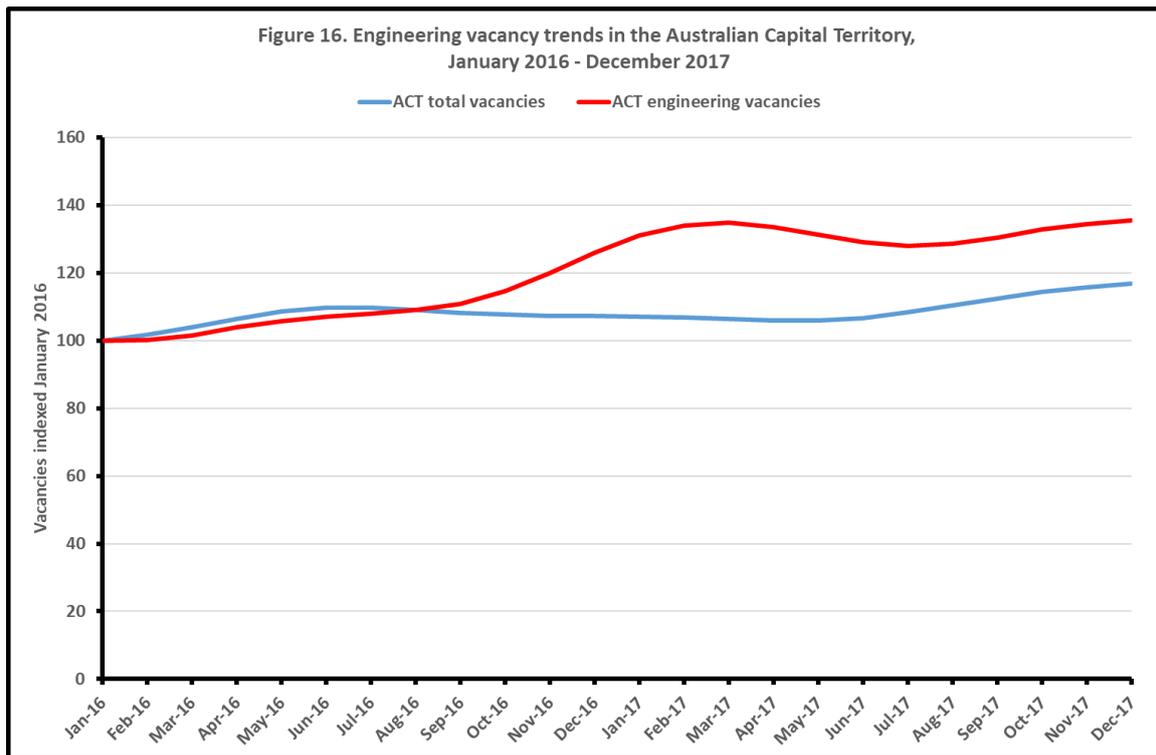


Figure 14 shows the two-year trend for engineering occupations in Tasmania in comparison to total Tasmanian vacancies. As seen in figure 16, engineering vacancies in Tasmania have been growing at a higher rate than overall Tasmanian vacancies since late 2016. However, it must be remembered that this has been off a small base number, so growth trends will be much more variable. In January 2017 there was 18 vacancies recorded for engineers, and this has grown slightly to 21 vacancies recorded in December 2017. The majority of these engineering vacancies were civil engineering occupations.

Figure 15 shows the two-year trend for engineering occupations in the NT in comparison to total NT vacancies. Engineering vacancies in the NT have been variable, but it must be remembered that the growth is off a much smaller base than other states. In January 2017 there was 38 vacancies recorded for engineers, which has grown strongly over the course of the year with 58 vacancies recorded in December 2017. Civil engineering occupations are the engineering occupation with the most vacancies recorded in the NT, followed by mining engineering occupations.

Figure 16 shows the two-year trend for engineering occupations in the ACT in comparison to total ACT vacancies. Engineering vacancies in the ACT had a small spike in late 2016, but has since levelled off. In January 2017 there was 77 vacancies recorded for engineers, growing to 80 vacancies in December 2017. In the ACT Civil engineering occupations and ICT Support and Test engineering occupations are the two dominant occupations, but again it is unclear how many of these occupations are engineering specific.



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