

**Manufacturing
Industry Skills
Alliance**

EXCERPT

Initial Workforce Plan

*The information in this document has been extracted
from the full 2023 Initial Workforce Plan*

**Jobs and
Skills
Councils**

An Australian Government Initiative

Manufacturing Industry Skills Alliance is
a Jobs and Skills Council funded by the
Australian Government Department of
Employment and Workplace Relations



A thriving Manufacturing sector relies on a dynamic, skilled workforce

As the Jobs and Skills Council for the manufacturing sector, the Manufacturing Industry Skills Alliance (Manufacturing Alliance) is dedicated to addressing the critical skills shortage in our industry.

This excerpt from our Initial Workforce Plan is central to our role as the manufacturing industry's voice in the skills system. It outlines current and future workforce challenges and charts a path for industry partners to address these challenges in a targeted and cohesive way.

It is a first step for the Manufacturing Alliance in developing a more comprehensive understanding of the manufacturing sector and the workforce challenges it faces.

The plan provides a high-level overview of the manufacturing industry and, in some instances, includes data on industry sub-sectors that have been allocated to other Jobs and Skills Councils.

Your input is key to the development of our next Manufacturing Workforce Plan which we anticipate sharing with you later in 2024.

Let us know the changes you foresee to the manufacturing workforce and the impact of those changes such as government regulation, energy costs, technology, economic conditions, and other global risks.

Here's how you can make an impact and contribute to the next workforce plan

1. **Complete a survey:** Please take 10 minutes to fill out our [survey here >>](#)
2. **Send us an email with your input:** Email solutions@manufacturingalliance.org.au
3. **Request a meeting:** For a more personalised discussion, request a meeting by emailing solutions@manufacturingalliance.org.au

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PURPOSE

A dynamic and future-focused workforce for the Manufacturing industry

This Initial Workforce Plan sets out the present and emerging workforce challenges in the Manufacturing industry, and charts a path for crafting and implementing strategies, and any further analysis or consultation, for industry partners to address these challenges in a targeted and cohesive way.

This report is authored by the Manufacturing Industry Skills Alliance (Manufacturing Alliance), the Jobs and Skills Council (JSC) for the manufacturing industry.

JSCs were established by the Australian government, as tripartite organisations, to fortify the Australian Education and Training sector by bringing together businesses and workers.

The JSCs work closely with Jobs and Skills Australia (JSA), the advisory body for skills and migration, assimilating insights from various stakeholders such as employers, trade unions, training providers, and governments. This collaboration ensures the skills sector aligns better with the aspirations of Australian businesses, workers, and the wider economy.



EXECUTIVE SUMMARY

Manufacturing is a diverse and growing industry

Manufacturing is Australia's 4th largest industry, and growing. With \$124 billion in value added in 2021–22, the industry is diverse in nature and geography, widely distributed across Australian states and territories.¹

Over the last decade, the diverse production manufacturing industry has seen a 22% growth spread across a range of production sub-industries within the value chain, notably driven by surges in primary metal and metal product manufacturing (62%), machinery and equipment manufacturing (37%), and basic chemical and chemical product manufacturing (36%).

The manufacturing industry employs over 875,000 workers and is expected to face a shortage over the next 5 years.

The manufacturing workforce is mostly concentrated on the east coast of Australia, and in major cities and inner regional areas. There are 875,000 people employed in the manufacturing industry, but high demand for core production skills are evident across the economy.²

There are 356,000 workers employed in core manufacturing production occupations, with most of the largest occupations, such as structural steel and welding trades workers, and metal fitters and machinists, facing a national shortage.²

Despite growth of the industry, manufacturing apprenticeships/traineeships have not grown at the same pace as apprenticeships/traineeships in other fields.

This slowing supply of trained workers, combined with radical transformation of the industry through advanced technologies, presents challenges to ensure sufficient supply of workers with the right skills for the future of the industry. This includes readiness for the opportunities that growing sub-industries bring, such as defence, clean energy, med tech /pharma and space.

The manufacturing workforce is facing 4 key skills crunch challenges over the next 5 years.

Analysis of workforce and skills data, combined with consultation, has distilled the workforce challenges into 4 key areas for focus:

Attraction: Misunderstanding or lack of awareness of exciting careers in manufacturing (inc. both real and perceived issues in relation to wages and conditions).

Demographics: An aging workforce of specialised trades/technicians creates a 'skills retirement cliff' if skills are not transferred or retention strategies like job transfer/redesign aren't implemented.

Diversity: Lack of diversity in the manufacturing talent pool, emphasising the need to better incorporate women, First Nations Australians, CALD communities, and individuals with disabilities within the workforce to address labour force pressures,

Relevant, future-focused skills deepening and reskilling: Need for broader and more consistent skills development that meets demand for emerging industries throughout careers (informal and formal),

There are opportunity areas for the Manufacturing Alliance to bring industry, unions and government together to progress towards maintaining and growing a strong manufacturing workforce in Australia.

There are areas for the Manufacturing Alliance to work with collaborators to respond to the skills crunch challenges, including:

- Making manufacturing an attractive worker proposition
- Facilitate the knowledge transfer across different age demographics
- Increase participation from underrepresented cohorts
- Provide skills and training that is responsive to emerging demand
- Enhance the access and quality of vocational training
- Increase the pipeline of apprentices

¹ ABS Australian Industry, Manufacturing Industry, (2021 & 2022);

² All estimates based off 4 qtr average of Nov 2022– Aug 2023, Detailed Labour Force Survey, (Table EQ08), ABS, trend data

MANUFACTURING AT A GLANCE

FOURTH LARGEST INDUSTRY AND GROWING¹

\$124 billion

in value added in 2021–22,
responsible for 8% of all industry
value added (IVA).

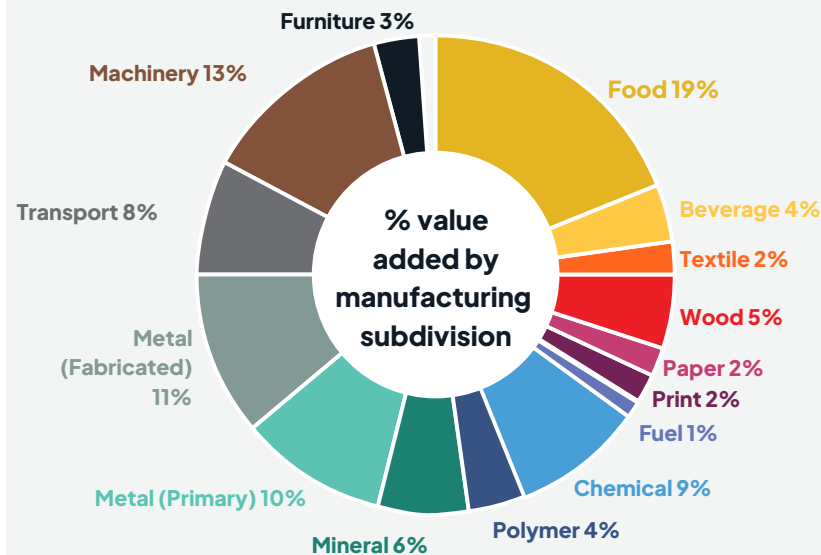
+15% growth

Growth in value added in year on year
2020–21 to 2021–2022.

4th largest industry

Behind mining, professional services and
construction.

DIVERSE IN NATURE¹



This is a high-level overview of the % value added by ANZSIC Division C – Manufacturing, as defined by the ABS. It therefore includes figures from some sectors allocated to other Job and Skills Councils such as transport, furniture and textiles.

HIGHLY INNOVATIVE²

**\$5.2 billion R&D
investment**

Manufacturing punches above
its weight in terms of business
expenditure on research and
development ('BERD'), contributing
to **25%** off all BERD despite only
making up 8% of IVA.

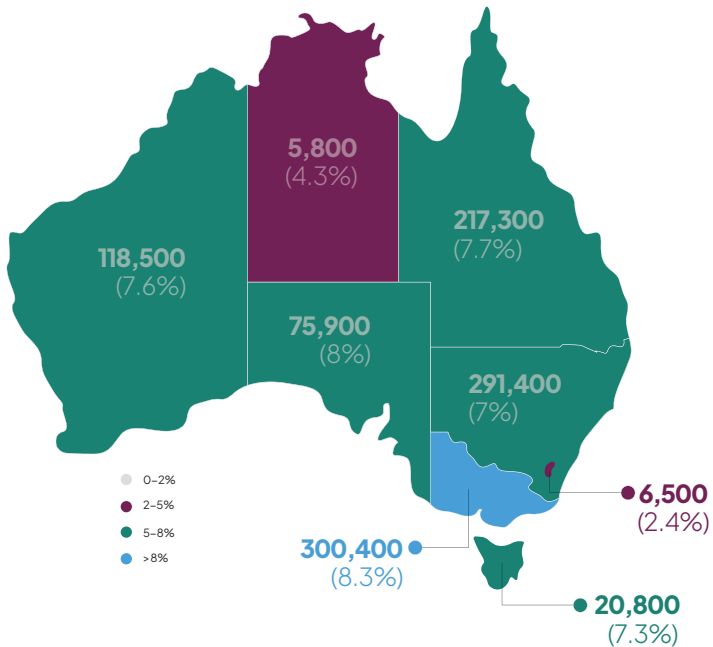
>19k R&D workers

Over 20% of Australia's
R&D workers operate in the
manufacturing sector, an outsized
proportion compared to the size
of the industry. This includes 7,500
researchers and 6,600 technicians.

¹ Source is ABS Australian Industry, Manufacturing Industry (2021 & 2022), where manufacturing has been defined as ANZSIC Division C. It is recognised that ABS ANZSIC C includes workforce numbers allocated to other JSCs.

² Source: ABS Research and Experimental Development, Businesses, Australia 2021–2022.

MANUFACTURING AT A GLANCE



Workers in the manufacturing workforce are distributed across all of Australia

Number of manufacturing workers, share of state/territory workforce 2023^{1,2}

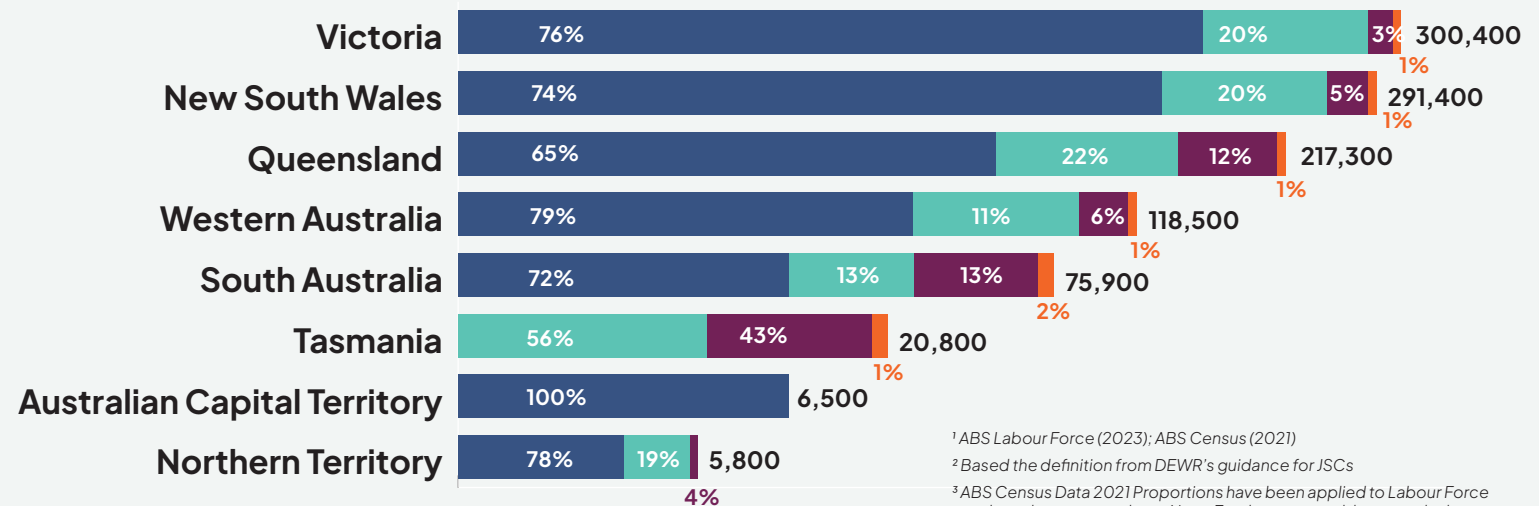
875,000

people employed in manufacturing industry Australia wide

Workers in the manufacturing industry are concentrated in the major cities

Number of manufacturing workers, share of state/territory workforce and remoteness area 2023^{1,3}

- Major cities
- Inner Regional
- Outer Regional
- Remote/Very remote



¹ ABS Labour Force (2023); ABS Census (2021)

² Based the definition from DEWR's guidance for JSCs

³ ABS Census Data 2021 Proportions have been applied to Labour Force total employment numbers. Note: Totals may not add up exactly due to rounding.

MANUFACTURING AT A GLANCE

Emerging industries and approaches offer significant opportunity, but will compound the ‘skills crunch’ if we are too slow to respond

Advanced manufacturing is transforming existing sub-industries

Advanced manufacturing (AM) is the adoption of innovative technologies to improve the manufacturing process or resultant products.

Advanced manufacturing can transform existing industries through technologies such as:

- Foundational AM: Big data, cloud computing, digital design and Internet of Things (IoT)
- Specialised AM: Advanced materials and composites (aviation), additive manufacturing, robotics, advanced electronics, biological integration, augmented reality/virtual reality and self-healing materials

AM creates opportunity for Australia as it can create new comparative advantages across the value chain, through the application of our knowledge-intensive technologies in areas where we typically have higher labour costs (e.g. production). But, it required a skills shift towards knowledge of these AM capabilities.

This ‘skills crunch’ is likely to continue as the sector is radically transformed by advanced technologies and emerging future-industries

Workforce impact

- Increased demand for manufacturing workers
- Shift in skill profile to advanced technologies (up to ~40% jobs by 2030)¹

¹ Based on a study of manufacturing job advertisements in Singapore and USA in which 40% of total advertisements requested AM skills. Indicative only. Source: Lightcast.



MANUFACTURING AT A GLANCE

New manufacturing sub-industries offer exciting opportunities, but require a new skilled workforce

01 DEFENCE



Development of sovereign defence capability is of rising importance. The Australian Government has committed \$150 million to support the workforce for nuclear submarines via the AUKUS plan. This funding supports university places, a skills taskforce and extension of the Defence Industry Pathways program. Defence industry development beyond AUKUS, is also expected to increase skill demand.

02 CLEAN ENERGY AND SUSTAINABILITY



Australia is at the beginning of its transition to renewable energy and there is an opportunity to be a leader in the production and export of renewable energies that will require skilled workers for the construction and maintenance of clean energy assets³. The development of a more circular economy will require increasingly enhanced manufacturing capabilities to improve resource recovery and use of recycled materials.

03 MEDTECH/PHARMACEUTICAL MANUFACTURING



The Australian Government has finalised a partnership with Moderna to open the first mRNA production facility in the Southern Hemisphere in Victoria in 2024. The growth of Australia's RNA sector will be alongside other developments in R&D, and MedTech/Pharmaceutical manufacturing could add \$18b to GDP by 2025.

04 SPACE



The Australian space industry has a A\$2 billion pipeline of planned capital investments, including A\$775 million private or foreign investment between FY19 to FY28. Around 4% of the sector involves the manufacturing of spacecraft and supporting equipment⁵.

Indicative workforce impact¹

+ 20,000 workers
by 2050² (AUKUS ALONE)

+ 60,000 workers
by 2030³

+ 28,000 workers
by 2025⁴

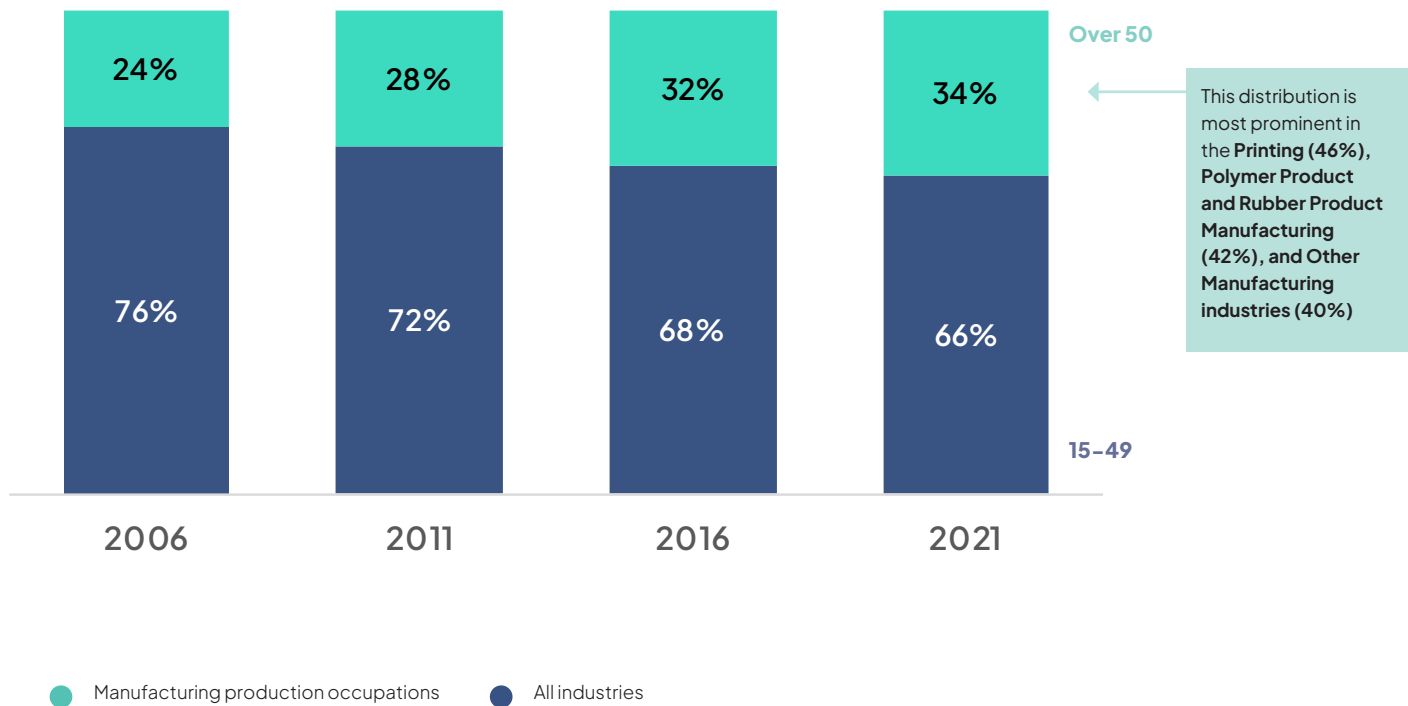
+ 13,000 workers
by 2030⁶

¹ Based on existing research and impact is not specific to manufacturing. Indicative only, with further work recommended. ² Department of Defence (2023), New Investment in skills paves the way for AUKUS workforce. ³ Based on analysis on transition of the carbon workforce; Climateworks (2023), Skilling Australian industry for the energy transition; ⁴ NSW Govt ⁵ Accenture/AlphaBeta (2021), ⁶ Australian Space Agency (2019) estimates there are 17,000 employed in 2021 and this will rise to 30,000 by 2030

WORKFORCE CHALLENGE 1

The manufacturing workforce is an ageing one, risking a 'skills retirement cliff'

Distribution of manufacturing production workforce by age group (15–49, 50+) 2006 to 2021¹



¹ All estimates based on ABS Census 2021 data where manufacturing is defined as per DEWR's guidance for JSCs. Only Production related occupations included



The **proportion of workers aged over 50 years** in the manufacturing production workforce **increased by 10 percentage points since 2006** compared to the average of five percentage points

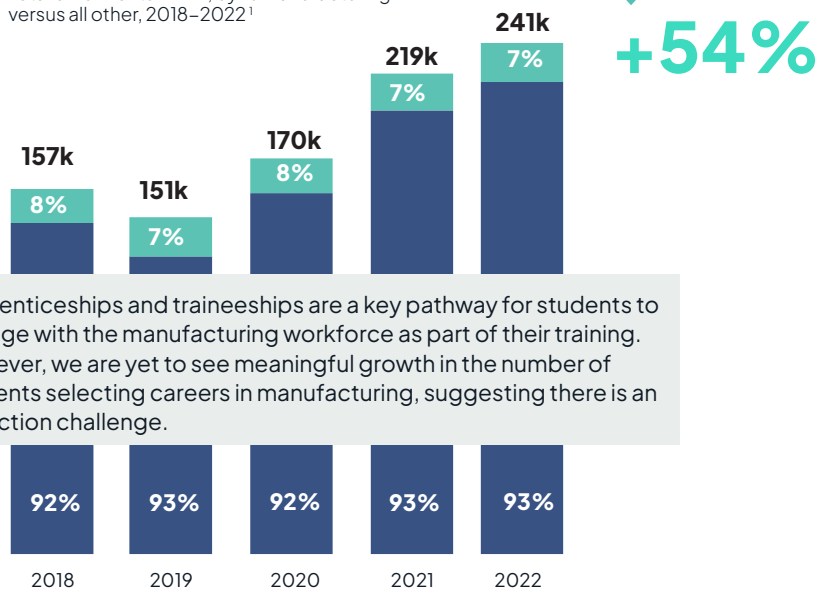
WORKFORCE CHALLENGE 2

We have not seen an increase in the relative uptake of manufacturing apprenticeships, with one contributing factor likely to be the wage profile of adjacent sectors such as mining

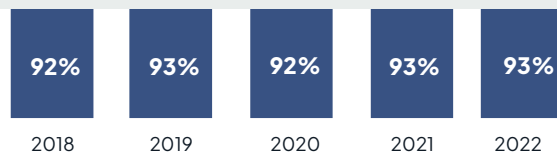


Total enrolments in apprenticeships/ traineeships across the VET sector

Total enrolments in VET, by % manufacturing versus all other, 2018–2022¹



Apprenticeships and traineeships are a key pathway for students to engage with the manufacturing workforce as part of their training. However, we are yet to see meaningful growth in the number of students selecting careers in manufacturing, suggesting there is an attraction challenge.

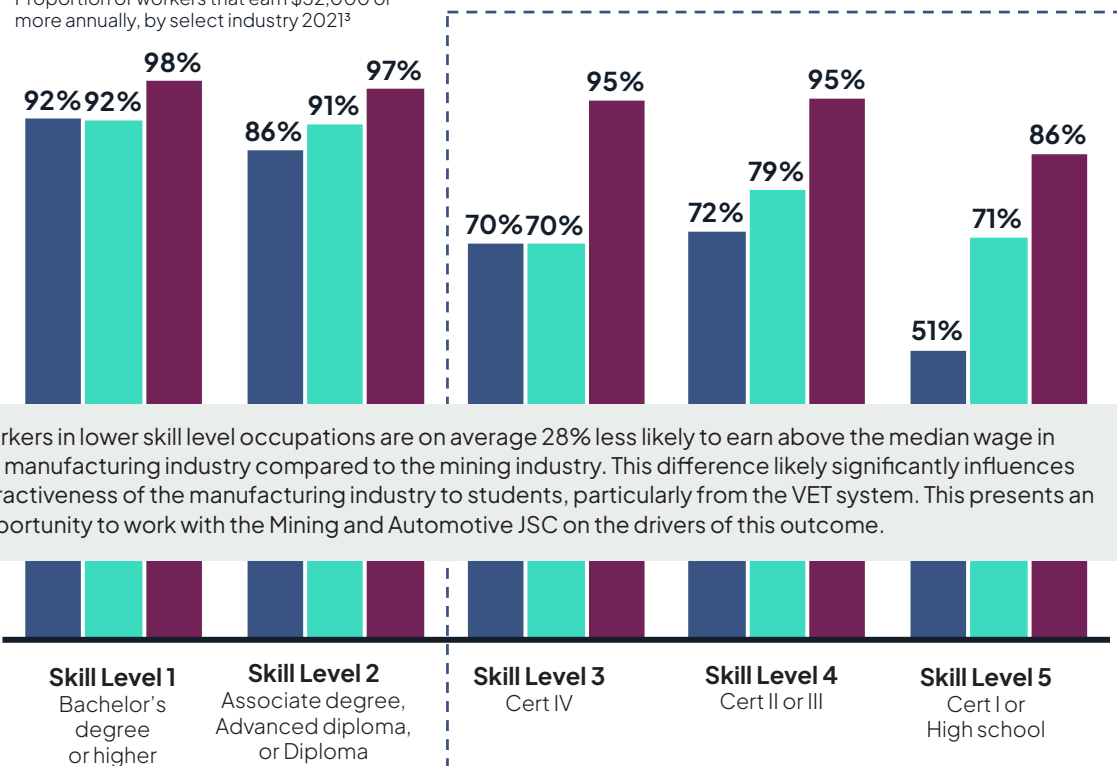


- Manufacturing related apprenticeships/traineeships
- All other apprenticeships/traineeships

Australians with VET qualifications earn more in Mining and Construction²

- Manufacturing
- Construction
- Mining

Proportion of workers that earn \$52,000 or more annually, by select industry 2021³



Workers in lower skill level occupations are on average 28% less likely to earn above the median wage in the manufacturing industry compared to the mining industry. This difference likely significantly influences attractiveness of the manufacturing industry to students, particularly from the VET system. This presents an opportunity to work with the Mining and Automotive JSC on the drivers of this outcome.

¹ NCVER Apprentices and trainees 2018–2022;

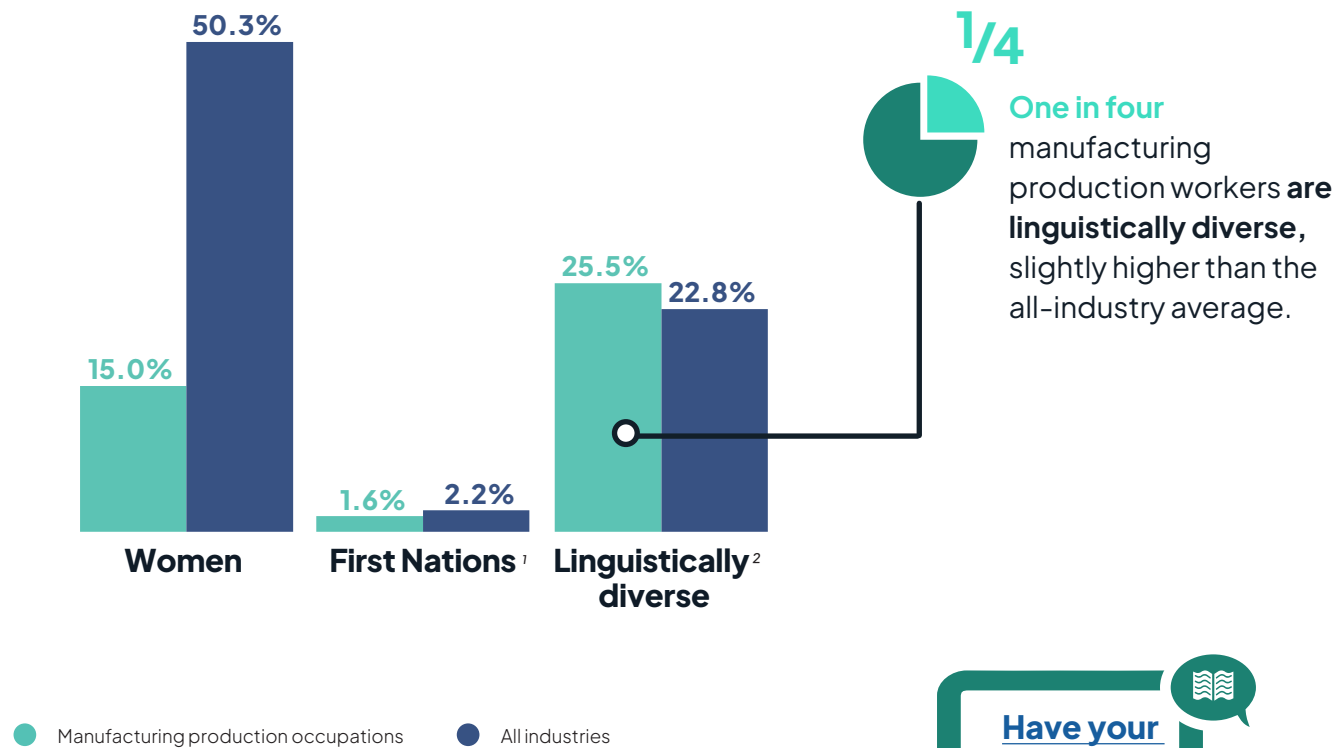
² Mining and construction industries have been selected as comparative industries given the overlap in occupational skills and frequent movement between these sectors and the manufacturing workforces.

³ ABS Census 2021 defined by 1–digit ANZSICs (i.e., 1–Digit Manufacturing, Construction and Mining)

WORKFORCE CHALLENGE 3

Women and First Nations Australians continue to be underrepresented

Proportion of manufacturing production workforce (%), 2021



¹ Refers to those who identify as Aboriginal, Torres Strait Island or both

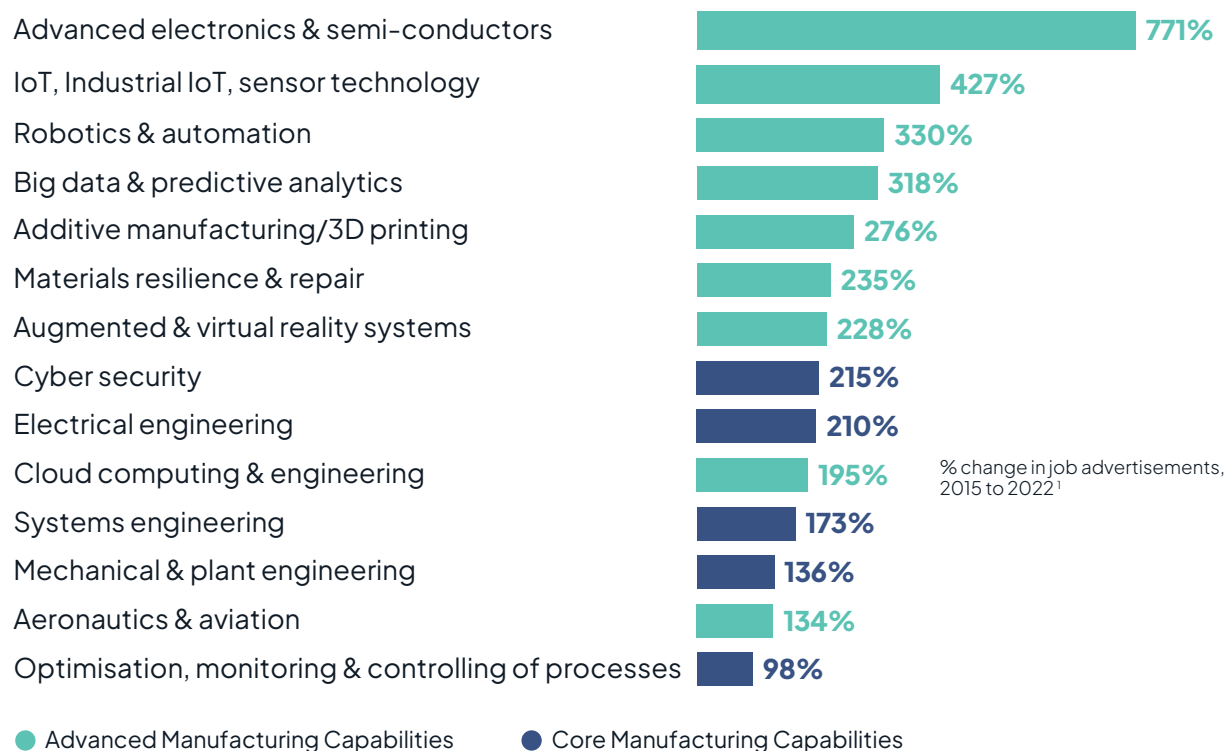
² Refers to those that identified as using a language other than English at home



WORKFORCE CHALLENGE 4

Since 2017, demand for traditional manufacturing skills has grown, but not as strongly as the demand for skills related to advanced manufacturing capabilities

Growth in skills demanded by employers for core manufacturing occupations



Source: Lightcast. ¹The high growth in the capabilities of advanced electronics and semi-conductors and augmented and virtual reality systems is due to a very low count of job advertisements in 2015



VET offers a limited range of training for emerging advanced manufacturing capabilities, suggesting a gap in the market to teach capabilities that industry are increasingly demanding

There are opportunity areas for the Manufacturing Alliance to work with collaborators to respond to the 'skills crunch' challenges



Make manufacturing an attractive worker proposition

Change perceptions or lack of awareness of exciting careers in manufacturing



Facilitate knowledge transfer across different age demographics

Improve reskilling opportunities and enable skills transfer to combat an ageing workforce in manufacturing



Increase participation from under-represented cohorts

Enhance representation of women, First Nations Australians, CALD groups, and individuals with disabilities to address labor supply challenges



Provide skills and training that are responsive to emerging demand

Promote consistent deepening and refreshing of skills that respond to demand from emerging industries



Enhance the access and quality of vocational training

Address constraints that impact VET quality, access, and skills responsiveness



Increase the pipeline of apprentices

Boost completion rates and ensure apprenticeships are more responsive to industry and learner needs

PRIORITY ACTIONS

1. Work with industry and government to review the pay and conditions for apprentices
2. Develop clear and defined career pathways to help future workers understand a career in manufacturing
3. Run awareness and promotional campaigns to improve the perception of the manufacturing industry and showcase the opportunities it offers

1. Support the establishment of mentorship programs to foster relationships between experienced employees and newcomers
2. Work with the manufacturing VET system to enhance opportunities to upskill and reskill workers

1. Identify the economic benefits of non-traditional cohorts and what skills they can offer the manufacturing sector
2. Identify examples and case studies of where non-traditional cohorts have benefited the manufacturing sector
3. Investigate opportunities to increase participation and retention of traditionally under-represented and underutilised cohorts

1. Understand the future skills required across emerging industries (i.e., clean energy, defence, RNA)
2. Assess and address the impact of demand from emerging industries on the skill requirements of VET trainers
3. Work with the manufacturing VET system to identify and begin implementing immediate measures to develop a more coherent and constructive framework for the future demand pressures that manufacturing workforce will face

1. Investigate and understand the capabilities and quality of VET trainers
2. Assess the effects and benefits of integrating new technologies and capabilities into the teaching process that uplift the quality of vocational training

1. Identify existing apprenticeship and traineeships for manufacturing and understand their usage and support from stakeholders
2. Identify barriers and other factors that limit the uptake of apprenticeships and traineeships in manufacturing¹
3. Identify barriers and other factors that contribute to the current rates of cancellations and withdrawals in manufacturing apprenticeships and traineeships
4. Identify options to enhance the apprenticeship and traineeship offerings

DATA LIMITATIONS

1. Review the relevancy of ANZSCOs in identifying and quantifying the manufacturing workforce

2. Engage with relevant departments and bodies to build a more detailed and up-to-date dataset of the outflows and inflows across the manufacturing sector

3. Engage with NCVER to undertake longitudinal analysis on apprenticeships/traineeships to improve policy and program design

¹ Part of this action will also involve reviewing the pay and conditions for apprentices as mentioned as action 1 under "Make manufacturing an attractive worker proposition"



We're particularly keen to understand if the challenges outlined in the Initial Workforce Plan resonate with your experiences.

Does our plan accurately reflect the issues your organisation or sector is facing? We welcome your input on the key challenges and opportunities:

- **Attracting a workforce** to manufacturing
- The **ageing workforce** and impending skills retirement cliff
- **Lack of diversity** in the manufacturing talent pool
- **Relevant, future-focused skills deepening and reskilling** - the need for broader and more consistent skills development that meets demand for emerging industries throughout careers.

Let us know the changes you foresee to the manufacturing workforce and the impact of changes in government regulation, energy costs, technology, economic conditions, and other global risks.



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