



Labour Market Research – Engineering Professions Australia 2017

Occupations in cluster	Rating *	Number of years in shortage over last 5	Number of years in shortage over last 10
2332-11,12,14,15	Civil Engineering Professionals ** Recruitment difficulty (for structural engineers, senior roles or specialised positions such as geotechnical)	0	5
2333-11	Electrical Engineer	0	5
2335-12	Mechanical Engineer	0	4
2336	Mining Engineers	1	6

*Based on research undertaken in the first half of 2017

**The Department's assessment for civil engineering professionals excludes 2332-13 quantity surveyor

Key issues

- Labour market conditions for engineering professionals remain soft, particularly when compared with those prior to the Global Financial Crisis.
- None of the occupations assessed in 2017 were found to be in shortage, although some employers had difficulty recruiting civil engineering professionals (for structural engineering positions and for senior roles in some other specialisations).
 - The labour market for civil engineering professionals has been tightening over the past couple of years although the labour markets for other assessed engineering professionals has not changed markedly.
- The 2017 survey results are consistent with the broader economic trends in the Australian economy. Specifically, mining investment has declined over the past few years while non-mining business investment has been trending upwards¹.
 - It is likely that the future demand for engineers in mining-related industry sectors will remain more subdued than the demand for engineers in non-mining related industries.

Survey results²

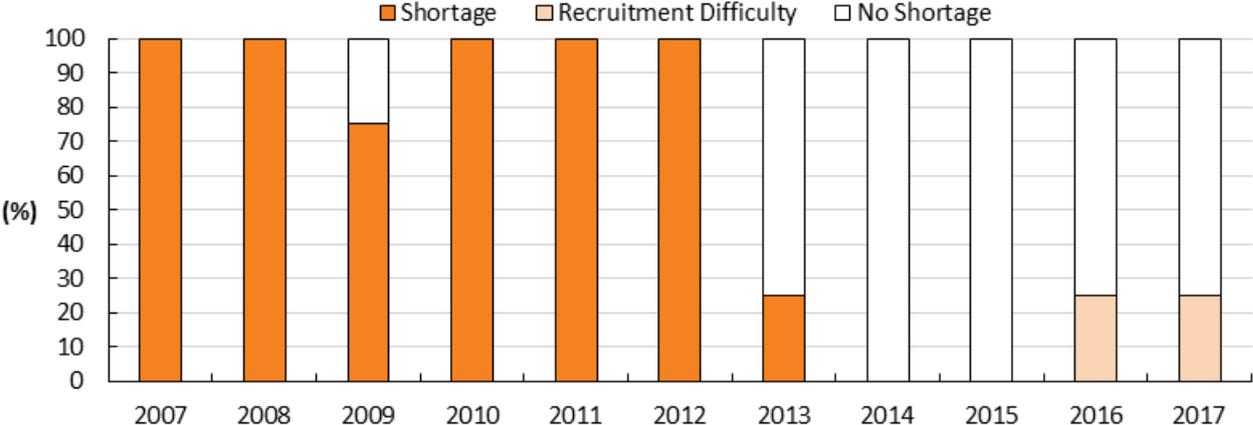
- Shortages have not been apparent for any of the assessed engineering professionals since 2013. This follows a period of relatively widespread shortages between 2008 and 2012 (see Figure 1).

¹ RBA, Statement on Monetary Policy, August 2017

² The methodology underpinning this research is outlined at [Skill Shortage Research Methodology | Department of Employment - Document library, Australian Government](#) and can also be accessed by the QR code.



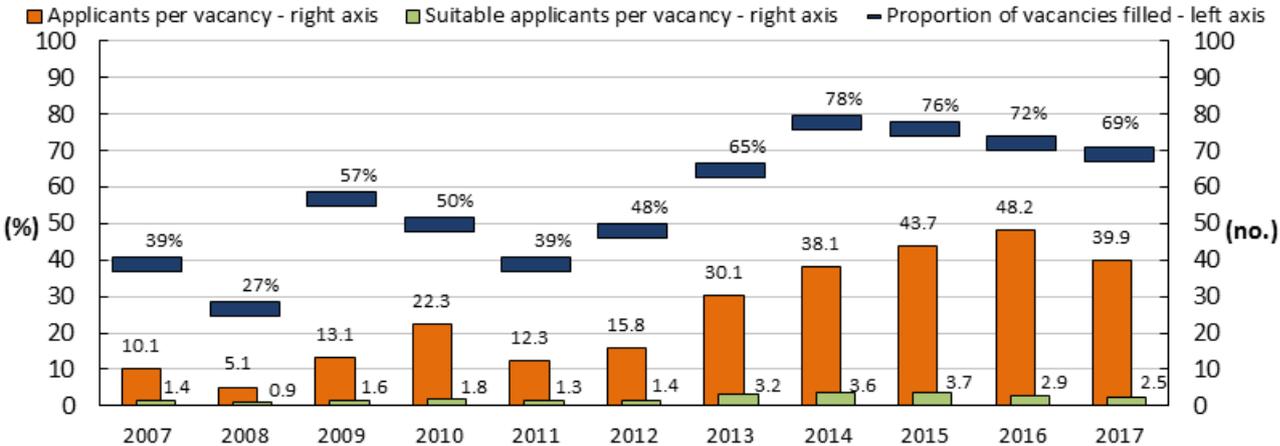
Figure 1: Proportion in shortage, Engineering Professions, Australia, 2007 to 2017



Source: Department of Employment, Skill Shortage Research, consistently assessed occupations

- The labour market for engineering professionals has tightened slightly over the past four years and this is reflected in employers’ ability to fill advertised vacancies.
- The proportion of vacancies filled has fallen from 78 per cent in 2014 to 69 per cent in 2017.
- Nonetheless, other indicators show there is an adequate supply of qualified engineers.
 - In 2017, employers attracted large numbers of applicants (on average, 39.9 per vacancy of whom 28.3 were qualified).
 - Although the average number of suitable applicants per vacancy has fallen from 3.6 in 2014 to 2.5 in 2017, there are considerably larger numbers than there were prior to 2013.

Figure 2: Proportion of vacancies filled (%), average number of applicants and suitable applicants per vacancy (no.), Engineering Professions, Australia, 2007 to 2017



Source: Department of Employment, Survey of Employers who have Recently Advertised
Occupational coverage varies over the time series

Results by occupation

- While the labour market for engineering professions overall remains soft, the labour market for civil engineering professionals has tightened. This occupation has driven the declining proportion of vacancies filled for the engineering professions as a whole.
- There is no evidence of shortages of mining engineers, with all advertised vacancies filled.
 - Demand is currently subdued in line with reduced mining investment and is evidenced by the substantially low numbers of internet vacancies.

- Supply to the occupation is strong, with employers attracting large numbers of qualified applicants.

Results by region

- In 2017, positions located in regional areas were more likely to be filled (77 per cent), compared with metropolitan vacancies (66 per cent).
 - Average applicant numbers were high in both regional and metropolitan areas, although there were large candidate fields in metropolitan areas (43 applicants per vacancy compared with 31 in regional areas).
- Although there was some variation in employers' recruitment experiences across the states and territories, in most states more than 70 per cent of surveyed vacancies for engineering professionals were filled (Attachment A).
 - The highest proportions of filled vacancies for engineering professionals were recorded in Western Australia (82 per cent) and Queensland (79 per cent).
 - The Northern Territory (31 per cent) and the Australian Capital Territory (36 per cent) recorded the lowest proportions of vacancies filled.

Reasons applicants were unsuitable

- Around 29 per cent of applicants were either unqualified or held qualifications that were not relevant to the position advertised.
- On average, employers attracted 28.3 qualified applicants per vacancy, almost nine in ten of whom were considered by employers to be unsuitable.
 - The main reasons for unsuitability were lack of sufficient experience in the profession (for example, recent graduates) or lack of experience in a particular specialisation or industry sector. Employers commented that experience is not generally transferable between sectors or specialisations.
 - Some applicants were considered to be unsuitable because they were not proficient in the use of particular engineering software.
 - A lack of soft skills, such as communication, mentoring and leadership skills, was also cited by employers as a key reason for unsuitability.

Demand and supply trends

Employment

- Engineering professionals are employed in a number of industries. More than one third are employed in the Professional, Scientific and Technical Services industry, although it is likely that many of these workers contract or consult to other key employing industries.

Table 2: Engineering Professionals by largest employing industries, 2016

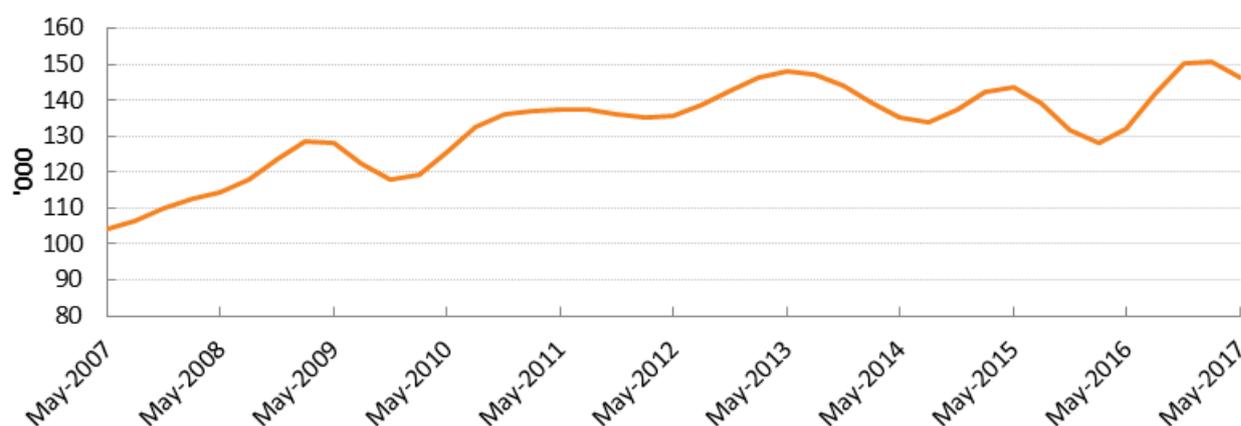
Industry	Engineering professionals employed in industry (no.)	Engineering professionals employed in industry (% of total engineers)
Professional, Scientific and Technical Services	42,700	34.9%
Manufacturing	21,900	17.9%
Construction	14,200	11.6%
Mining	13,400	10.9%
Public Administration and Safety	10,200	8.4%

Source: ABS, Labour Force, annual average 2016

Engineering professionals comprise ANZSCO 233 and includes some occupations which were not assessed

- All five industries recorded an increase in employment over the year to May 2017.³
- Across all industries, employment of engineering professionals increased by 14,300 or 10.8 per cent over the year to May 2017.

Figure 3: Employment, Engineering Professionals, May 2007 to May 2017



Source: ABS, Labour Force, Department of Employment trend

Note: Engineering professionals comprises ANZSCO 233 and includes some occupations which were not assessed

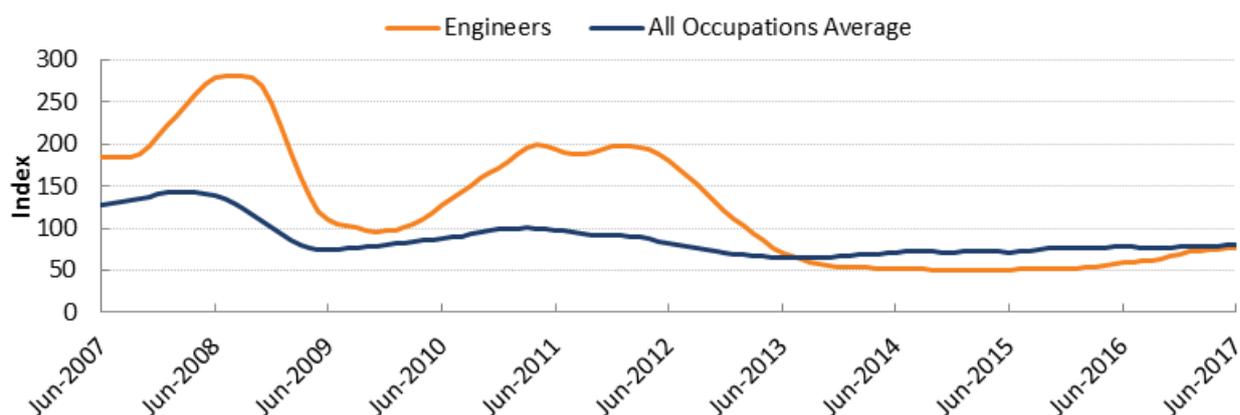
Vacancy levels

- Over the year to June 2017, job advertisements for engineers grew by 32 per cent after being relatively flat in 2014 and 2015. This trend occurred across all engineering occupations.⁴
 - Of particular note was a rebound in vacancies for mining engineers.
- Although these increases in vacancy levels are significant, they are nonetheless from a relatively low base in the time series and vacancy levels across all engineering occupations remain well below the levels recorded prior to the Global Financial Crisis.

³ ABS, Labour Force, May 2017, Department of Employment trend

⁴ Department of Employment, Internet Vacancy Index, June 2017, trend and 12 month moving average

Figure 4: Internet vacancies, Engineers, June 2007 to June 2017 (indexed)

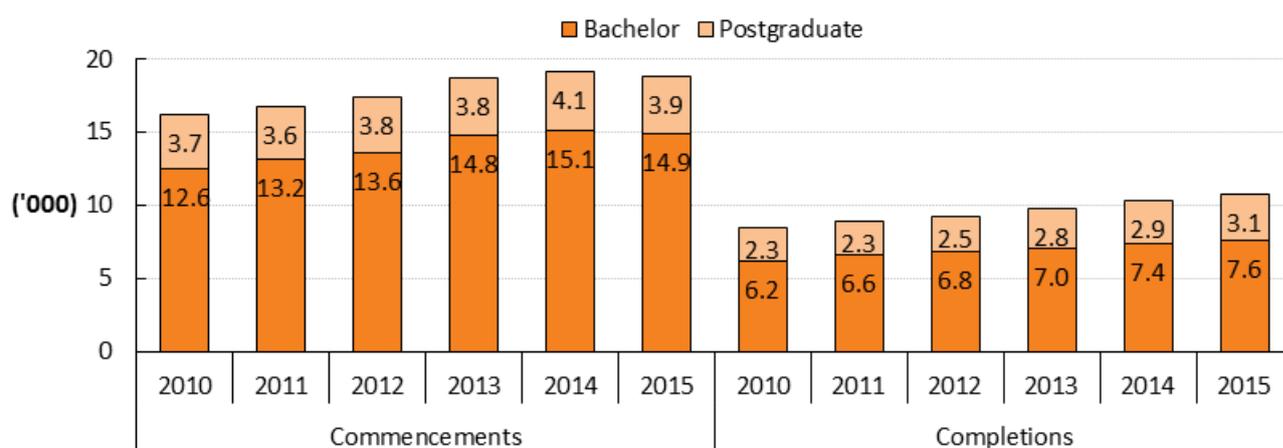


Source: Department of Employment, Internet Vacancy Index, trend (January 2006 = 100)
 Engineers comprise ANZSCO 233 and include some occupations which were not assessed

Training trends

- The number of domestic students commencing a bachelor degree in engineering⁵ decreased by 1.1 per cent (or 160) over the year to 2015, representing the first annual decline since 2005.
- Over the last five years, domestic bachelor degree commencements increased by almost 2400 (or 18.8 per cent) to 14,910 in 2015.
 - Postgraduate commencements in this field also fell over the year (down by 4.3 per cent or about 180), while over the five years to 2015 there was an increase of 7.6 per cent (or around 280).
- Domestic bachelor degree completions in engineering increased in 2015, by 3.1 per cent or 230. Completions have now increased for eight consecutive years to a record high of more than 7630.
 - Postgraduate engineering completions are also at a record high of 3120, having grown strongly over the last five years (up by 35.9 per cent or 820).

Figure 5: Higher education commencements and completions, Engineering and Related Technologies, 2010 to 2015 ('000)



Source: Department of Education and Training, Higher Education Student Statistics Data Cube

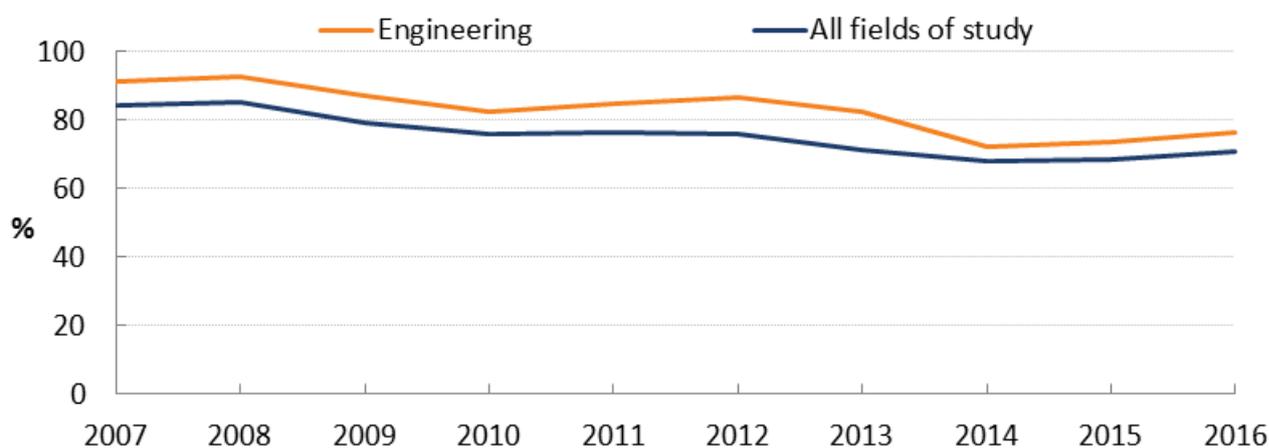
⁵ Department of Education and Training, Higher Education Student Statistics Data Cube, award courses, domestic students. Data refers to the broad field of Engineering and Related Technologies

- Over the five years to 2015, there has been an upward trend in the number of domestic students completing courses in civil, mining and mechanical engineering.⁶ Completions of electrical engineering courses have remained relatively steady.

Graduate outcomes

- Following a significant deterioration in full-time graduate employment outcomes in 2014, employment outcomes for bachelor degree graduates who studied Engineering improved in 2015, with a further improvement in 2016.⁷
 - In 2016, 76.4 per cent of students were in full-time employment four months after graduation (up by 2.5 percentage points compared with 2015 and by 4.2 compared with 2014).
- Full-time employment outcomes for engineering graduates have consistently been higher than the average for all fields of study since 2007.
 - In 2016, employment outcomes for engineering graduates were 5.5 percentage points higher than the average across all fields of study.

Figure 6: Graduate full-time employment outcomes, for Engineering and for all fields of study, 2007 to 2016



Source: Graduate Outcomes Survey, custom tables (Refers to the proportion of bachelor degree graduates who are working full-time four months after graduation as a proportion of those available for full-time work)

- While there was an overall increase in full-time employment outcomes in 2016 for engineering graduates, there was some variation across particular fields of study.
 - Civil engineer graduates recorded a significant improvement in outcomes, with the proportion of graduates in full-time employment rising from 77.7 per cent in 2015 to 81.7 per cent in 2016.
 - The full-time employment outcome for electrical and electronic engineering declined in 2016 by 2.8 percentage points to 75.4 per cent, but remained above the average for all fields of study (70.9 per cent).
 - For mechanical engineering graduates, full-time employment outcomes remained relatively steady at 72.3 per cent in 2016.

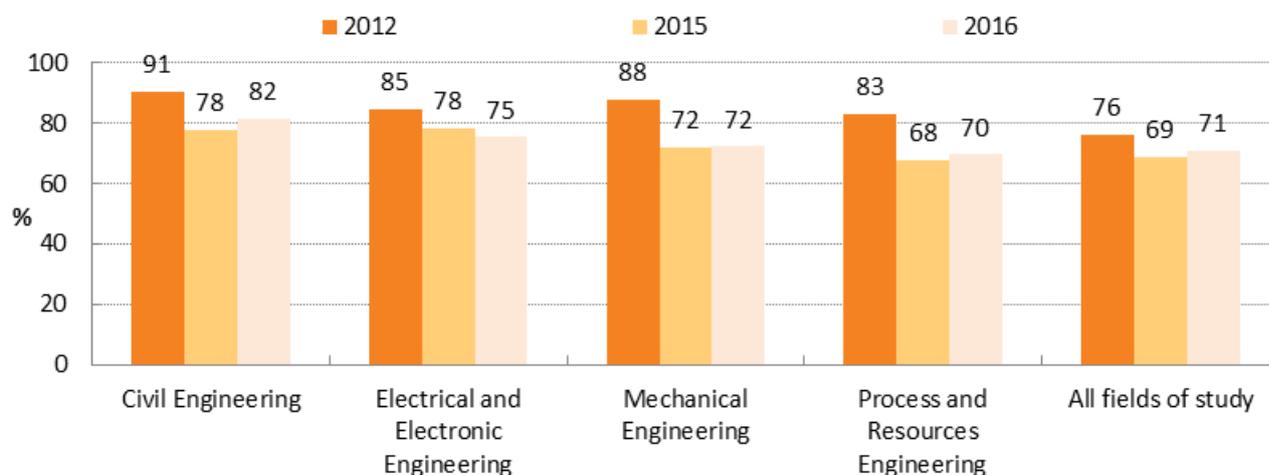
⁶ Department of Education and Training, *Higher Education Student Data Collection*, 2015, customised tables. Data for commencements by engineering specialisation are not reported as many students are not required to state their major when commencing their studies. Domestic completions refer to the combined total of bachelor and postgraduate completions.

⁷ *Graduate Outcomes Survey*, custom tables, 2016

Note: employment outcomes refer to those employed full-time four months after completing their bachelor degree as a proportion of those available for full-time work

- Although the employment outcome for process and resources engineering⁸ increased by 1.8 percentage points in 2016 to 69.6 per cent, it remained below the average for all fields of study.

Figure 7: Graduate full-time employment outcomes, by field of study, 2012, 2015 and 2016



Source: Graduate Outcomes Survey, custom tables (Refers to the proportion of bachelor degree graduates who are working full-time four months after graduation as a proportion of those available for full-time work)

Trends in 457 visa numbers⁹

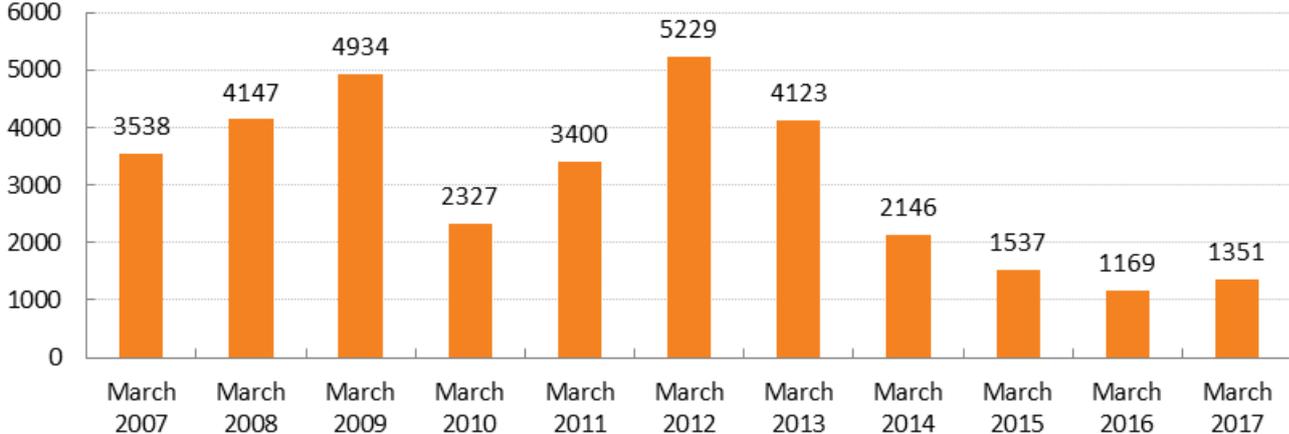
- There were around 2230 engineering professionals on 457 visas in Australia as at 31 March 2017.
- The number of 457 visa grants for engineering professionals has generally been trending downwards since 2012.
 - Over the year to March 2017, there were 1351 visa grants (457) for this group, representing an increase of 15.6 per cent compared with the year to March 2016.
 - Notwithstanding this increase, the total number of 457 visa grants for engineering professionals remains well below the decade average and well below the peak of 5229 in the year to March 2012.

⁸ Includes chemical engineering, mining engineering, materials engineering and food processing technology fields of study

⁹ Department of Immigration and Border Protection, Subclass 457 visa holders pivot table and Subclass 457 visa grants pivot table, 31 March 2017

On 18 April 2017, the Government announced that the Subclass 457 visa will be abolished and replaced with the new Temporary Skill Shortage (TSS) visa in March 2018

Figure 8: Number of 457 visa grants in the year to March, 2007 to 2017



Source: Department of Immigration and Border Protection, Subclass 457 visa grants pivot table, 31 March 2017