Australian Government | Australian Workforce and Productivity Agency

Manufacturing

…covers the manufacturing of food, beverage and tobacco products, textile, leather, clothing and footwear, wood, pulp and paper, petroleum and coal product, polymer and rubber product, chemical and chemical product, non-metallic mineral product, primary metal and products, fabricated metal, transport equipment, machinery and equipment, furniture, and other products. It also includes printing.

This suite of Industry Snapshots complements *Future Focus*, the 2013 National Workforce Development Strategy. These snapshots provide additional information and analysis on each industry to assist stakeholders in planning for the future of their industry or sector. It should be noted that the longer term data contained in this publication is based on AWPA's four scenarios for Australia to 2025 and is not intended to be compared to other data sources or projections.

Key points

- Manufacturing represents one of the largest industries in the Australian economy and employs approximately 954,200 persons, accounting for just over eight per cent of the total Australian workforce.
- Over the past five years, employment in the industry has decreased at a rate of two per cent per annum.
- Employment in manufacturing is spread relatively evenly between small enterprises (i.e. those that employ less than 20 workers), medium-sized enterprises (i.e. those that employ between 20 and 199 workers), and large-sized enterprises (i.e. those that employ 200 workers or more).
- Around a third (35 per cent) of manufacturing workers are employed in regional and remote areas: slightly below the all-industry average of 37 per cent.[1]
- Manufacturing industry workers are predominantly male (65 per cent).
- The proportion of older workers (aged 45 years or above) is slightly higher for manufacturing, at 41 per cent, than for all industries (at 38 per cent).
- Only 14 per cent of people employed in the manufacturing industry work part-time, compared to 30 per cent for all industries.
- More than a third of all manufacturing employees have attained VET qualifications at Certificate III level or higher, with a further 14 per cent holding a Bachelor degree or higher, but nearly half (45 per cent) of the workforce do not hold post-school qualifications. A detailed employment profile can be found at www.skillsinfo.gov.au.

Industry outlook

Manufacturing is an important industry within the Australian economy and in terms of industry gross value added, manufacturing contributed 7.6 per cent ($105.1b) to the national economy in 2011–12, down from $107.8b in 2010–11.[2]

[1] Regional and remote areas are defined as those outside state capital cities.

Short-term growth

Table 1 shows that manufacturing is a large employing industry, with nearly one million workers. Over the past five years, the manufacturing sector has experienced a decrease in employment growth at a rate of around two per cent per annum.

Table 1 Current and past employment in manufacturing

Industry	Current employment		Past growth: five years	
	'000	% of total	'000	%
Manufacturing	**954.2**	**8.2**	**-118.7**	**-11.1**
Food Product Manufacturing	196.7	1.7	-7.4	-3.6
Beverage and Tobacco Product Manufacturing	24.1	0.2	-3.0	-11.0
Textile, Leather, Clothing and Footwear Manufacturing	45.0	0.4	-4.5	-9.1
Wood Product Manufacturing	35.2	0.3	-14.2	-28.7
Pulp, Paper and Converted Paper Product Manufacturing	14.8	0.1	-5.4	-26.7
Printing (including the Reproduction of Recorded Media)	48.3	0.4	-7.3	-13.1
Petroleum and Coal Product Manufacturing	8.6	0.1	-0.1	-1.6
Basic Chemical and Chemical Product Manufacturing	35.2	0.3	-9.5	-21.2
Polymer Product and Rubber Product Manufacturing	39.0	0.3	-8.1	-17.2
Non-Metallic Mineral Product Manufacturing	35.2	0.3	-7.9	-18.4
Primary Metal and Metal Product Manufacturing	84.9	0.8	-0.1	-0.2
Fabricated Metal Product Manufacturing	43.0	0.4	-34.4	-44.4
Transport Equipment Manufacturing	79.5	0.7	-23.7	-22.9
Machinery and Equipment Manufacturing	104.1	0.9	-11.1	-9.7
Furniture and Other Manufacturing	54.4	0.5	-9.8	-15.3
All industries	**11,588.7**	**100.0**	**798.1**	**7.4**

Note: Data for industry subsectors may not sum to the industry total because data for each subsector have been separately seasonally adjusted and trended and at the higher levels include 'not further defined' categories.
Source: ABS (2013) *Labour Force Australia*, February, cat. no. 6291.0.55.003 (DEEWR trend).

Long-term growth

Australia needs to position itself in a world where work is changing rapidly. Technological innovation, globalisation, the Asian century and new patterns of work are impacting on the demand for skills and the speed of change is making it hard to predict and plan for the future.

To deal with this uncertainty, the Australia Workforce and Productivity Agency (AWPA) has adopted a scenario planning approach to help us overcome these limitations in making projections about the future. Scenarios are alternative visions of potential futures, and provide a means to make decisions that take account of uncertainty.

AWPA developed four possible, plausible scenarios for Australia to 2025.

- In the **Long Boom** scenario, the high demand for resources traded with China and other countries continues. Industries challenged by the high terms of trade undertake structural adjustment. This results in a scenario of sustained prosperity and a restructured economy.

[2] 'Industry value added' is the measure of the contribution by industry to gross domestic product (GDP) at basic prices. ABS (2012) *Australian System of National Accounts*, cat. no. 5204.0, Table 11.

- In **Smart Recovery**, the challenges facing Europe and the United States affect financial markets. This means low growth for Australia to 2014–15. Growth then improves and Australia benefits from industry and government strategies to implement a knowledge economy.
- In **Terms of Trade Shock**, resource prices fall mainly due to increased supply from other countries, the Australian dollar falls and we move to a broader-based economy.
- **Ring of Fire** is a risky world with multiple economic and environmental shocks resulting in ongoing lower growth.

Economic modelling against each of these four scenarios was undertaken by Deloitte Access Economics (DAE) to determine the skills demand for the economy into the future.[3]

As Table 2 shows, the manufacturing industry is forecast to grow steadily in the Ring of Fire world. Within the other three scenarios, employment in the industry is expected to contract by between 1 and 1.8 per cent per annum to 2025. This reflects a slower rate of decline than that seen over the past five years, during which time employment in the industry has shrunk by approximately 2 per cent per annum.

Table 2 Average annual industry employment growth in four scenarios, 2011–18 and 2011–25 (% per annum)

Industry	Long Boom		Smart Recovery		Terms of Trade Shock		Ring of Fire	
	2018	2025	2018	2025	2018	2025	2018	2025
Manufacturing	**-1.4**	**-1.5**	**-0.5**	**-1.3**	**-0.4**	**-1.0**	**1.3**	**0.6**
Food Product Manufacturing	-2.1	-2.3	-1.4	-2.1	-1.0	-1.7	0.4	-0.1
Beverage and Tobacco Product Manufacturing	6.6	2.6	7.5	2.8	7.8	3.2	9.4	4.9
Textile, Leather, Clothing and Footwear Manufacturing	-7.3	-6.5	-5.5	-5.9	-5.0	-5.3	-2.9	-2.9
Wood Product Manufacturing	-1.1	-2.6	0.8	-2.2	0.9	-1.6	3.1	0.9
Pulp, Paper and Converted Paper Product Manufacturing	-11.0	-8.7	-9.3	-8.4	-9.1	-7.8	-7.2	-5.4
Printing (including the Reproduction of Recorded Media)	-4.3	-3.1	-2.1	-3.0	-0.7	-1.8	0.1	-0.4
Petroleum and Coal Product Manufacturing	-0.4	-0.7	1.4	-0.5	2.0	0.2	3.8	2.3
Basic Chemical and Chemical Product Manufacturing	-1.4	-0.9	0.4	-0.7	0.9	0.0	2.7	2.1
Polymer Product and Rubber Product Manufacturing	-4.9	-5.8	-3.1	-5.6	-2.6	-4.9	-0.9	-2.9
Non-Metallic Mineral Product Manufacturing	-0.7	-0.6	-1.4	-0.5	-2.0	-0.8	0.0	0.7
Primary Metal and Metal Product Manufacturing	2.1	2.5	2.6	2.5	2.4	2.6	3.8	3.6
Fabricated Metal Product Manufacturing	-3.2	-3.8	-2.8	-3.8	-2.9	-3.7	-1.6	-2.8
Transport Equipment Manufacturing	-3.7	-3.6	-3.3	-3.5	-3.7	-3.6	-1.7	-1.8
Machinery and Equipment Manufacturing	0.3	-0.2	0.7	-0.1	0.2	-0.1	2.3	1.7
Furniture and Other Manufacturing	-0.8	-1.8	1.1	-1.2	1.6	-0.6	4.0	2.0
All industries	**2.1**	**2.0**	**1.5**	**1.5**	**1.7**	**1.6**	**0.8**	**0.7**

Source: Deloitte Access Economics (2012) *Economic modelling of skills demand and supply*, Scenario output – detailed employment results.

[3] A description of the scenarios and the Deloitte Access Economics modeling of employment in each, with state and territory breakdowns, is available at the AWPA website www.awpa.gov.au.

The trend towards a tighter labour market in manufacturing under the Long Boom, Smart Recovery and Terms of Trade Shock scenarios is due to the more competitive international trade environment envisaged under these future worlds, with higher terms of trade, the pressures of structural adjustment and increased supply from other countries presenting challenges for the future. Under the Ring of Fire scenario, however, a more protectionist economy will limit access to domestic markets and there is less pressure from structural adjustment, with a move to protect jobs through increased regulation.

Among the manufacturing subdivisions, Beverage and Tobacco Product Manufacturing is expected to show positive growth to 2025 under all four scenarios, reaching 3.2 per cent growth per annum under Terms of Trade Shock and 4.9 per cent under Ring of Fire. Employment in Primary Metal and Metal Product Manufacturing is likewise projected to expand by between 2.5 and 3.6 per cent per annum across all scenarios, while Petroleum and Coal Product Manufacturing grows between 0.2 and 2.3 per cent to 2025 under Terms of Trade Shock and Ring of Fire.

Conversely, subdivisions such as Polymer Product and Rubber Product Manufacturing, Textile, Leather, Clothing and Footwear Manufacturing and Pulp, Paper and Converted Paper Product Manufacturing are forecast to show a downturn across all worlds. This is particularly true of Pulp, Paper and Converted Paper Product Manufacturing which is expected to show the lowest negative growth across all scenarios between 2011–15 and 2011–25.

Occupation outlook

Key occupations

The top ten manufacturing occupations account for only 31.5 per cent of industry employment as a whole, reflecting the diversity of employment areas across the manufacturing sector.

Table 3 Top ten manufacturing occupations

Occupation		People employed	Industry employment
		'000	% of total
3223	Structural Steel and Welding Trades Workers	53.5	5.5
3232	Metal Fitters and Machinists	39.8	4.1
1335	Production Managers	38.5	4.0
8321	Packers	32.3	3.3
8322	Product Assemblers	26.1	2.7
8311	Food and Drink Factory Workers	25.9	2.7
7213	Forklift Drivers	23.5	2.4
6211	Sales Assistants (General)	23.0	2.4
3941	Cabinetmakers	20.7	2.1
3511	Bakers and Pastrycooks	20.7	2.1
Total manufacturing		**964.8**	**31.5**

Source: ABS (2013) *Labour Force Australia*, detailed quarterly report, 2012 average of four quarters (cat. no. 6291.0.55.003).

Short-term growth

Table 4 shows current employment and past growth for the occupations that feature prominently within the industry. **Note that the figures refer to the expected number of people in these occupations across all industries, not just in the manufacturing sector**.

Employment in a number of manufacturing occupations has grown strongly over the past five years. These include Production Managers (at 38.6 per cent), Food and Drink Factory Workers (17.1 per cent), Metal Fitters and Machinists (13 per cent), and Sales Assistants (General) (2.5 per cent). In contrast, employment in occupations such as packing and product assembly has decreased markedly over the past five years, corresponding with technological change and growing automation in these areas.

Table 4 Current and past employment in key occupations

Occupation		Current employment (all industries)		Past growth: five years	
		'000	% of total	'000	%
3223	Structural Steel and Welding Trades Workers	79.1	0.7	-1.4	-1.8
3232	Metal Fitters and Machinists	115.6	1.0	13.3	13.0
1335	Production Managers	63.7	0.6	17.7	38.6
8321	Packers	63.8	0.6	-5.4	-7.8
8322	Product Assemblers	34.1	0.3	-15.6	-31.5
8311	Food and Drink Factory Workers	31.7	0.3	4.6	17.1
7213	Forklift Drivers	55.0	0.5	-3.5	-6.0
6211	Sales Assistants (General)	492.5	4.4	12.0	2.5
3941	Cabinetmakers	23.9	0.2	-4.6	-16.0
3511	Bakers and Pastrycooks	25.5	0.2	-3.1	-10.7
All employed		**11,588.7**	**100.0**	**798.1**	**7.4**

Source: ABS (2013) *Labour Force Australia*, February, cat. no. 6291.0.55.003 (DEEWR trend).

Long-term growth and job openings

Table 5 indicates the long-term net job growth per annum expected in these occupation groups, according to Deloitte Access Economics' economic modelling of the scenarios. Employment growth to 2025 is expected to be highest for Production Managers, Sales Assistants (General), Metal Fitters and Machinists and Bakers and Pastrycooks across all four scenarios.

Table 5 Average annual occupation growth in four scenarios, 2011–18 and 2011–25 (%pa)

Industry		Long Boom		Smart Recovery		Terms of Trade Shock		Ring of Fire	
		2018	2025	2018	2025	2018	2025	2018	2025
3223	Structural Steel and Welding Trades Workers	0.7	0.2	0.4	-0.1	0.1	-0.3	0.3	-0.1
3232	Metal Fitters and Machinists	1.3	1.0	1.0	0.7	0.7	0.5	0.5	0.1
1335	Production Managers	2.8	2.0	2.7	1.7	2.7	1.7	2.8	1.8
8321	Packers	0.2	-0.1	-0.1	-0.5	0.1	-0.3	0.2	-0.3
8322	Product Assemblers	-2.4	-2.4	-2.3	-2.6	-2.4	-2.5	-1.4	-1.6
8311	Food and Drink Factory Workers	-0.4	-0.5	-0.3	-0.7	-0.1	-0.5	0.6	0.2
7213	Forklift Drivers	0.5	0.8	0.2	0.5	0.1	0.4	0.0	0.1
6211	Sales Assistants (General)	1.2	1.1	0.9	0.7	1.3	0.7	0.8	0.2
3941	Cabinetmakers	-2.9	-2.6	-2.4	-2.7	-2.5	-2.7	-1.5	-1.6
3511	Bakers and Pastrycooks	3.0	1.3	3.0	1.1	3.2	1.2	3.6	1.4
All occupations		**2.1**	**2.0**	**1.5**	**1.5**	**1.7**	**1.6**	**0.8**	**0.7**

Source: Deloitte Access Economics (2012) *Economic modelling of skills demand and supply*, Scenario output – detailed employment results.

As noted, the data in Table 5 concerns employment growth in an industry. The number of total **job openings** which includes both employment growth and **the replacement resulting from individuals leaving the occupation net of those re-entering** can also be estimated. This replacement requirement is particularly significant in industries where there are high numbers of people retiring or leaving the occupation.

Table 6 shows the average annual job openings projected in key manufacturing occupations to 2025. Under all four scenarios, the highest proportion of job openings is forecast for sales assistants and salespersons, with around 6 per cent per annum under the Long Boom, Smart Recovery and Terms of Trade Shock and 5.4 per cent under Ring of Fire.

Table 6 Average annual job openings per annum, 2011 to 2025, in four scenarios

Occupation		Long Boom		Smart Recovery		Terms of Trade Shock		Ring of Fire	
		('000)	%	('000)	%	('000)	%	('000)	%
3223	Structural Steel and Welding Trades Workers	1.7	1.9	1.6	1.6	1.6	1.5	1.6	1.6
3232	Metal Fitters and Machinists	4.1	3.1	3.6	2.8	3.4	2.6	3.1	2.2
1335	Production Managers	2.3	3.9	2.1	3.6	2.1	3.6	2.1	3.6
8321	Packers	2.2	3.0	2.2	2.7	2.2	2.8	2.2	2.9
8322	Product Assemblers	0.8	0.2	0.8	0.0	0.8	0.0	0.8	1.0
8311	Food and Drink Factory Workers	1.1	2.5	1.1	2.3	1.1	2.6	1.3	3.2
7213	Forklift Drivers	2.0	2.0	1.8	1.7	1.7	1.6	1.5	1.4
6211	Sales Assistants (General)	35.7	6.3	33.3	6.0	33.5	6.0	30.6	5.4
3941	Cabinetmakers	1.0	0.7	1.0	0.7	1.0	0.7	1.1	1.8
3511	Bakers and Pastrycooks	1.0	3.1	1.1	2.9	1.1	3.0	1.1	3.3
All occupations		**576.4**	**4.4**	**500.9**	**3.9**	**513.3**	**4.0**	**391.4**	**3.1**

Source: Deloitte Access Economics (2012) *Economic modelling of skills demand and supply*, Scenario output – detailed employment results. Net replacement demand by CEET (2013).

As Table 7 shows, the majority of job openings in the manufacturing sector are created by replacement demand than by new growth under all four scenarios. The only notable exception to this trend is Forklift Drivers, for whom most job openings are attributable to annual growth: that is, new jobs.

For Structural Steel and Welding Trades Workers in the Long Boom world, it is expected that more than five times as many job openings (21,100) will be created by replacement requirements than from new jobs (4,200). This is attributable to workforce demographics such as the age profile of current workers. Workforce dynamics such as the rate of job turnover are also primary driving factors behind high replacement demand.

Table 7 Total job openings (growth and net replacement) in four scenarios, 2011 to 2025

7.1 Long Boom

Occupation		Total growth (persons)		Net replacement estimates (persons)		Total job openings (persons)	
		('000)	%	('000)	%	('000)	%
3223	Structural Steel and Welding Trades Workers	4.2	16.6	21.1	83.4	25.2	100.0
3232	Metal Fitters and Machinists	22.0	36.2	38.8	63.8	60.8	100.0
1335	Production Managers	16.7	49.1	17.3	50.9	34.0	100.0
8321	Packers	2.7	8.0	30.5	92.0	33.1	100.0
8322	Product Assemblers	0.4	3.7	11.0	96.3	11.4	100.0
8311	Food and Drink Factory Workers	2.0	12.2	14.1	87.8	16.0	100.0
7213	Forklift Drivers	17.1	56.5	13.2	43.5	30.3	100.0
6211	Sales Assistants (General)	97.7	18.2	438.5	81.8	536.2	100.0
3941	Cabinetmakers	2.5	17.0	12.3	83.0	14.8	100.0
3511	Bakers and Pastrycooks	6.5	41.5	9.1	58.5	15.6	100.0
All occupations		**3,889.7**	**45.0**	**4,755.6**	**55.0**	**8,645.3**	**100.0**

7.2 Smart Recovery

Occupation		Total growth (persons)		Net replacement estimates (persons)		Total job openings (persons)	
		('000)	%	('000)	%	('000)	%
3223	Structural Steel and Welding Trades Workers	3.8	15.6	20.6	84.4	24.4	100.0
3232	Metal Fitters and Machinists	16.6	30.5	37.8	69.5	54.4	100.0
1335	Production Managers	13.8	44.7	17.1	55.3	30.9	100.0
8321	Packers	2.5	7.6	29.8	92.4	32.3	100.0
8322	Product Assemblers	0.5	4.2	11.0	95.8	11.4	100.0
8311	Food and Drink Factory Workers	2.4	14.7	14.1	85.3	16.5	100.0
7213	Forklift Drivers	14.0	52.1	12.9	47.9	26.9	100.0
6211	Sales Assistants (General)	69.4	13.9	429.9	86.1	499.3	100.0
3941	Cabinetmakers	2.6	17.4	12.4	82.6	15.1	100.0
3511	Bakers and Pastrycooks	6.7	42.3	9.1	57.7	15.8	100.0
All occupations		**2,953.2**	**39.3**	**4,559.6**	**60.7**	**7,512.9**	**100.0**

7.3 Terms of Trade Shock

Occupation		Total growth (persons)		Net replacement estimates (persons)		Total job openings (persons)	
		('000)	%	('000)	%	('000)	%
3223	Structural Steel and Welding Trades Workers	3.2	13.8	20.3	86.2	23.5	100.0
3232	Metal Fitters and Machinists	13.4	26.4	37.3	73.6	50.7	100.0
1335	Production Managers	13.9	44.9	17.1	55.1	31.0	100.0
8321	Packers	2.5	7.7	30.1	92.3	32.7	100.0
8322	Product Assemblers	0.5	4.0	10.9	96.0	11.4	100.0
8311	Food and Drink Factory Workers	2.7	15.8	14.3	84.2	16.9	100.0
7213	Forklift Drivers	13.0	50.4	12.8	49.6	25.7	100.0
6211	Sales Assistants (General)	68.2	13.6	434.8	86.4	502.9	100.0
3941	Cabinetmakers	2.7	17.7	12.4	82.3	15.1	100.0
3511	Bakers and Pastrycooks	7.0	43.2	9.2	56.8	16.2	100.0
All occupations		**3,080.4**	**40.0**	**4,619.3**	**60.0**	**7,699.6**	**100.0**

7.4 Ring of Fire

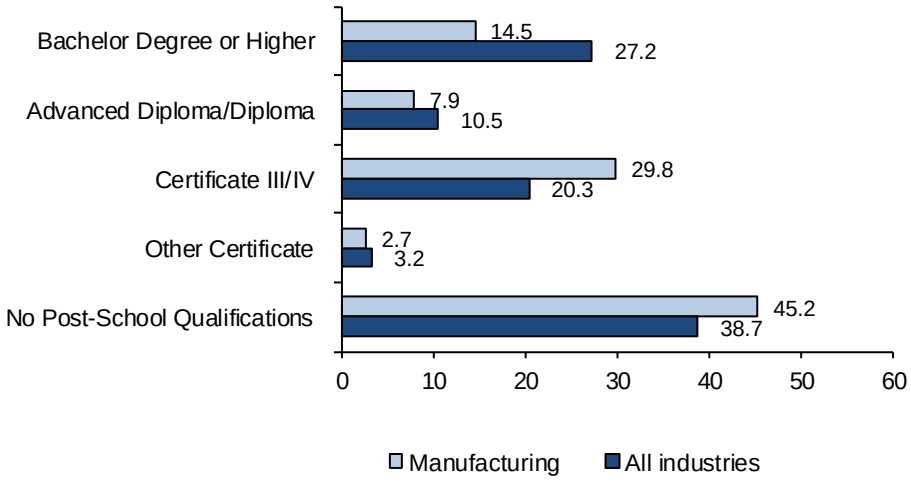
Occupation		Total growth (persons)		Net replacement estimates (persons)		Total job openings (persons)	
		('000)	%	('000)	%	('000)	%
3223	Structural Steel and Welding Trades Workers	3.6	15.0	20.5	85.0	24.2	100.0
3232	Metal Fitters and Machinists	9.9	21.4	36.4	78.6	46.4	100.0
1335	Production Managers	14.4	45.6	17.2	54.4	31.6	100.0
8321	Packers	2.8	8.6	30.3	91.4	33.1	100.0
8322	Product Assemblers	0.9	7.2	11.7	92.8	12.6	100.0
8311	Food and Drink Factory Workers	4.1	21.4	15.0	78.6	19.0	100.0
7213	Forklift Drivers	10.4	45.2	12.6	54.8	23.0	100.0
6211	Sales Assistants (General)	39.2	8.5	419.9	91.5	459.1	100.0
3941	Cabinetmakers	3.2	19.5	13.3	80.5	16.6	100.0
3511	Bakers and Pastrycooks	7.6	44.7	9.4	55.3	17.0	100.0
All occupations		**1,532.9**	**26.1**	**4,338.5**	**73.9**	**5,871.4**	**100.0**

Source: Deloitte Access Economics (2012) *Economic modelling of skills demand and supply*, Scenario output – detailed employment results. Net replacement demand by AWPA (2013).

Education and training profile

Almost one in every three workers holds a Certificate III/IV or other certificate. This reflects the fact that the largest occupations in the manufacturing industry are engineering trades (such as Structural Steel and Welding Trades Workers and Metal Fitters and Machinists), for whom vocational education and training is a vital source of skills. The industry is also marked by a relatively high proportion of workers who do not hold post-school qualifications, at 45 per cent compared with 39 per cent for all industries.

Figure 1 Education profile of the manufacturing workforce (%)



Note: Excludes 'Level of education not stated' from total.
Source: DEEWR (2012) *Australian Jobs 2012* (ABS 2011 Census data).

Figure 2 illustrates how demand for qualifications is expected to change over time. It shows the current education profile for each respective occupation: across all industries and within the manufacturing industry. It also shows projected levels of educational attainment to 2025 by each occupation group depending on which of the four scenarios eventuates.

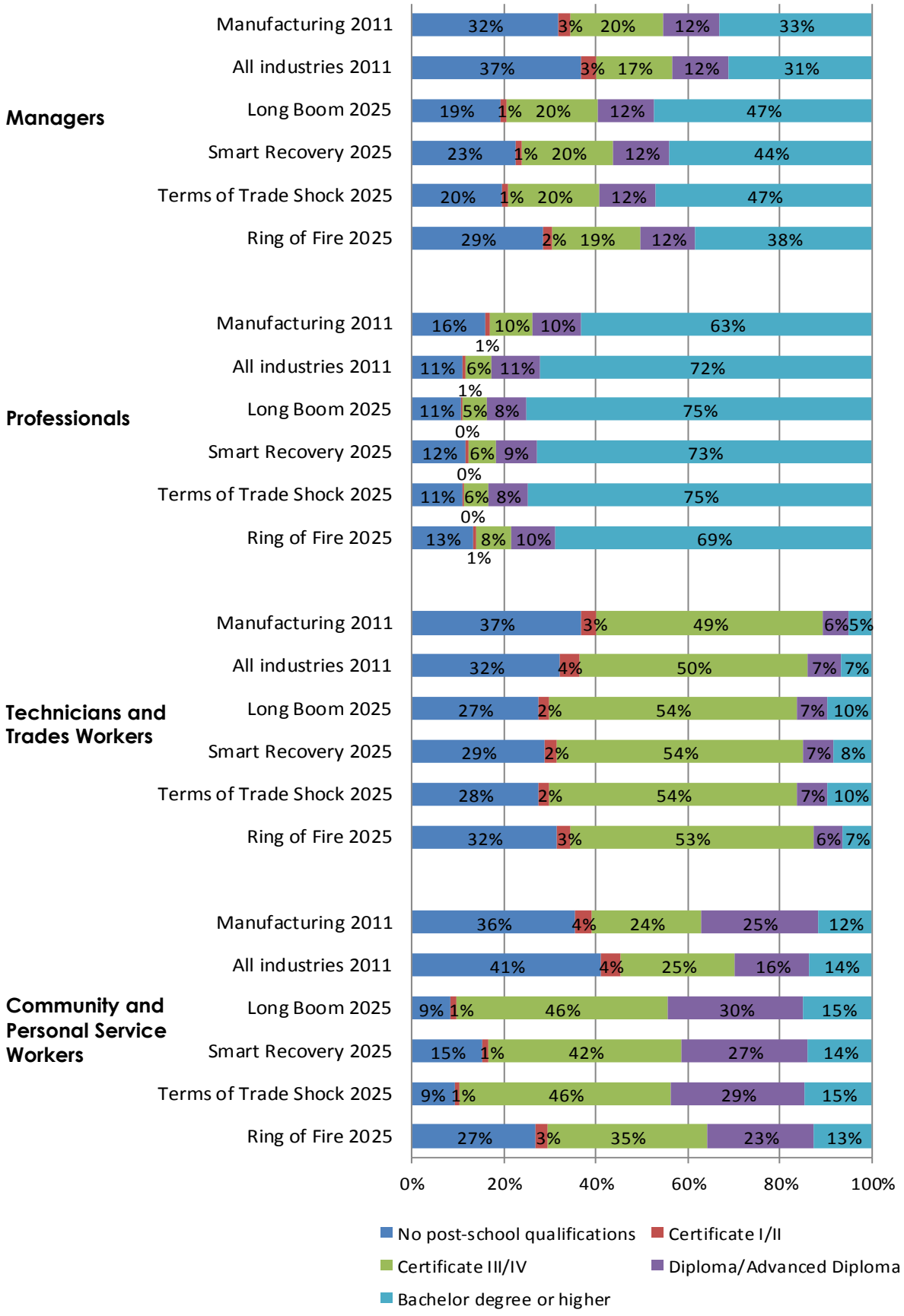
As Figure 2 indicates, managers are expected to upskill in the years to 2025, with the share of those with Bachelor degrees or higher increasing to 47 per cent under Long Boom, compared to 33 per cent in 2011.

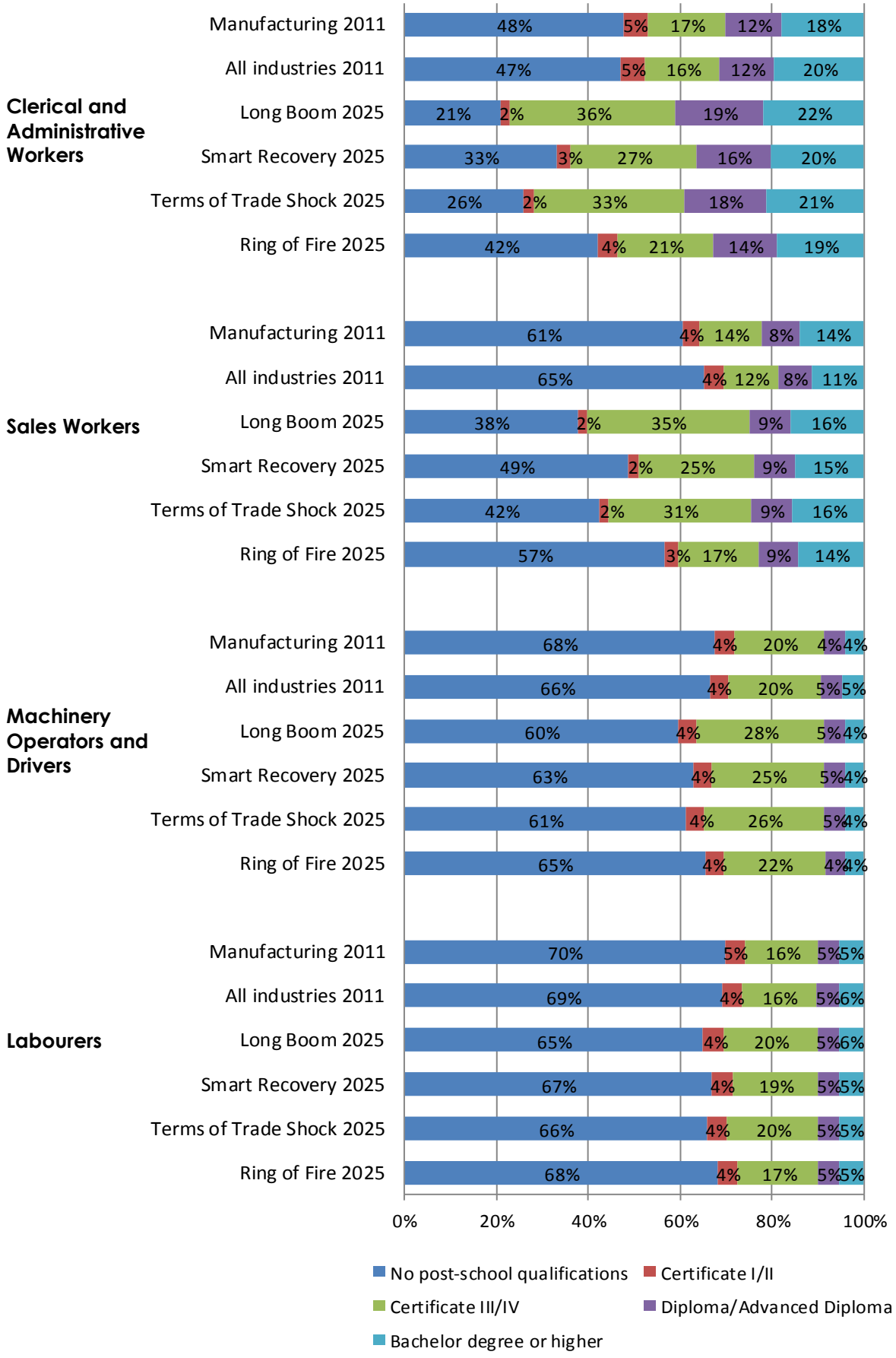
This trend of upskilling/skills-deepening is also pronounced among technicians and trades workers, clerical and administrative workers, and sales workers, with these occupational groups showing significant growth at the Certificate III/IV level.

Community and personal service workers also show growth at the Certificate III/IV and Diploma/Advanced Diploma levels, but this is a relatively small occupational group within the manufacturing sector, employing only 8,000 workers.

By contrast, lower-skilled occupations such as machinery operators and driver and labourers show a more modest reduction in the proportion of workers without post-school qualifications, with an additional 5 per cent of workers gaining qualifications to 2025 compared to 2011.

Figure 2 Educational attainment in the manufacturing industry, by occupation, 2011 and projections to 2025 (%)





Source: ABS (2012) *Survey of Education and Work 2012*, cat. no. 6227.0; and DAE (2012) Unpublished data.

Specialised occupations

In *Future Focus*, the 2013 National Workforce Development Strategy, AWPA has proposed that national planning for skills and industry workforce development should focus on **specialised occupations**. Specialised occupations are defined as those 'where specialised skills, learned in formal education and training, are needed at entry level and where the impact of market failure is potentially significant for the economy and/or the community.'

Specialised occupations demonstrate these characteristics:

- long lead time—skills are highly specialised and require extended learning and preparation time over several years;
- high use—skills are deployed for the uses intended (i.e. good occupational 'fit');
- high risk—the disruption caused by the skills being in short supply is great, resulting either in bottlenecks in supply chains or imposing significant economic or community costs because an organisation cannot operate; and
- high information—the quality of information about the occupation is adequate to the task of assessing future demand and evaluating the first three criteria.

Monitoring skills supply, especially for specialised occupations, will remain a critical element in meeting our workforce needs.

Specialised occupations associated with the manufacturing industry include:

Production Managers (Mining)
Chemical and Materials Engineers
Industrial, Mechanical and Production Engineers
Metal Casting, Forging and Finishing Trades Workers
Sheet Metal Trades Workers
Structural Steel and Welding Trades Workers
Metal Fitters and Machinists
Precision Metal Trades Workers

More detailed information about specialised occupations is available in *Future Focus, 2013 National Workforce Development Strategy* at http://www.awpa.gov.au.

Example workforce development initiatives

Investment in workforce development has been shown to maximise people's capabilities, lift productivity and increase workforce participation. Employee satisfaction levels and engagement also increase when enterprises make better use of their employees' skills.[4] Current workforce development initiatives in manufacturing include the following examples:

- Manufacturing Skills Australia's **QualJobMatch** database allows users to find information relating to MSA qualifications, match the qualifications to the Australian and New Zealand Standard Classifications of Occupations (ANZSCO) and to the relevant Modern Award. For more information, see the Manufacturing Skills Australia (MSA) website at http://www.mskills.com.au/.

- **MySkills** is a new career and skills manager website that will enable users to keep track of their work history, industry contacts, skills and qualifications achieved. MySkills will share information with Skills4Jobs, so prospective employees can indicate their interest for work and their skills can be matched with those being sought by prospective employers. Further information can be found at www.myskills.gov.au.

- **Skills4Jobs** is a skills and job matching tool that lets employers nominate specific skill requirements, prioritise the most important skill needs, register a job vacancy and generate a ranked list of available candidates who would suit that job. Further information can be found at www.skills4jobs.net.au.

- **MSkills Manager** is a complete workforce development tool to help enterprises build and manage workforce capability. MSkillsManager enables the user to analyse work requirements, link work activities to CSUs, develop work specifications, create competency profiles, undertake skills audits and analyse training needs. Further information can be found at www.mskillsmanager.net.au.[5]

- **Printing and Graphic Arts Training Package Professional Development Workshops** in consultation with key industry stakeholders are jointly being designed by the Industry Skills Council Innovation and Business Skills Australia (IBSA) and the Electrotechnology, Printing, Information and Communication Industry Training Board. The goal of the workshops is to prepare the printing industry's workforce for the future through equipping the industry with updated competency standards and qualifications. Competency standards for the digital print sector of the printing communications industry have also been introduced. For further information go to www.ibsa.org.au.

[4] Skills Australia (2012) *Better use of skills, better outcomes: A research report on skills utilisation in Australia.*
[5] Manufacturing Skills Australia 2013, *Environmental Scan 2013*, http://www.mskills.com.au/industry-intelligence/info/environmental-scan