



# Advancing Manufacturing Skills Strategy

**REVIEW**

May 2022



# Advancing Manufacturing Skills Strategy - Review

May 2022

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# Advancing Manufacturing Skills Strategy - Review 2022

*“Being advanced relies little on what you make but on how you make it”*  
Dr Jens Goennemann, MD, Advanced Manufacturing Growth Centre, 2019

## Executive summary

This review of Jobs Queensland’s 2018 *Advancing Manufacturing Skills: A Skills, Training and Workforce Development Strategy for the Manufacturing Industry in Queensland (the Strategy)* has been undertaken to support the establishment of Manufacturing Skills Queensland (MSQ), a 2019 election commitment of the Palaszczuk Government.

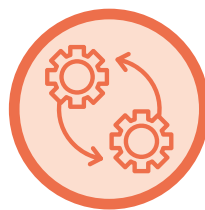
The purpose of the review was to evaluate the relevance of the Strategy’s ten priority action areas (PAAs) in today’s economic climate, and to provide the new entity with an evidence base for future advice.

The review found that all ten PAAs remain relevant and could be grouped into three focus areas:



### Focus area 1:

Building the talent pipeline



### Focus area 2:

Managing change



### Focus area 3:

Growing the industry

There is significant overlap between the focus areas, and no one area has a greater priority. As with all strategies, there are areas where action now will have impact in the short to medium term, and other areas where actions will take longer to produce outcomes. A key theme throughout the review is the need for collaboration across government, with industry and at regional level, as well as with other key stakeholders such as the education and training system. Working together will support manufacturing to not just survive but to thrive and provide sustainable and interesting jobs across Queensland.

# Context

As part of the Advancing Queensland program, the Queensland Government in 2016 released the *Queensland Advanced Manufacturing 10-year Roadmap*.<sup>i</sup> The Roadmap recognises the value of manufacturing to the Queensland economy, and provides a 10-year vision for the industry which will see traditional manufacturers transition to advanced manufacturing. The Roadmap sets out an action plan to guide government and industry on the journey.

In February 2018, Jobs Queensland released *Advancing Manufacturing Skills: A Skills, Training and Workforce Development Strategy for the Manufacturing Industry in Queensland* (the Strategy).<sup>ii</sup> Stakeholders consulted for the Strategy considered that advanced manufacturing was a journey rather than an end point, and many manufacturers were on the journey of 'advancing' manufacturing. The Strategy identified ten priority action areas (PAAs) requiring collaboration between industry and government to support the industry's transition to advanced manufacturing, often referred to as Industry 4.0.

This review has been undertaken to support the establishment of MSQ, and to provide the entity with a basis for future advice. It has been informed by key stakeholders from government and industry, including Queensland Treasury, the Department of Regional Development, Manufacturing and Water, the Australian Industry Group Industry Advisers, the Advanced Manufacturing Gateway to Schools Program coordinator, and industry research undertaken by the Australian Robotics Centre.



## COVID-19 response

Both nationally and in Queensland, government intervention was required to sustain our economy through the early months of the pandemic. In Queensland, several initiatives were introduced including the Small Business Adaption Grant program, which provided support for small and micro businesses to adapt and sustain their operations and build their resilience.<sup>iii</sup>

The fragility of global supply chains and the need for a strong domestic manufacturing capability has been highlighted by the pandemic. There is recognition that Australia needs to better manage its sovereign capability in this area to safeguard against future shocks. In late 2020, *Make it Happen: The Australian Government's Modern Manufacturing Strategy* was launched to revitalise Australia's manufacturing capability.<sup>iv</sup>

As we slowly emerge from the acute phase of the pandemic, the Queensland Government's commitment to manufacturing remains strong with manufacturing recognised as a key component of the state's recovery. A major 2019 election commitment of the Palaszczuk Government was the establishment of MSQ. In the 2020-21 Budget, \$16.51 million was committed to establish MSQ.<sup>v</sup>

## Impact of COVID-19 on manufacturing

Australian manufacturing lost 56,600 jobs during the second quarter of 2020, although there is evidence that employment was recovering by October 2020. The impact has been greater in New South Wales and Victoria, largely driven by Victoria's extended lockdown and Queensland's strong alignment to food and beverage, machinery and equipment manufacturing.<sup>vi</sup>

COVID-19 has highlighted the importance of the Australian manufacturing industry both now and into the future, and while unanticipated, provided opportunities for Australian manufacturers. This resulted in a 0.9 per cent growth in production in the 2021 June quarter. The impact of recurrent lockdowns in New South Wales and Victoria interrupted this growth.<sup>vii</sup>

The impacts of the pandemic on Queensland's manufacturing industry are still evolving.

Global supply chain disruption has resulted in some sectors/manufacturers reshoring parts of their operations. This has been reported most frequently in the textile manufacturing sector, as the supply of textiles into Australia for a range of downstream value-add activities has become severely constrained.<sup>viii</sup>

Prior to the pandemic, many manufacturers had service agreements with equipment manufacturers based in other countries. In these agreements, the equipment could only be serviced by technicians supplied by the original equipment manufacturer (OEM). Due to COVID-related travel restrictions, access to specialist technicians has been severely restricted. Anecdotal evidence suggests that this is leading many manufacturers to rethink these service

agreements and increasing the demand for Australian-based service centres. Building service capabilities in-house will also increase the skills of the manufacturing workforce, while supporting manufacturing sovereignty for the future.

The move to online delivery of services and working from home arrangements for some employees has been identified by the industry as another catalyst for change. Some manufacturers reported that, because of the pandemic, plans to improve/increase their online presence have been prioritised.<sup>ix</sup>

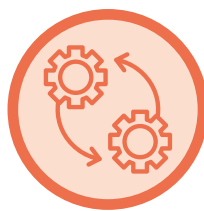
## Key focus areas for consideration

As the measures introduced to manage the virus have taken effect, the focus has shifted to rebuilding the economy, both in the short term and for the future. Access to employment in quality work<sup>x</sup> will be vital to rebuilding the Queensland economy, and ensuring a strong, dynamic and equitable society. The review of the Strategy has found that the original PAAs remain relevant in Queensland's emerging COVID-constrained economy. As an outcome of the review, they have been grouped into three key focus areas (see Appendix A):



### Focus area 1:

Building the talent pipeline



### Focus area 2:

Managing change



### Focus area 3:

Growing the industry

While three key focus areas have been identified, they are interconnected and support the ongoing growth and sustainability of manufacturing in Queensland. The time required to achieve measurable outcomes for each of the PAAs within each key focus area may vary because of the differing strategies required to address them. Collaboration between industry (including employers and workers), unions and government is needed to ensure that these strategies are targeted and effective. The education and training sector will also have significant role in ensuring manufacturing's future.



# Focus area 1

## Building the talent pipeline

People are key to a thriving manufacturing industry. Securing an appropriately skilled workforce to meet both current and future employment demands requires a proactive and agile pipeline of talent. Collaboration between government, industry and the education sector (schools, VET and higher education) underpins this goal.



Increasing adoption of advanced technologies such as artificial intelligence (AI), 'big data' and robotics requires workers who are creative thinkers, adaptable and digitally-savvy. With an ageing workforce, the industry needs to build a strong talent pipeline to take advantage of the opportunities and meet the challenges of the future, plus attract both a younger and more diverse workforce. Stakeholders are reporting that current labour and skills shortages are hampering growth.

Looking outside the traditional workforce profile to identify under-utilised cohorts is one strategy to meet current and future labour and skill shortages. The changing and increasing use of technologies such as artificial intelligence (AI) has the potential to increase the pool of workers that could be attracted to the industry. Two cohorts that are currently under-represented in the industry are women and Aboriginal and Torres Strait peoples.<sup>xi</sup>

In the 2016 Census, the number of Aboriginal and Torres Strait Islander peoples employed nationally in manufacturing had fallen by 10.5 per cent to just over 8,500 workers.<sup>1</sup> Women make up less than 30 per cent of the workforce, with many employed in non-trade occupations (Appendix B). Stakeholders report that the number of women in the industry is increasing albeit without formal attraction and retention strategies.<sup>xii</sup>

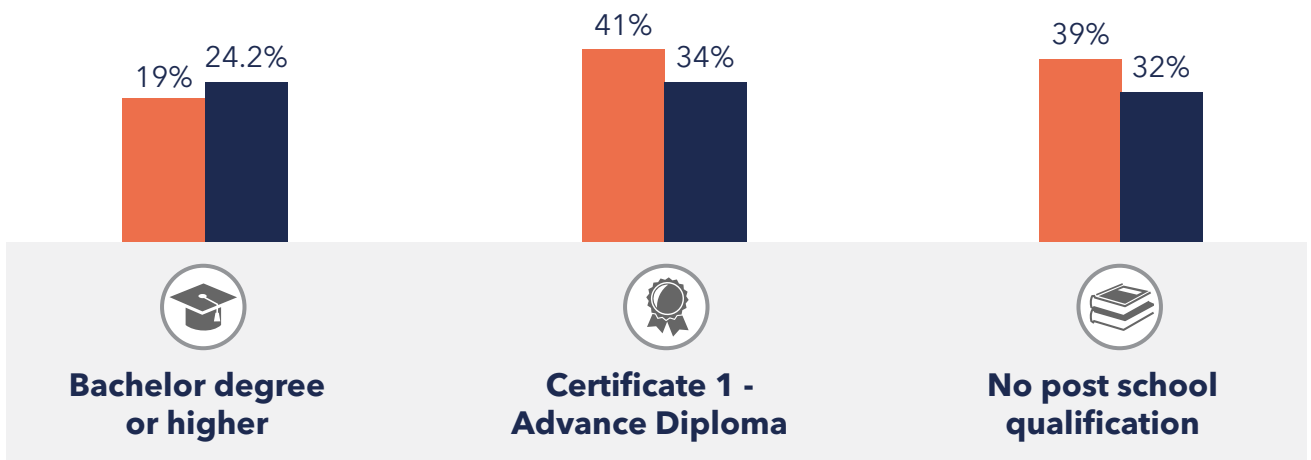
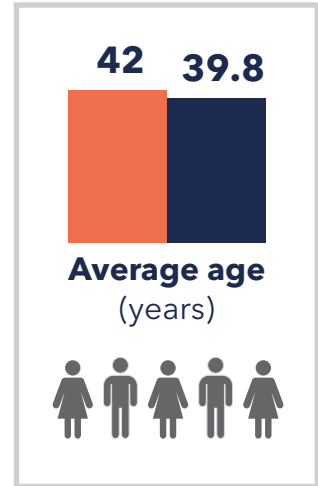
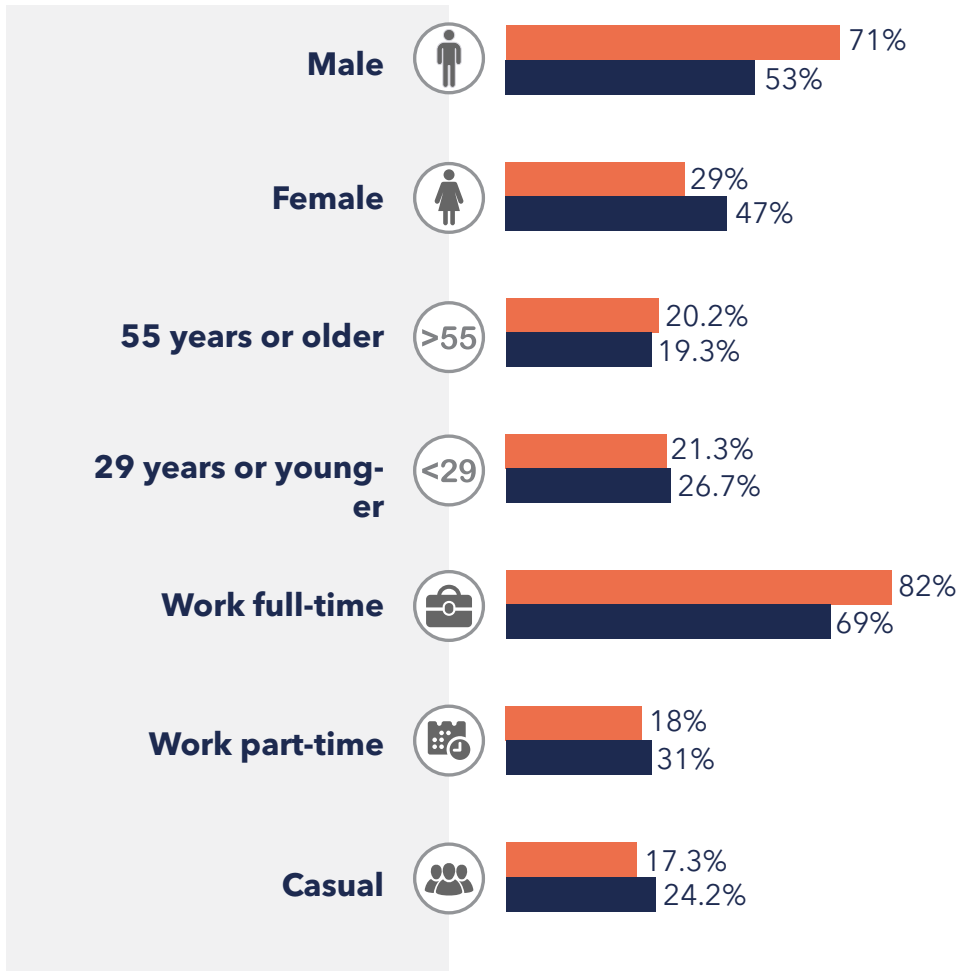
1. Current data on the employment of Aboriginal and Torres Strait Islander peoples in manufacturing is not available. Relevant 2021 Census data will be released in October 2022.



# Graphic 1 - Workforce profile 2020

## Manufacturing

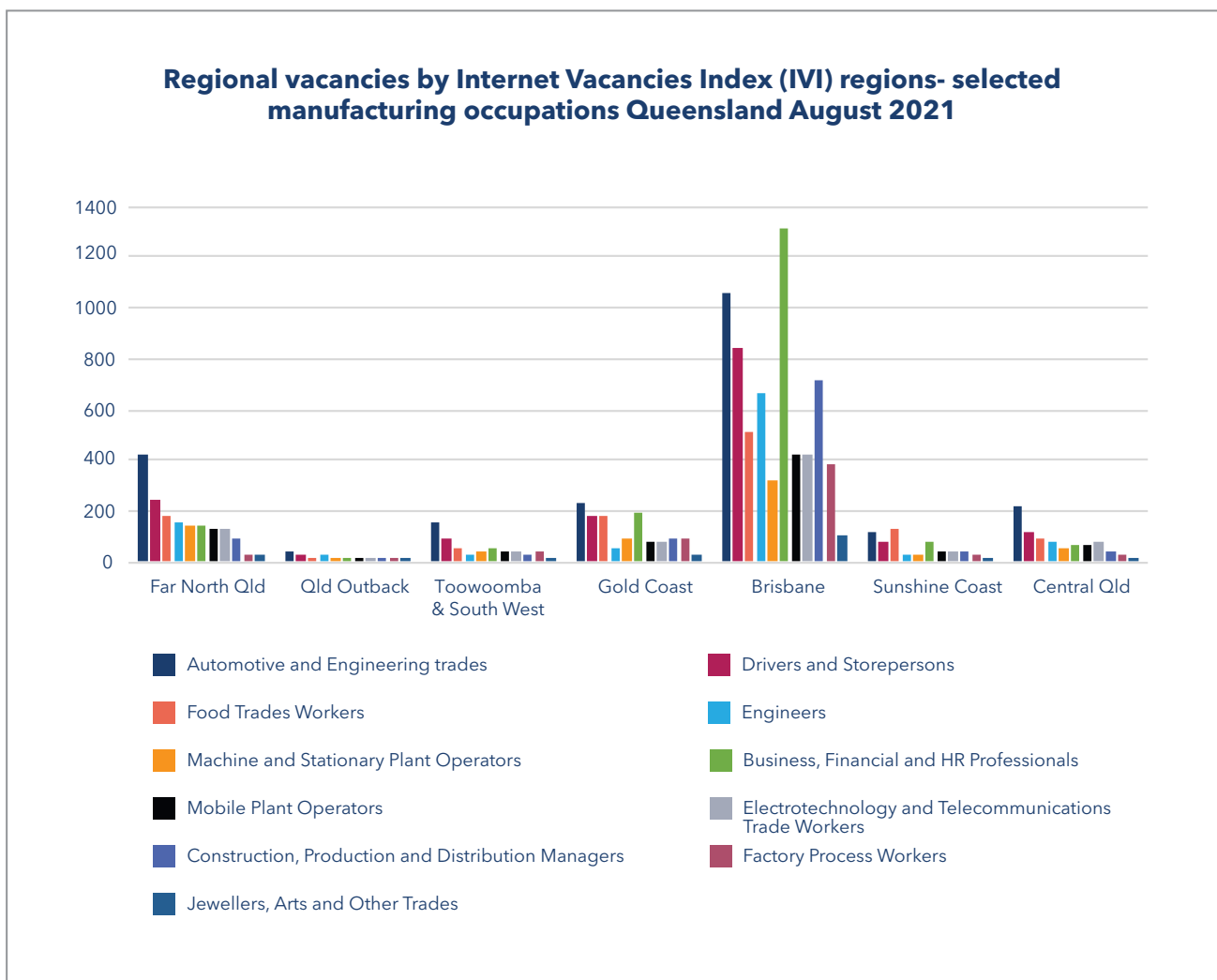
## All industries



Source: AiGroup, 2020, Manufacturing Jobs in Australia: long-term trends and the impact of COVID-19. Blog, October 28. Melbourne: Australian Industry Group

## Potential Queensland skills shortage

As Queensland’s economy recovers from the acute impact of the pandemic, analysis of the Internet Vacancies Index (IVI) shows that many manufacturing occupations are in demand. These occupations made up 22 to 30 per cent of all occupations in demand across Queensland in August 2021.<sup>xiii</sup> Consistently across regions, employers are struggling to fill traditional manufacturing trades roles, such as boilermakers, fitters, diesel fitters, mechanics, and sheet metal workers. These trades form the basis of employment in manufacturing, and are also in demand in other industries such as mining. Competition for skilled workers is expected to increase as other industries recover.



Source: National Skills Commission, 2021. *Internet Vacancies Index*. <https://lmip.gov.au/default.aspx?LMIP/GainInsights/VacancyReport>

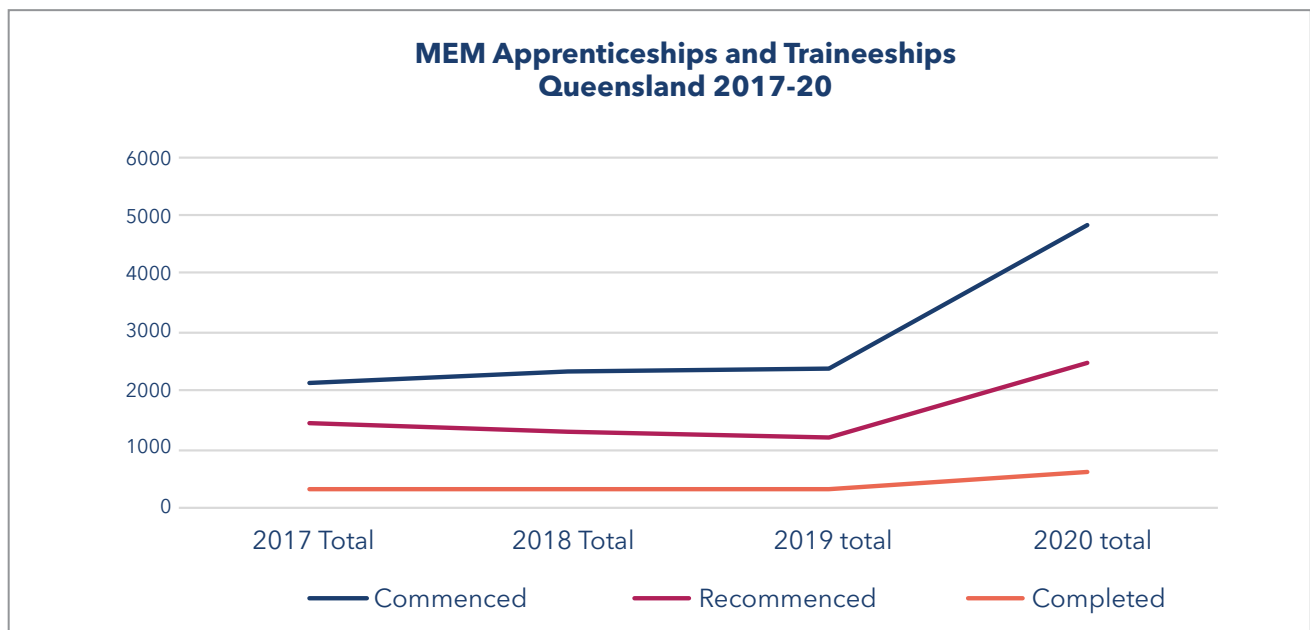
## Workforce supply and demand

The closure of both international and interstate borders has impacted labour supply for the industry, with some sectors reporting both a skills shortage and a labour shortage. Employers are looking to recruit from non-traditional sectors of the economy. To do this, they need a better understanding of the skills they need for their business, rather than recruiting on traditional occupational profiles. One tool available to assist employers to identify the skills needed is the Australian Skills Classification, developed by the National Skills Commission.<sup>xiv</sup>

As the skills needs of the industry change in response to changing technologies and customer demand, it is becoming increasingly important to identify existing workers with appropriate skill sets and the desire to upskill or reskill into new roles and ways of working. This is key for manufacturing businesses to be able to take advantage of the opportunities that new technologies offer. Getting the skilling and training parameters right should be an immediate priority. Investing in reskilling and upskilling the existing workforce will ensure that these workers can be redeployed and continue to be employed in manufacturing.<sup>xv</sup>

## Skills and training

The primary entry into manufacturing occupations remains via the national apprenticeship system supported by VET. The pandemic has disrupted vocational education delivery and assessment, with the forced closures of training organisations driving a move to online delivery for theoretical components.<sup>xvi</sup> While completion rates for apprentices and trainees in Queensland have risen through 2020, the full impact of the disruption to training services is not yet clear.



Source: NCVET, 2021. VOCSTATS. Adelaide: National Centre for Vocational Education Research.<sup>2</sup>

2. MEM - Metal and Engineering is the primary training package for the industry. It provides the core skills needed and allows for worker mobility within the industry and career progression for the individual. This training package accounted for over 50 per cent of all manufacturing-related apprenticeship and traineeship commencements in 2020.

In response to changing skills needs because of the pandemic, the industry has been using short courses and micro-credentials to meet training needs within the current workforce. Much of this training is non-accredited. While this training meets enterprise-specific needs, there is not yet a mechanism to formally recognise, at a national level, the learning outcomes and skills gained. This potentially may limit skills transferability and worker mobility within the industry and to other industries.

The move to online delivery has been beneficial for many employers who found it both time- and cost-effective.<sup>xvii</sup> There is evidence that, while online learning has been effective for existing workers, it is less efficient for practice-based education such as apprenticeships and traineeships.<sup>xviii</sup>



*Image credit - courtesy of H E Tech*



## Focus area 2 Managing change

Change is not new for the manufacturing industry. Prior to the pandemic, manufacturing was already being impacted by the introduction of new technologies and new processes through Industry 4.0. The pandemic has increased the speed of change within the industry. To take advantage of opportunities and to ensure the sustainability of manufacturing in Queensland, the industry has needed to develop the capabilities to respond to and manage rapid change. These capabilities (e.g. leadership, agility and innovation/creative thinking) will continue to be important for the industry as Queensland's economy rebuilds.

**FOCUS AREA**  
**2**

 **Position the manufacturing workforce as a key partner in the journey towards advanced manufacturing.**

 **Build a highly skilled, adaptable and capable existing workforce.**

### Technology

Advanced manufacturing involves the adoption of new technologies such as AI, robotics/automation and the Internet of Things (IoT). This digital transformation will drive business reform and increase opportunities for enterprises to grow their business.<sup>xix</sup>

Despite being aware of the need to transform to survive, many manufacturers are reluctant to adopt new technologies.<sup>xx</sup> For small businesses, the cost of investment and risk of obsolescence can inhibit adoption. Among workers, there may be a fear that the new technology will replace their jobs. It is important that business owners and managers collaborate with employees to overcome these perceptions. Workplace changes driven by responses to COVID-19 is also contributing to change fatigue. Successful transformation requires partnering with the workforce to overcome such resistance and to manage change fatigue.

## Culture

As technology transforms manufacturing workplaces, opportunities will emerge for new and exciting roles. Traditionally the manufacturing workforce has been male dominated.<sup>xxi</sup> When recruiting for these new roles, the industry will have opportunity to diversify its workforce, as well as attract younger talent. Supporting and integrating this new workforce into the existing one will require shifting to a more inclusive culture.

Employers and supervisors within the industry will require strategies to guide and assist with cultural change. A more inclusive culture will support the attraction of a younger and more diverse workforce. This will be crucial for the longer-term growth and sustainability of the industry.

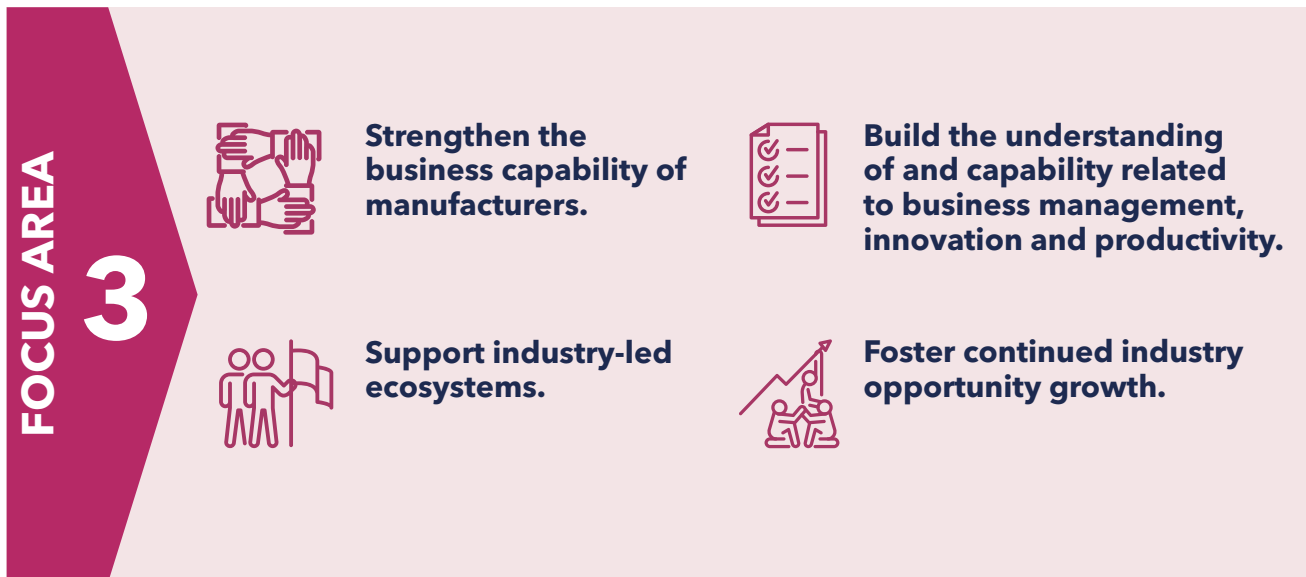


*Image credit - courtesy of Queensland Training Awards, Department of Employment, Small Business and Training.*



## Focus area 3

# Growing the industry



The pandemic has provided the industry with a unique opportunity to change public perceptions that a career in manufacturing is ‘dirty, dangerous and dull’. The disruption of global supply chains has highlighted the need to increase local manufacturing capability. The introduction of new technologies and increasing use of robotics and AI within the industry, as well as ongoing, stable and well-paid employment, can be used to increase the appeal of the industry to a new and more diverse cohort of workers.

Employment in manufacturing is projected to grow over the next 20 years with the majority of growth occurring in South East Queensland. (Appendix C)<sup>xxii</sup> This reversal in the long-term trend of falling employment will be driven by the transition to advanced manufacturing, and provide unique opportunities for the emergence of new and exciting manufacturing enterprises using cutting edge technologies and innovative processes. The number of manufacturing business within Queensland has been stable over the last five years.<sup>xxiii</sup>

The emergence of ‘new’ manufacturing has the potential to increase the number of manufacturing businesses in Queensland and revitalise the industry. Supporting industry growth, both in terms of the number of businesses as well as employment size is required if the industry is to capitalise on current and future opportunities.

### Queensland regional manufacturing

Regional manufacturing is a core component of regional supply chains, providing services and products to other industries within the region, as well as developing skilled local workers.

While manufacturing business numbers in Queensland have remained relatively unchanged over the eight years to June 2020, manufacturing's regional presence is shifting.<sup>xxiv</sup> The Greater Brisbane area now has fewer manufacturing businesses than the rest of Queensland combined, which may reflect land availability/use and changing sectoral composition (Appendix D). Despite this shift, manufacturing employment is projected to grow across both areas over the coming decades.<sup>xxv</sup>

Outside of the southeast corner, there is concern that the 'drift' of young people to larger metropolitan areas is resulting not only in skills shortages but also labour shortages. Even before the pandemic, regional manufacturing stakeholders had identified succession planning as a key area of need.

An unexpected effect of the pandemic has been the increase in interstate migration to Queensland. The demographics of those moving to regional areas appears to have shifted from retirees to become increasingly those of working age with families.<sup>xxvi</sup> Many of these interstate arrivals are choosing to settle outside of the Greater Brisbane area, offering regional areas opportunities for economic renewal and reversal of an ageing workforce.<sup>xxviii</sup> For regional manufacturing and its related supply chains, these new residents present an opportunity to address skills and labour shortages.

## **Queensland's regional manufacturing hubs<sup>xxviii</sup>**

The Queensland Government has established six regional manufacturing hubs, Cairns, Townsville, Rockhampton, Gladstone, Gold Coast and Mackay for the purpose of bringing together key stakeholders in each region to identify and grow the local manufacturing ecosystem. Each hub has specific focus areas which reflect the manufacturing profile of the region.



*Image credit - courtesy of Queensland Training Awards, Department of Employment, Small Business and Training.*



The hubs have been set up to offer access to a wide range of services including skills development and training programs for regional manufacturers. Skills development and training programs need to be given a higher profile to encourage and enable manufacturing businesses to transition to advanced manufacturing, and grow the local workforce they need.

## **Innovation and productivity**

With an ageing workforce and a shortage of appropriately skilled workers, the industry will increasingly rely on technology to improve productivity and remain viable. Enterprises that have adopted digital technologies, including robotics, have not only increased their productivity through new processes and products, they have also increased their workforce, expanded into new markets and become more competitive in existing niche markets.

Globally, digital technologies in manufacturing have been identified as key to manufacturing sustainability and productivity.<sup>xxix</sup> One effect is that they raise the skills profile of the industry which has been shown to be linked to increased productivity and greater innovation.

<sup>xxx</sup> The reluctance of Australian manufacturers to embrace new technologies will hamper the growth of the industry and improvements in productivity. Manufacturers that have invested in technology such as robotics, automation and digitisation are expanding into new markets, new product lines or becoming more competitive in existing niche markets. These technologies have also been shown to increase jobs rather than replace them.<sup>xxxi</sup>



*Image credit - courtesy of Queensland Training Awards, Department of Employment, Small Business and Training.*

# Looking forward

As manufacturing looks to the future, there are opportunities and challenges ahead.

Emerging sectors such as renewable hydrogen, clean energy technology, space and super yachts all offer opportunities for the industry to grow and increase its global footprint. The Queensland Government's Net Zero Emissions by 2050<sup>xxxii</sup> strategy is driving significant investment in research and development, as well as supporting pilot programs across the state. Queensland manufacturers have a unique opportunity to become leaders in the manufacturing of technologies for these sectors, as well as producers of renewable hydrogen.<sup>xxxiii</sup> Already the transition to renewable energy is creating new manufacturing opportunities and jobs as companies establish battery manufacturing and wind turbine manufacturing facilities in Queensland.<sup>xxxiv</sup>

While the impact of COVID-19 has been the main focus of the industry in the last two years, there are other factors also impacting manufacturing. Tensions between Australia with Geopolitical tensions have impacted some manufacturing sectors. These tensions are driving Australian manufacturers to seek alternate markets for their goods.<sup>xxxv</sup> The pandemic has in some cases also provided a stronger domestic market, due to the disruption of global supply chains.

The increased use of cloud-based technologies and online business environments has increased the risk of cyber-attacks for enterprises.<sup>xxxvi</sup> In 2021, a cyber-attack shut down the global operations of meat processing company, JBS Food, threatening Australia's meat supply chain.<sup>xxxvii</sup> Within manufacturing, the transition to Industry 4.0 with its integrated industrial systems increases the risk of cyber-crime.<sup>xxxviii</sup> Developing the capabilities and skills of manufacturers in this area will assist in minimising this risk.

The transition to net zero emissions nationally opens new markets and opportunities. Changing customer preferences will drive demand for 'green' manufacturing products. This will drive innovation and the need for new skills and knowledge within the workforce.<sup>xxxix</sup>

Already the food processing sector is implementing corporate social responsibility (CSR) practices as consumers demand 'clean, green' products. Sustainably-produced foods and transparency of supply chains are just some of the challenges that food processors are having to incorporate into their business practices.<sup>xl</sup>

While COVID-19 has had a severe and sudden impact on the manufacturing industry, these challenges will have deeper and more far-reaching impacts, especially in the areas of business practices and worker skills, knowledge and capabilities. There is a need for both the industry and government to look beyond immediate issues to address these longer-term impacts.

# As manufacturing looks to the future, there are opportunities and challenges ahead.

## Challenges

-  geopolitical tensions have impacted some manufacturing sectors
-  disruption to global supply chains
-  risk of cyber-attacks
-  sustainably-produced foods and transparency of supply chains

## Solutions

Developing the capabilities and skills of manufacturers



Innovation



New skills and knowledge

**Opportunities**  
stronger domestic market

**Opportunities**  
transition to net zero emissions



**Opportunities**  
renewable hydrogen,  
clean energy technology,  
space and super yachts

**Opportunities**  
transition to  
renewable energy



Image credit - courtesy of B&R Enclosures

# Appendix A

## Priority Action Areas grouped by focus area



### Building the talent pipeline

FOCUS AREA 1

	<p>Priority Action Area 9 <b>Position manufacturing as a first-choice career.</b></p>		<p>Priority Action Area 10 <b>Facilitate enhanced partnerships and engagement to better prepare new entrants.</b></p>
	<p>Priority Action Area 6 <b>Strengthen the role of apprenticeships and traineeships and the VET system in supporting skills development.</b></p>		<p>Priority Action Area 8 <b>Increase the diversity of the manufacturing workforce.</b></p>



### Managing change

FOCUS AREA 2

	<p>Priority Action Area 1 <b>Position the manufacturing workforce as a key player in the journey towards advanced manufacturing.</b></p>		<p>Priority Action Area 7 <b>Build a highly skilled, adaptable and capable existing workforce.</b></p>
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### Growing the industry

FOCUS AREA 3

	<p>Priority Action Area 2 <b>Strengthen the business capability of manufacturers.</b></p>		<p>Priority Action Area 3 <b>Build the understanding of capability related to business management, innovation and productivity at all levels of the manufacturing industry.</b></p>
	<p>Priority Action Area 4 <b>Support industry-led ecosystems.</b></p>		<p>Priority Action Area 5 <b>Foster continued industry opportunity growth.</b></p>

## Appendix B

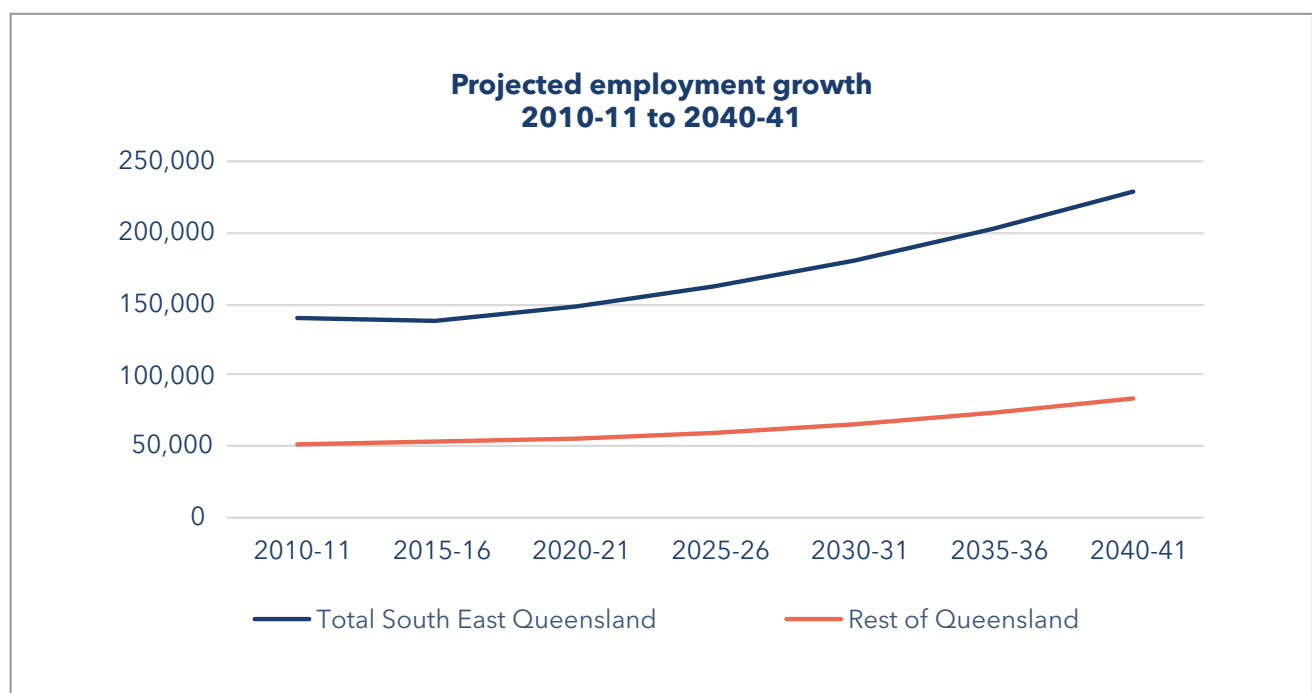
### Proportion of female employment in top 10 manufacturing occupations (four quarter average, 2021)

Occupation	Skill level	Proportion female
Structural Steel and Welding Trades Workers	3	1%
Production Managers	1	16%
Metal Fitters and Machinists	3	1%
Packers	5	59%
Cabinetmakers	3	2%
Advertising, Public Relations and Sales Managers	1	41%
Manufacturers	1	24%
Food and Drink Factory Workers	5	30%
Bakers and Pastrycooks	3	32%
Storepersons	4	21%

Australian Government, (n.d.) *Labour Market Insights*. Canberra: Australian Government.  
<https://labourmarketinsights.gov.au/industries/industry-details?industryCode=C>

## Appendix C

### Projected manufacturing employment by region 2010-11 to 2040-41



Source: Queensland Government Statistician's Office, 202. Industry employment, Queensland, 2010-11 to 2040-41

## Appendix D

### Manufacturing businesses by region and employment size 2013 - 2020

Number of manufacturing businesses in Queensland by employment size and location: 30 June 2013-30 June 2020

Region	Greater Brisbane <sup>3</sup>					
Year	Non-employing	1 - 4 persons	5 - 19 persons	20 - 199 persons	200+ persons	TOTAL
2013	1,727	1,179	897	303	3	4,109
2014	1,759	1,161	865	309	3	4,097
2015	1,698	1,119	880	303	6	4,006
2016	1,680	1,142	838	307	12	3,979
2017	1,698	1,149	818	298	12	3,975
2018	1,698	1,116	787	319	9	3,929
2019	1,708	1,101	847	322	9	3,987
2020	1,797	1,047	793	311	9	3,957
Region	Remainder of South East Queensland					
Year	Non-employing	1 - 4 persons	5 - 19 persons	20 - 199 persons	200+ persons	TOTAL
2013	3,685	2,143	1,515	494	3	7,840
2014	3,661	2,299	1,392	445	6	7,803
2015	3,605	2,267	1,521	435	12	7,840
2016	3,644	2,268	1,484	398	6	7,800
2017	3,655	2,323	1,485	448	6	7,917
2018	3,692	2,341	1,441	530	6	8,010
2019	3,781	2,230	1,411	532	3	7,957
2020	3,880	2,186	1,423	542	0	8,031
Region	Rest of Queensland					
Year	Non-employing	1 - 4 persons	5 - 19 persons	20 - 199 persons	200+ persons	TOTAL
2013	2,157	1,156	970	280	3	4,566
2014	2,129	1,165	929	248	18	4,489
2015	2,029	1,193	984	260	3	4,469
2016	2,123	1,139	908	212	6	4,388
2017	2,092	1,116	913	205	3	4,329
2018	2,167	1,126	828	289	6	4,416
2019	2,246	1,167	839	277	6	4,535
2020	2,169	1,153	846	286	3	4,457

Source: Queensland Government Statistician's Office. 2021. Queensland regional database. Business Counts by 1-Digit ANZSIC06 by Employment Size - Series: C - Manufacturing

3. Greater Brisbane area includes the SA4s of: Brisbane - East; Brisbane - North; Brisbane - South; Brisbane - West and Brisbane Inner City.

## End notes

- i Advance Queensland, 2018. *Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan (2 ed.)*. Brisbane: Queensland Government. [https://www.rdmw.qld.gov.au/\\_\\_data/assets/pdf\\_file/0016/1531024/advanced-manufacturing-roadmap-full.pdf](https://www.rdmw.qld.gov.au/__data/assets/pdf_file/0016/1531024/advanced-manufacturing-roadmap-full.pdf)
- ii Jobs Queensland, 2018. *Advancing Manufacturing Skills, A Skills, Training and Workforce Development Strategy for the Manufacturing Industry in Queensland*. Ipswich: Queensland Government. <https://jobsqueensland.qld.gov.au/projects/advancing-manufacturing/#strategy>
- iii Business Queensland, 2020. *Small Business COVID-19 Adaption Grants*. Brisbane: Queensland Government. <https://www.business.qld.gov.au/starting-business/advice-support/grants/adaption>
- iv Department of Industry, Science, Energy and Resources, 2020. *Make it Happen: The Australian Government's Modern Manufacturing Strategy*. Canberra: Australian Government. <https://www.industry.gov.au/data-and-publications/make-it-happen-the-australian-governments-modern-manufacturing-strategy>
- v Minister for Employment and Small Business and Minister for Training and Skills, 2020. \$200 million to be invested in future training. *Media statement*, 1 December, 2020. Brisbane: Queensland Government. <https://statements.qld.gov.au/statements/91079>
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