Process Manufacturing, Recreational Vehicle and Laboratory Industry Reference Committee

Skills Forecast and Proposed Schedule of Work 2019–2023

MSM Manufacturing Training Package

April 2019

IBSA MANUFACTURING

Administrative Information

Name of Industry Reference Committee (IRC):
Process Manufacturing, Recreational Vehicle and Laboratory (PMRVL)

Name of Skills Service Organisation (SSO):
Innovation and Business Skills Australia (IBSA Manufacturing)

About the Industry Reference Committee

The **Process Manufacturing, Recreational Vehicle and Laboratory Industry Reference Committee** comprises eight members and was constituted in April 2017.

The 2019 Industry Skills Forecast and Proposed Schedule of Work was reviewed and approved by the membership below:

Mr Keith Monaghan (Chair)
Mr Ian Curry
Mr Stuart Lamont
Ms Leah Simmons
Mr Nigel Haywood
Mr Han Michel
Mr Grahame Aston
Ms Julie Warren

About the Skills Forecast

The Industry Reference Committee (IRC) Skills Forecast and Proposed Schedule of Work identifies priorities for training package development work to meet the needs of industry. This document is based on research, analysis and consultations with IRC members and industry stakeholders and provides evidence of current and emerging industry skills needs.

Industry Reference Committee Signoff

This 2019 return of the Process Manufacturing, Recreational Vehicle and Laboratory IRC Skills Forecast and Proposed Schedule of Work for the MSM Manufacturing Training Package was agreed as the result of a properly constituted IRC decision and was approved by:

IRC Chair: Keith Monaghan

Date: April 2019

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This IRC Skills Forecast and Proposed Schedule of Work has been prepared on behalf of the PMRVL Industry Reference Committee for submission to the Australian Industry and Skills Committee (AISC).

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Contents

Executive Summary

Workforce challenges and opportunities facing the process manufacturing and recreational vehicle industries in the areas of legislative changes, changing technology, sustainability demands and skill shortages are resulting in new and emerging skill development priorities for these industries, including:

- increased product safety standards to be met in the manufacture of recreational vehicles
- new or more advanced skills, and new combinations of skills needed to meet changes in technology and advanced manufacturing processes
- potential changes to job roles in trade measurement inspection and verification
- emerging job roles related to the use of high-pressure water jetting and vacuuming.

The Proposed Schedule of Work 2019–2020 to 2022–2023 was developed by the IRC, with support from IBSA Manufacturing, based on identified industry trends. The Schedule lists the priorities over the next four years, the rationale and the proposed timeframes for these activities. The priority identified by the IRC as important and proposed for completion in 2019–2020 is the review of recreational vehicle qualifications to reflect requirements of the upcoming Road Vehicle Standards Act (RVSA), to ensure currency in relation to any new trends and changes in practice in the sector and to consider whether there is a need for inclusion of business skills within recreational vehicle qualifications.

Further details about this priority can be found in the Proposed Schedule of Work. A Case for Change for this priority will be submitted in 2019–2020.

Sector Overview

What are the Process Manufacturing and Recreational Vehicle Industries?

The process manufacturing sector is involved in the production of goods that are manufactured in bulk quantities from raw materials, as opposed to products manufactured from parts. Process-manufactured goods include food, beverages, refined oil, gasoline, pharmaceuticals, medical technologies, chemicals and plastics. The process manufacturing qualifications in the MSM Manufacturing Training Package are deliberately generic and have been designed to support the work of people in production support roles, rather than in the manufacture of specific goods.

The MSM Manufacturing Training Package includes qualifications related to a range of manufacturing sectors, including the following:

- Surface preparation and coating – specialises in preparing metal surfaces and applying a coating that increases its durability and protection against rust
- Manufactured mineral products – uses minerals extracted from the earth to produce a range of products used in the building and construction, civil construction, heavy industry, automotive and landscaping industries, and
- Fenestration – the manufacture of windows and doors.

The recreational vehicle sector includes the manufacture of motor homes, caravans, camper trailers, slide-on campers and fifth wheelers. The relevant qualifications in the MSM Manufacturing Training Package covers the three aspects of the recreational vehicle sector:

- recreational vehicle manufacture
- recreational vehicle service and repair
- recreational vehicle and accessories retailing.

A number of skill sets are also included in the MSM Manufacturing Training Package, which cover:

- trade measurement
- high pressure water jetting, drain cleaning and vacuuming
- high risk work boiler operations
- supervision
- confined space work.

Industry Snapshot

Due to the broad number of sectors and job roles covered by the MSM Manufacturing Training Package, there are inherent difficulties in identifying relevant industry and occupational data.

Despite the following limitations, the data can be useful in highlighting recent trends and, when supplemented with qualitative advice from industry, can help to develop a useful picture of current and prospective industry conditions.

- Selected data from the Australian Bureau of Statistics (ABS) included in this report is based on two hierarchical classification systems – the Australian and New Zealand Standard Industrial Classification[1] (ANZSIC) and the Australian and New Zealand Standard Classification of Occupations[2] (ANZSCO). A list of ANZSIC and ANZSCO codes that have been identified by key industry stakeholders as relevant to the MSM Training Package are provided at Appendix A and Appendix B.
- Census data, the most recent being 2016, can generally be broken down to the four-digit levels of these classifications. However, annual data is only available at the three-digit levels. Some of the industries or occupations that are included at the available level of aggregation may not be specifically relevant to this Training Package. To support the analysis of annual data included in the report, Appendix C provides a more detailed breakdown of occupational data based on the 2016 Census.
- Furthermore, the ANZSIC and ANZSCO classification systems were introduced in 2006, with minor revisions incorporated into the ANZSCO structure in 2009 and 2013. The Process Manufacturing, Recreational Vehicle and Laboratory IRC has noted that some ANZSIC and ANZSCO codes are now outdated and do not represent some emerging industries or occupations. In addition, the classification systems may not be sensitive to localised specialisations.

1 ABS Cat.no.1292.0.55.002 Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 – Codes and Titles.

2 ABS Cat.no.1220.0 ANZSCO – Australian and New Zealand Standard Classification of Occupations, 2013, Version 1.2.

Process Manufacturing

Process manufacturing is the production of goods that are manufactured in bulk quantities from raw materials, as opposed to goods manufactured in from parts. Process-manufactured goods include food, beverages, refined oil, gasoline, pharmaceuticals, chemicals and plastics.

The process manufacturing qualifications in the MSM Manufacturing Training Package are designed for workers in process manufacturing production support roles, rather than specific technical roles. They also apply to employees who operate across more than one area within the process manufacturing sector or those with responsibility for 'specialised processes' only when required. The production management qualification contained in the MSM Manufacturing Training Package is focused on the planning, directing and coordinating of production in process manufacturing or other manufacturing environments.

Due to their generic nature and ability to be customised through a wide range of electives, the process manufacturing qualifications are in use across diverse industry sectors. A recent survey of Registered Training Organisations (RTOs) with these qualifications on scope found that they are being delivered to employees in mining and resources, chemical manufacturing, food and beverage production, commercial laundries, recycling facilities, water and sewage treatment, engineering works, furniture assembly, construction equipment manufacturing, the canvas/textile industry, steel product manufacturing, packaging, plastics, concrete supplies and more.

Business Landscape

Due to the widespread use of the process manufacturing qualifications, it is difficult to quantify the number of businesses that may potentially use them. However, a number of observations can be made about the two main manufacturing sub-sectors to which they relate.

The Performance of Manufacturing Index (PMI) shows that petroleum, coal, chemicals and rubber products (a large sub-sector that includes fertilisers, pharmaceuticals, toiletries and health supplements, as well as construction-related products such as paints, adhesives and surface treatments) has been growing since 2015 but has experienced a slowing of growth during 2018. This has been attributed to a low Australian dollar, increasing oil prices and high gas costs.[3]

The PMI also shows that non-metallic mineral products, which are mainly building-related (e.g. glass, cement and tiles), reached a record high in September 2018 and have also been in a state of expansion since 2015. The growth is attributed to a strong pipeline of residential and non-residential construction work.[4]

3 AiGroup, 2018, Performance of Manufacturing Index Report, September 2018.

4 Ibid.

ABS data indicates that across the petroleum, coal, chemicals and rubber products and non-metallic mineral products sub-sectors, there were 9,143 businesses operating in mid-2017. This represents a growth of around 1.6% since 2015. Most of these businesses are small or non-employing, with only 9% medium and 1% large.[5]

Number of businesses	Growth since 2015
9,143	1.6% growth: 90% small businesses 9% medium businesses 1% large businesses

Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

Key Stakeholders

Peak bodies in this sector are those related to manufacturing, including AiGroup and Manufacturing Australia, as well as those related to the individual sub-sectors.

Unions representing this sector include the Australian Workers Union (AWU), Australian Manufacturing Workers Union (AMWU) and the National Union of Workers (NUW).

Recreational Vehicles

The recreational vehicle sector manufactures, repairs, services and retails recreational vehicles and accessories, including motor homes, caravans, camper trailers, slide-on campers and fifth wheelers.

Unlike the broader motor vehicle and motor vehicle part manufacturing sector to which the recreational vehicle sector belongs, recreational vehicle manufacturing in Australia continues to see strong growth. Over 22,000 units were constructed in 2017; a 2.5% increase on 2016 and representing the second highest level of production in 37 years. The number of units manufactured has consistently exceeded 20,000 units since 2010, despite a huge increase in imported product into the market, which now accounts for approximately 30% of the total product being supplied to market.[6]

5 Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

6 Data supplied by the Caravan Industry Association of Australia.

Recreational vehicle registrations also grew by over 5% from 2017, which equates to a total of nearly 680,000 caravan and campervans on Australia's roads. 2018 saw caravan registrations break through 600,000 for the first time, with campervans continuing their strong growth from previous years to total 66,592.[7]

Growth	Growth since 2016	Growth since 2017
	2.5% growth in units constructed	5% growth in recreational vehicle registrations

Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

Business Landscape

Within currently available data, it is not possible to distinguish between recreational vehicles and other automotive vehicles in terms of businesses involved in sales, manufacture, service and repair.

According to industry advice, the sector predominantly comprises micro businesses. However, the manufacturing area is dominated by:

- Jayco Corporation Pty Ltd – a large company, with more than 1,000 employees across Australia, headquartered in Dandenong South, Victoria.
- Fleetwood Corporation Limited – a large manufacturer of caravans, with more than 200 employees, headquartered in East Perth, Western Australia.
- Avida – a large manufacturer of Recreational Vehicles, with more than 200 employees, headquartered in Emu Plains, New South Wales.
- New Age Caravans – a medium company, with more than 130 employees, based in Epping, Victoria.

Key Stakeholders

The key industry associations related to recreational vehicle manufacture, service, repair and sales are the:

- Caravan Industry Association of Australia
- Caravan and Camping Industries Association of South Australia Incorporated
- Caravan, Camping and Touring Industry and Manufactured Housing Industry Association of NSW Limited
- Caravan Industry Association Western Australia Incorporated
- Caravan Trade and Industries Association of Queensland
- Caravan Trade and Industries Association of Victoria.

7 Data supplied by the Caravan Industry Association of Australia.

Surface Preparation and Coating

The surface preparation and coating industry specialises in treating the surface of a substance or material to increase its adhesion to a coating, and then applying a coating to the prepared surface. The industry treats a range of metal products (mainly dealing with heavy industry, marine infrastructure and built infrastructure) to increase durability, provide protection against rust and achieve a decorative finish.

Business Landscape

According to IBISWorld,[8] weak demand from domestic metal manufacturing markets has limited growth in revenue in the Australian industry; contrary to the global trend of increasing growth due to infrastructure investment in Asia and the Middle East. However, it is predicted that industry performance will improve in the next 5 years in line with improved demand from infrastructure, mining and building markets, and increased investment in defence programs.

Number of businesses	Decline since 2015
1,463	4.6% decline: 94% small businesses 6% medium businesses 0% large businesses

Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

According to ABS data,[9] there were 1,463 businesses operating in this sector in 2017, which represents a decline of 4.6% since 2015. The large majority of these businesses are small or non-employing, with only 6% medium and no large businesses in this industry segment.[10]

This is due to the fact that most businesses in this sector are located close to their clients to reduce transport costs, and therefore tend to specialise in the processes and services needed by their clients, rather than offering a diverse range of services from a more centralised location.[11]

Key Stakeholders

The two largest businesses in this sector, Valmont Group Holdings Pty Limited and PPG Industries Australia Pty Ltd, account for 5.4% and 11.2% of the market share respectively.

Peak bodies in this sector include the Galvanizers Association of Australia (GAA) and the Australasian Institute of Surface Finishing (AISF).

8 IBISWorld, 2017, Industry Report C2293 – Metal Coating and Finishing in Australia, Dec 2017.

9 Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

10 Ibid.

11 IBISWorld, 2017, Industry Report C2293 – Metal Coating and Finishing in Australia, Dec 2017.

Manufactured Mineral Products

The manufactured mineral products industry sector uses minerals extracted from the earth through excavating, quarrying, dredging or tunnelling. These minerals are used to produce a range of materials and products that are typically used by other industries rather than directly consumed by the public.

Industries using manufactured mineral products include building and construction (cement, concrete and fibre cement products), civil construction (cement, concrete products, asphalt) and landscaping (concrete blocks and pavers).

Although the industry sector has a broad remit, the focus of the new Certificate III in Manufactured Mineral Products is specifically on cement, concrete, precast concrete, quarry and asphalt products.

Business Landscape

According to ABS data, there were 2,088 businesses operating in the broad manufactured mineral products sector in 2017. This represents a slight increase of about 2% on the number of businesses in operation in 2015. Like the other manufacturing sectors covered by the MSM Manufacturing Training Package, the manufactured mineral products sector is comprised predominantly of small and micro business, with only 9% medium sized and 1% large businesses operating in 2017.[12]

Number of businesses	Growth since 2015
2,088	2.0% growth: 90% small businesses 9% medium businesses 1% large businesses

Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

According to IBIS World reports, fluctuations in residential building markets have negatively impacted on the demand for manufactured mineral products. Substitution of cheaper materials and imported products is also contributing to constrained growth in the cement sector.

Significant declines in major infrastructure projects in the mining and energy sectors have negatively impacted on demand for ready-mix concrete and concrete products. However, the market is expected to recover over the next five years as investment in building, roads and other infrastructure projects increases.

12 Source: ABS 8165.0 Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

Key Stakeholders

The key industry associations related to the manufactured mineral products industry sector are:

- Cement, Concrete and Aggregates Australia
- Cement Industry Federation
- National Precast Concrete Association.

The Housing Industry Association and Master Builders Australia also represent some businesses involved in the sector.

Fenestration

Fenestration relates to the construction of openings in buildings, including windows, doors, louvres, vents, wall panels, skylights, storefronts, curtain walls, and slope glazed systems. The focus on the newly developed qualification in fenestration is on the skills needed for the manufacture of windows and doors.

Business Landscape

Demand for window and door manufacturing is heavily influenced by the residential building market, which, according to IBISWorld reports, has been in a state of flux over recent years, but is expected to experience a return to growth over the next five years.

Development of commercial buildings is, however, supporting demand for these products. Aluminium windows and doors in particular are seen as a sustainable material for non-residential construction, and demand for these is expected to increase as developers seek to gain higher sustainability ratings for buildings to meet customer demands.

In recent years, Australia's glazing and window manufacturing industries have invested heavily in new plant, equipment, projects and staff training in response to government and market demands for more sustainable buildings. The industry has the capacity to not only compete with imports, but to locally produce world-class high-technology energy efficient window products.

Key Stakeholders

The largest companies operating in this sector are JELD-WEN Australia, which manufactures doors and windows under a number of brands, G James Glass & Aluminium, Viridian, Chevron Glass Group, Flat Glass Industries and Walshs Glass.

The Australian Window Association is the peak body for the industry sector.

Training Snapshot

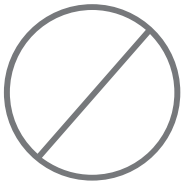
In 2017, a learner enrolled in a qualification from the MSM Manufacturing Training Package was most likely to be:

ENROLLED IN CERTIFICATE III IN PROCESS MANUFACTURING

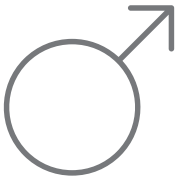
STUDYING IN QUEENSLAND

IN THE 19 YEARS OR YOUNGER AGE BRACKET

NOT IN AN APPRENTICESHIP OR TRAINEESHIP



ENROLLED WITH A PRIVATE RTO.

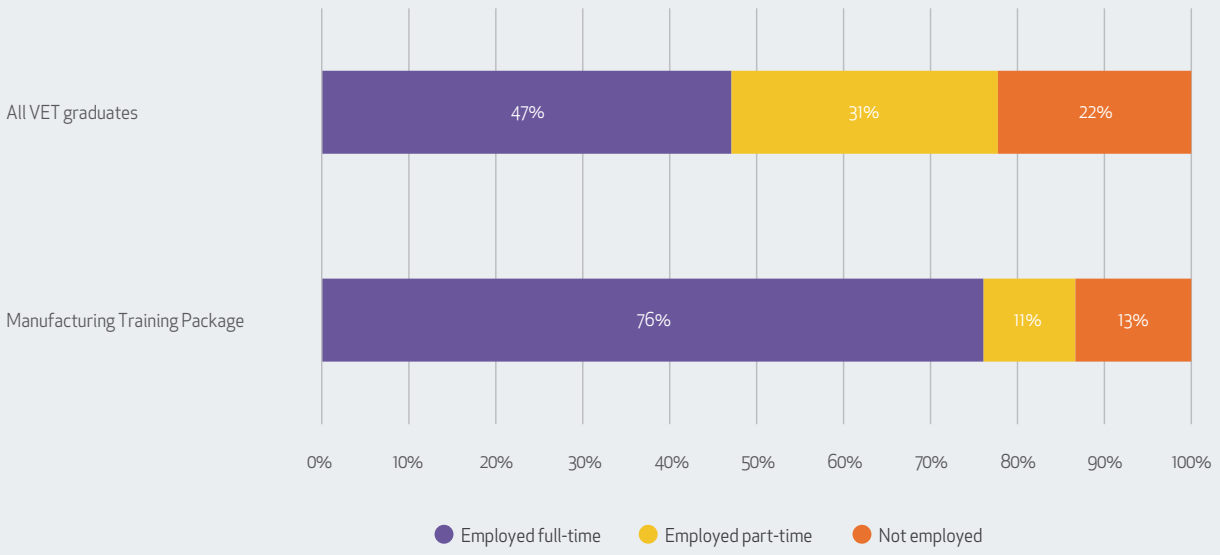


MALE

Source: NCVER VOCSTATS (Program enrolments 2017 by various breakdowns).

Of the graduates of MSM Manufacturing Training Package qualifications in 2017, 86.7% were employed after training, with the majority of these (75.6%) employed full-time. As illustrated in Figure 1 below, this level of post-qualification employment is higher than that of Vocational Education and Training (VET) qualifications overall.

Figure 1 – VET graduates – employment outcomes after training



Source: NCVER VET student outcomes 2017, Data visualisation – VET graduate outcomes, all VET graduates.

Only 10% of enrolments in MSM Manufacturing Training Package qualifications were as part of a traineeship and these were predominantly in the Certificate III in Process Manufacturing.[13]

This is despite several qualifications being funded as traineeships across various states; namely:

- Certificate II in Process Manufacturing (funded in WA and TAS)
- Certificate II in Recreational Vehicle Manufacturing (funded in WA)
- Certificate III in Process Manufacturing (funded in WA, SA, TAS and ACT)
- Certificate III in Surface Preparation and Coating Application (funded in VIC, WA and TAS)
- Certificate III in Recreational Vehicle Service and Repair (funded in VIC, QLD, TAS and NT)
- Certificate III in Recreational Vehicle Manufacturing (funded in VIC, QLD, WA and TAS)
- Certificate IV in Process Manufacturing (funded in VIC).[14]

13 Source: NCVER VOCSTATS , extracted on 13/08/2018.

14 This data is sourced from state and territory training authorities and is provided for information only. It must be confirmed with these authorities.

There were 2,147 VET delivered to secondary students (formerly VET in Schools) enrolments in MSM Manufacturing Training Package qualifications in 2017, with 85% of these enrolled in Queensland. In 2017, VET delivered to secondary students enrolments accounted for 24% of all enrolments in the MSM Training Package.

Most of these enrolments were in the two qualifications designed for delivery in schools:

- Certificate II in Manufacturing Technology
- Certificate I in Manufacturing (Pathways).

For a snapshot of enrolments in the MSM Manufacturing Training Package please refer to Appendix D.

Training Delivery

As illustrated in Table 1 below, delivery by private RTOs accounts for the majority of enrolments, although this has declined slightly from 72% in 2015 to about 64% in 2017.

Table 1 – Proportion of program enrolments by provider type

Provider type	Government funded enrolments 2016	Government funded enrolments 2017	Total VET enrolments 2016	Total VET enrolments 2017	Percentage provider type for 2017
TAFE	639	799	1,122	1,206	13%
Private training provider	3,475	4,239	5,352	5,750	64%
University	33	5	49	12	0%
Enterprise provider	155	151	246	292	3%
School	118	94	1,666	1,660	19%
Community education provider	-	29	-	29	0%

Table 2 indicates the number of RTOs with MSM Manufacturing Training Package qualifications on scope. This data is current at August 2018, per the listing on the National Register of VET available at www.training.gov.au.

The Certificate III in Manufactured Mineral Products is not included on this list as it has only recently been endorsed. However, four RTOs had the previous qualification on scope as of the same date.

Similarly, the Certificate III in Fenestration is not included as it is a new qualification that has not yet been added to the scope of any RTO.

Table 2 – Number of RTOs by nationally recognised qualifications on scope

Qualification name	No. of RTOs on scope
Certificate I in Process Manufacturing	4
Certificate I in Manufacturing (Pathways)	38
Certificate II in Process Manufacturing	15
Certificate II in Manufacturing Technology	17
Certificate II in Recreational Vehicle Manufacturing	1
Certificate III in Process Manufacturing	42
Certificate III in Surface Preparation and Coating Application	6
Certificate III in Recreational Vehicle Service and Repair	6
Certificate III in Recreational Vehicle Manufacturing	7
Certificate IV in Process Manufacturing	10

Source: https://training.gov.au. RTOs approved to deliver this qualification. Accessed August 2018.

Qualifications Available

The following qualifications and skill sets are contained in the MSM Manufacturing Training Package.[15]

Process Manufacturing

- Certificate I in Process Manufacturing
- Certificate II in Process Manufacturing
- Certificate III in Process Manufacturing
- Certificate IV in Process Manufacturing.

Related Qualifications

- Diploma of Production Management.

VET Delivered to Secondary Students Qualifications

- Certificate I in Manufacturing (Pathways)
- Certificate II in Manufacturing Technology.

Recreational Vehicles

- Certificate II in Recreational Vehicle Manufacturing
- Certificate II in Recreational Vehicle Service and Repair
- Certificate III in Recreational Vehicle and Accessories Retailing
- Certificate III in Recreational Vehicle Manufacturing
- Certificate III in Recreational Vehicle Service and Repair
- Certificate IV in Recreational Vehicle and Accessories Retailing
- Certificate IV in Recreational Vehicles
- Diploma of Recreational Vehicles.

15 Source: https://training.gov.au/Search, accessed 13/08/18.

Surface Preparation and Coating

- Certificate III in Surface Preparation and Coating Application.

Manufactured Mineral Products

- Certificate III in Manufactured Mineral Products.

Fenestration

As highlighted earlier in the report, a new qualification, has been added to the MSM Manufacturing Training Package.

- Certificate III in Fenestration.

Industrial Services Skill Sets

- Use high pressure water jetting equipment
- Operate a high pressure water jetting system
- Operate a drain cleaning system
- Operate a vacuum loading system.

Trade Measurement Skill Sets

- Trade Measurement Inspection
- Trade Measurement Verification (Complex Measuring Instrument)
- Trade Measurement Verification (Limited Weighing Instrument)
- Trade Measurement Verification (Liquid Measuring Instrument Using Volume Measures)
- Trade Measurement Verification (Simple Measuring Instrument)
- Trade Measurement Verification (Simple Measure).

Other Skill Sets

- Licence to operate a standard boiler
- Licence to operate an advanced boiler
- Leading Hand/Supervisor
- Confined space work team.

Qualification Uptake

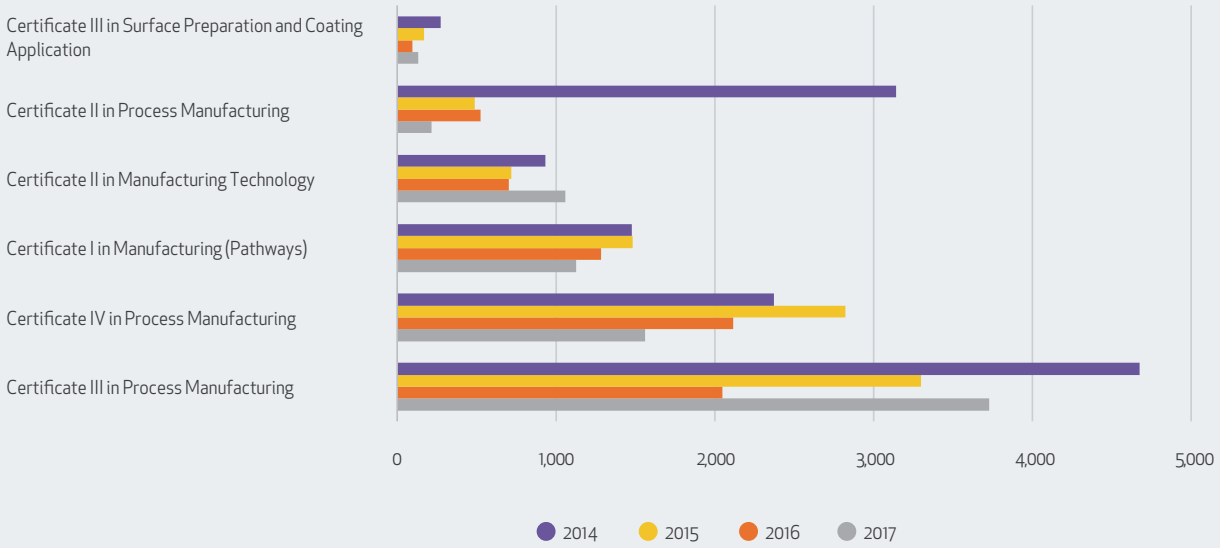
As illustrated in Figure 2 below, enrolments in MSM Manufacturing Training Package qualifications have been declining since 2014, although there has been a slight increase (5%) in 2017. Declines have been most evident in privately funded enrolments (almost 150% between 2014 and 2017).

Of the 8,945 enrolments in 2017, 59% were government funded.

Figure 2 – Total program enrolments in MSM Manufacturing qualifications, 2014–2017

The majority of enrolments are in the Certificate III and Certificate IV in Process Manufacturing (see Figure 3 on the next page). Together they accounted for 67% of all enrolments in 2017, with the two school related qualifications accounting for a further 27% of enrolments.

Figure 3 – Qualification enrolments, 2014–2017 – top six MSM Manufacturing qualifications by TVA in 2017 individually identified



The Certificate III in Process Manufacturing accounted for 54% of all completions across MSM Manufacturing Training Package qualifications in 2017, with the other three most popular qualifications accounting for a further 36% of completions. These proportions of completions are roughly aligned with enrolment patterns.

Whilst enrolments in the Certificate III in Surface Preparation and Coating Application are relatively small, the 131 enrolments in this qualification in 2017 represent a 39% increase on 2016 figures.

In the Recreational Vehicles sector, the Certificate III in Recreational Vehicle Manufacturing and Certificate III in Recreational Vehicle Service and Repair continue to attract relatively small numbers of enrolments (72 and 38 enrolments respectively in 2017). The Certificate II in Recreational Vehicle Manufacturing attracted 13 enrolments in 2017; the first ever enrolments for this qualification.

The remaining Recreational Vehicles qualifications and the Diploma of Production Management did not have any enrolments in 2017.

The Certificate III in Manufactured Mineral Products that has been moved into the MSM Manufacturing Training Package attracted 13 enrolments in 2017, which is a decrease of 75% since 2014.

The most significant declines in enrolments were in the Certificate I and Certificate II in Process Manufacturing. However, they still attracted 32 and 216 enrolments respectively in 2017. In addition, consultations with a large manufacturer indicated that the Certificate I in Process Manufacturing is actively used as an entry-level qualification for new employees.

Challenges and Opportunities

For Industry and Employers

Technology

The most significant challenges and opportunities across the sectors covered by the MSM Manufacturing Training Package relate to changing technology and increasing levels of automation. These will impact upon the sectors in a number of different ways.

Research is showing that, although technology is unlikely to eliminate many job roles entirely, almost all jobs will be affected in some way, with tasks involving predictable physical work, data processing and data collection the most susceptible to being automated.[16] It also suggests that by 2022, at least 54% of all employees will require significant reskilling and upskilling, while all workers will need a 'mindset of agile learning as they shift from the routines and limits of today's jobs to new, previously unimagined futures.'[17]

Consultations indicate that the nature of work roles across different parts of the manufacturing sectors is already changing. For example, advanced manufacturing methods are starting to be used in the recreational vehicle sector with the importation of labour from the departing automotive industry, requiring new skills in technologies such as robotics and 3D printing. In process manufacturing, increasing levels of automation and use of advanced manufacturing processes are also a feature.

In the Industry 4.0 conference conducted by IBSA Manufacturing in 2018, 88% of delegates described the challenge of technology as either significant (48%) or very significant (40%) and almost two-thirds (62%) identified skills or training as forming part of that challenge. When asked whether the VET sector was keeping up with changing technology, 72% of delegates said 'no', adding comments such as:

- 'Often VET prepares workers for current work roles with little capacity to adapt to changes, especially when they are rapidly occurring.'
- 'There is not much awareness of technological impacts in the development of training packages.'[18]

Work conducted by CSIRO on advanced manufacturing identified that sustained growth in the sector will require investment and translation of enabling science and technology, including: sensors and data analytics, advanced materials, smart robotics and automation, 3D printing, and augmented, mixed and virtual reality, which in turn has implications for underpinning digital literacy and Science, Technology, Engineering and Mathematics (STEM) skills across the workforce.[19]

16 McKinsey and Company (2016) *Where machines could replace humans – and where they can't (yet)*, McKinsey Quarterly, July 2016.

17 Centre for the New Economy and Society (2018) The Future of Jobs Report, World Economic Forum. Pix.

18 https://ibsa.org.au/industry-4-0-unpacking-the-skills-challenges-conference/.

19 CSIRO (2016) Advanced Manufacturing; A Roadmap for unlocking future growth opportunities for Australia.

A recent Australian Industry Group survey of its members found that employers are experiencing difficulties recruiting employees with STEM skills, particularly technicians, trade workers and professionals. They also identified that the most significant capability improvements required by managers are in the areas of technology/digitalisation; therefore, employers have prioritised digital technology training for managers. [20]

Sustainability

Rising awareness amongst consumers is driving demand for more environmentally sustainable products in the recreational vehicle sector. In addition to technology that increases sustainability, such as solar power and improved battery storage, consultations indicate a growing demand for the use of composites and other lightweight materials in the manufacture of recreational vehicles to reduce their weight and fuel consumption.

Consultations also identified that lean manufacturing processes are increasingly being used in the manufacture of recreational vehicles, and that there is a need for a greater focus on lean manufacturing in the process manufacturing qualification to meet workplace demands.

Sustainable manufacturing, both in terms of business models and processes and the manufacture of sustainable products, was identified by CSIRO as one of the key opportunities for Australia's manufacturing sector.[21]

Sustainability in manufacturing is also an important focus of Queensland's recently released 10-Year Roadmap and Action Plan, with support to be provided for local manufacturers to 'address input costs such as energy and electricity, reduce waste and to meet the increasing customer demand for products that are both affordable and have a light environmental footprint'.[22]

Business and Economics

Changes in the manufacturing sector also include changes in business models and practices, with research suggesting that to remain competitive, manufacturers also need to take advantage of opportunities in the adoption of:

- Customised high-margin solutions – this includes design services, and the manufacture of superior components and novel products.
- Selling services – this includes maintenance and repair services, workflow management services and health and biosecurity services.
- Global value chains – which have been shown to provide businesses with exposure to new technologies, processes and skills.[23]

20 Australian Industry Group (2018) Skilling: A National Imperative.

21 CSIRO (2016) Advanced Manufacturing; A Roadmap for unlocking future growth opportunities for Australia.

22 Advance Queensland (2018) Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan, Department of State Development, Manufacturing, Infrastructure and Planning, p 30.

23 CSIRO (2016) Advanced Manufacturing; A Roadmap for unlocking future growth opportunities for Australia.

In the recreational vehicle sector, consultations identified several factors impacting the economic viability and business practices of businesses in the sector including:

- Cheap imports are becoming a major competitor to the local market, requiring streamlining of production costs and implementation of cost controls.
- Increasing numbers of customers in the younger demographics and amongst young families are driving price point of products lower.
- Lack of understanding of the repair process and costs involved by the insurance industry (which is one of the biggest customers of the repair side of the recreational vehicle sector) is impacting on the ability of workshops to retain and maintain a highly skilled workforce.

Political and Institutional

Technology is moving faster than the pace of regulation and standards, creating a significant challenge in ensuring product quality across the sector.

The upcoming RVSA legislative reform is the largest change to federal vehicle legislation in the past three decades. The Bill, which was passed at the end of 2018, provides an administrative framework to strengthen compliance enforcement across the recreational vehicle sector, making a training culture even more important. Two of the standards, AS5601:2 and AS3001, are likely to impact upon recreational vehicle manufacturing and design processes.

A review of the legislation that underpins Australia's measurement standards is also currently underway to bring the standards up-to-date with changed technology, as well as to identify aspects of Australia's measurement framework that can be modernised, streamlined or simplified. Options for reform are to be presented to the government for consideration in 2020; therefore, legislative changes are unlikely to occur for several years.

Supply-side Challenges and Opportunities

Impact of technological disruption

A recent report by NCVER, which analysed the potential impact on technological disruption and the Fourth Industrial Revolution on workplaces and the implications for the VET system, suggested that:

- training needs to equip the workforce with the knowledge and skills to use new technologies as well as prepare them for an expanded scope of tasks within job roles
- generic/soft skills will play an essential role in preparing workers to be flexible and cope with the rate and scope of change
- in some firms (especially in advanced manufacturing firms), specialist technology skills will be needed
- there is a need for collaboration between employers and the VET sector to support lifelong learning within the workforce.[24]

24 Seet, P., Jones, J., Spoer, J. and Hordacre, A. (2018) The Fourth Industrial Revolution: the implications of technological disruption for Australian VET, NCVER, Adelaide. p 9–10.

The research also identified a shortage of local training providers with the capacity to deliver training in the skills needed to utilise new technologies.[25]

Consultations in the recreational vehicle sector also identified that the skills to operate, maintain and service the more technologically advanced equipment that is starting to be used in the manufacture of recreational vehicles (robotics, 3D printing, etc.) are scarce.

Labour and skill shortages

Consumers are increasingly purchasing and fitting accessories to recreational vehicles. However, there are currently no formal training options for vehicle accessory fitting. At the same time a lack of awareness of career options in vehicle accessories fitting amongst school leavers, parents, school career councillors and other influencers is also contributing to labour and skill shortages in this area.

A shortage of training providers delivering sector-specific training is also impacting on the ability of the sector to access the skills it needs.

Micro-credentials and modular learning

Micro-credentials (i.e. small chunks of learning) were also identified as a potential way of being more responsive to rapidly changing training and skill development needs.[26]

The idea of modular learning and greater choice over the content of training was also raised in recent research by the Advanced Manufacturing Growth Centre, which reported that 'Employers seek greater involvement in Australia's VET system. As one manufacturer told AMGC: 'We want to tailor the training schemes for us; to cherry-pick what we want'. Another said: 'The education system doesn't need to be reorganised around Industry 4.0. What needs to take place is the development of the little modules so that a manufacturer can come along and say I want that piece.'[27]

25 Seet, P., Jones, J., Spoer, J. and Hordacre, A. (2018) The Fourth Industrial Revolution: the implications of technological disruption for Australian VET, NCVER, Adelaide. p 36.

26 Seet, P., Jones, J., Spoer, J. and Hordacre, A. (2018) The Fourth Industrial Revolution: the implications of technological disruption for Australian VET, NCVER, Adelaide, p 46.

27 Advanced Manufacturing Growth Centre (2018), Industry 4.0: An Opportunity for Every Australian Manufacturer; Submission to the Department of Industry, Innovation and Science.

For Learners and Training Package Development

Consultations with industry and RTO representatives identified some specific opportunities for training package development work related to particular qualifications and skill sets from the MSM Manufacturing Training Package.

Process Manufacturing

A survey and series of in-depth interviews was conducted with RTOs delivering one or more of the MSM process manufacturing qualifications. Feedback from the 30 survey responses and 10 in-depth interviews identified the following.

- RTOs who are currently delivering one or more of the Certificate I, II, III or IV in Process Manufacturing are very happy overall with their ability to meet employer and learner needs through these qualifications.
- The flexibility to customise the qualifications to meet employer needs was noted as being of particular value.
- At the same time, several RTOs who have these qualifications on scope are no longer delivering them due to a lack of demand and challenges in finding skilled trainers to deliver them.
- These qualifications are delivered predominantly to existing employees, across a wide range of industries, including manufacturing, mining and resources, chemicals, warehouse/logistics, food and beverage, commercial laundries, recycling facilities, water and sewage treatment, hospitals, engineering works, furniture assembly, construction equipment manufacturing, canvas/textile industry, steel products, importing, packaging, plastics industries and concrete supplies.
- A stronger focus on industry trends such as lean manufacturing (e.g. by incorporating electives from competitive systems and practices qualifications) and a possible reduction in the length of the Certificate III and IV qualifications may make this group of qualifications more attractive to employers and learners into the future.
- The full Process Manufacturing RTO Survey is provided at Appendix E.

High Pressure Water Jetting, Drain Cleaning and Vacuuming

Industry consultations identified that the current units of competency and skill sets are mostly 'hitting the mark' in terms of industry needs. However, the following issues could be addressed through training package development work over the next few years:

- The need for greater clarity about the purpose and differences between the skill sets 'Use high pressure water jetting system' and 'Operate a high pressure water jetting system'.
- Clarification of the scope of the high pressure water jetting units of competency is needed in relation to waterjet cutting, which is used in some MEM Manufacturing and Engineering units of competency.
- Ambiguity in the wording of some assessment criteria is resulting in different interpretations of assessment requirements by RTOs.
- There is potential for the development of a qualification at the Certificate III or IV level.
- Formal training that aligns with a job role emerging in the telecommunications industry that requires the digging of holes using high pressure water jetting and vacuuming equipment.

Trade Measurement

Industry and RTO consultations identified the following issues relating to the trade measurement units and skill sets contained in the MSM Manufacturing Training Package:

- A review of the legislation underpinning measurement standards (described in the Challenges and Opportunities section) is currently underway.
- The assessment requirements of the current units, particularly those related to verification, do not align well with job roles and are in need of review. It appears that much of the content of the 'inspection' units have been copied across to the 'verification' units and is not always relevant.
- It is unclear as to whether there is any connection between these trade measurement verification competencies and other calibration units of competency in the MSL Laboratory Operations Training Package and MEM Manufacturing and Engineering Training Package.

Cross-industry Challenges and Opportunities

The challenges and opportunities facing the manufacturing industry sector in relation to changing technology and increasing automation are likely to be widespread across all sectors.

Opportunities may also exist through existing cross sector projects (Teamwork and Communication; Consumer Engagement Through Online and Social Media; Supply Chain Skills). The IRC will engage with cross sector projects to provide input on the skill needs and experiences of the manufacturing industry. See the Cross Sector Projects section for more details.

Employment and Skills Outlook

Employment Outlook

Table 3 details the numbers of employees and expected growth in employment over the next five years for the main occupations covered by the MSM Manufacturing Training Package.

A few important points need to be made in relation to this data:

- Process manufacturing qualifications are used across a wide range of industry sectors and are unable to be fully captured in the occupational data below.
- Recreational vehicle manufacturers, retailers and repairers are a specialised subset of the Vehicle Body Builders and Trimmers, Motor Vehicle and Vehicle Parts Salespersons and Motor Mechanics occupations listed below.
- Metal Finishing and Coating is only a small subset of Sheetmetal Trades Workers, with Census data showing a total of 317 people employed in this sub-sector in 2016.

A list of the qualifications relating to each of these occupations can be found in Appendix B.

As has been noted earlier, the IRC has cautioned against too great a reliance solely on ANZSCO classified data because of the challenges outlined above.

Table 3 – Number of employees and expected growth in employment over the next five years for the main occupations covered by the MSM Training Package.

ANZSCO Occupation Unit Group		Estimated Number of Employees (rounded to nearest 100)			Projected number of employees	% Growth over five years
		2016	2017	2018	2023	2018–2023
1335	Production Managers	54,300	61,800	53,300	56,300	5.6%
3129	Other Building and Engineering Technicians	27,200	24,700	21,100	21,700	2.9%
3212	Motor Mechanics	98,200	92,500	103,700	101,800	-1.9%
3222	Sheetmetal Trades Workers	6,000	6,500	8,100	8,500	4.7%
3242	Vehicle Body Builders and Trimmers	5,900	6,100	4,000	4,000	0.6%
3990	Miscellaneous Technicians and Trades Workers nfd	0	100	100	100	0.3%
3999	Other Miscellaneous Technicians and Trades Workers	16,200	16,400	17,900	21,100	17.9%
6213	Motor Vehicle and Vehicle Parts Salespersons	32,800	37,700	34,700	35,900	3.5%
7111	Clay, Concrete, Glass and Stone Processing Machine Operators	3,200	2,900	4,300	5,000	15.2%
7119	Other Machine Operators	11,300	11,700	13,700	13,700	0.0%
8322	Product Assemblers	26,300	27,500	33,800	35,900	6.3%
8390	Miscellaneous Factory Process Workers nfd	0	0	100	100	0.0%
8399	Other Factory Process Workers	10,300	9,500	10,600	10,400	-2.5%
8994	Motor Vehicle Parts and Accessories Fitters	11,300	13,200	10,500	10,500	-0.4%
8999	Other Miscellaneous Labourers	54,200	68,200	61,700	63,100	2.2%

Source: Department of Jobs and Small Business, Labour Market Information Portal.

Occupation time series data (May 2014 to May 2017) has been sourced from the ABS 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly, May 2018. Figures are average of preceding 4 quarters, whereas May 2018 and projection to May 2023 figures are seasonally adjusted and trended as sourced from LMIP.

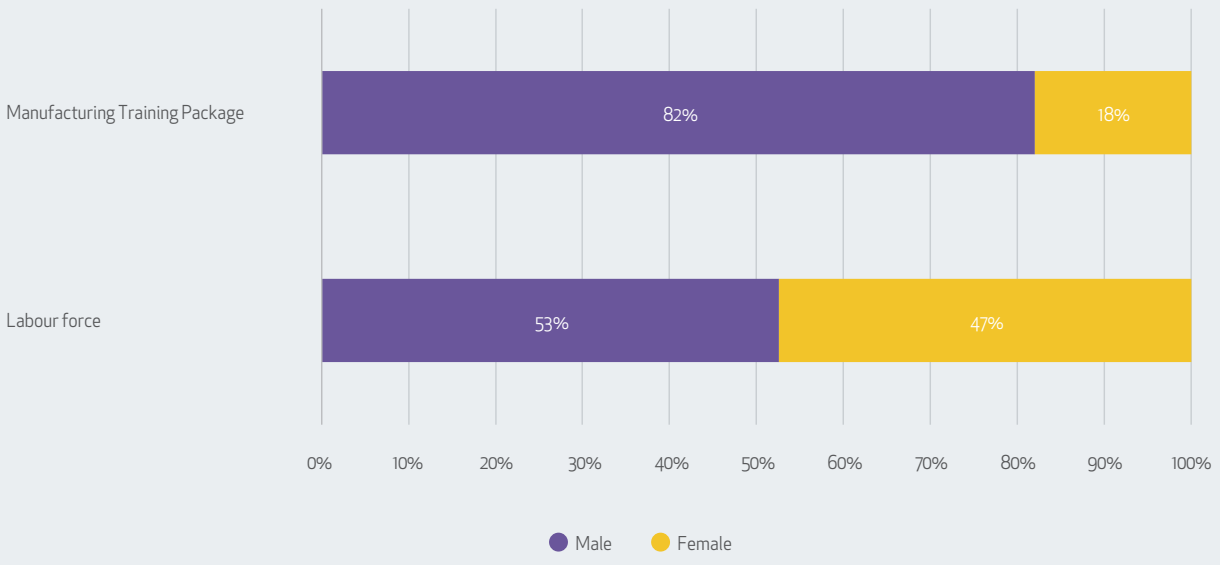
These historical and projected employment patterns highlight the following points:

- Whilst employment numbers for the manufactured minerals related occupation of Clay, Concrete, Glass and Stone Processing Machine Operators are comparatively small, it is a projected growth occupation.
- Production managers are a relatively large group of employees and are projected to grow. However, there have been low or no enrolments in the Diploma of Production Management from 2014–2017. This may indicate a need to review the relevance of this qualification.
- The Sheetmetal Trades Worker occupation, of which Metal Coating and Finishing is a subset, is another growth area. This is supported by census data that shows an 8% increase in employment from 2011–2016[28] and IBISWorld data, which projects employment in the Metal Coating and Finishing sector to grow by about 10% over the period 2018–2023.[29]
- Whilst employment for Motor Mechanics and Vehicle Body Builders and Trimmers is expected to decline, or experience minimal growth, this does not reflect feedback from the Recreational Vehicles that indicates this is a growing sector.

Other significant observations that can be made from ABS Census data in relation to employment in the industries related to the MSM Manufacturing Training Package include the following.

- The workforce across the selected industry classes is predominantly male, comprising 82% of the workforce, compared with 53% male in the overall Australian labour force.

Figure 4 – Gender of employees in selected industry classes versus the general labour force, Census 2016

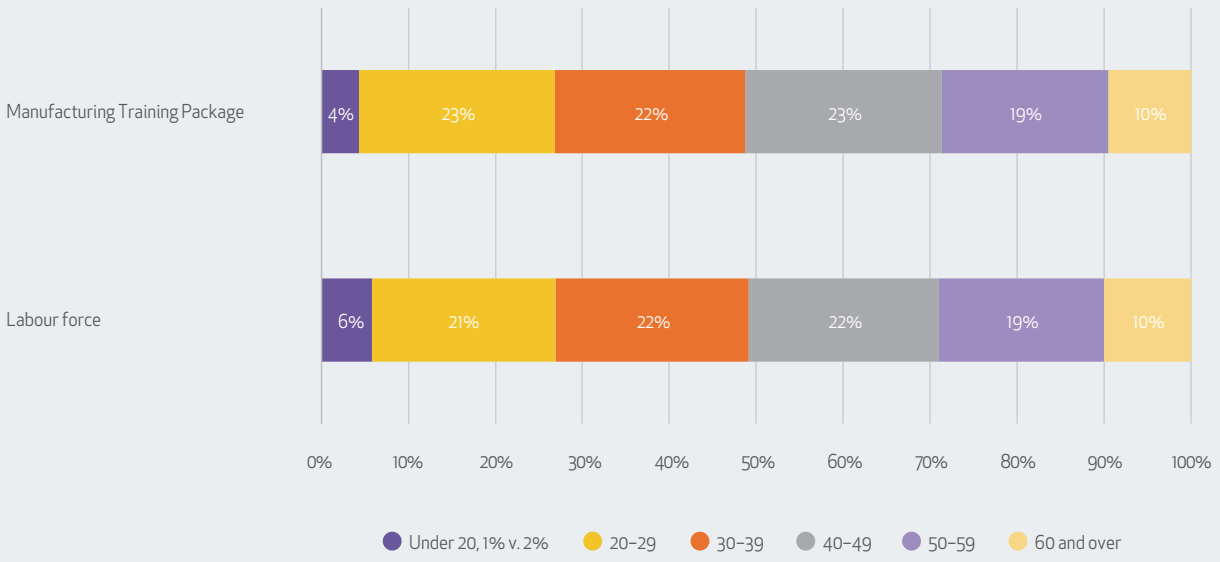


28 ABS Census of Population and Housing 2006, 2011, 2016.

29 IBISWorld, 2017, Industry Report C2293 – Metal Coating and Finishing in Australia, Dec 2017.

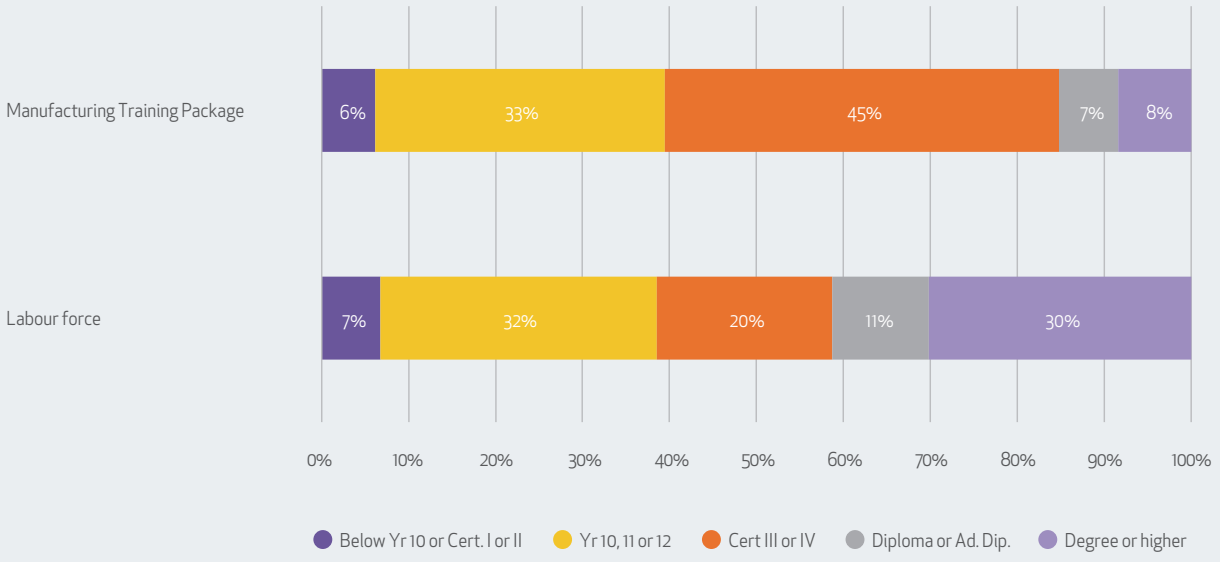
- The age profile of the selected industry classes is similar to that of the profile of the overall labour force.

Figure 5 – Age of employees in selected industry classes versus the general labour force, Census 2016



- Those working in the selected industry classes are more likely to have a VET qualification at Certificate III or IV level than the general labour force and less likely to have a Diploma or Advanced Diploma or Degree or higher qualification.

Figure 6 – Highest educational attainment of employees in selected industry classes versus the general labour force, Census 2016



Workforce Supply Challenges

The 2018 Australian Industry Group survey report[30] identified three major issues impacting upon the supply of skills across the manufacturing industry. These were:

- Skills shortages: which were reported by 75% of survey respondents and represented a 49% increase from the previous year's survey. Skills shortages were most significant in technician and trades worker roles and recruitment difficulties most often experienced in relation to STEM skills, automation, big data and artificial intelligence solutions.
- Insufficient levels of literacy and numeracy: which was reported as a challenge by 99% of respondents. This was an increase from 92% in the previous year.
- Lack of leadership and management skills: with 62% of respondents believing that a lack of leadership and management skills is having a high impact on the business. This was an increase from 56% in the previous year.

Consultations in the recreational vehicle sector identified the following specific workforce supply challenges.

The recreational vehicle industry is growing due to the availability of a wide variety of products from low-priced imports, through to high-end locally-manufactured products. All these products at some point require repair, maintenance, alteration and upgrading, which has placed high demand on the experienced trade qualified technicians in an industry which lacks a lot of regulatory enforcement. With consumers becoming more time poor, increasing demand is being placed on existing technicians, forcing consumers to engage unqualified people to carry out repairs. This lack of sufficient numbers of skilled technicians to meet this growing demand is posing a long-term reputational risk to the industry.

At the same time, attracting new/young apprentices and trainees to the recreational vehicle sector is a challenge and the retention of quality staff is becoming more difficult as local businesses try to remain competitive in a saturated local and global market. Challenges in attracting and retaining skilled workers for the recreational vehicle sector was the driver behind the recently released Caravan Industry Association Victoria Jobs, Career & Training Strategy, which sets out a number of initiatives for addressing these challenges, including:

- Establishment of a Caravan Industry Skills Centre (CIA)
- Development of a 'Job and Career Portal' on the CIA Vic website
- Implementation of a 'Career Pass' for industry induction, training and career development
- Business culture, mindset and innovation programs for managers, supervisors and staff
- Partnerships with Government and community organisations.[31]

30 Australian Industry Group (2018) Skilling: A National Imperative.

31 nem Australasia (2018) Caravan Industry Association Victoria Jobs, Career & Training Strategy, p 3.

Changes in the recreational vehicle sector are also increasing the demand for specific skills in the sector workforce, including:

- technical skills, such as electrical, plumbing, fibreglass and adoption of new manufacturing processes and materials.
- advanced manufacturing skills, such as robotics, 3D printing, virtual reality, holographics.
- vehicle accessories fitting technical skills, including light automotive mechanical, panel beating/auto dismantling, spray painting and auto electrical, and the fitting of new products/technologies.
- business related skills, such as business operations, marketing, compliance and licensing.
- managerial skills, particularly to improve and oversee new processes.
- digital skills.
- generic skills, such as communication and collaboration, learning and adapting to change.
- skills in using/adapting to environmentally/sustainable practices to reduce waste, save costs and make better products for the consumer.
- basic knowledge of 12v, solar, plumbing and repair techniques to ensure the correct information is being provided to customers of sales and repair services.

Skills Outlook

Key Generic Skills

The Process Manufacturing, Recreational Vehicle and Laboratory IRC noted that the categorisation of generic skills, in particular the grouping together of skills that differ significantly (e.g. management vs leadership), rendered the ranking of the generic skills listed below quite unhelpful in terms of training product development.

They suggested that a more useful approach would be to consider the generic skills most needed to support changing work practices and skill demands across the industry (e.g. the rise of automation) and to then identify what skills are a priority for different types of work roles (e.g. operator roles, maintenance roles, programming and design roles).

Generic skills such as problem solving, as well as the willingness and ability to absorb new learning and apply skills in new roles and to new technology were seen as very important for adapting to the rapid pace of change across the industry.

With these comments in mind, the ranking of key generic skills in Table 4 by the Process Manufacturing, Recreational Vehicle and Laboratory IRC remains unchanged. Where there are only certain aspects of the generic skills area that were seen as important, these have been highlighted within the text in the table.

IRC members previously observed that although they would expect that learners would already possess the necessary underpinning Language, Literacy and Numeracy (LLN) and STEM skills when enrolling in qualifications, this is often not the case.

Customer service skills are important for sectors that include retail businesses, such as the Recreational Vehicles sector. However, the IRC commented that 'customer' can also be defined as the next person on the production line, and that getting the 'product' to this person is critical in the manufacturing process. Similarly, customers can also be defined as different organisations within the supply chain.

Table 4 – Key generic workforce skills

Combined Manufacturing IRCs		Process Manufacturing, Recreational Vehicle and Laboratory IRC	
1	Design mindset/Thinking critically/Systems thinking/ Solving problems skills	1	Technology use and application skills
2	Technology use and application skills	2	Design mindset/Thinking critically/Systems thinking/ **Solving Problem skills**
3	Learning agility/Information literacy/Intellectual autonomy and self-management skills	3	Managerial/Leadership skills
4	Communication/Collaboration including virtual collaboration/Social intelligence skills	4	LLN skills
5	STEM skills	5	STEM skills
6	LLN skills	6	**Learning agility**/Information literacy/**Intellectual autonomy and self-management skills**
7	Data analysis skills	7	**Customer service**/Marketing skills
8	Managerial/Leadership skills	8	**Communication**/Collaboration including virtual collaboration/Social intelligence skills
9	Customer service/Marketing skills	9	Data analysis skills
10	Environmental and Sustainability skills	10	Environmental and Sustainability skills
11	Entrepreneurial skills	11	Financial skills
12	Financial skills	12	Entrepreneurial skills

Demand for generic skills may vary considerably between industry sectors, regions and individual businesses. Employers may prioritise some generic skills over others depending on their particular context, workforce and business imperative. All of the identified generic skills are important throughout the workforce. This ranking represents the importance of generic skills across an industry but should not be expected to reflect the specific experience of every business and employer within that industry.

Through the research and consultation processes for the development of this Industry Skills Forecast, the Process Manufacturing, Recreational Vehicle and Laboratory IRC has identified the priority areas for training package development, listed in Table 5 below.

Table 5 – Priority areas for Training Package development

Rank	Skill	How identified
1	New manufacturing processes and practices in the recreational vehicle sector arising from legislative changes and changing technology	Consultations
2	New manufacturing processes and practices in the process manufacturing sector arising from changing technology and business practices	Consultations Literature review

Key Drivers for Change and Proposed Responses

Table 6 – Priority skills and key drivers for change

Priority Skills	Key Driver for Change	Proposed Response
Regulatory/Legislative		
Product safety	Changes to Road Vehicle Standards	Review current recreational vehicle qualifications to identify any impacts of legislation
Measurement inspection and verification	Measurement Law Review currently underway	Review trade measurement skill sets/units of competency to ensure alignment with changes to measurement standards
Industry Specific		
Process Manufacturing	Increasing demands for lean manufacturing processes	Review process manufacturing qualifications to ensure they reflect current industry trends
High pressure water jetting and vacuuming	Emerging job roles	Identify the requirements of emerging job roles in the areas of Industrial Services and digging of pits for telecommunications infrastructure and determine implications for training products
Technology		
Changing skill needs arising from automation and robotics	Increasing levels of automation, digitalisation and robotics in the manufacturing industry	Investigate the impact of automation, digitalisation and robotics on process manufacturing and surface preparation and coating occupations and determine the implications for skill development
Changing skill needs arising from new technology	Increasing demand to incorporate new technologies into recreational vehicle products	Investigate the impact of new technology on recreational vehicle manufacture, service/repair and sales and determine the implications for skill development

Training Product Review

Current Activities

Manufactured Mineral Products 2017 Project

In February 2017, IBSA Manufacturing was commissioned to undertake training package development work on the PMC Manufactured Mineral Products Training Package. The project involved the review of all PMC qualifications and resulted in the rationalisation of four qualifications and associated units and development of a new MSM qualification, Certificate III in Manufactured Mineral Products.

The Case for Endorsement was approved by the Australian Industry Skills Committee (AISC) in August 2018.

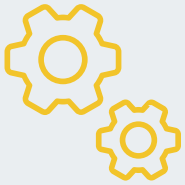
Manufacturing 2017 Project

In February 2017, IBSA Manufacturing was commissioned to undertake training package development work on the MSM Manufacturing Training Package. The project involved the development of a new qualification in fenestration, at Certificate III level.

The project supports an increased demand in the window and door manufacturing sector which has resulted in significant investment into facilities and equipment by industry. The lack of a suitable qualification has led to a shortage of trained fabricators in the window and door industry.

The Case for Endorsement was approved by the AISC in November 2018.

Training Product Review – Activities Timeline



COMPLETE

Manufactured Mineral Products 2017 Project

Case for Endorsement approved by the AISC in August 2018

Manufacturing 2017 (Fenestration) Project

Case for Endorsement approved by the AISC in November 2018

IN PROGRESS

Stakeholder Consultation

Continue to monitor industry imperatives

COMING UP...

Recreational Vehicle Qualifications

2019–2020

Process Manufacturing Qualifications

2021–2022

AISC Cross Sector Projects

In 2017, the AISC established nine cross sector projects in the common skill areas of: automation, big data, digital skills, consumer engagement through social media, cybersecurity, environmental sustainability, inclusion of people with disability in VET, supply chain, and team work and participation. This signalled a new approach to training package development that aims to simplify VET and improve mobility through recognition of qualifications between occupations.

To ensure cross sector units are relevant to multiple occupations and industry sectors, each project includes representation across multiple industries. Cross sector units of competency will be housed in the most relevant training package and marked with a cross sector identifier. Once available on training.gov.au, the units can be adopted across all industry training packages as qualifications and skill are reviewed or developed.

The following cross sector projects have been identified as potentially impacting the MSM Manufacturing Training Package:

- The Teamwork and Communication cross sector project aims to develop common 'teamwork' and 'communication' units that can be used across multiple industries. The project includes the development of five new units to be included in the BSB Business Services Training Package.
- The Consumer Engagement Through Online and Social Media cross sector project is looking at key skills for businesses to remain competitive in a global market including cultural awareness, customer service, marketing, communication and social media skills. The project proposes the development of eight new cross sector units and four skill sets in the areas of ethical practices, privacy regulations and protocols and awareness of online/social media users.
- The Supply Chain Skills cross sector project aims to support industries increase efficiencies and meet consumer demands through the development of 10 new skill sets related to the establishment and maintenance of high-performing supply chains.

There are a further three cross sector projects that may also impact the MSM Manufacturing Training Package: Automation Skills, Digital Skills and Environmental Sustainability. The next phase of work on these projects is being determined and the Process Manufacturing, Recreational Vehicle and Laboratory IRC will continue monitoring their progress for consideration in future training package development work.

The Process Manufacturing, Recreational Vehicle and Laboratory IRC will consider recommendations to integrate the new units developed under the above cross sector projects into qualifications in the MSM Manufacturing Training Package once components are available.

Upcoming Activities

Priorities 2019–2023

Following consideration and analysis of the industry challenges and opportunities, current and emerging skills needs and the key drivers for change, the Process Manufacturing, Recreational Vehicle and Laboratory IRC has identified a number of areas for training product development. These training priorities are outlined in the IRC's Proposed Schedule of Work 2019–2020 to 2022–2023 table which lists the priorities for the next four years. This table also provides a rationale for the priorities, proposed scope and timeframes for these activities.

Important Priorities for 2019–2020

The IRC identified the following training priority as important and propose its inclusion as a priority for the 2019–2020 schedule of work.

- Recreational Vehicles Qualifications: Review all recreational vehicle qualifications and update as required to ensure they meet requirements of the new RVSA and modifications to Australian Standards AS5601:2 and AS3001 and reflect changes in practice in the sector.

Priorities Over the Next Three Years

The IRC identified the following training priorities to be considered over the next three years.

- Process Manufacturing: Review the current qualifications and units of competency related to process manufacturing for currency and relevance, particularly in relation to increased emphasis of lean manufacturing processes.

Future Priorities

In their analysis of the industry challenges and opportunities, current and emerging skills needs and the key drivers for change, the Process Manufacturing, Recreational Vehicle and Laboratory IRC identified the following areas for further consultation and potential future training product development.

- Trade measurement: Review the trade measurement units of competencies and skill sets and update as necessary to create better alignment with trade measurement verification job roles and to reflect changes to legislation that arise from the Measurement Law Review.
- High pressure water jetting, drain cleaning and vacuuming: Investigate the need for training products to meet the needs of emerging job role in digging holes for telecommunications infrastructure using high pressure water jetting, as well as the potential need for a qualification in industrial services. At the same time, update high pressure water jetting skill sets to better reflect the scope of job roles and remove ambiguity of wording in assessment criteria.
- VET Delivered to Secondary Students Qualifications: review the uptake and outcomes of the MSM Manufacturing Training Package qualifications used in schools and ensure that they are leading to valid outcomes for students and industry.

Consultation Undertaken

The 2019 Skills Forecast and Proposed Schedule of Work 2019–2023 builds on the consultations undertaken as part of the 2018 return. Feedback on industry imperatives were also captured as part of training package development projects undertaken throughout 2018.

More specifically, key individual industry and group stakeholders, identified by the Process Manufacturing, Recreational Vehicle and Laboratory IRC, were consulted during the development of the Industry Skills Forecast. See Appendix F for the consultation list.

Feedback was gathered via the following methods:

- forums, meetings and focus groups – attended in person and via webinar
- interviews and one-on-one consultation – via phone/teleconference and/or face-to-face
- nationwide and organisation-specific surveys or questionnaires.

Issues and Sensitivities Raised

Industry consultation identified a number of issues and sensitivities, relating to particular areas within the industry, which have been outlined in the table below. The Proposed Schedule of Work section provides further information on the action to be taken to address these issues/sensitivities.

Table 7 – Issues and sensitivities raised by stakeholders during consultation

Area	Issue and/or sensitivity	Action to be taken
Recreational vehicle qualifications	• A review of qualifications will be required, following the upcoming changes to regulations and legislation. • Need to improve delivery mechanisms and create tools, which improve participation in the industry. • Problems delivering qualifications due to geographical dispersal of industry businesses.	Proposed activity 2019-2020
Process manufacturing qualifications	• Decreased enrolment due to the volume and length of the Certificate III and IV qualifications. • Not enough focus within the qualifications on employer-centred methodologies, such as lean manufacturing • Potential demand for additional content in laboratory skills, mathematics, chemistry and automation/robotics • Confusion about the delineation between process manufacturing and other manufacturing roles.	Proposed activity 2020-2021
Trade measurement	• Units of competency and skill sets need to be better aligned with trade measurement verification job roles. • Units of competency need to reflect legislation changes that arise from the Measurement Law Review.	Identified for further consultation and potential future training product development
High pressure water jetting, drain cleaning and vacuuming	• Ambiguity of wording in assessment criteria, resulting in different interpretations of assessment requirements by RTOs. • Need for greater clarity about the purpose and differences between 'MSMSS00003 Use high pressure water jetting system' and 'MSMSS00004 Operate a high pressure water jetting system'. • Lack of formal training options for digging holes for telecommunications infrastructure using high pressure water jetting. • Need for a qualification in industrial services at the Certificate III or IV level.	Identified for further consultation and potential future training product development

Proposed Schedule of Work 2019–2020 to 2022–2023

Process Manufacturing, Recreational Vehicle and Laboratory IRC

MSM Manufacturing Training Package

Contact details: Keith Monaghan

Date submitted to Department of Education and Training: April, 2019

Year	Items to be Included in the National Schedule
2019–2020	**Recreational Vehicle Qualifications** Review recreational vehicle qualifications to reflect requirements of the new RVSA, to ensure currency in relation to any new trends and changes in practice in the sector and to consider whether there is a need for inclusion of business skills within recreational vehicle qualifications. **Rationale** **What has changed?** • The recreational vehicle sector is experiencing significant changes due to the new RVSA, revised product safety standards and new technology's and processes. As a result, existing workers need to upskill, and additional skilled workers are required to fill skills shortages. Therefore, it is critical that training products in the recreational vehicle stream of the MSM Manufacturing Training Package be updated to reflect current and emerging skill needs and changes. Industry have identified the following skill areas as critical to the future workforce: • new RVSA, passed in 2018, represents the most significant change to the regulatory framework in 30 years and may have implications for the Recreational Vehicles Qualifications • revised product safety standards relating to recreational vehicle construction, AS5601:2 and AS3001, which will require modification to some manufacturing process and design changes to meet the new Standards • automation, digitalisation and robotics, and the introduction of new technology (robotics, 3D printing etc) • business skills for small and micro businesses that make up the Recreational Vehicles sector • sustainable products and lean manufacturing processes. • accessory fitting to support the growing consumer trend to accessorise recreational vehicles. • customer service skills. **Employer/Industry Drivers** Industry stakeholders have identified the need to review and update recreational vehicle qualifications to reflect upcoming changes to regulations and legislation. Details of the issues and sensitivities raised by industry can be found in the Consultation Undertaken section above.

Year	Items to be Included in the National Schedule
2019–2020	**Employment Data/Occupational Outcomes**

Recreational vehicle manufacturers, retailers and repairers are a specialised subset of the Vehicle Body Builders and Trimmers, Motor Vehicle and Vehicle Parts Salespersons and Motor Mechanics occupations. Employment numbers for these occupations is projected to remain relatively stable with a 0.6% growth over the five years 2018-2023. However, the recreational vehicle sector is expected to have higher growth compared to the sector average, especially in fitting accessories to SUVs and duel cabs (over 50% of all new vehicles purchased Australia wide).

Qualification Usage and History

Although the recreational vehicle qualifications have experienced low or no enrolments over the past four years this is expected to change as the industry expands to meet consumer demand. Industry has indicated that revised qualifications that better reflect the needs of industry to fill job roles will attract more enrolments.

The eight recreational vehicle qualifications in the MSA Training Package where transitioned to the MSM Manufacturing Training Package in December 2015. Although these qualifications have been updated several times since being transitioned the changes have all related to updating unit codes for imported units and have not changed the native units or the qualification packaging rules. Therefore, there have been no changes to the content of the 37-recreational vehicle native units since there initial release in December 2015.

Ministers' Priorities Addressed:

At its inaugural meeting, the Council of Australian Governments (COAG) Industry and Skills Council (CISC) agreed on six objectives for reform of the VET system. The table below outlines the priorities that would be addressed by this project.

Ministers' Priority	How Addressed
Removing obsolete and superfluous qualifications from the training system	The use of Skill Sets to meet industry need for a targeted range of skills to meet skill gap in thin markets
Making more information available about industry's expectations of training product delivery	The Implementation Guide will include information to the Skill Set
Ensuring the training system better supports individuals to move easily from one related occupation to another	The skill set include transferable skills that can be applied across industry sectors.
Improving the efficiency of the training system by creating units that can be owned and used by multiple industry sectors and housing these units in a 'work and participation bank	Where relevant the updated training package components will use cross sector units.
Fostering greater recognition of skill sets	The development of a Skills Set provides alternative pathways and supports upskilling of existing workers.

Year	Items to be Included in the National Schedule
2019–2020	**Consultation Plan:** To ensure the training package components produced by this project reflect the skill and knowledge Consultation activities will provide opportunities for ongoing engagement with stakeholders through: Internet project page Face to face meetings Webinar Survey Email updates / newsletters **Scope of Project:** The project will review include all eight recreational vehicle qualifications listed below and consider the following options: Rationalisation of qualifications at each AQF level Introduction of skill sets to support upskilling of workers Importation of units from relevant cross sector projects including Automation and Digital skills **Training products potentially impacted:** Details of individual components are provided in Table A as an excel attachment.
2020–2021	Process Manufacturing Qualifications Review process manufacturing qualifications for currency and relevance and ensure they reflect current industry trends. Rationale Process manufacturing qualifications are used across a wide range of industries for a wide range of purposes. Consultation feedback has suggested that while they are meeting industry needs in many ways, they do not reflect current industry trends in areas such as lean manufacturing and automation. This has been identified as a particular issue at the Certificate III and Certificate IV levels. At the same time there is confusion amongst employers about the skills covered by these generic qualifications and declining enrolments in the Certificate II. These issues suggest that this group of qualifications needs to be evaluated for relevance and currency and updated as needed. Further consultation needs to be undertaken to validate this activity. **Training products potentially impacted:** Further analysis is required to identify training package components with the process manufacturing stream impacted within the MSM Manufacturing Training Package.

Appendix A: Occupation Classifications

For the purposes of analysing employment trends, the following ANZSCO codes have been used.

Four-Digit Classification		Six-Digit Classification		Related MSM Manufacturing Training Package Qualifications
8392	Plastics and Rubber Factory Workers	839200	Plastics and Rubber Factory Workers	Certificate I in Process Manufacturing
8399	Other Factory Process Workers	839999	Factory Process Workers nec	Certificate I in Manufacturing (Pathways) Certificate II in Manufacturing Technology Certificate IV in Process Manufacturing
8399	Other Factory Process Workers	839912	Chemical Plant Worker	Certificate II in Process Manufacturing
8999	Other Miscellaneous Labourers	899916	Mechanic's Assistant	Certificate II in Recreational Vehicle Service and Repair
8322	Product Assemblers	832211	Product Assembler	Certificate II in Recreational Vehicle Manufacturing
8390	Miscellaneous Factory Process Workers	839000	Miscellaneous Factory Process Workers	Certificate III in Process Manufacturing
3222	Sheetmetal Trades Workers	322211	Sheetmetal Trades Workers	Certificate III in Surface Preparation and Coating Application
3212	Motor Mechanics	321211	Motor Mechanic (General)	Certificate III in Recreational Vehicle Service and Repair
3242	Vehicle Body Builders and Trimmers	324211	Vehicle Body Builder	Certificate III in Recreational Vehicle Manufacturing Certificate IV in Recreational Vehicles
6213	Motor Vehicle and Vehicle Parts Salesperson	621311	Motor Vehicle or Caravan Salesperson	Certificate III in Recreational Vehicle and Accessories Retailing Certificate IV in Recreational Vehicle and Accessories Retailing
1335	Production Managers	133512	Production Manager (Manufacturing)	Diploma of Production Management Diploma of Recreational Vehicles
7111	Clay, Concrete, Glass and Stone Processing Machine Operators	711100	Clay, Concrete, Glass and Stone Processing Machine Operators	Certificate III in Manufactured Mineral Products

nec = not elsewhere classified

Please note that due to the broad number of sectors and job roles covered by the MSM Manufacturing Training Package, there are inherent difficulties in identifying relevant industry and occupational data.

Appendix B: Industry Classifications

For the purposes of analysing the business landscape, the following ANZSIC codes have been used.

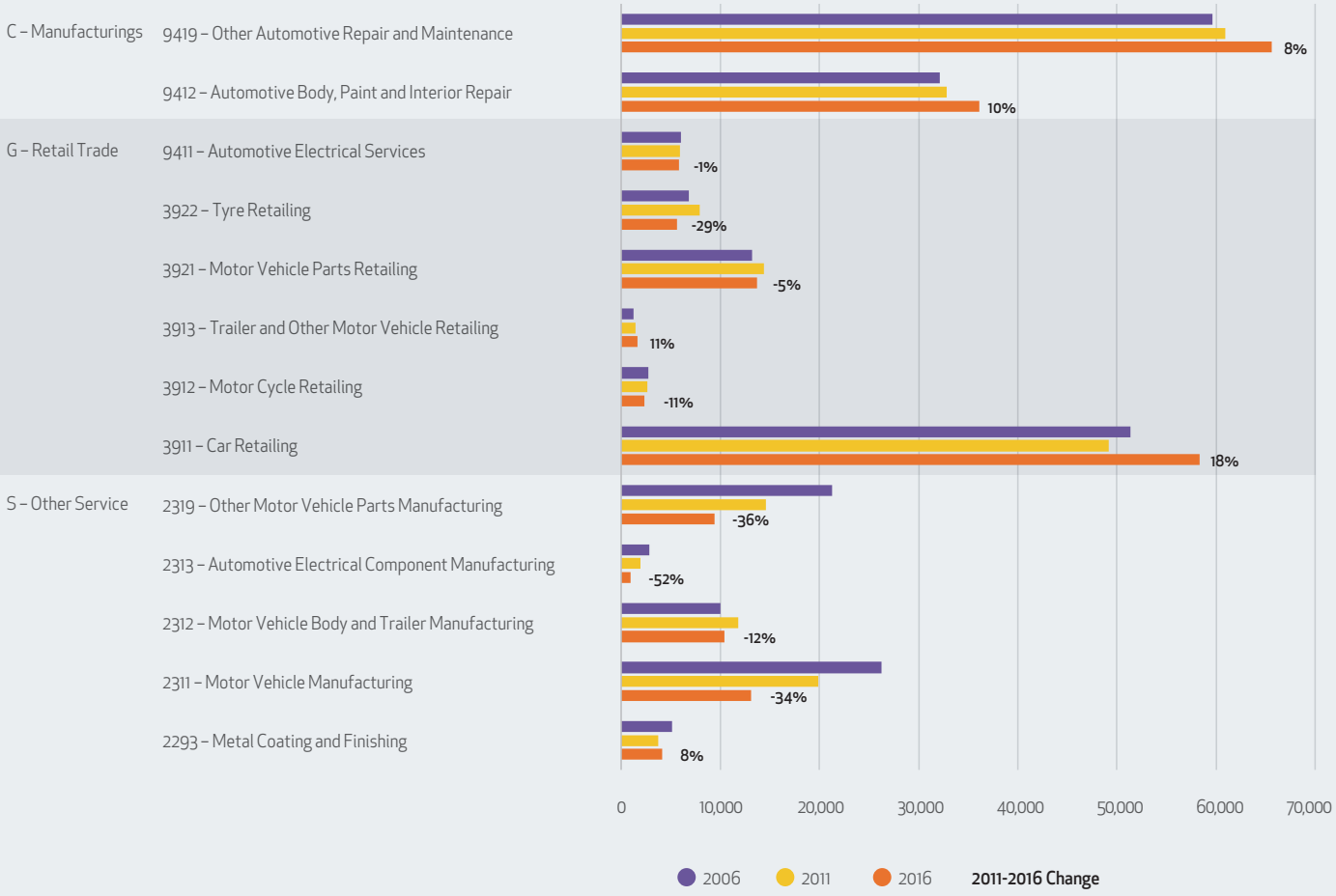
ANZSIC Code	ANZSIC Name	Related MSM Manufacturing Training Package qualifications
17	Petroleum and Coal Product Manufacturing	Process Manufacturing
18	Basic Chemical and Chemical Product Manufacturing	Process Manufacturing
19	Polymer Product and Rubber Product Manufacturing	Process Manufacturing
20	Non-Metallic Mineral Product Manufacturing	Process Manufacturing
229 2293	Other Fabricated Metal Product Manufacturing Coating and Finishing	Surface Preparation and Coating
231	Motor Vehicle and Motor Vehicle Part Manufacturing	Recreational Vehicles
391 3913	Motor Vehicle Retailing Trailer and Other Motor Vehicle Retailing	Recreational Vehicles
392 3921	Motor Vehicle Parts and Tyre Retailing Motor Vehicle Parts Retailing	Recreational Vehicles
941	Automotive Repair and Maintenance	Recreational Vehicles
091	Construction Material Mining	Manufactured Mineral Products
170	Petroleum and Coal Product Manufacturing	Manufactured Mineral Products
203	Cement, Lime, Plaster and Concrete Product Manufacturing	Manufactured Mineral Products

Please note that due to the broad number of sectors and job roles covered by the MSM Manufacturing Training Package, there are inherent difficulties in identifying relevant industry and occupational data.

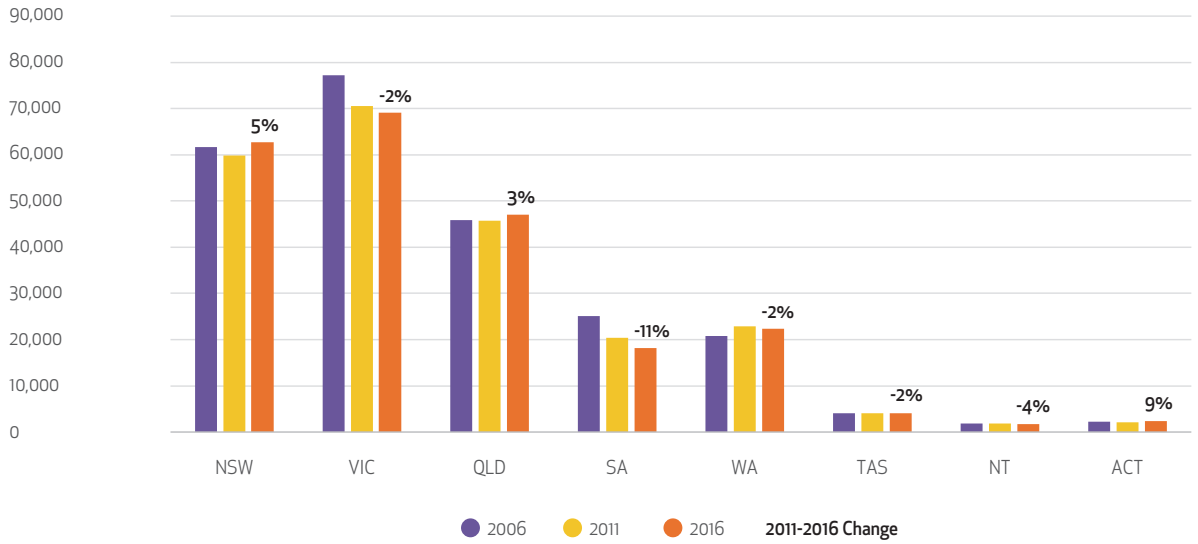
Appendix C: Census Snapshot

MSM Manufacturing Training Package

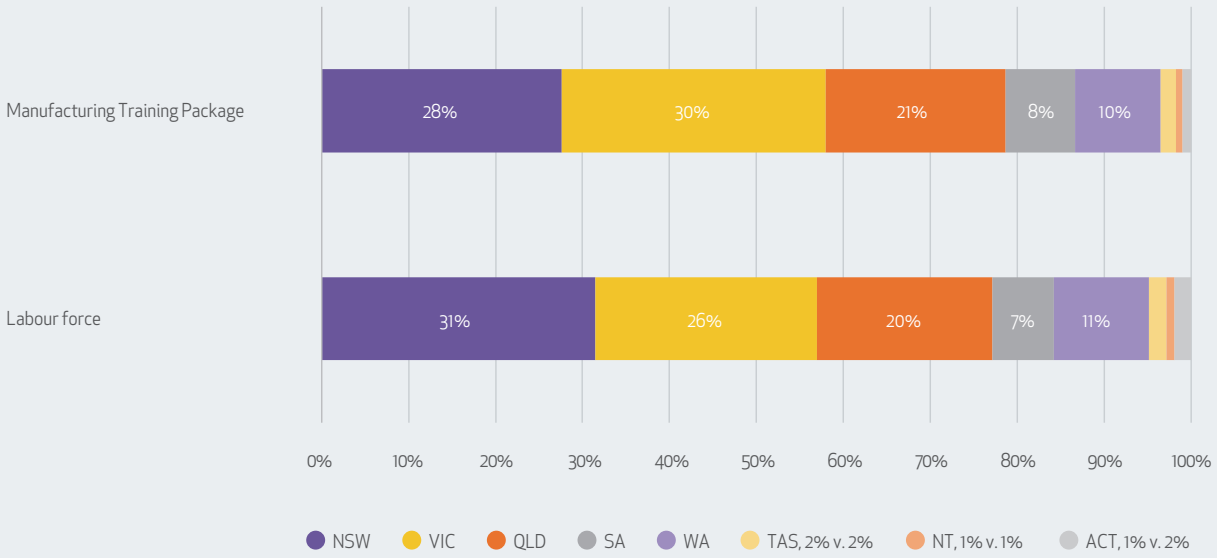
Number of employees in selected industry classes, Census 2006–2016 and five-year change from 2011 to 2016



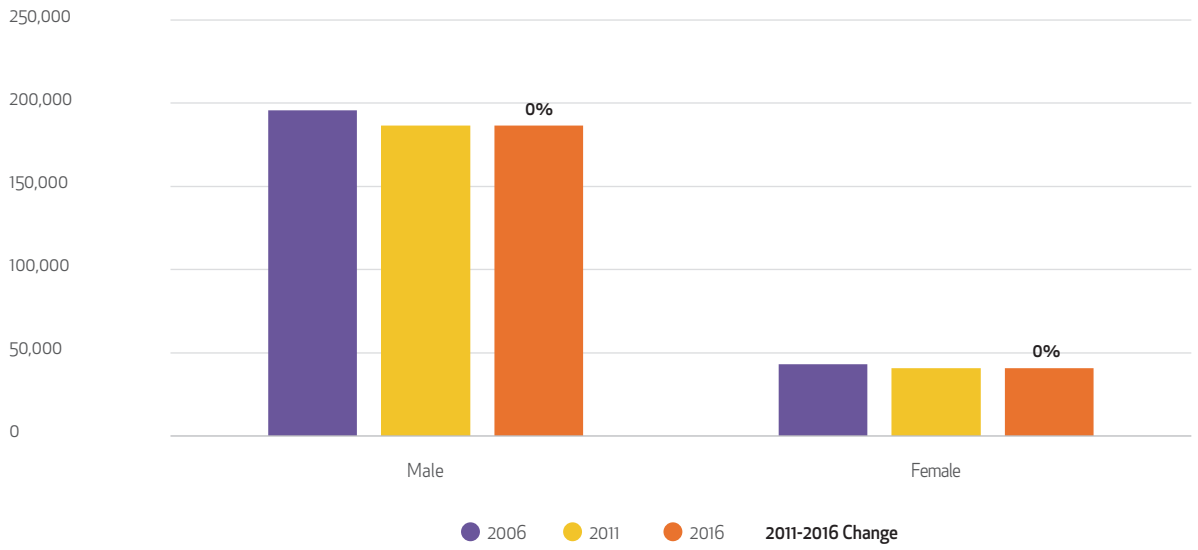
Number of employees in selected industry classes by state of residence



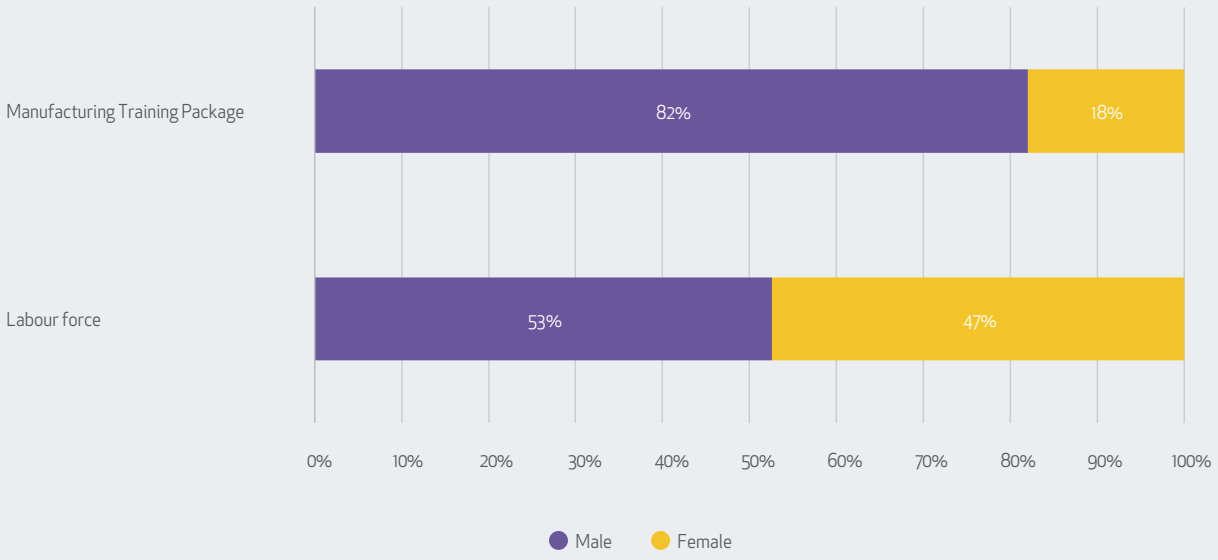
State – selected industries vs. general labour force, 2016



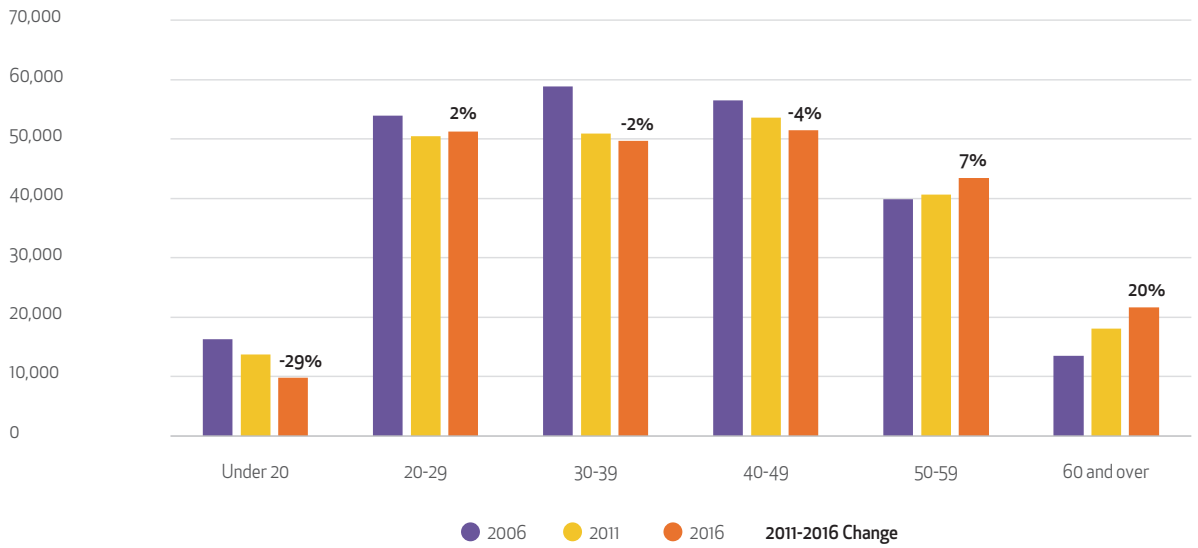
Number of employees in selected industry classes by gender



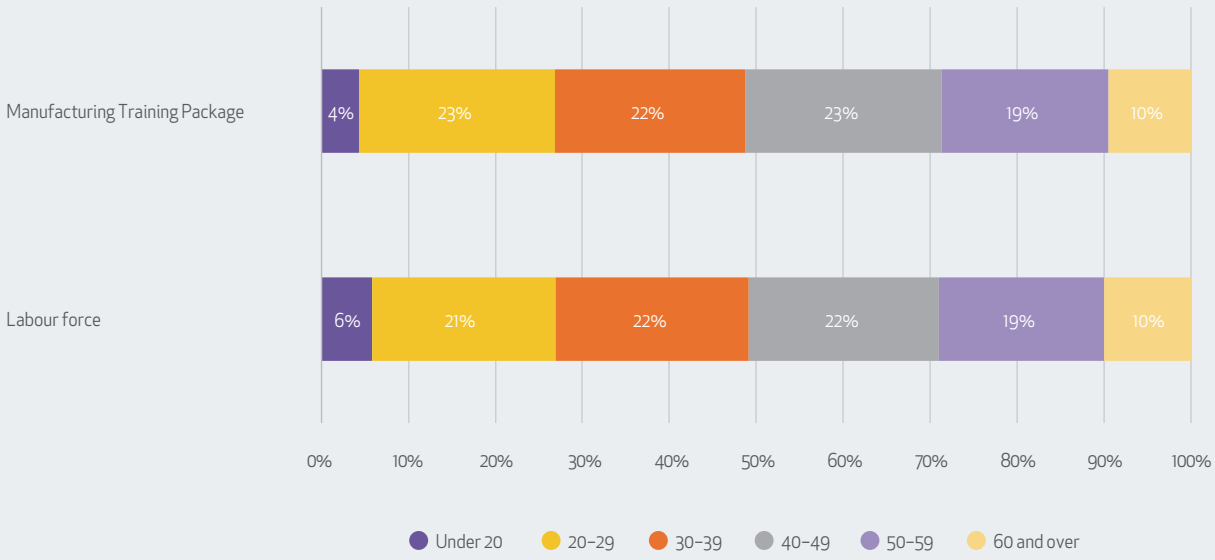
Gender – selected industries vs. general labour force, 2016



Number of employees in selected industry classes by age

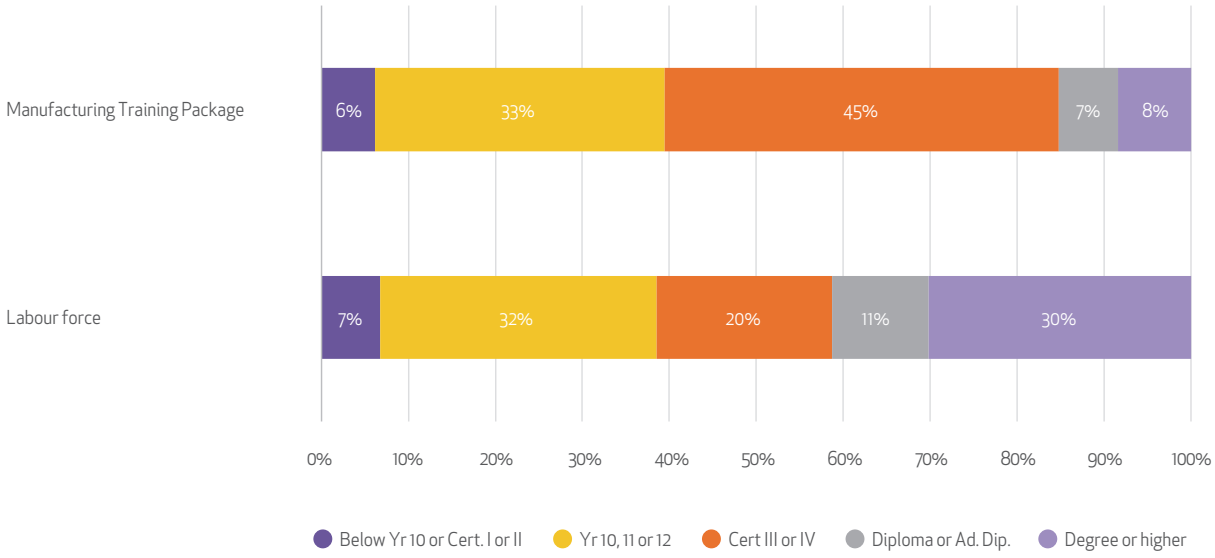


Age – selected industries vs. general labour force, 2016



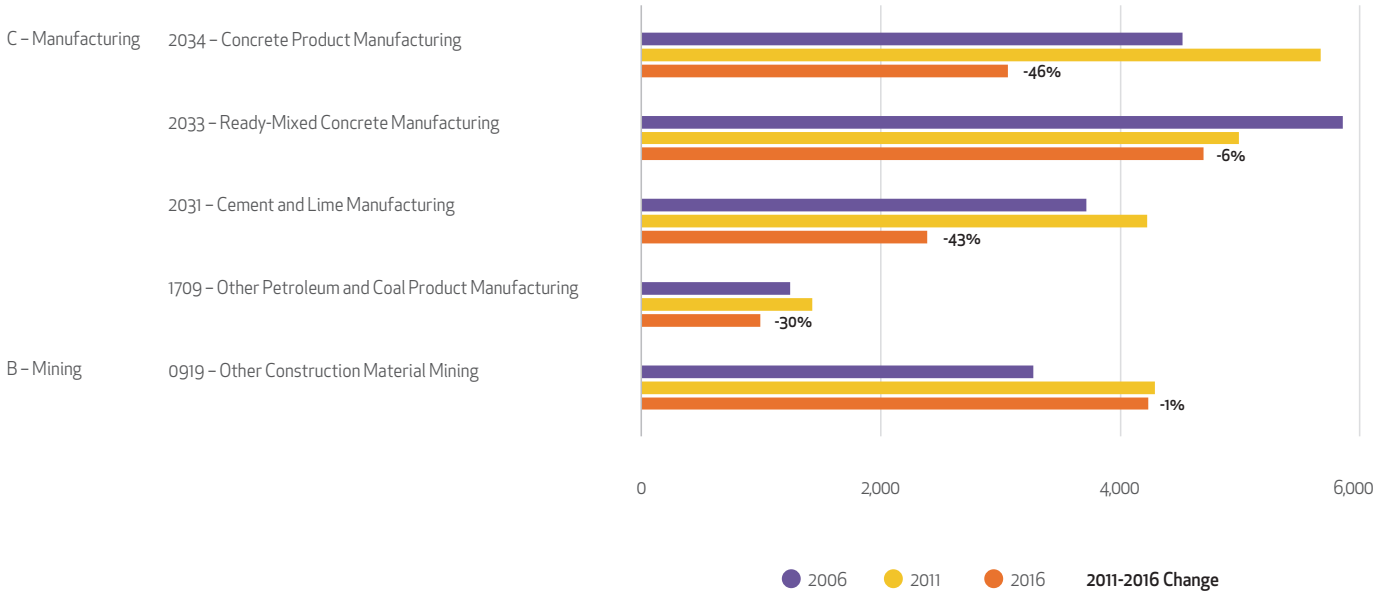
Highest educational attainment – selected industries vs. general labour force, 2016

excludes those whose educational attainment was not stated or not applicable

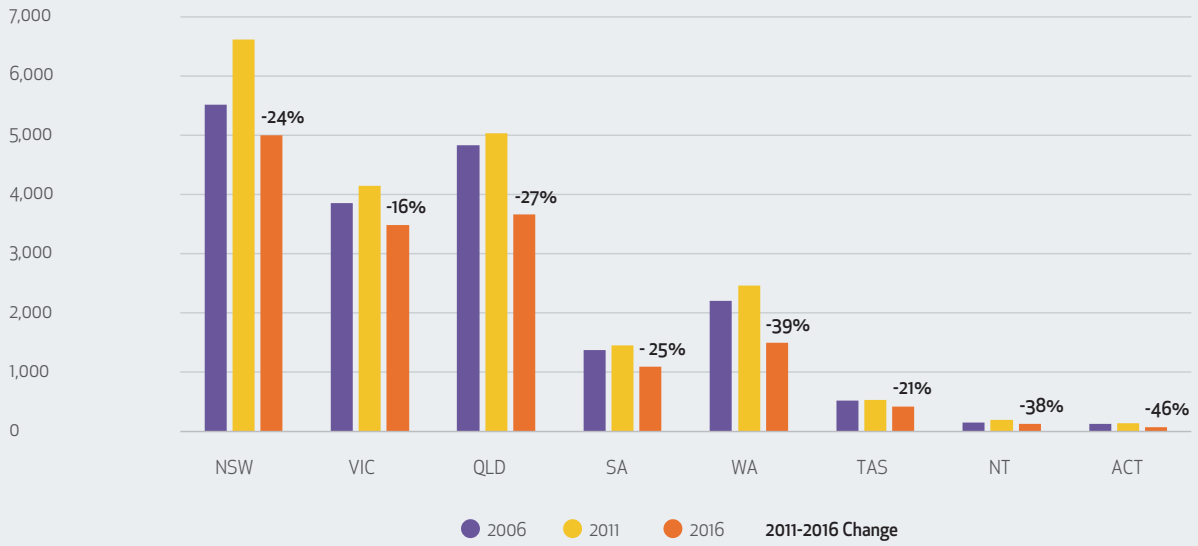


PMC Manufactured Mineral Products Training Package

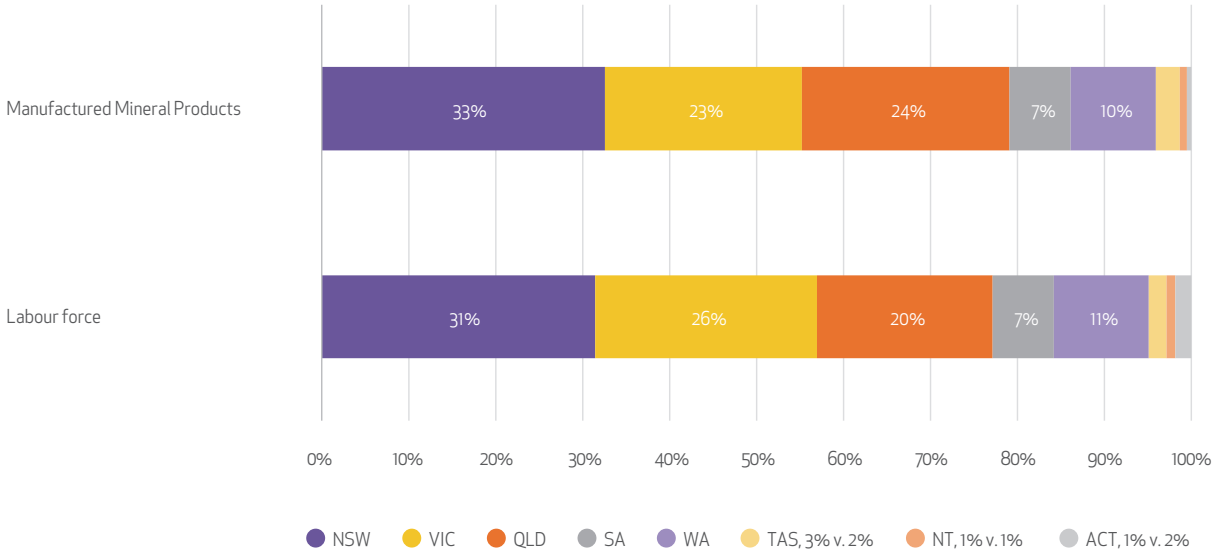
Number of employees in selected industry classes, Census 2006–2016, and five-year change from 2011 to 2016



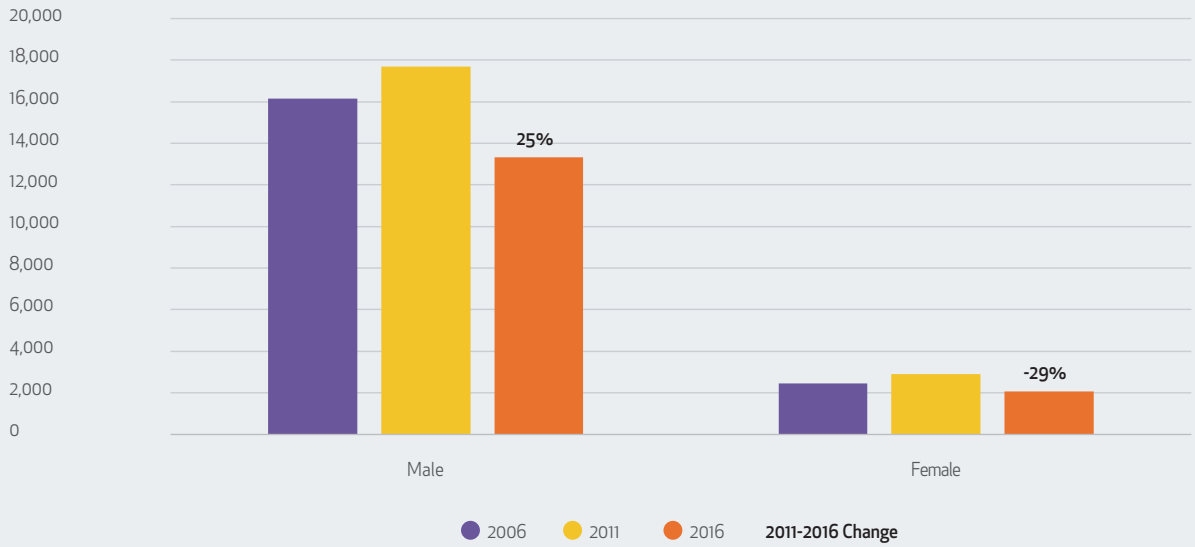
Total number of employees in selected industry classes by state of usual residence, census 2006–2016



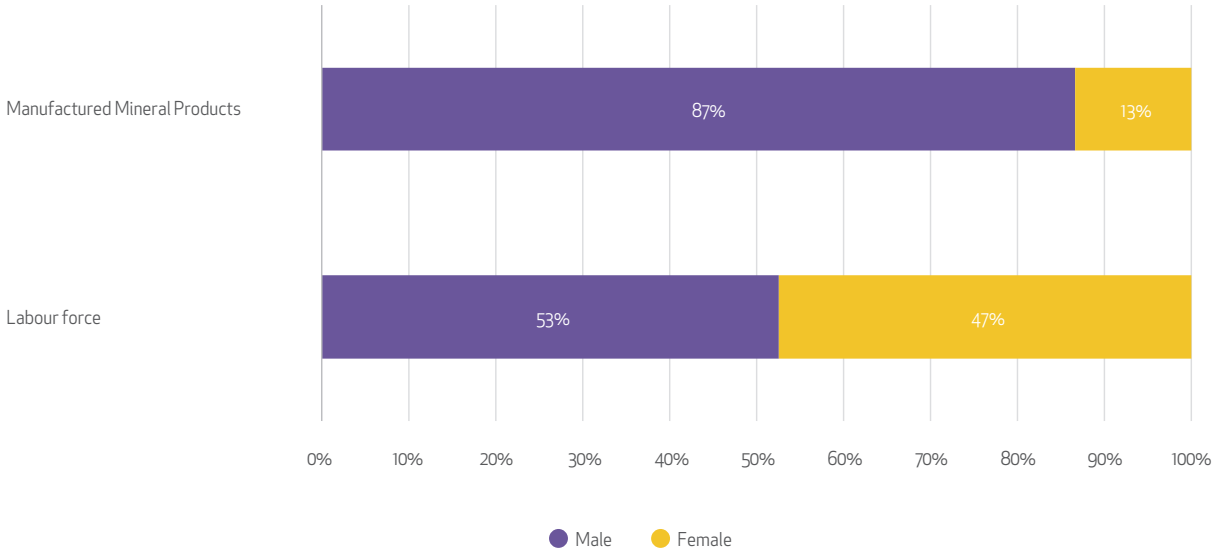
State of usual residence of employees in selected industry classes versus the general labour force, Census 2016



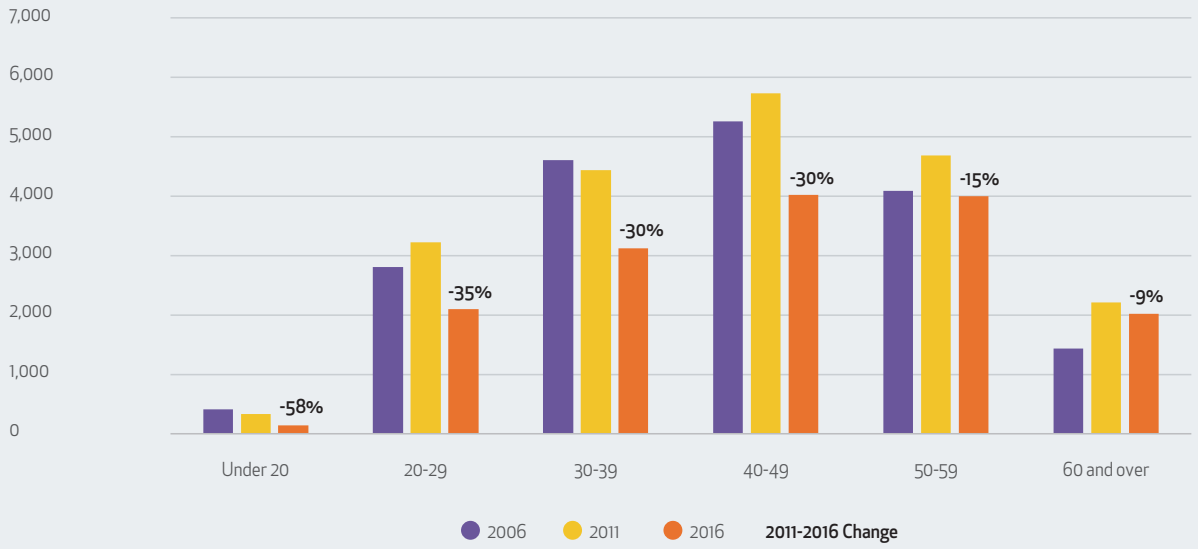
Number of employees in selected industry classes by gender, Census 2006-2016



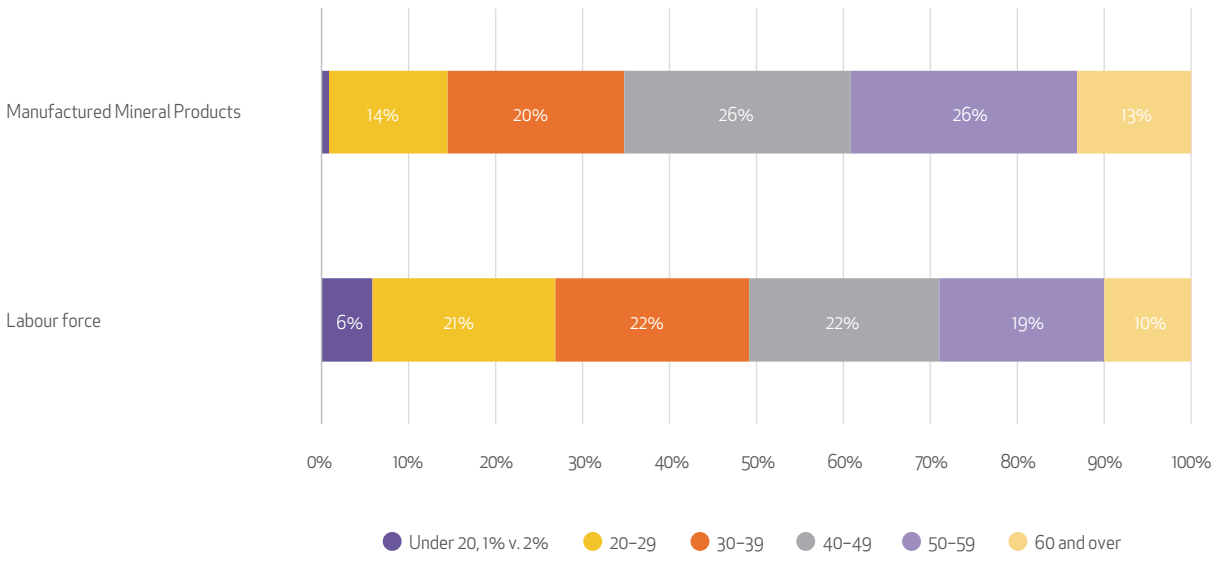
Gender of employees in selected industry classes versus the general labour force, Census 2016



Total number of employees in selected industry classes by age, Census 2006–2016

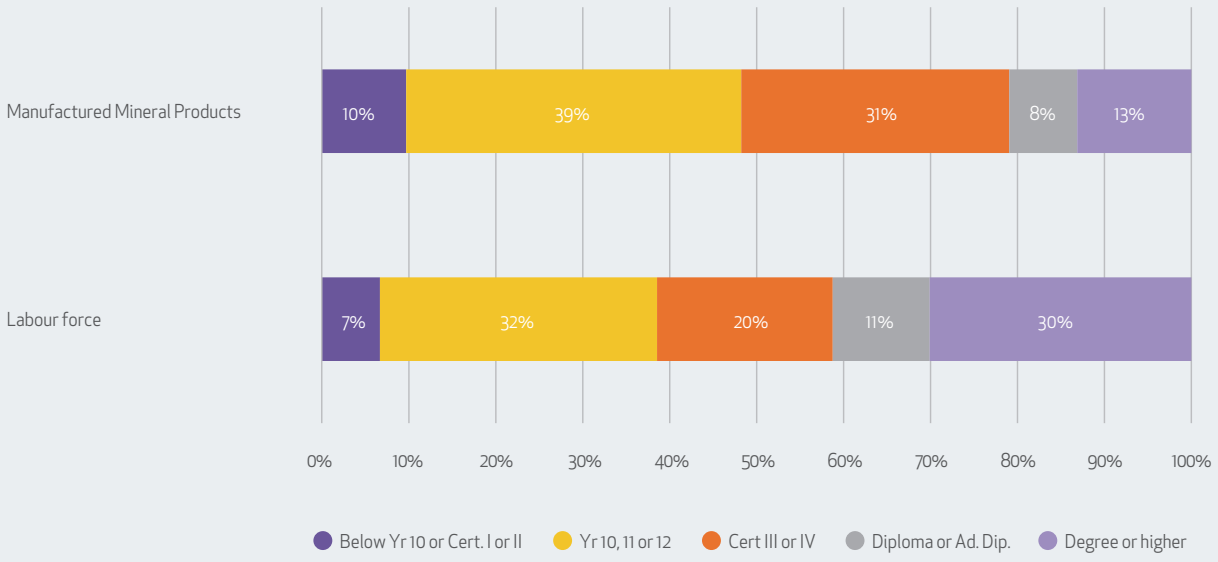


Age of employees in selected industry classes versus the general labour force, Census 2016



Highest educational attainment of employees in selected industry classes versus the general labour force, Census 2016

excludes those whose educational attainment was not stated or not applicable



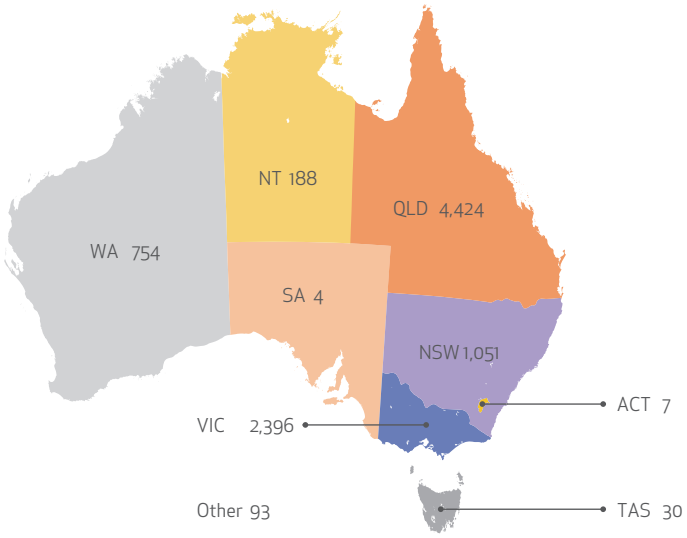
Source: Australian Bureau of Statistics (ABS) Census of Population and Housing: 2016 Census – Employment, Income and Education; 2011 Census - Employment, Income and Unpaid Work; 2006 Census – Labour Force. Data extracted using TableBuilder.

Appendix D: Enrolment Snapshot

MSM Manufacturing Training Package

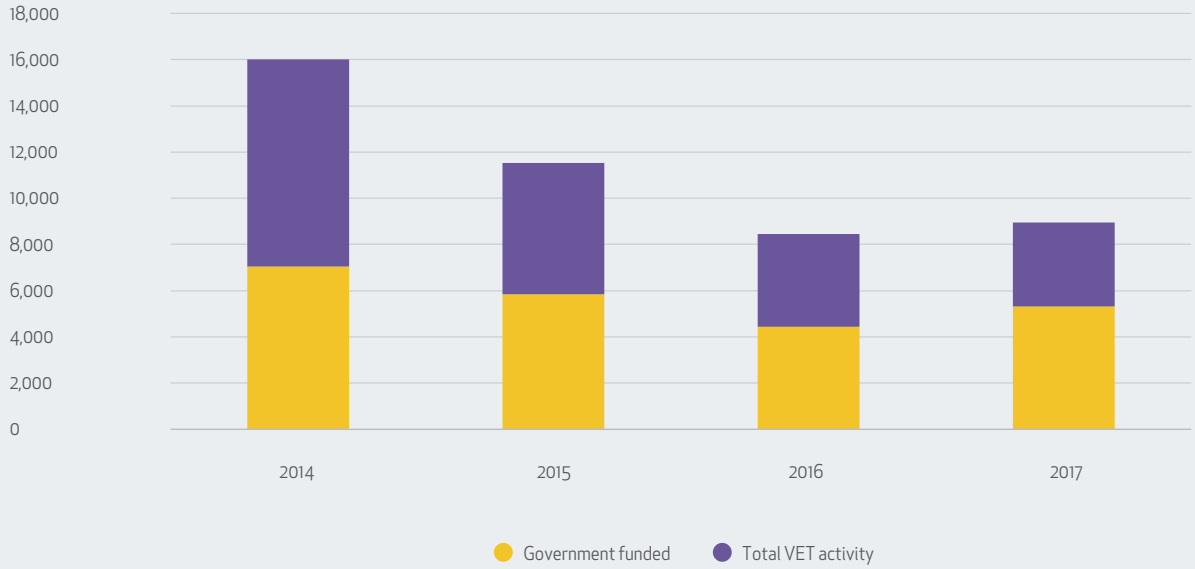
Program enrolments in MSM Manufacturing qualifications by state/territory of student residence

2017 Total VET Activity



Total program enrolments in MSM Manufacturing qualifications

2017 Total VET Activity



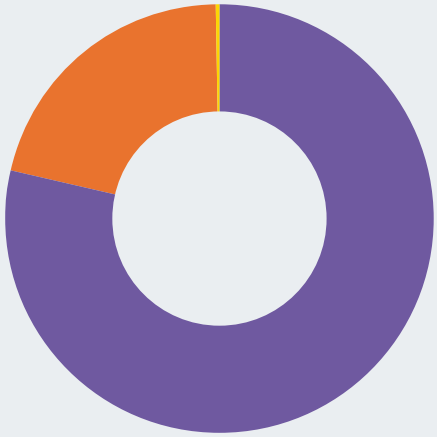
Proportion of program enrolments in MSM Manufacturing qualifications by training provider type

2017 Total VET Activity

	2014	2015	2016	2017
TAFE	11%	7%	13%	13%
Private training provider	76%	72%	63%	64%
University	1%	1%	1%	0%
Enterprise provider	2%	4%	3%	3%
School	11%	16%	20%	19%
Community education provider	0%	0%	0%	0%

Program enrolments in MSM Manufacturing qualifications by gender

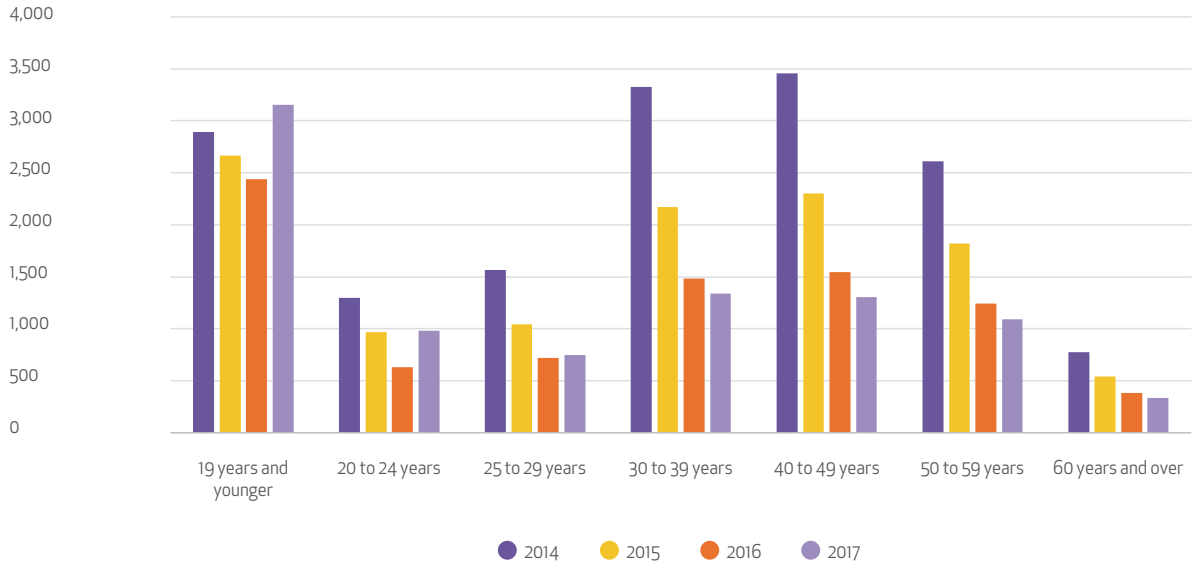
2017 Total VET Activity



Male	7,057
Female	1,880
Not known	14

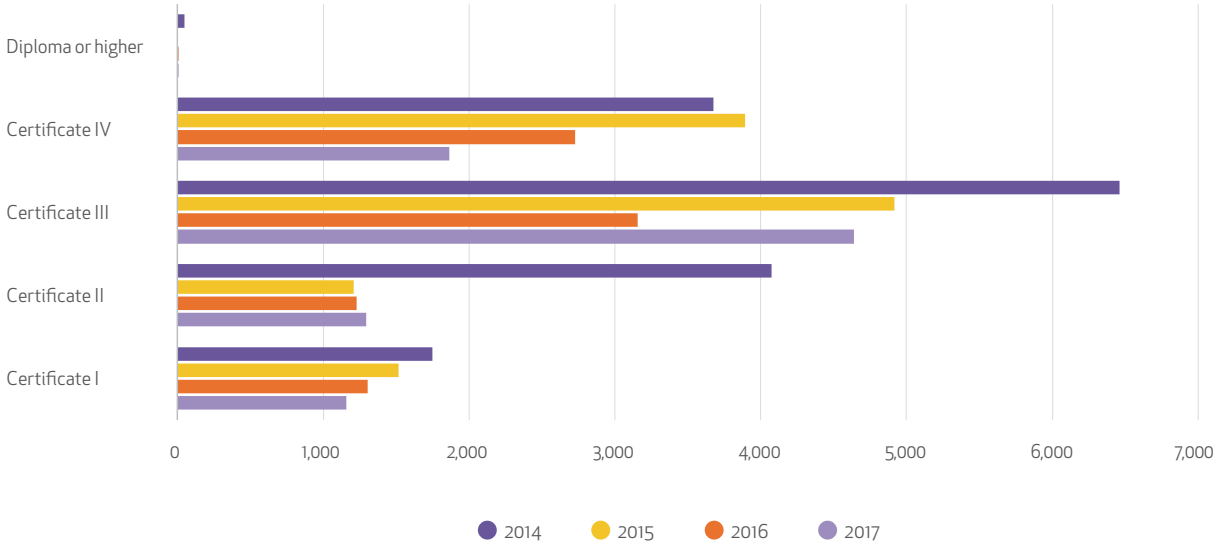
Program enrolments in MSM Manufacturing qualifications by age group

2014–2017 Total VET Activity



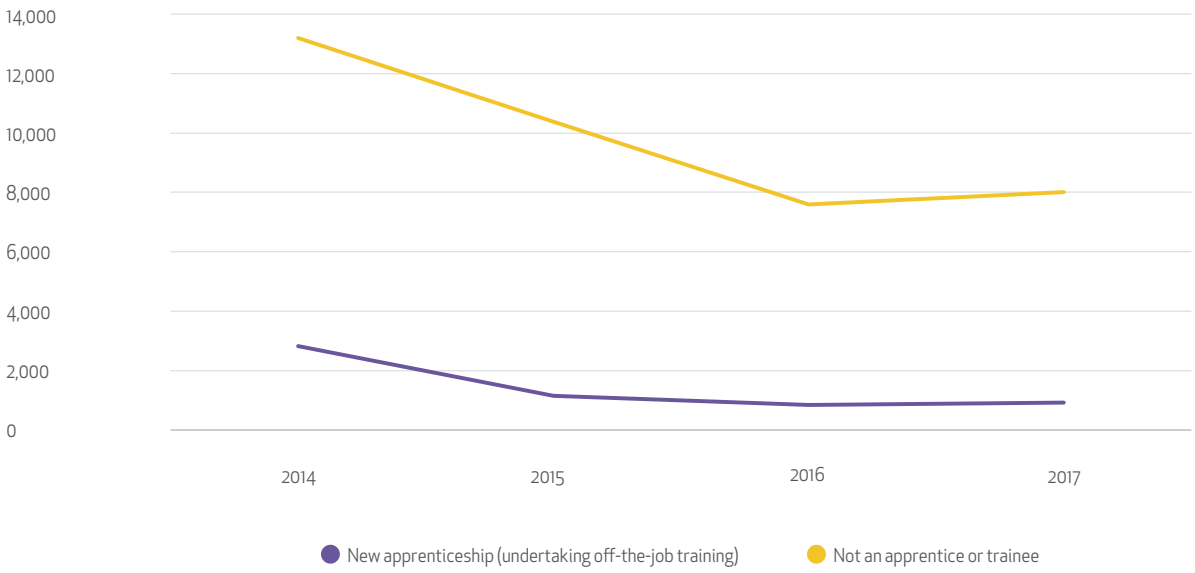
Program enrolments by qualification level in MSM Manufacturing qualifications

2014–2017 Total VET Activity



Program enrolments in MSM Manufacturing qualifications by apprentice/trainee undertaking off-the-job training

2014–2017 Total VET Activity

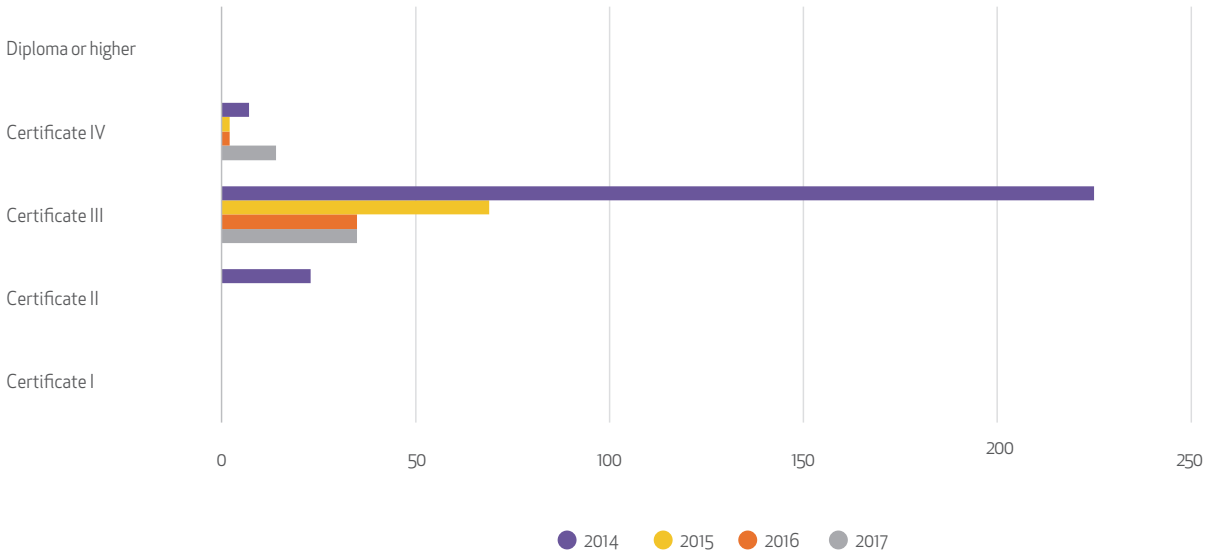


PMC Manufactured Mineral Products Training Package

Four PMC Manufactured Mineral Products qualifications have been consolidated into one new qualification in the MSM Manufacturing Training Package, Certificate III in Manufactured Mineral Products. This is supported by the data below, which indicates that the other qualifications had low/no enrolments over the period 2014–2017.

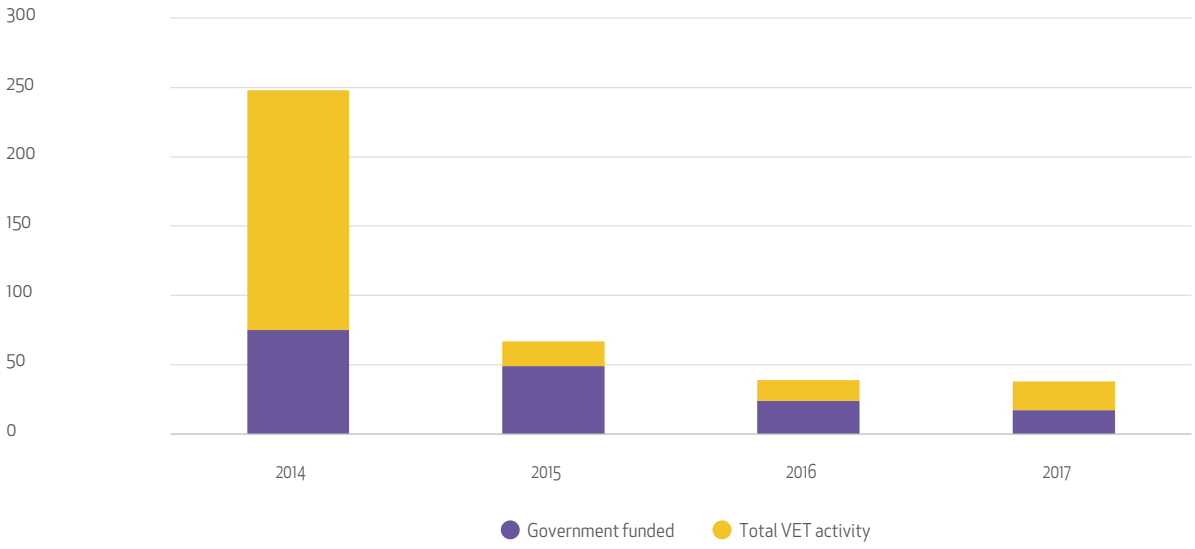
Program enrolments by qualification level in PMC Manufactured Mineral Products qualifications

2014–2017 Total VET Activity



Total program enrolments in PMC Manufactured Mineral Products qualifications

2014–2017 Total VET Activity



Source: All data in this appendix was extracted from VOCSTATS on 15/08/2018 by IBSA Manufacturing who take responsibility that the information extracted is appropriate for its intended use.

VOCSTATS data are 'randomly' adjusted by small amounts by a data perturbation tool to avoid the release of confidential data. Hence numbers are only approximate. The perturbation impact is negligible for most practical purposes. The effect can be significant and must be considered when interpreting small numbers.

Appendix E: Process Manufacturing RTO Survey

Survey Findings Report

Key Findings

The results of the survey show that:

- overall, RTOs are very happy with the process manufacturing qualifications;
- the flexibility of the qualifications is highly valued;
- the majority of RTOs for whom these qualifications are working well are partnering with employers to tailor the qualifications to specific workplace needs;
- strengthening the focus on industry trends such as lean manufacturing and reducing the length of the Certificate III and IV qualifications may make this group of qualifications more attractive to employers and learners in the future.

About the Survey

IBSA Manufacturing commissioned Ithaca Group to undertake a survey of RTOs with Certificate I, II, III or IV in Process Manufacturing on their scope of registration. The survey was conducted in August–September 2018.

Initially, all 47 RTOs that had any of these qualifications on their scope of registration were contacted in order to determine:

- how many were actually delivering these qualifications
- what the level of demand was
- reasons for not delivering them.

In-depth interviews were then conducted with a selection of these RTOs to learn more about learner cohorts and whether changes are needed to the qualifications.

These survey findings are intended to inform preparation of the 2019 Industry Skills Forecast and Proposed Schedule of Work for the MSM Manufacturing Training Package.

Findings of Initial Survey Contacts

Of the 47 public and private RTOs across Australia with one of more of the process manufacturing qualifications on their scope of registration, 30 responded to the initial brief telephone survey. Of these, 22 were delivering one or more of the qualifications.

Further details of which qualifications are and aren't being delivered by these 30 RTOs are outlined in the table below (note that some RTOs deliver more than one of the qualifications).

Qualification on Scope	Currently Delivering	Not Currently Delivering
Certificate I	1	3
Certificate II	1	3
Certificate III	15	6
Certificate IV	4	1
Total	22	13

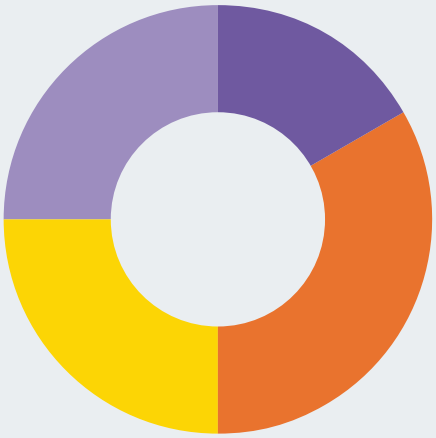
Of the RTOs not currently delivering qualifications on scope, one RTO was planning to deliver all four qualifications within the next year and another was planning to remove the qualifications from their scope.

The most common reasons given for not delivering process manufacturing qualifications on scope were a lack of demand and a lack of skilled trainers.

Findings of In-Depth Interviews

Following the initial scoping conversations, in-depth interviews were conducted by phone or through written responses with a total of ten individuals representing twelve RTOs across Australia.

Figure A: RTO Locations and numbers



Western Australia	2
New South Wales	4
Queensland	3
Victoria	3

Amongst RTOs participating in the in-depth interviews, the most commonly delivered qualification was the Certificate III in Process Manufacturing.

Of the respondents:

- one RTO was currently delivering the Certificate I in Process Manufacturing;
- one RTO was currently delivering the Certificate II in Process Manufacturing;
- eight RTOs were currently delivering the Certificate III in Process Manufacturing; and
- three RTOs were currently delivering the Certificate IV in Process Manufacturing.

Learner Types & Industries

Five of the RTOs involved in the in-depth interviews had between 50 and 100 learners enrol in process manufacturing qualifications in 2018, four RTOs had more than 100, while one RTO had 10–50 learners enrol this year. Two of the RTOs were unable to tell us how many learners they had enrolled in 2018.

Eight of the twelve RTOs delivered these qualifications solely to employees. In some cases, qualifications were offered to both employees and jobseekers, however in these cases the larger proportion of learners (up to 80%) were existing workers. Just two RTOs (out of twelve) delivered process manufacturing qualifications to jobseekers only.

Learners enrolling in these qualifications represented a wide range of job roles generally comprising technicians/operators at the Certificate I–III level and supervisors/team leaders at the Certificate IV level.

Process manufacturing qualifications can be applied to almost any industry. As such, learners also represented an extremely wide range of industries including manufacturing, mining and resources, chemicals, warehouse/logistics, food & beverage, commercial laundries, recycling facilities, water and sewage treatment, hospitals, engineering works, furniture assembly, construction equipment manufacturing, canvas/textile industry, steel products, importing, packaging, plastics industries, concrete supplies and more.

Industry, Employer and Learner Needs

In order to find out how well qualifications within the Process Manufacturing Training Package are currently meeting the needs of industry, employers and learners, respondents were asked to identify what's working well, what could be improved and what's missing in the qualifications that they deliver. Respondents also provided their opinion of the effectiveness of the qualifications in meeting employer and learner needs by rating the qualifications that they deliver on a scale of 1–10.

What is Working Well?

Flexibility, content and skills development were most commonly cited as working well in the current qualifications. These, and other responses, are expanded below.

Flexibility

Overall, the flexibility of the qualifications was viewed as a real benefit by almost all respondents (90%). Reasons cited included:

- Being able to add value from the broad range of units in other packages as electives;
- Their generic nature which allows them to be applied to any number of industries; in comparison, other qualifications were considered too restrictive to allow this;
- Being able to tailor qualifications to meet employer needs.

For many, and particularly RTOs delivering in workplace settings, the real value of flexibility lies in the fact that the packaging rules are open but enable specialisation as well. For example, in tyre manufacturing, the packaging rules allow RTOs to construct qualifications that enable learners to specialise in polymer manufacture.

The broad nature of the qualifications allows them to be packaged up to include a mixture of process manufacturing (MSM) and competitive systems and practices units (MSS). Forklift units were also noted to be in demand.

In the case of the Certificate I, the flexibility of being able to choose electives out of other equivalent qualifications or the Certificate II allows providers to modify the qualification to closely resemble the occupation.

Overall, the flexibility of the qualifications was seen to be of benefit to employers because, as one participant noted, 'It allows us to say, "let's map YOUR processes", which makes it relevant to the employer.' For learners, it is also of benefit because the result is a fully contextualised qualification, relevant to the industry that they are working in.

Content

Approximately half of respondents explicitly identified that the existing core units were good, with one participant extending this to include electives.

Skills Development

Overall, the majority of respondents felt that the qualifications meet the primary skills development needs of employers and learners. Respondents noted that the qualifications:

- Provide a good grounding in employability skills including skills like working in a team;
- Help learners to develop a basic understanding of workplace practices;
- Cover what most employers are looking for, which are the general skills, e.g. make calculations, identify signs, and health and safety; and
- Introduce both the process and maintenance aspects of process manufacturing.

One respondent delivering the Certificate IV felt that the qualification enables a transformational change in thinking and practice that is incredibly valuable both to learners and employers, and which can be applied to any process or industry.

'This is a really good qualification for anyone who does a trade because it steps people into a different mindset, or a new way of thinking about process improvement and sustainability.'

Contextualisation

At their core, these qualifications – particularly at the higher levels – were identified as being about organising people, processes and purpose. These are skills that are universal to all process manufacturing environments. Their focus on problem solving and continuous improvement can also be applied to any process or system. According to respondents, this gives process manufacturing qualifications great relevance as they can be contextualised to nearly any job or industry.

This ability to contextualise training has significant benefits for both employers and learners. By contextualising training material and assessments to the specific workplace, using projects to achieve workplace outcomes that demonstrate continuous improvement, and addressing key topics for all businesses such as WHSE, quality, performance, cost reduction, speed of delivery, teamwork and customer focus, both employers and learners immediately perceive the value of training. As one respondent noted, 'It provides a good "sell-case" to employers as we can approach them and say look at this selection of units: we can make this work for you.'

Ability to Create a Specialised Qualification

One RTO identified that they were currently delivering the Certificate IV in the workplace as a 'specialised' qualification that combines general process manufacturing with a specialised focus, e.g. process plant technology. For this RTO, this provides greater value from an otherwise generic qualification, tailored to the specific needs of employers.

Another respondent suggested that there is significant potential for the process manufacturing qualifications to be packaged up with a combination of MSM, MEM and MSS units (including units such as 3D printing, hand tools, injection moulding) to create a pathway from Cert II and Cert III into higher-level Industry 4.0 qualifications, such as the accredited course being implemented in Victoria.

Training Accessibility

One respondent suggested that because these are generic qualifications, there is no limitation on who can come into training; i.e. it's not tied to industry (people don't need to already have a job) in the way that other qualifications are. This means that the qualification is accessible to anyone and there is no artificial limitation on the number of people coming into training. This helps people to get jobs, rather than restricting access to training only to those who are already employed.

Return on Investment

For some RTOs, an immediate return on investment for both learners and employers was seen to be one of the key benefits of undertaking these qualifications. For employers, having workers complete these qualifications enables an immediate return through improved efficiency and productivity gains, while for learners it enables them to have an immediate value in the workplace (as long as there is supportive middle management). Outcomes that were cited as easily traced and attributed to this program include savings efficiency, increased staff retention, less waste and less time on floor. For learners, the learning from the qualifications helps them address the question, 'What can be done to make this more efficient or useful?'

At lower AQF levels, the fact that qualifications provide milestone certification was identified as giving learners the feeling of having achieved something, while demonstrating competency to employers.

What Could be Improved?

The two most commonly reported areas for improvement in the current process manufacturing qualifications were reducing the volume of learning at the Certificate III level and a desire for greater focus on employer-centric methodologies such as lean manufacturing within the qualifications.

Length of the Qualification

The size of the Certificate III qualification was the biggest area for improvement noted by the majority of respondents. Reducing the qualification to 15–18 units (from 21 currently) was suggested to be more attractive and realistic for a generic qualification without specific outcomes.

While the core units and qualification overall were perceived to be valuable, reducing the size of the qualification was suggested to be necessary to reduce the big time and cost commitment that present an upfront barrier to employers and learners engaging in training.

'21 units is a lot of units for a Certificate III. 18 units would be more realistic.'

'A major setback of this qualification and one of the reasons why – for our RTO at least – enrolments have decreased is because it is seen to be too long. We lose people. Employers and learners don't want to commit to 2 years. While the units are good, if there is any way that can be found to rationalise and restructure it so that it can be built in terms of the enterprise, this would be good.'

Content

'The qualification could include more lean manufacturing units. This is what the majority of employers that we approach are looking for.'

Some respondents suggested that a greater (or more obvious) focus on employer-centred methodologies such as lean manufacturing or 'just-in-time' manufacturing could help the qualifications gain employer relevance, as 'this is where manufacturing industries are going around the world.' It is also language that employers understand and recognise.

In order to accommodate this, a suggested improvement to the units on offer is to:

- remove either MSMSUP200 Achieve Work Outcomes or MSMSUP210 Process and Record Information; and
- replace with MSS403033 Map an Operational Process or MSS403010 Facilitate Change in an Organisation Implementing Competitive Systems and Practices.

It was suggested that making these changes would help to set up an overview of what the whole course is about, i.e. lean business.

Another respondent identified that within the Group A electives, there is not much related to chemical, hydrocarbons and refining (the PMA training package). It was suggested that an additional one or two units could be helpful.

However, it was also noted that overall, not too much change was needed to the core units or electives.

Packaging Rules and Assessment Requirements

While overall it was felt that the training package requirements offered significant flexibility, respondents did identify some areas that could be improved. For example, it was suggested that, for those who are employed, the requirement to select five Group A units can be too restrictive. 'It can be hard to find five that are really relevant to the workplace.' It was suggested that reducing this to four may be better.

Likewise, one respondent suggested that the Training Package evidence requirements were restrictive and should be reviewed. Within the Certificate I, the units of competency criteria for some units sometimes repeat, e.g. follow OH&S procedures. In this instance, the RTO concerned consistently received learner feedback to say, 'I've done that before', and suggested a need to make sure that the assessment criteria between core and specific electives don't clash.

Style and Language

At the Certificate II and III level in particular, there is a need to ensure that wording is clear and concise, uses common industry language and avoids 'waffle'.

Specialisation

Alongside the benefits of flexibility, there was some recognition amongst a small number of respondents that too much flexibility can also detract from outcomes and have both positive and negative effects. Respondents were split, however, as to whether defining streams or specialisations within the qualifications (e.g. allowing learners to choose an area of expertise such as process manufacturing – tyre manufacture) could be helpful, or whether this may get in the way of the flexibility of these qualifications.

Positioning

Several respondents identified that improving the way the qualifications are positioned would help.

One respondent identified that improving the marketing, labelling and language used in the Certificate IV would help employers and learners to better understand its relevance. Even though it's about lean methodology – highly attractive for employers – it was felt that this doesn't really come through in the way it is described. 'The pathway is not as sharp or smooth as other qualifications such as Competitive Systems and Processes. It is hard for people to understand. There is a need to take out the dry, uninteresting words from the package and "shine it up a bit"'.

There is also a need to ensure that the qualifications and training package support material fully capture the breadth of scope that these qualifications relate to. For example, one respondent noted that the preamble currently refers to three industries for which the qualification is relevant, however doesn't include food processing, a key industry to which they deliver. This should instead reflect any instance where a process is employed to create a product. Similarly, where applicable job roles are identified, this is limited to production line only, and excludes other important roles such as refining.

What is Missing?

While a significant proportion of respondents (30%) were satisfied with the existing qualifications as is, including the ability to import units from other qualifications, other respondents made specific recommendations. Responses are summarised below.

Clarity

A clear delineation between manufacturing and process manufacturing via training package definitions is needed. One respondent suggested that this would help to clarify unit selection that is relevant to process manufacturing, as currently there is a lot of overlap between the two.

Specific Units and Electives

Respondents suggested several specific units and electives that could enhance process manufacturing qualifications, including:

- Implement Continuous Improvement Based on Standardised Work Practices as an 'other' elective. This can be used to build a process map which makes it easier for the team to see the whole context;
- A laboratory unit at the Certificate III level (in addition to those at the Certificate IV level currently) might provide greater flexibility;
- Mathematics (ability to perform computations) and chemistry;
- A unit on automation and robotics.

OH&S 'Key Risk' Performance Criteria

One respondent indicated that the core OH&S unit performance criteria could be enhanced by including key risks occurring in most occupations. At the moment, this enterprise RTO delivers its own unit providing critical training in ten things rated by the company as potentially fatal, e.g. load tie down, fatigue management, chemicals and risky personal behaviour. They issue a company certificate for this unit to trainees before they go onto a client's site. It would be useful to apply some of the key cross-occupational risks that fall into this category (e.g. drug and alcohol and fatigue management) to the OH&S core unit too to improve and enhance knowledge needed.

Absorption of Discontinued Training Packages

With the PMC training package being absorbed into the MSM Training Package, it will be important to ensure that those manufactured minerals products are being picked up in the process manufacturing qualifications.

It was noted that the work being done on the PMB Training Package needs to be closely monitored and anything that no longer sits there might need to be captured under the process manufacturing qualifications as well.

Effectiveness in Meeting Employer and Learner Needs

In order to evaluate how effective the current qualifications are in meeting employer and learner needs, respondents rated the qualifications on a scale of 1–10, with 1 representing the lowest possible score and 10 the highest.

Overall, the current qualifications scored relatively highly, as shown below, suggesting that tweaks rather than complete overhaul of the qualifications are what's needed.

Employer Needs

Lowest score: 7

Lower scores were given by one RTO delivering the Certificate III as a generic qualification for jobseekers and one enterprise RTO that has created an additional unit to expand on 'key risks' not covered by the current occupational health and safety unit.

Highest score: 9

RTOs using the flexibility of the training package to deliver specialised qualifications gave the highest ratings.

Average Score (of all responses): 7.9

Learner Needs

Lowest score: 6

The lowest score was given by one RTO due to the duplication of evidence requirements across units.

Highest score: 9

RTOs that gave the highest ratings attributed this to the ability to provide a high level of contextualisation specific to industry and workplace needs, as well as the suitability of the qualifications for learners who may experience learning difficulties (e.g. learners from non-English speaking backgrounds).

Average score (of all responses): 7.8

Appendix F: Consultation List

The 2019 Skills Forecast and Proposed Schedule of Work 2019–2023 builds on the consultations undertaken as part of the 2018 return. Feedback on industry imperatives were also captured as part of training package development projects undertaken throughout 2018.

More specifically, key individual industry and group stakeholders, identified by the Process Manufacturing, Recreational Vehicle and Laboratory IRC, were consulted during the development of the Industry Skills Forecast. See the consultation list below.

Feedback was gathered via the following methods:

- forums, meetings and focus groups –in person and via webinar
- interviews and one-on-one consultations – via phone/teleconference and/or face-to-face
- nationwide and organisation-specific surveys or questionnaires.

Consultation List

Organisation	
AI Group Training Services	One Stop Group Pty Ltd
ARC Training	Options Training Services
Australasian High Pressure Water Jetting Association	Pinnacle Training Solutions
BSI Learning	Pivotal Training & Development Pty ltd
Caravan Industry Association of Australia	South Metropolitan TAFE
Chisholm Institute	St Michaels
Complete Lean Solutions	Strategix Training Group Pty Ltd
Dynamic Learning Services Pty Ltd	TAFE New England
Fenner Dunlop	TAFE NSW – Illawarra Institute
Formation Training	TAFE NSW – Open Training & Education Network (OTEN)
HS Business School	TAFE NSW – Western Sydney Institute
Illuminate Group, Illuminate Educate	TAFE Queensland East Coast
Leadership Management Australia/Think Perform	The Learning Collaborative
Maxis Solutions Pty Ltd, Insight Training Group Australia Pty Ltd, Precision Training Australia Pty Ltd (Maxis, Insight & Precision all under the umbrella of Kirana Ed)	The Management Edge
National Measurement Institute	Training Werx
National Training Services	Vative
Nationwide Training Pty Ltd	Zokal Safety Training Pty Ltd