

Australian Engineering Employment Vacancies

January to December 2022

February 2023



ENGINEERS
AUSTRALIA

Australian Engineering Employment Vacancies

Author: Louis Field

© Institution of Engineers Australia 2023

All rights reserved. Other than brief extracts, no part of this publication may be reproduced in any form without the written consent of the publisher. The report can be downloaded at engineersaustralia.org.au

Engineers Australia

11 National Circuit, Barton ACT 2600

Tel: +61 2 6270 6555

Email: policy@engineersaustralia.org.au

engineersaustralia.org.au

Contents

Introduction	4
Summary	4
Data source and methodology.....	4
Australia	5
Vacancies by engineering occupation	6
New South Wales.....	8
Victoria.....	9
Queensland	10
Western Australia.....	11
South Australia.....	12
Tasmania and the territories.....	13
Tasmania.....	14
Northern Territory	14
Australian Capital Territory	14

Introduction

The start of 2022 saw Australia well on its way to economic recovery following the turmoil seen during previous years. However, COVID-19 induced lockdowns in other countries continued to linger and unforeseen geopolitical events have significantly impacted the global economy. Inflation topped 7.8 per cent by Q4 2022, the highest since 1990.¹ With the cost of living going up, the Reserve Bank of Australia (RBA) started to raise interest rates which reached 3.10 per cent by December 2022, hindering most economic sectors.

The construction sector is the most affected. This is a sector already overstretched and operating at capacity. Rising material costs brought the end of two major operators, leaving the \$237 billion national five-year pipeline of major infrastructure projects with fewer contractors able to deliver. This has contributed to blown-out budgets and increasing project slippage². The impact on engineering vacancies is noticeable, dividing 2022 into two phases, a growth phase during the first half, with a second half either plateauing off or declining. Nationally, engineering vacancies have increased by 22 per cent, peaking in July and stagnating by December. State and Territory trends were similar: while all major states reported increased vacancies for the year, many registered declined in the September and December quarters.

Engineers have remained in the spotlight with several major stimulus projects from the Commonwealth Government relying on the profession's skills and expertise. However, engineering skills shortage is ever growing, with continued demand outstripping supply. Infrastructure Australia forecasts labour demand in 2023 to grow by 42,000 to a peak of 442,000, more than doubling the projected available supply. Although borders have now reopened, the pressure has yet to ease. Strong demand for engineers is by no means unique to Australia, with heightened efforts to attract engineering talent across the region and the world. In the medium to long-term, Australia needs to explore new and innovative ways to build its engineering capability, including how we support migrant engineers. Engineers Australia research has shown there is a significant cohort of migrant engineers already in Australia who have long-term difficulties securing employment appropriate to their experience.³ Tapping into this latent supply offers one means of easing skills shortages.

Summary

- GDP grew by 3.6 per cent in 2021-22⁴ and is expected to grow by only 1.75 per cent in 2022-23 amid global economic uncertainty, rising material costs and high interest rates.
- Engineering vacancies increased nationally in 2022 despite stagnating in the second half of the year. Over the past 2 years, engineering vacancies have grown by 80 per cent nationally compared to 42 per cent for all averaged Australian occupation vacancies.
- Queensland is the best performing state in terms of engineering vacancies growth among the major states in 2022 with 44 per cent increase. NSW is where with the greatest number of engineering vacancies have been generated, followed by Queensland, WA, Victoria, South Australia and Tasmania. ACT is the best performing of the territories.
- Major states reported increased vacancies for the year, though they recorded limited or negative growth in the September and December quarters.
- The engineering profession remains resilient amid global economic uncertainty, supported by considerable fiscal stimulus, mainly in transport infrastructure, renewable energies and defence.
- The profession continues to experience a shortage of critical engineering skills throughout Australia due to increased projects requiring engineering skills.

¹ Australian Bureau of Statistics, *Consumer Price Index, Australia*, December 2022 (accessed January 30, 2023) <<https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/consumer-price-index-australia/latest-release>>

² Infrastructure Australia, *Infrastructure Market Capacity 2022 Report*, December 2022, pp7, 12

³ Romanis, J 'Barriers to Employment for Migrant Engineers; Research Report' *Engineers Australia* (accessed 23 November 2021) <<https://engineersaustralia.org.au/sites/default/files/resource-files/2021-10/barriers-employment-migrant-engineers.pdf>>

⁴ Reserve Bank of Australia, *Statement on Monetary Policy*, August 2022 (accessed February 6, 2023) <<https://www.rba.gov.au/publications/smp/2022/aug/economic-outlook.html>>

Data source and methodology

This report investigates engineering employment trends in Australia through analysis of engineering vacancies data produced by the Australian Government, Jobs and Skills Australia (Jobs and Skills Australia).

Jobs and Skills Australia published a monthly Internet Vacancy Index (IVI), analysing job vacancy trends over the preceding 12 months using advertisements published on *CareerOne*, *Seek* and *JobSearch*. This most recent data released was for the period to December 2022.

Advertised vacancies provide a valuable gauge of the labour market. In general, as vacancies increase, unemployment falls and vice versa (the 'Beveridge Curve'), providing a broad indication of the direction of the engineering labour market. This should not be read as a report on specific job numbers but rather as a valuable analysis of vacancy trends which provides a broad indication of the direction of the engineering labour market. It includes Australian, state and territory trends as well as trends in a range of specific engineering occupations. The index provides includes data on all major engineering occupations:

- Civil engineering professionals⁵
- Chemical and materials engineers⁶
- Electrical engineers⁷
- Electronics engineers⁸
- Engineering managers⁹
- Information and Communication Technologies (ICT) support and test engineers¹⁰
- Industrial, mechanical and production engineers¹¹
- Mining engineers¹²
- Telecommunications engineers¹³
- Other engineering professionals¹⁴

Some occupations where the number of employed persons is too small to allow for meaningful analysis may be excluded from this analysis.

⁵ The IVI's 'Unit group 2332' - including civil engineers, geotechnical engineers, quantity surveyors, structural engineers and transport engineers

⁶ Unit group 2331 - including chemical engineers and materials engineers

⁷ Unit group 2333

⁸ Unit group 2334

⁹ Unit group 1332

¹⁰ Unit group 2632 - including ICT quality assurance engineers, ICT support engineers and ICT systems test engineers. Some caution should be taken with this data, as whether relevant employment constitutes engineering-specific work is often difficult to gauge.

¹¹ Unit group 2335 - including industrial engineers, mechanical engineers and production or plant engineers

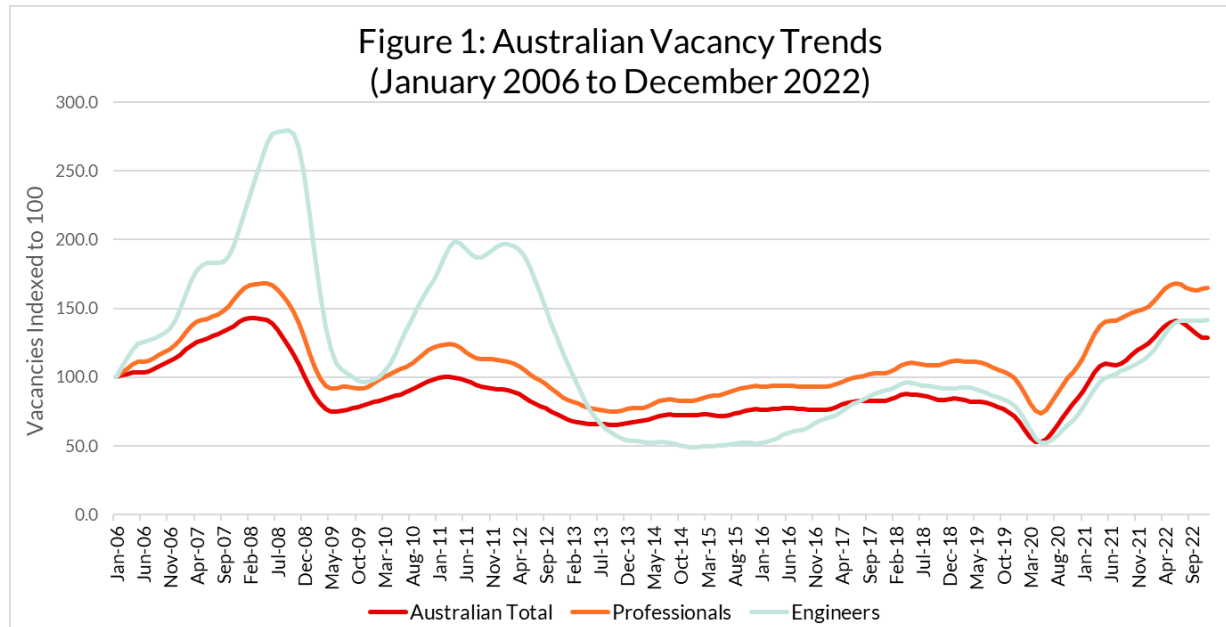
¹² Unit group 2336 - including petroleum engineers

¹³ Unit group 2633 - including telecommunications engineers and telecommunications network engineers

¹⁴ Unit group 2339 - including aeronautical engineers, agricultural engineers, biomedical engineers, engineering technologists, environmental engineers, naval architects and engineering professionals not elsewhere classified

Australia

The first half of 2022 saw a healthy growth in engineering vacancies across Australia, with an increase of around 21 per cent nationally. A slowdown followed in the second half, with little to no increase in the number of engineering vacancies as geopolitical events brought significant additional disruptions to supply chains already affected by the COVID-19 pandemic. This has resulted rising inflation, forcing the RBA to increase interest rates to the highest level seen in years. While an increase in vacancies has levelled, high vacancy numbers mean employment prospects for engineers remains positive, with demand still outstripping supply in many sectors.

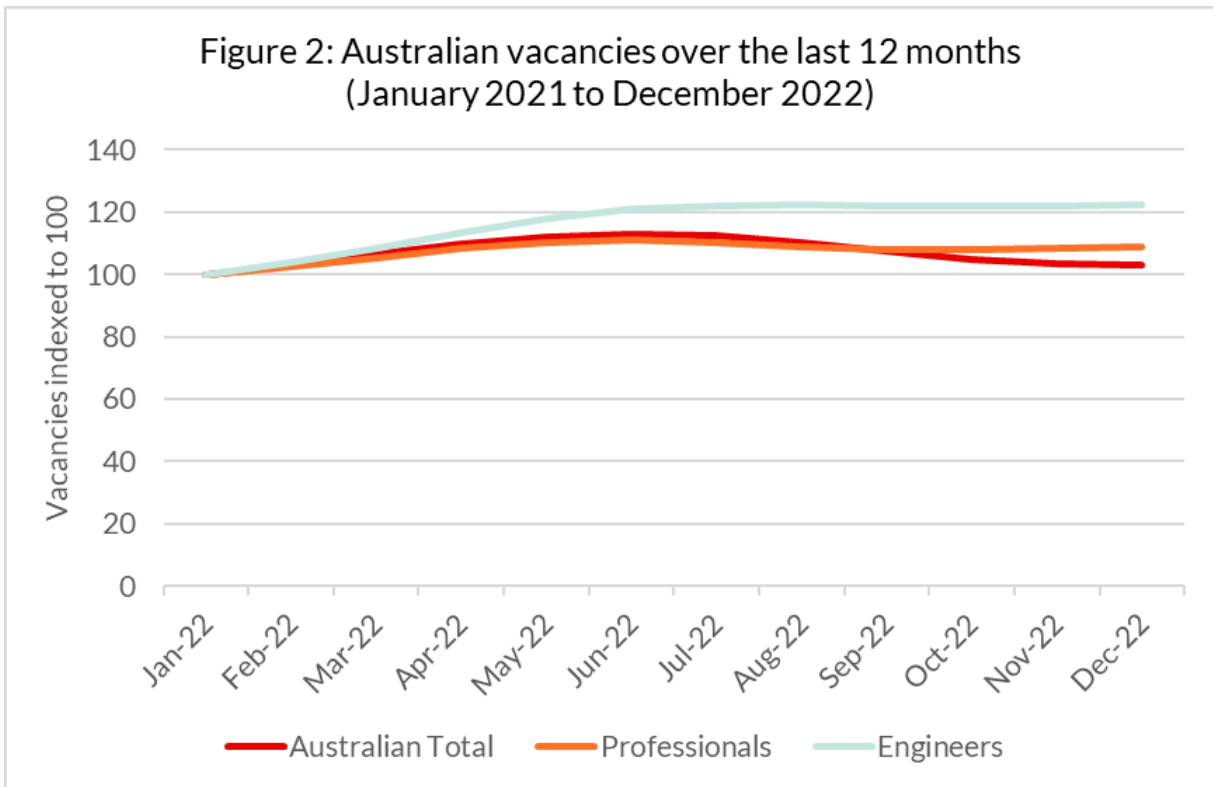


Infrastructure Australia notes¹⁵ construction companies are the most affected by both labour scarcity, with a significant number of construction companies operating at 90 per cent or above capacity, and also the cost of construction materials, rising by an average 24 per cent in the last 12 months. With \$237 billion in value of major public infrastructure projects in the Australia’s five-year pipeline, engineers are and will remain in high demand throughout the country, but project delays due to all the constraints previously mentioned are starting to translate into a recruitment slowdown.

Overall, engineering vacancies have increased by 22 per cent in 2022 and shows engineering as one the strongest professions in demand in Australia. Demand for engineers has grown by 80 per cent over the past 24 months, and although the end of 2022 has shown some signs of a slowdown, it is projected to keep growing in 2023, supported by strong governments’ investments in public infrastructure, defence and renewable energy to name a few.

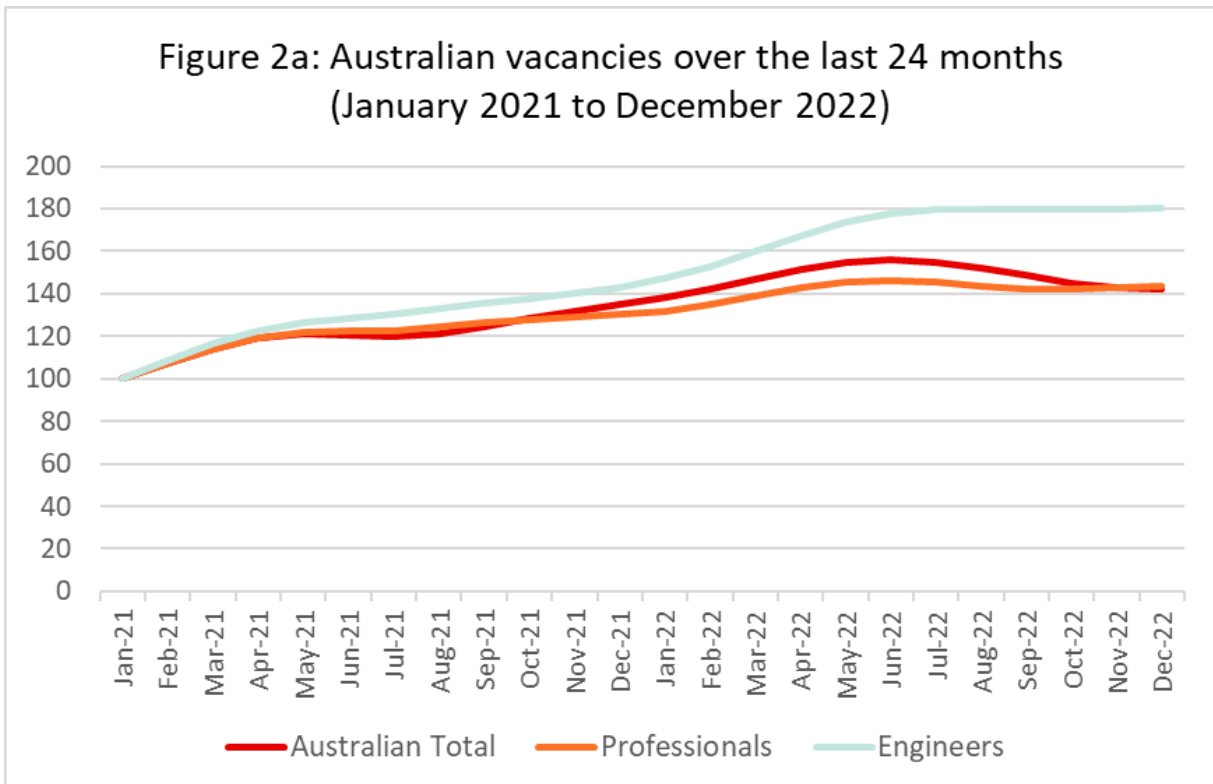
¹⁵ Infrastructure Australia, *Infrastructure Market Capacity 2022 Report*, December 2022, p12

Figure 2: Australian vacancies over the last 12 months
(January 2021 to December 2022)



- 12 months engineering vacancy growth rate¹⁶: +22%
- 6 months engineering vacancy growth rate: +0%
- 3 months engineering vacancy growth rate: +0%

Figure 2a: Australian vacancies over the last 24 months
(January 2021 to December 2022)



- 24months engineering vacancy growth rate: +80%
- 12 months engineering vacancy growth rate: +22%
- 6 months engineering vacancy growth rate: +0%

¹⁶ All growth rate figures cited in this report are for growth in engineering vacancies to December 2022

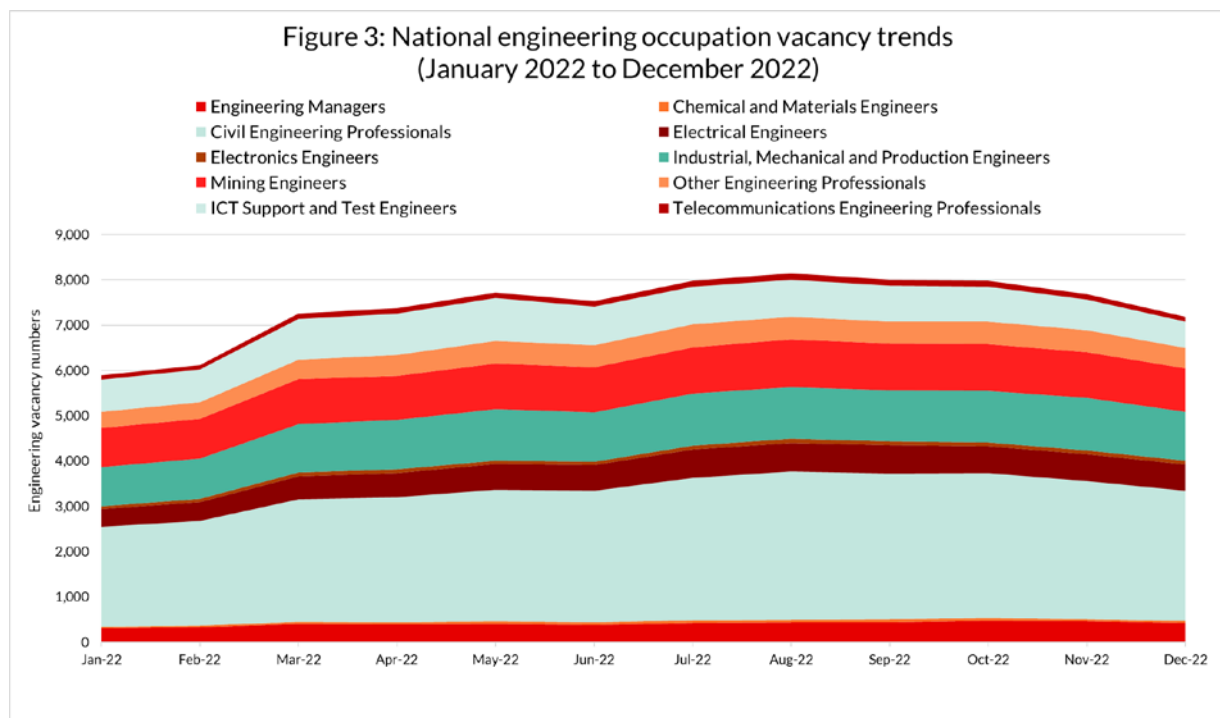
Vacancies by engineering occupation

At the occupation level, civile engineers remain the most in demand like last year. Demand for civil engineers has been strong all throughout the year, with a 31 per cent increase from January to December 2022. This is in direct correlation with the \$15 billion increase in 2022 committed by governments in the five-year pipeline of major public infrastructure¹⁷. It then started to slowdown from August 2022, which can be explained by the economic uncertainty and project delays.

Like in 2021, Industrial, Mechanical and Production engineers also continued as the next most in demand, beating mining engineers for the second year in a row. A contributing factor to this demand was the impact of the war in Ukraine on commodity price, resulting in 25 per cent more vacancies for this engineering occupation.

Vacancies for mining engineers were the third most in demand in 2022, up a position from 2021. The strong demand in commodities to support the transition to a net zero economy in Australia and in the rest of the world as well as their rising price due to the war in Ukraine has brought a 10 per cent increase in the number of vacancies offered in that engineering occupation. This demand is expected to remain strong in 2023 as demand for lithium, copper, and other commodities essential to electric vehicles and renewable energies will keep on growing in Australia and everywhere else in the world to decarbonise our economies.

The biggest increase in engineering vacancies in 2022 is with electrical engineers, with 44 per cent more vacancies seen throughout the year. The rollout of renewable energies and a soaring energy price is directly correlated to this strong increase.



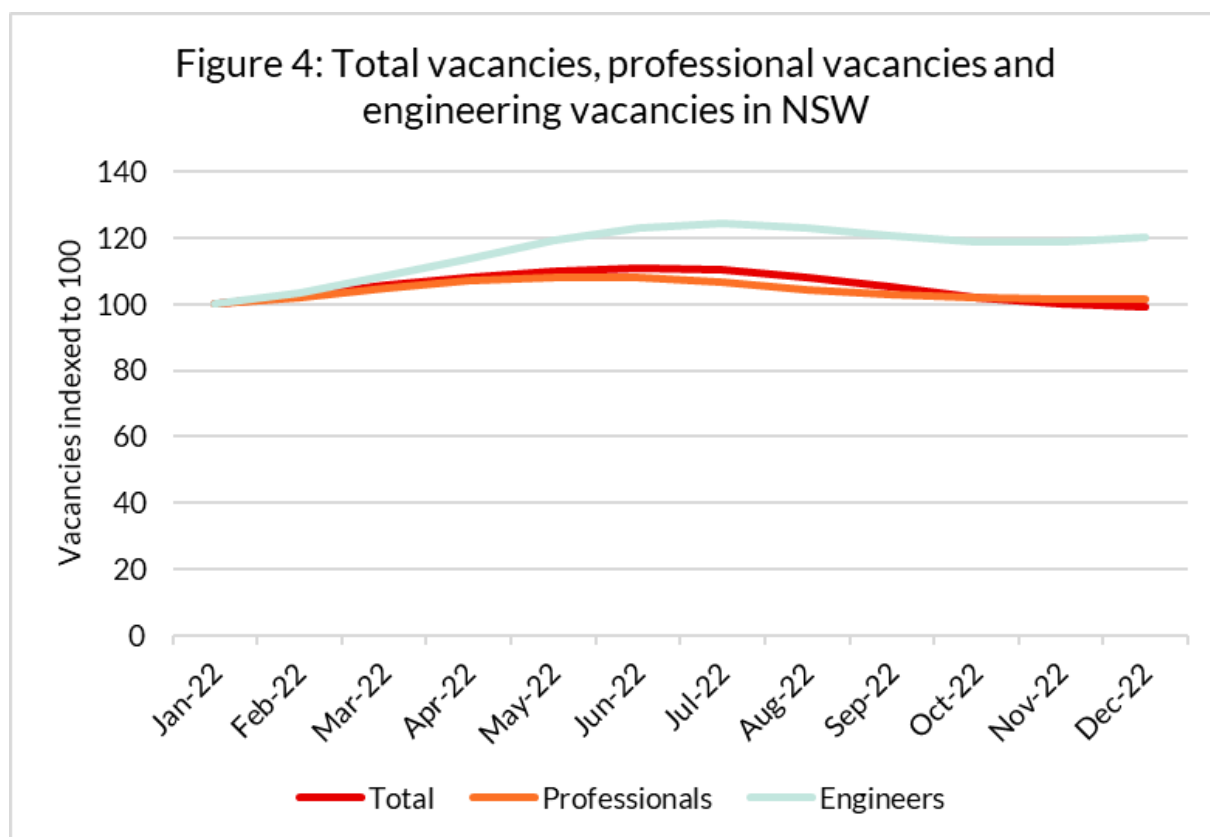
¹⁷ Infrastructure Australia, *Infrastructure Market Capacity 2022 Report*, December 2022, p12

New South Wales

Engineering vacancies in NSW are still rebounding. They increased by 20 per cent during 2022. This demand is primarily led by expanded investments through the NSW Government in infrastructure projects, with \$116.6 billion committed over four years on transport, hospitals and school upgrades¹⁸.

Despite interest rate rises impacting the housing market, natural disasters in regional NSW and economic uncertainty, engineers are still in high demand within the state. Demand reduced mid-2022, with a 6 per cent contraction, but regained strength in the last quarter to finish in a better place than the average in the state. The relax in COVID-19 restrictions coupled with the high vaccination rate helped to support the economic recovery.

While civil engineers are remaining the most in demand, totalling almost 42 per cent of all engineering vacancies advertised in NSW in 2022 and increasing by 28 per cent over the year. Electrical engineering vacancies has seen the biggest increase of all engineering occupations, up by 34 per cent. This rise in numbers can be explained by the NSW Government's commitment to NET Zero Emissions by 2050 and the 28 renewable energy projects currently in construction or due for an imminent start in the state¹⁹. The demand should remain strong as NSW concluded a \$7.8 billion agreement with the Australian Government to use the NSW Transmission Acceleration Facility and the Australian Government's Rewiring the National Plan as well as its commitment to the NSW Electricity Infrastructure Roadmap, with 16 additional projects shortlisted²⁰.



- **12 months** engineering vacancy growth rate: **+20%**
- **6 months** engineering vacancy growth rate: **-3%**
- **3 months** engineering vacancy growth rate: **+1%**

¹⁸ NSW Government, *2022-2023 Half-Yearly Review*, February 7, 2023 (accessed February 8, 2023), p10 <<https://www.budget.nsw.gov.au/sites/default/files/2023-02/2022-23-Half-Yearly-Review-factsheet.pdf>>

¹⁹ Clean Energy Council, *Project Tracker - Updated in December 2022* (accessed January 27, 2023) <<https://www.cleanenergycouncil.org.au/resources/project-tracker>>

²⁰ NSW Government, *2022-2023 Half-Yearly Review*, February 7, 2023 (accessed February 8, 2023), p4 <<https://www.budget.nsw.gov.au/sites/default/files/2023-02/2022-23-Half-Yearly-Review-factsheet.pdf>>

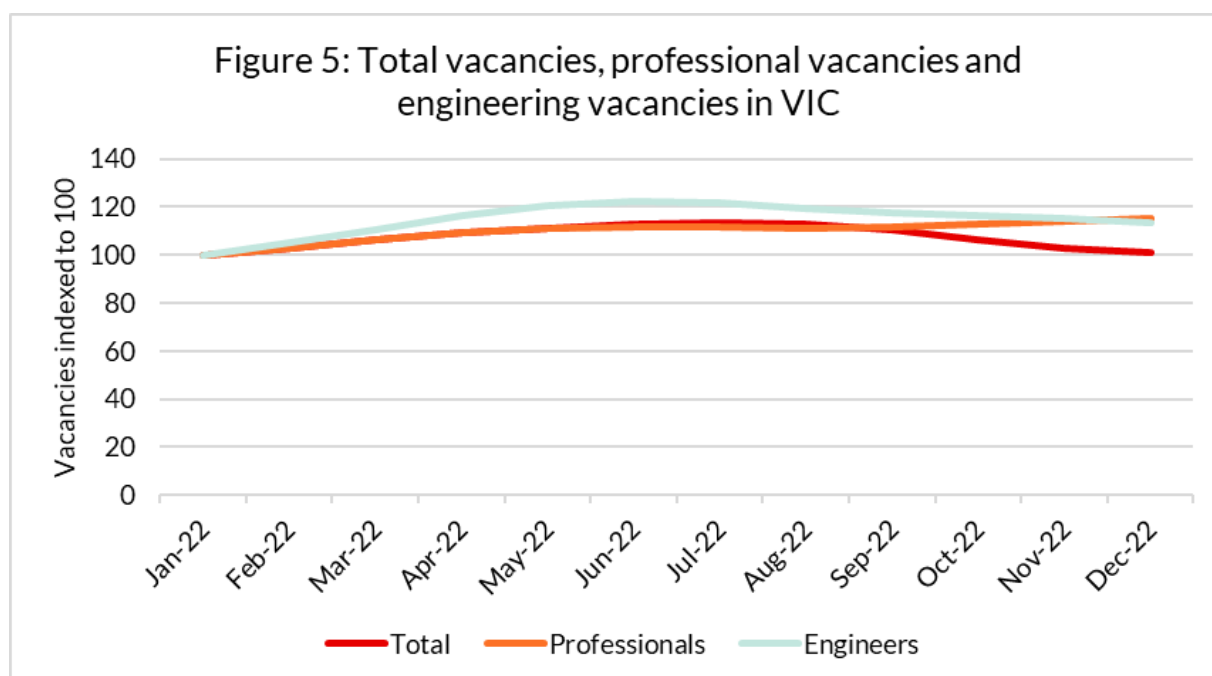
Victoria

While Victoria rebounded strongly in 2021-22 with 5 per cent Gross State Product (GSP) growth, 2022-23 has been impacted more significantly than other states by the current economic disruptors - inflation, rise in interest rates, geopolitical uncertainty and the global pandemic – putting the world economy under stress. Estimates by the Victorian government of GSP growth are of 3 per cent for 2022-2023.

Engineering vacancies have yet grown by 14 per cent in 2022 with a peak in June/July. However, the second half of the year has seen the number of new engineering vacancies offered contract by 7 per cent. Project delays and a fall in dwelling commencements of 15.1 per cent compared to decade average in Q3²¹ can explain that slowdown in engineering recruitment.

Like in NSW, civil engineers are the most in demand in Victoria, led by robust investments in infrastructure projects. Similarly, electrical engineering vacancies have seen the biggest increase in demand with a 44 per cent increase emerging over 2022. Contributing to this is Victoria having the second most renewable energy projects in construction or due to start soon.²²

Decline in vacancies seen can be correlated with delays and even possible postponing of transport megaprojects like the Suburban Rail Loop as labour shortages, material price rises, and an overstretched construction industry inflict budget and schedule blowouts on major infrastructure works²³.



- **12 months** engineering vacancy growth rate: **+14%**
- **6 months** engineering vacancy growth rate: **-7%**
- **3 months** engineering vacancy growth rate: **-2%**

²¹ Commbank, *Quarterly CommSec State of the States report - October 2022*, p6

²² Clean Energy Council, *Project Tracker - Updated in December 2022* (accessed January 27, 2023)
<<https://www.cleanenergycouncil.org.au/resources/project-tracker>>

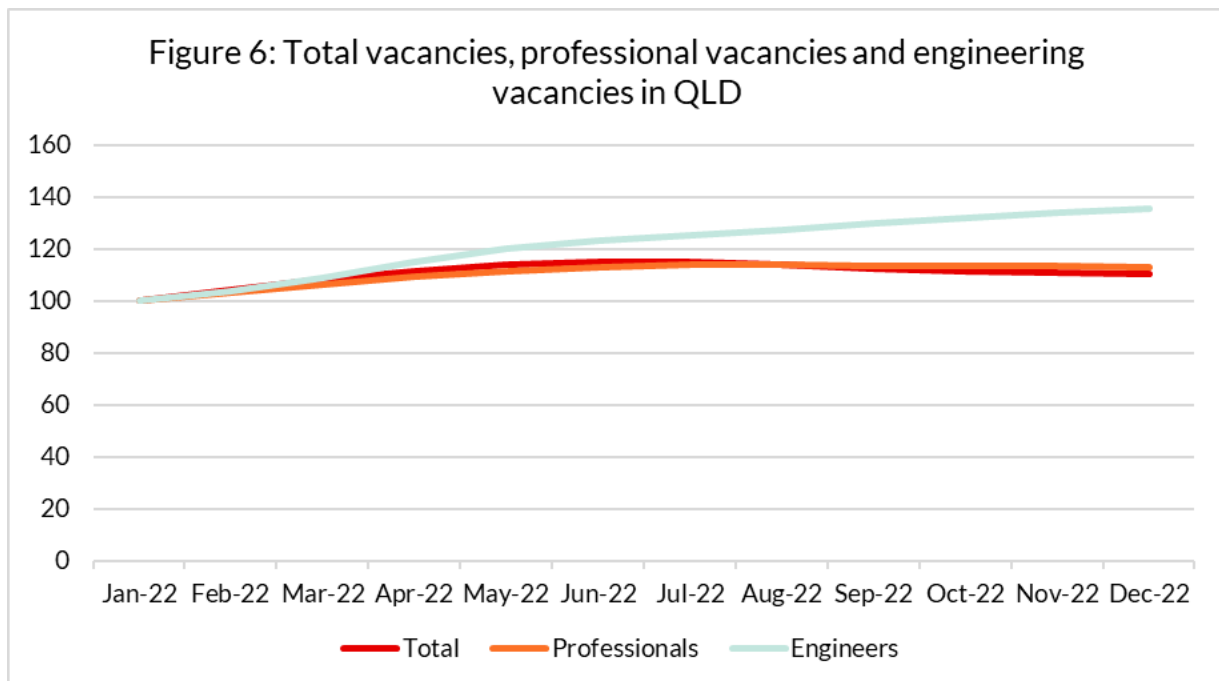
²³ The Age, *State warned on risk megaproject delays and budget blowout*, December 14, 2022 (accessed January 19, 2023)
<<https://www.theage.com.au/national/victoria/state-warned-on-risk-of-megaproject-delays-and-budget-blowouts-20221213-p5c5yr.html>>

Queensland

The sunshine state has been the most buoyant market in Australia in 2022 with a steady growth throughout the year and 36 per cent increase in engineering vacancies. Queensland is forecast to record solid economic growth of 2.5 per cent in 2022-23, with Australia's third strongest five-year pipeline in infrastructure projects (\$34.1 billion) and strong coal and petrol exports benefitting from high commodity prices and a weaker Australian dollar²⁴.

Civil engineers are the most in demand in Queensland too, with 41 per cent increase in 2022, followed by mining engineers and industrial, mechanical and production engineers, respectively increasing by 24 and 35 per cent over the course of the year. Electrical engineering vacancies have also jumped significantly in 2022, like in NSW and Victoria, Queensland ranks third in the number of renewable energy projects under construction or soon to commence (18)²⁵.

Strong commodity prices and export projections coupled with a decade-long pipeline of works connected to the 2032 Olympic and Paralympic Games are poised to put Queensland in the best position to meet the challenges ahead. While the rise in natural disasters across the state, potential slowdown of the Chinese economy and extreme international volatility make firm predictions difficult, the sunshine state appears well positioned for continued growth.



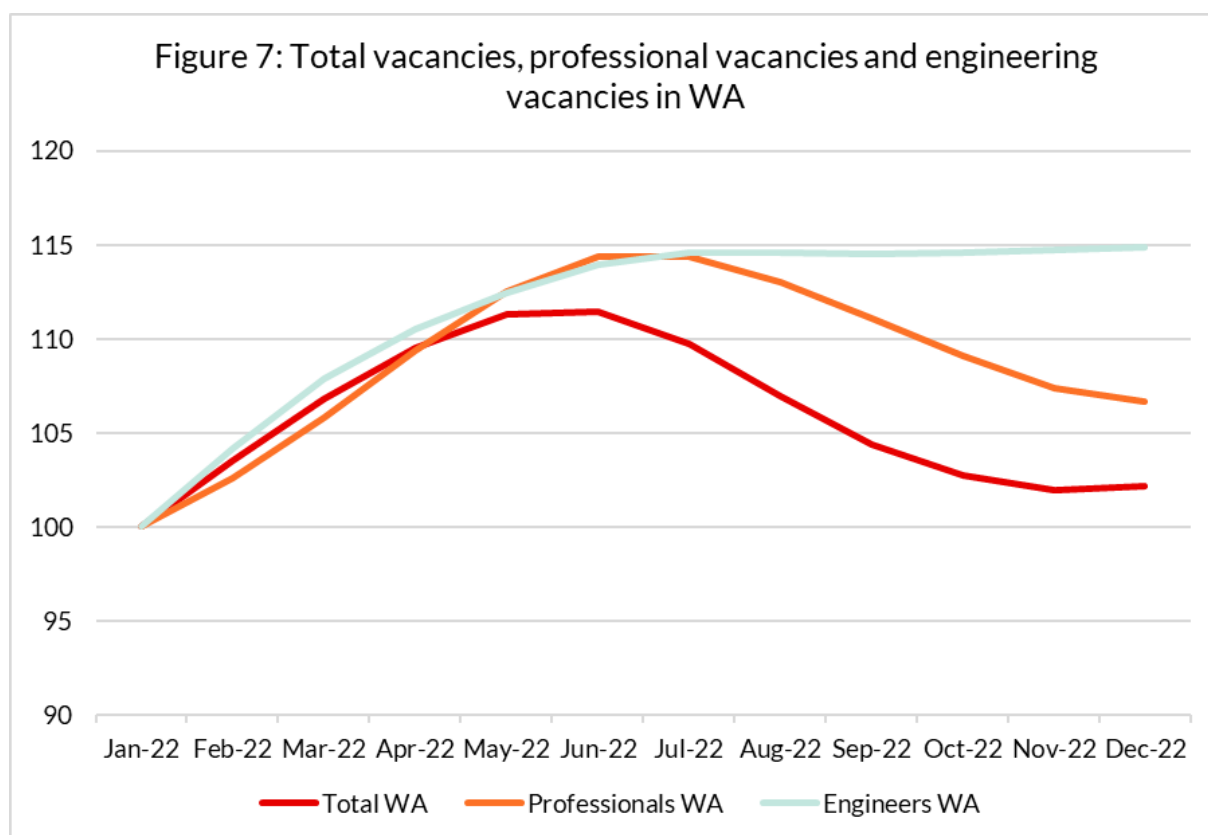
- **12 months** engineering vacancy growth rate: **+36%**
- **6 months** engineering vacancy growth rate: **+8%**
- **3 months** engineering vacancy growth rate: **+3%**

²⁴ Queensland Government, *2022-2023 Queensland Budget Update*, December 7, 2022 (accessed January 19, 2023) <[²⁵ Clean Energy Council, *Project Tracker - Updated in December 2022* \(accessed January 27, 2023\) <\[>\]\(https://www.cleanenergycouncil.org.au/resources/project-tracker\)](https://statements.qld.gov.au/statements/96750#:~:text=2022%2D23%20Budget%20Update%20highlights,cent%20forecast%20in%20June%202022.>></p></div><div data-bbox=)

Western Australia

2022 has been a challenging year for Western Australia in many aspects. Omicron was its first challenge, after having been graced by an almost COVID-19 free life until then. The year started well for the mining and resources sector, with record high prices for some commodities and rising energy transition-related demand²⁶. But weakened near-term demand expectations due to Chinese COVID outbreak had iron ore price plunged from a ten year high in June 2021 to a three year low in October 2022²⁷. The war in Ukraine disrupting supply chains and the surge in inflation across the world hit WA the most, with recorded CPI increased in Perth second highest in the country to 8.3% over the past year²⁸.

Yet engineering vacancies have seen a healthy growth, with a 15 per cent increase over the year, peaking in Q3 and remaining at that level until the end of the year. Civil engineering is this year's biggest provider of vacancies, with the WA government's \$6 billion investment in infrastructure, METRONET, and \$9 billion major road projects and upgrades across the state²⁹ supporting the growth. Following this is mining engineers with a 2 per cent increase and industrial, mechanical and production engineers with 36 per cent growth. Electrical engineering vacancies have also stepped up with a 34 per cent rise that could be linked to WA's decarbonisation plan and the 11 renewable energy projects in construction or sue to start soon³⁰.



- **12 months** engineering vacancy growth rate: **+15%**
- **6 months** engineering vacancy growth rate: **+0%**
- **3 months** engineering vacancy growth rate: **+0%**

²⁶ Mining.com.au, *Optimistic outlook for mining in 2023 despite ongoing macroeconomic challenges*, December 15, 2022 (accessed January 30, 2023) <<https://mining.com.au/optimistic-outlook-for-mining-in-2023-despite-ongoing-macroeconomic-challenges/>>

²⁷ Trading Economics, *Iron Ore* (accessed January 30, 2023) <<https://tradingeconomics.com/commodity/iron-ore>>

²⁸ Australian Bureau of Statistics, *Consumer Price Index, Australia*, December 2022 (accessed January 30, 2023) <<https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/consumer-price-index-australia/latest-release>>

²⁹ Government of Western Australia, *WA State Budget 2022-23*, reviewed May 12, 2022 (accessed January 30, 2023) <<https://www.ourstatebudget.wa.gov.au/2022-23/transport.html>>

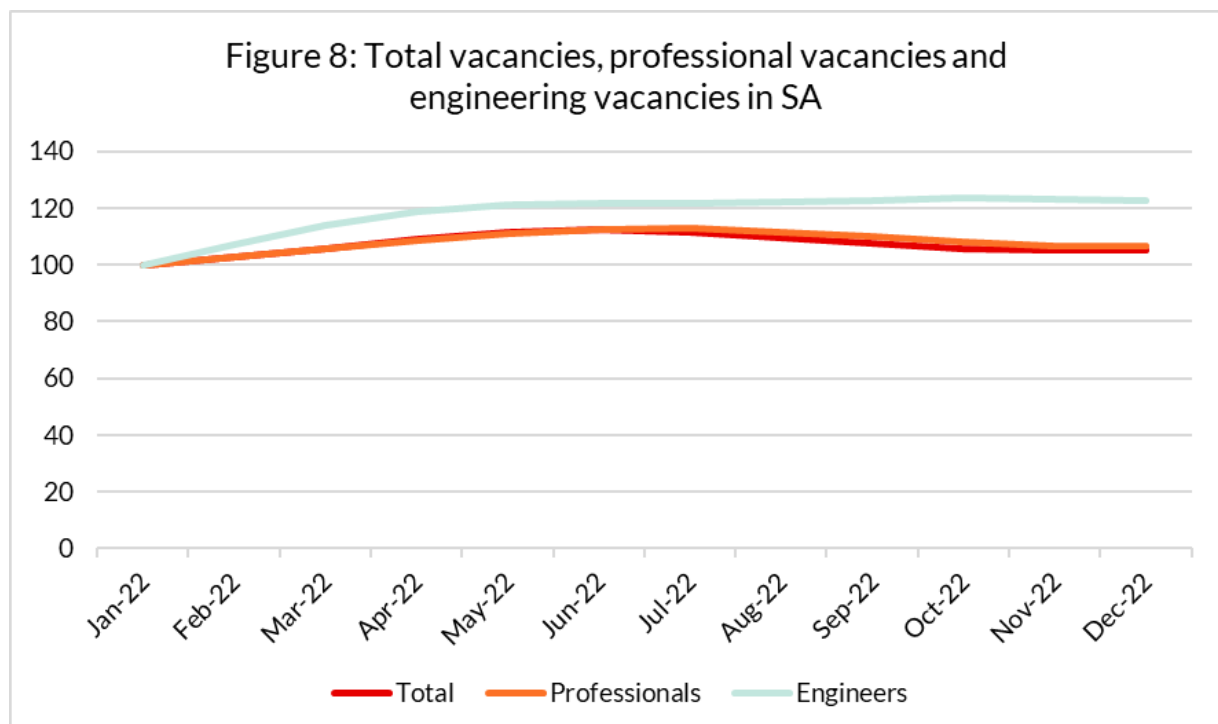
³⁰ Clean Energy Council, *Project Tracker - Updated in December 2022* (accessed January 27, 2023) <<https://www.cleanenergycouncil.org.au/resources/project-tracker>>

South Australia

After a strong 2022 start and a 5.1 per cent GSP growth in 2021-22, higher interest rates and inflation flowed to moderate spending and investment decisions, impacting the second half of 2022 and lowering GSP forecast to 2 percent for 2022-23³¹.

Engineering vacancies have increased by 23 per cent in 2022 in South Australia, outperforming the trend and resisting better than other sectors with a very slight decline in December. Civil engineers are once again the most in demand, increasing by 43 per cent last year, supported by SA government's commitment of \$13.1 billion in its five-year pipeline in public infrastructure³². The "defence state" has seen a rise in vacancies for electrical engineers (100 per cent) but also industrial, mechanical and production engineers (13 per cent) and mining engineers (29 per cent), these two categories representing respectively its second and third biggest purveyors of new engineering vacancies.

Ongoing government investment in renewables, space and defence offers further cause for bullishness on engineering employment in 2023.



- **12 months** engineering vacancy growth rate: **+23%**
- **6 months** engineering vacancy growth rate: **+1%**
- **3 months** engineering vacancy growth rate: **-1%**

³¹ Government of South Australia, *State Budget 2022-23, Mid-Year Budget Review*, October 2022 (accessed February 1, 2023) <<https://www.statebudget.sa.gov.au/budget-papers/Mid-Year-Budget-Review-2022-23.pdf>>

³² Infrastructure Australia, *Infrastructure Market Capacity 2022 Report*, December 2022, p28

Tasmania and the territories

The number of engineering vacancies recorded in each of Tasmania, the Northern Territory and the Australian Capital Territory is consistently low. Trend analysis for these jurisdictions have therefore been combined and compared to the national total (see Figure 9).

After a challenging 2021 for Tasmania and the territories due to the COVID-19 outbreaks, 2022 has globally been showing some more positive signs of economic recovery, with governments led infrastructure projects assisting greatly. However, like most of the rest of the states in Australia, inflation and the interest rates hike have hindered that recovery of provided new sets of challenges to face.

Tasmania

Engineering vacancies in Tasmania rebounded significantly in 2022 with 44 per cent increase despite a 3 per cent decline in the last quarter, which could be attributed to the rise in material costs and interest rates putting its construction sector under stress. Civil engineers are still the most in demand with 38 per cent increase in 2022 supported by the \$2.7 billion investment by the Tasmanian Government in roads and bridges, including the new \$786 million Bridgewater Bridge³³.

Northern Territory

Northern Territory recorded the lowest rise in engineering vacancies in Australia, with only 7 per cent increase in 2022. Engineering vacancies declined up to 9 per cent by the last quarter of 2022 despite a 4.7 per cent GSP in 2021-22. The two biggest engineering occupations in NT have fared in opposite ways, mining engineering vacancies declined by 28 per cent, consequence of the expected temporary shutdown window of the Darwin LNG plant, while civil engineering vacancies increased by 74 per cent, with construction sector supported by significant defence and gad-related projects³⁴.

Australian Capital Territory

The ACT is the best performing out of the three, with 2022 seen 47 per cent more engineering vacancies. With \$7 billion allocated in infrastructure program over the five years, including \$1.4 billion for 2022-23 alone³⁵, the ACT is the only territory to not see any decline in its engineering vacancies by the end of 2022. Civil engineering vacancies overtook ICT support and test engineers as main source of engineering vacancies in ACT in 2022, civil engineering vacancies increasing by 53 per cent while ITC support and test engineering vacancies declining by 5 per cent.

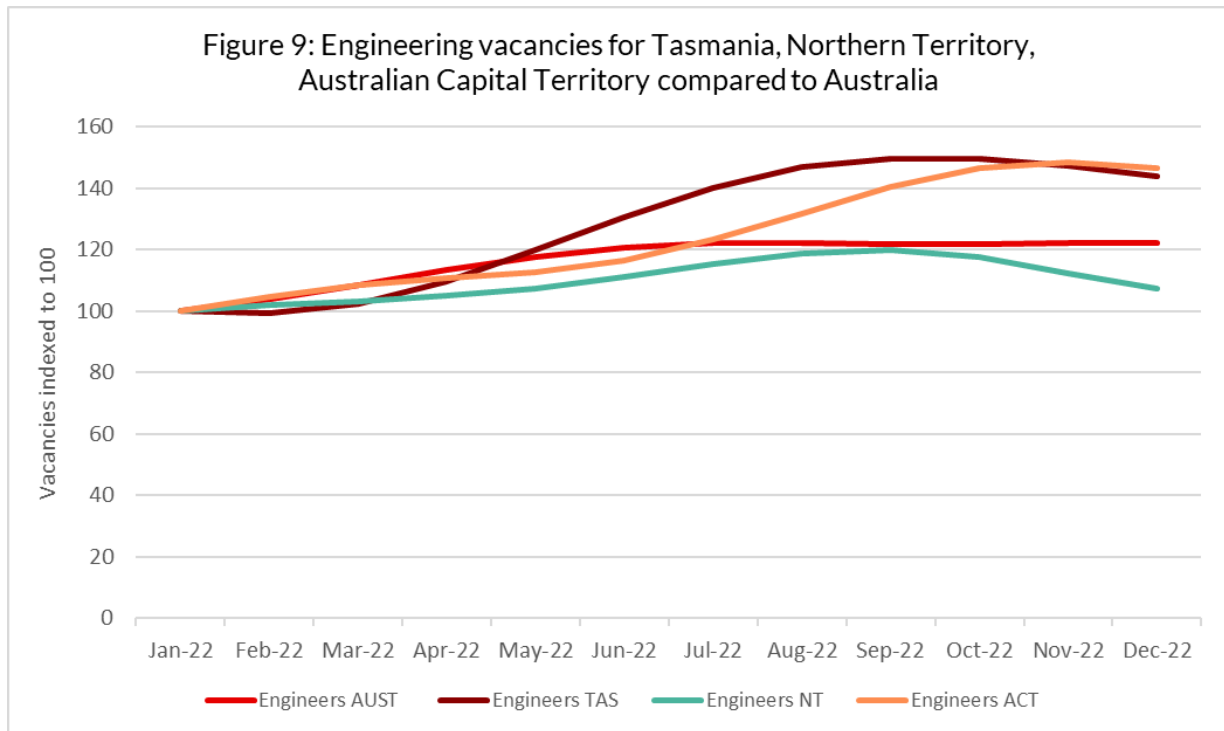
³³ Tasmanian Government, *Tasmanian Budget 2022-23 Overview*, May 2022,

<https://www.premier.tas.gov.au/_data/assets/pdf_file/0034/186199/Tasmanian_Budget_2022-23_-_Overview.pdf>

³⁴ Northern Territory, *Budget 2022-23 - Industry Outlook*, 2022, pp8, 18

<https://budget.nt.gov.au/_data/assets/pdf_file/0013/1103152/2022-23-industry-outlook-book.pdf>

³⁵ Chartered Accountant ANZ, *ACT Budget 2022-23 Overview*, August 3, 2022 (accessed Thursday 2, February 2023) <<https://www.charteredaccountantsanz.com/news-and-analysis/news/act-budget-2022-23-overview#:~:text=The%20government%20continues%20efforts%20to,%249.9%20billion%20in%202025%2D26.>>>



- **12 months** TAS engineering vacancy growth rate: **+44%**
- **6 months** TAS engineering vacancy growth rate: **+3%**
- **3 months** TAS engineering vacancy growth rate: **-4%**
- **12 months** NT engineering vacancy growth rate: **+7%**
- **6 months** NT engineering vacancy growth rate: **-7%**
- **3 months** NT engineering vacancy growth rate: **-9%**
- **12 months** ACT engineering vacancy growth rate: **+47%**
- **6 months** ACT engineering vacancy growth rate: **+19%**
- **3 months** ACT engineering vacancy growth rate: **+0%**



ENGINEERS
AUSTRALIA