

Innovate, Transform and Thrive

Securing Australia's Manufacturing Industry

THE POWER OF BEING UNDERSTOOD
ASSURANCE | TAX | CONSULTING





ACKNOWLEDGEMENT OF COUNTRY

RSM Australia acknowledges the Traditional Owners of the lands and waters on which we live and work. We pay respect to Elders past and present as the custodians of their culture and continuous connection to Country.

Artwork entitled "Kaara-Benang-Bidi" by Michelle Kickett depicts Perth's waterways symbolising RSM's establishment on Whadjuk Country over 100 years ago, and captures the firm's growth across six states and territories of Australia.



Foreword

Australia's diverse manufacturing sector is weathering the storm of international factors, a changed domestic economy and skills shortages.

The sector is resilient but equally, is open to change. Manufacturing in food and beverage, machinery and equipment, defence and resources, metals and, increasingly advanced manufacturing, are transforming the industry. According to the Intergenerational Report, over the last 40 years real output has increased 40%, even as it has fallen as a share of the economy. The workers who remain are more highly skilled and higher paid.

In the post-COVID world, there remain significant challenges for Australia. The cost of labour and equipment is up, while incentives such as the tax write-off of the temporary full expensing measure has ended. Costs are rising.

However, there is hope that more skilled migrants – such as much-needed mechanics, engineers, welders and boiler makers – may be enticed to come to Australia following the significant increase of the Temporary Skills Migration Income threshold to \$70,000.

Likewise, the imminent \$15bn National Reconstruction Fund will be a shot in the arm for the industry, especially in its target sectors of critical technologies, renewables, advanced manufacturing and value-adding in resources.

This report will delve into Australian manufacturing strengths and weaknesses, and offer a strategic approach for the future.

At RSM, we work with leading manufacturers across regional and metro Australia every day and deeply understand the complexities of the sector.

We believe targeted government investment and incentives to reinstate asset write-offs, raise investment in specific advanced manufacturing niches, overall tax reform, and research and development are needed for our nation to keep up and thrive in the developing net zero global economy.

Like our global competitors, we also need to develop and implement green energy technologies at scale to capitalise on our natural resources and existing skills in mining and related services. The coming decade will herald a great transition for manufacturing and other industries. With industry and government working together, we have the smarts and the ability to lead the way.

Jessica Olivier
National Leader, Manufacturing
 RSM Australia



Recommendations

1. Increase the quantum of funding and number of government contracts for advanced manufacturing to allow Australia to compete on a global level. The \$15bn National Reconstruction Fund will be significant, but it pales in comparison to US and EU allocations. With grant allocations, provide substantially larger amounts to a smaller number of companies to make a meaningful impact.
2. Appropriately target the National Reconstruction Fund to critical industries where Australia has a competitive advantage. Maintain transparency about funding and sector priorities to overcome the current lack of visibility over where this funding will be allocated.
3. Continue international agreements to embed Australian manufacturing in global supply chains. Consider Australia-first supply chain requirements for major projects and mandates for majority-owned Australian companies to support local business. This is already in place with some of our trading partners, including the US and EU, which support their local manufacturers first, creating an uneven playing field.
4. Reinstate the instant asset tax write-off to provide a greater incentive and ability to purchase capital equipment and machinery. The modernisation of production processes and equipment can also support decarbonisation, productivity and advanced manufacturing processes.





Fast-moving advances in manufacturing are accelerating innovation that is spurring other shifts in the economy

Introduction

Manufacturing has been a core contributor to Australia's economic development for over a century, shaping our nation's identity and contributing significantly to growth. As a sector that spans a wide range of industries, manufacturing has been pivotal for employment, innovation and technology.

The processes and advancements devised by Australian manufacturers have added value to existing products and stimulated other industries. Some advocates argue that manufacturing is not merely an industry, but a capability that "cuts every other sector in which something is being made". According to the Advanced Manufacturing Growth Centre, it is: "The whole value chain, starting with research and development then design, logistic production, distribution, sales and services". Likewise, the [Centre for Future Work](#) highlights manufacturing's strategic importance to broader national prosperity and security.

However, like many developed nations, Australia's manufacturing sector has faced its share of challenges in recent years, with globalisation, automation and shifting market dynamics disrupting the industry significantly. Further, global kinks in supply chains, rising operating costs and worldwide inflation are raising the challenge of doing business, even as manufacturers are raising their efficiency and capacity for productivity.

In the early 1960s economic and social boom of Australia, the sector accounted for more than 30% of the economy and employment. Amid trade protectionism, industry assistance and a global economy that had yet to transition to a services-based economy, the industry experienced a period of record prosperity. Australia's manufacturing rode high. The country's first fully manufactured vehicle, the Holden 48/215, had rolled off the assembly line about a decade earlier in 1948 and researchers created the air flight black box recorder.

Australia's manufacturing industry has demonstrated resilience as it seeks to redefine itself in the face of these challenges and build a sustainable future. Now, the industry is experiencing a shift in its sectors, products and technologies as global economies change. Australian manufacturing these days has a greater focus on high-value products in health, energy, and food, among others, and its share of gross domestic product has fallen to about 10%. The [Centre for Future Work](#) found Australia ranked last in manufacturing self-sufficiency among all OECD countries. From \$565bn worth of manufactured products purchased each year,

Australia produces about \$380bn in value. This has prompted advocates to call for governments to remove disincentives and add enablers for growth, notably for advanced manufacturing.

Following recent global instability from the COVID-19 pandemic and wars impacting supply chains, manufacturing in Australia has transformed from an economic activity to a critical plank of national security and capability. The Australian Government has incentivised reshoring and near-shoring to build our internal capacity amid geopolitical instability. In addition, as the world transitions towards an era of sustainable development and green technologies, Australia's manufacturing sector has the opportunity to deliver nation-building "green" infrastructure to ensure economic prosperity while mitigating environmental impacts. Fast-moving advances in manufacturing are accelerating innovation that is spurring other shifts in the economy, especially in health and clean energy. The sector remains important, with a total economic contribution of \$108bn in 2020 and supporting sovereign capabilities. Australia must use its competitive advantages as a society built on a solid regulatory system, supported by highly educated and skilled workers, to drive efficiencies and productivity across the sector. This includes the advancement of research and development, and commercialisation of those advances.

Australian manufacturing is on the cusp of a new era. We have the human capital and technological capabilities to propel the value of production in manufacturing. However, we need more people and more financial support to allow the transition from research to commercialisation, and the development of more efficient and productive manufacturing through Industry 4.0. Australia is well-placed to be a leader in high-tech, high-margin manufacturing where we can have a competitive advantage

“Manufacturing plays an essential role, adding value and providing input back into primary industries and enabling and requiring the provision of services to ensure usable products. Manufacturing is the most innovation-intensive sector in the whole economy. No country can be an innovation leader without a strong manufacturing base.”

The Centre for Future Work

Global economic factors

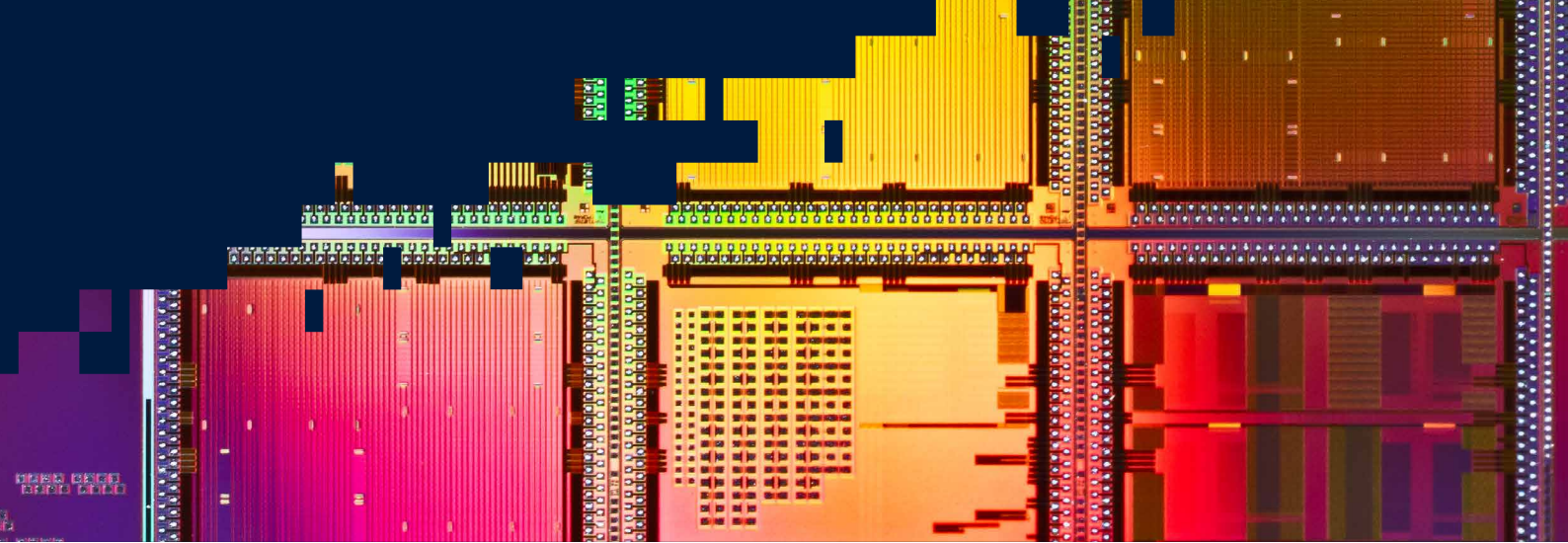
Manufacturing has experienced extraordinary volatility in recent years. Rapidly changing economic conditions around the world amid the COVID-19 crisis influenced production levels, as well as input costs and relative competitiveness. This sent the global industry on a wild ride with 1.3% lower production in 2020, followed by an overcorrection of 7.2% more in 2021, its highest growth since the post global financial crisis rebound of 2010. International trade patterns and confounded supply chains changed the dynamics as well. The unpredictability of the pandemic, paired with geopolitical tensions in Europe and around China, added to market volatility and uncertainty. The United Nations Industrial Development Organisation ([UNIDO World Manufacturing Report](#)) noted the experience of developing and developed nations diverged. Production in developing and emerging industrial economies increased 4.3% amid high volatility, whereas industrialised economies exceeded their pre-pandemic production in the first quarter of 2021 and had achieved stable year-over-year growth of 3.2% since then. But the overall figures masked deeper trends. Medium-high and high-technology industries achieved growth of 4.7%, exceeding their pre-pandemic levels. Low-technology industries bounced back 3.8%. These sectors significantly outperformed medium-low technologies, which rose 1.4%, such as manufacturing of mineral products or basic metals.

The fragility of logistics and supply chain constraints have also risen to public awareness. The Australian manufacturing industry has not been immune to these impacts. Previously an invisible enabler, the “just-in-time” nature of global supply chains became suddenly stark. As a nation heavily reliant on international trade for materials, components and finished goods, the disruptions exposed gaps in sovereign capabilities. Previous efforts to maximise efficiency and minimise inventories became a hindrance to global trade. The [shutdowns of Chinese ports](#), for example, exacerbated supply chain backlogs, leading to one in five of the world's container ships being lined up outside the nation's ports.

A lack of available microchips disrupted the manufacture of motor vehicles and delayed supply for months. According to UNIDO, auto manufacturing had yet to return to its pre-COVID levels two years on from the start of lockdowns despite supercharged consumer demand. It experienced a year-on-year fall in production of 9.1% in the first three months of 2022 due to supply chain challenges.

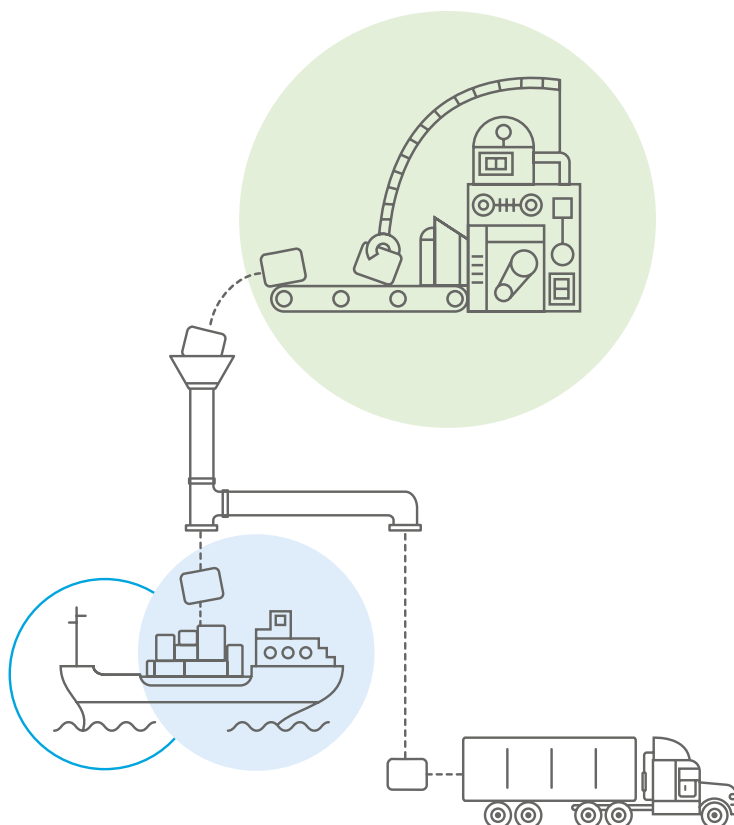
The shift in global supply chain stability had a profound impact on manufacturing. While previously companies sought to reduce costs by relocating manufacturing bases to developing nations with lower labour costs, Australia has been part of the trend of the developing world to reshore its operations. Companies are also diversifying their sourcing and production locations to increase their resilience to geopolitical tensions, natural disasters, or regulatory change. The Australian Manufacturing Outlook survey in 2021 found more than half (55%) of respondents intended to reshore their operations to Australia to overcome volatility. Almost one in four (22%) had already done so.

International trade disruptions and geopolitical risks are also impacting the manufacturing environment. The global political landscape of recent years has been marked by escalating trade tensions – notably with Australia's biggest trading partner China – the rise of protectionist policies in the United States, and geopolitical uncertainties as highlighted in the Ukraine war and the Israel-Palestine conflict. The USA's Inflation Reduction Act is a watershed for America's sovereign manufacturing, promising \$500bn on new spending and tax breaks to deliver clean energy capabilities, reshoring capacity and the development of critical supply industries. Much of the funding is directed at the private sector, with a range of tax credits and incentives to encourage domestic manufacturing. Likewise, the European Union, the United Kingdom, Japan and other nations are introducing similar measures.



As an open, export-reliant nation with a strong base on resources and diverse manufacturing, Australia has been particularly exposed to international headwinds. This was borne out in 2020 when China imposed trade sanctions on Australia and effectively blocked more than \$20bn worth of exports, including coal and agricultural products, as well as manufactured goods. Exporters and the government scrambled to secure [other markets](#), initiatives that have been deemed successful, but the vulnerability to a dominant market will linger in the minds of business leaders. Then, when Russia invaded Ukraine in February 2022, commodity prices, fuel and fertilisers shot up and supply chains were again disrupted. Further, the changes led to currency volatility, which can impact manufacturing costs and international competitiveness.

However, while the supply chain and global challenges were significant, the hurdles also accelerated the adoption of technology and digitisation. The March [2022 CommBank Manufacturing Insights](#) report revealed three out of four manufacturers increased their spend on technology during the pandemic. About the same number expected their investments to rise. The main investments were in process control, as companies sought to raise their production capacity while ensuring quality. These investments will help efficiency, while also reducing dependence on international factors in the long term.



“We have a reputation globally for being able to deliver high-, low-volume product around the world. We should focus on that.”

Dr. Marcus Zipper
Director, CSIRO Manufacturing Business Unit

Australia's manufacturing capabilities

Several key industries dominate Australia's manufacturing sector. Food and beverages and tobacco; machinery and equipment; petroleum, coal and chemicals; and metal products make up about 80% of manufacturing, according to the Reserve Bank.

This has changed significantly since the 1990s, when there was more production of metal products, textiles, clothing and footwear, and the machinery and equipment sectors, but less non-metallic mineral products, wood and paper products and food, beverages, and tobacco. Especially since COVID-19, there is an increasing focus on industrial manufacturing in high-value areas of health, defence and energy. However, manufacturing remains largely the domain of small business. Almost 95% of firms employ 20 or fewer people.

The remote nature of Australia's geography is cited as an enduring challenge. Transport costs are on average about 20–25% higher than the global average. Importantly, Australia's labour costs are high compared to other markets. According to the RBA, nominal manufacturing labour costs increased about 80% in Australian dollar terms from 1997 to 2012, an average of 4% per year. "Rising labour costs in foreign currency terms need to be offset by productivity gains in order to maintain international competitiveness," a report said. "However, manufacturing productivity had not grown by enough in Australia to offset increasing domestic labour costs and the higher Australian dollar, resulting in a loss of competitiveness against other economies up to 2012. Relatively high labour costs imply that the domestic industry has a comparative disadvantage in producing homogenous, labour-intensive goods.

Australia's growth dividend

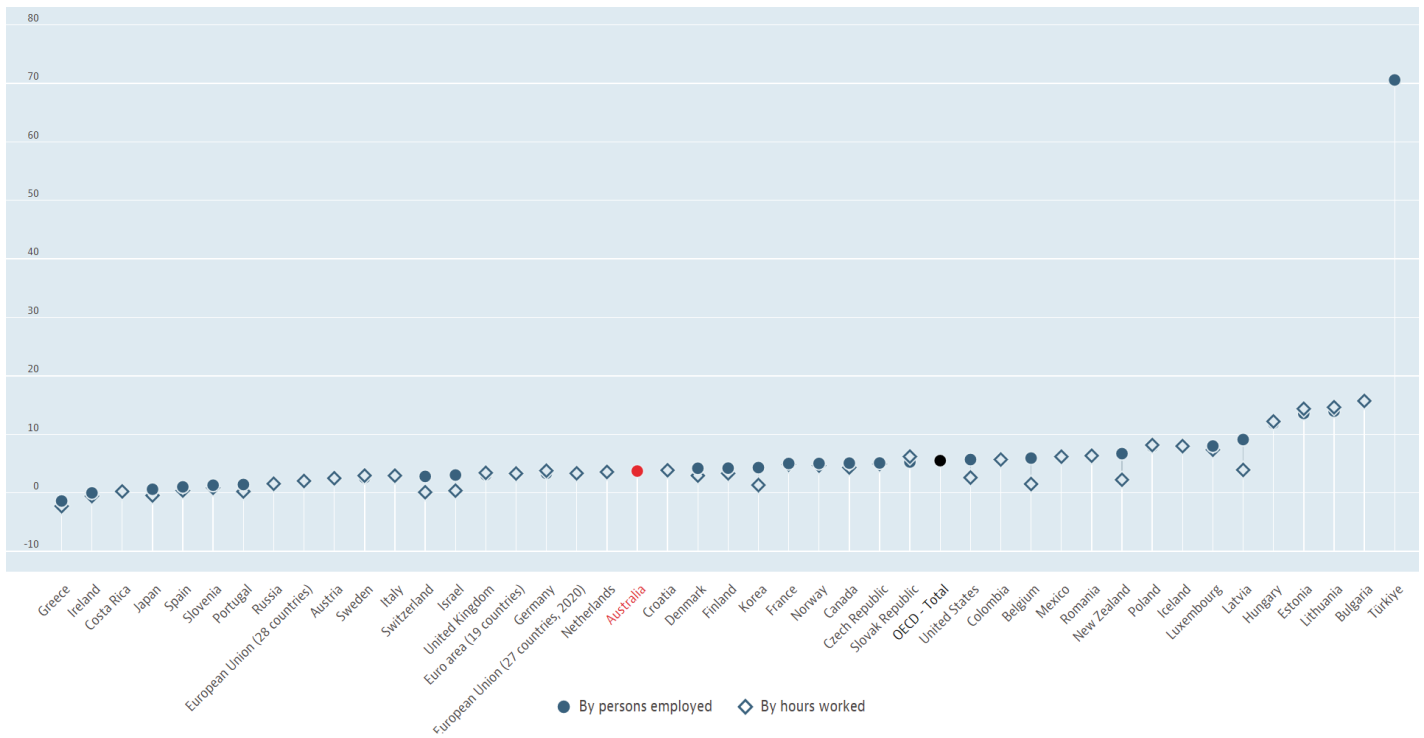
The value we could create from increasing our stake in global supply chains

Global supply chain	Global \$ value	Our current stake by %	Doubling our stake would be worth \$
Agriculture	\$2.3 tn	2.0%	\$51 bn
Defence	\$148 bn	1.8%	\$3 bn
Clean energy	\$2.6 tn	0.6%	\$24 bn
Advance manufacturing	\$6.6 tn	2.9%	\$197 bn
Professional services including education	\$9.6 tn	2.4%	\$230 bn
Health	\$858 bn	0.7%	\$6 bn

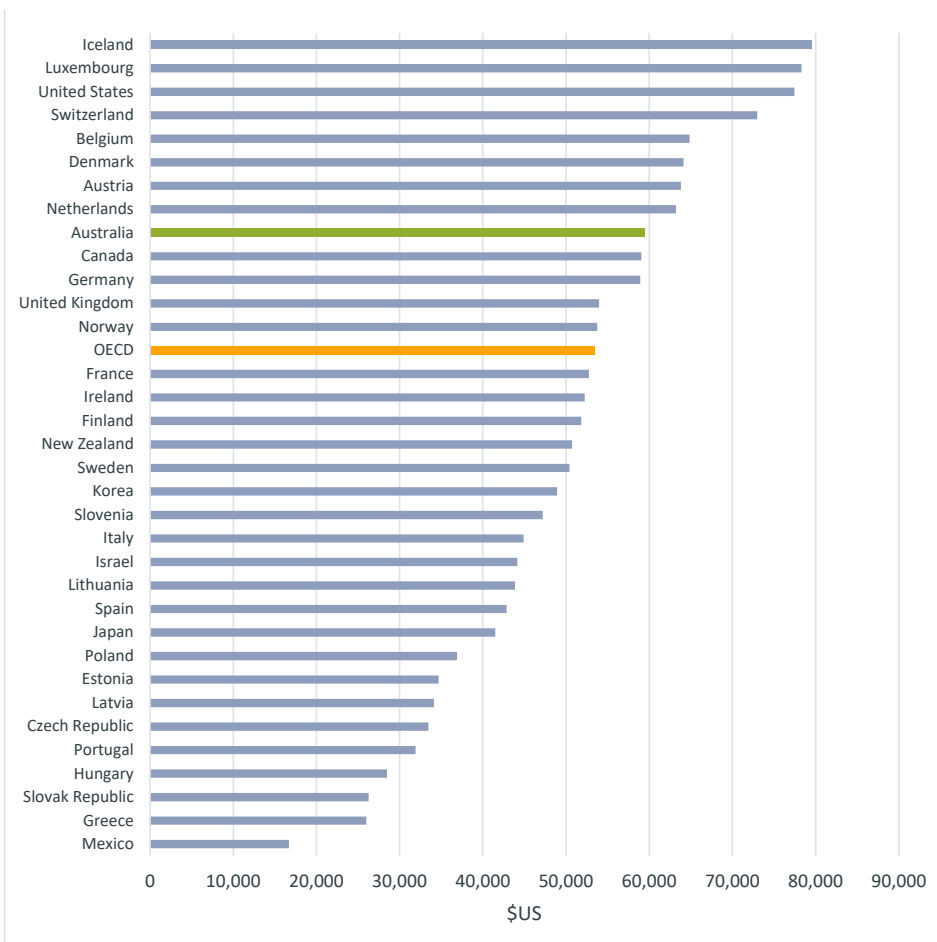
Unit labour costs

Source: Labour: Unit labour cost – quarterly indicators – early estimates

By persons employed / By hours worked, Percentage change, previous period, 2022 or latest available



International Comparison of Average Wages (in \$US) (2022 or latest available)



Analysts point to the potential for manufacturing to develop into a high-value, high-tech sector. This could be achieved on the foundation of a skilled workforce, ongoing investment in R&D, incentives and co-investments. An Australian Parliamentary Committee into the manufacturing industry reported in 2022 that Australia had to change its industry to keep up. "Manufacturing world-wide has entered a period of transformation," the report said. "The rapid development of computing power and internet connectivity are changing what is being manufactured and how that manufacturing is done. While this may very well be disruptive, it generates new opportunities for Australian industry."

Source: OECD (2023), Average wages (indicator). doi:10.1787/cc3e1387-en (Accessed on 12 July 2023).

See <https://data.oecd.org/earnwage/average-wages.htm>

Government support for the sector

The Australian Government has reinvigorated its financial support for manufacturing, particularly advanced manufacturing, since the pandemic. The \$15bn [National Reconstruction Fund](#) will be a national “manufacturing bank” to provide finance “for projects that diversify and transform Australia’s industry and economy”.

Through loans, equity investments and guarantees, the NRF aims to increase the productivity, resilience and emissions-intensity of industry. There is a specific allocation of \$1.5bn for medical manufacturing, as well as \$1bn each for value-adding in resources, critical technologies and advanced manufacturing. The Department of Industry, Science and Resources has conducted consultation on the initiative, as it shapes the investment mandate for the Fund. The Board was announced in July 2023, with subcommittees for each priority area yet to come. Chair Martijn Wilder was a founding director of the Clean Energy Finance Corporation, the government “green bank” on which the NRF was based.

One of the imminent programs, however, is the funding and commercialisation [Industry Growth Program](#) aimed at retaining and growing startups and small and medium enterprises. The \$392m early-stage support seeks to overcome the commercialisation gap with matched grants. The focus is on seven priority areas: value-add in resources, value-add in the agriculture, forestry and fisheries sectors, transport, medical science, renewables and low emission technologies, defence capability and enabling capabilities.

“The ‘valley of death’ is an early stage of business development where a new business will often experience

a substantial period of negative cash flow,” the program discussion paper said. “They require time and financial outlay to successfully bring their new product or process to market before they make money. The new Industry Growth Program is designed to provide a bridge during this challenging period.”

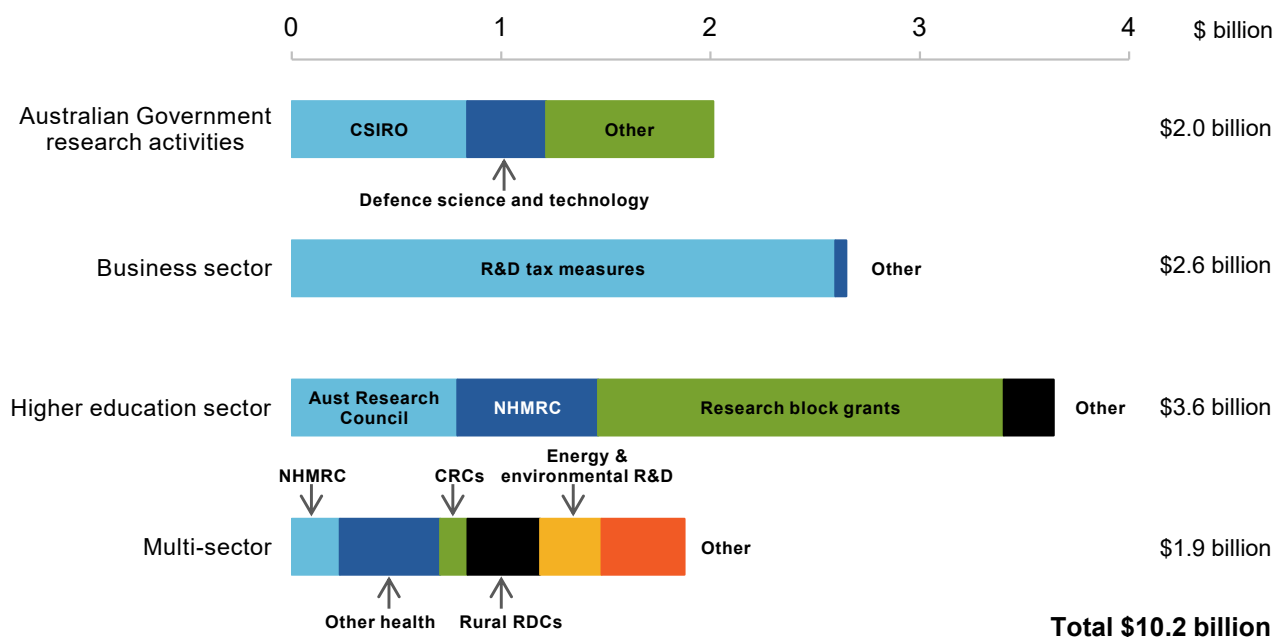
Since the COVID-19 pandemic, the Australian Government has increased its spending on research and development. In 2019–2020, more than \$10.2bn was spent on private and public R&D across more than 150 programs, according to the Productivity Commission. “Spending on R&D makes up around a third of all industry assistance provided by the Australian Government to the private sector,” the Commission said.

“The manufacturing sector received \$772m in R&D assistance in 2019–20. This is around 20% of total assistance for R&D from the Australian Government. It is also about three times the share of manufacturing in the economy.” The blockbuster program across the economy is the Commonwealth’s R&D Tax Incentive, which allows companies to offset the costs of their innovation programs. For companies with a turnover of less than \$20m, the refundable offset rate is the company tax rate plus a premium of 18.5%.

For larger companies, the rates and premiums are also generous. It has supported companies such as Boeing Australia to develop modern production processes through structural composite components for commercial planes, and HeiQ Australia to create new materials and processes for the textile industry. It is broadly supported across the population, too. A survey for the Business Council of Australia found nine out of ten agreed that spending on research and development was vital to provide a competitive edge.

In Queensland, the [MiQ](#) (Made in Queensland) policy is set to pay out \$32m in grants for manufacturers to adopt new technologies for energy efficiency, export, reshoring, supply chain improvements and decarbonisation. Australia’s only privately owned synthetic grass manufacturer, Urban Turf Solutions, installed a tufting machine to increase the efficiency and accuracy of its product. MiQ is a \$101.5m program for small and medium-manufacturers. Packer Leather secured a grant to invest in an automated batching system and advanced machinery, as well as a rapid pattern press.

Australian Government spending on R&D, 2019–20^{a,b}



^a Estimated actual.

^b National Health & Medical Research Council (NHMRC); Cooperative Research Centres (CRCs); Rural R&D Corporations (RDCs).

Data source: Updated from PC (2017a, p. 3) using data from DISER (2021).

Despite these programs, there is widespread acknowledgement that commercialisation in Australia is lagging. Industry leaders have called for the implementation of a 'patent box' regime, an advanced manufacturing incentive to raise international competitiveness, such as exists in the UK and France. A scheme already exists in Australia, but it is limited to medical and biotech. ResMed President Operations, Andrew Price, told a parliamentary inquiry an incentive such as this would improve Australia's comparative economic position. "Right now, companies that develop innovative technologies in Australia are incentivised to undertake R&D in Australia, but disincentivised to manufacture and commercialise in Australia," he said. "The current policy settings here in Australia incentivise med to manufacture and commercialise our innovation outside of Australia. This needs to change. Now is the time to make these changes." Mr Price said an incentive could include the design, build and employment value chain. "Companies that onshore the whole value chain should be rewarded for doing so, and we believe this is the key to unlocking Australia's scientific capabilities and advanced manufacturing base." Similarly, CSL Vice President, Strategic Industry Engagement, Dr. Andrea Douglas said the current policy framework did not favour Australian manufacturing operations. "We have invested in some manufacturing of international products here, but we have choices about where to locate those manufacturing facilities," she said. "The tax system certainly doesn't assist us in choosing Australia." CSL has also called for the expansion of the patent

box system. "It is all about trying to keep the intellectual property (IP) that was originally generated in that country," she said. "It is great that our universities and medical research institutes generate IP here and license it overseas, they will get some royalties back. The amount you get back, and the further along the value chain you can take it before you out-licence – particularly if you can manufacture the prohere – we are talking about orders of magnitude in terms of growth for Australia."

Manufacturing is fortunate to have received strong support from the Australian and state governments. In recognition of the key role that the sector has in developing the economy overall, there has been ongoing support for industry resilience and competitiveness. These have included financial grants or tax incentives, research and development assistance and trade and policy support. The Productivity Commission reported the industry had received "a disproportionately high share of government assistance" in the past. It estimated that between 1997 and 2012, the industry received \$30bn in transitional assistance to support the automotive sector amid global competition. However, while they rejected the idea of additional financial support, the commission said there remained impediments to research and development and domestic and foreign investment that the government could address. Likewise, they called for improved management of supply chains, streamlined government procurement and enabling trade policy, education and training.

Case study

Omega Manufacturing Group Pty Ltd

omegatechnical.com.au



Okuma Multus U4000 Multitasking Lathe with FANUC R-2000iB 210F machine tending robot



Batch run of machined aluminium sensor mounts



Kreon Ace Skyline measuring arm and 3D laser scanner



Okuma LT3000 Horizontal Lathe with FANUC M-710iC machine tending robot

Australian companies are proving they can compete on a global scale with the right niche products, manufactured to a high standard. Wodonga-based advanced manufacturer Omega Manufacturing Group has been transforming its CNC (Computer Numerical Control) manufacturing facility using automation and vertical integration, allowing for end-to-end production of precision parts for a range of industries.

Emma Forbes, the Finance and Commercial Support Manager at Omega Manufacturing Group, highlights the company's multifaceted operations. The company provides subcontracting services under the Omega Technical Engineering banner while simultaneously developing their own proprietary product line, [Ross Performance Parts](#) for the after-market high performance automotive sector. "Automation is something that we have been transitioning to over the past three to five years to enhance operational efficiency," she said. "It's not about reducing headcount, or downsizing the workforce, but rather, it's about using the skilled people we have to undertake high-value tasks instead of the mundane loading and unloading of machines. Manufacturing requires high-capital investment, so we are optimising usage to get the most productivity we can out of those investments."

By day, the company focuses on labour intensive machine setup, proving out programs, and handling one-off small batch subcontracting work for sectors including agriculture, defence, food processing, MedTech, hydraulics / pneumatics and high-end recreational sporting industries. At night, the machines are dedicated to completing batch runs and carrying out machining processes for their own proprietary product, seamlessly achieving 'lights out production'.

Their Ross Performance Parts harmonic dampers, EFI trigger kits and oiling systems are now a successful export product, with almost 40% of production going to the US, Europe, Japan and New Zealand.

"Part of it is finding a niche and setting yourself up to be able to manufacture as efficiently as you can in that niche," she said.

The company has plans to accelerate growth via further expansion into the US with negotiations underway to acquire a complimentary business, facilitating import replacement and additional export opportunities.

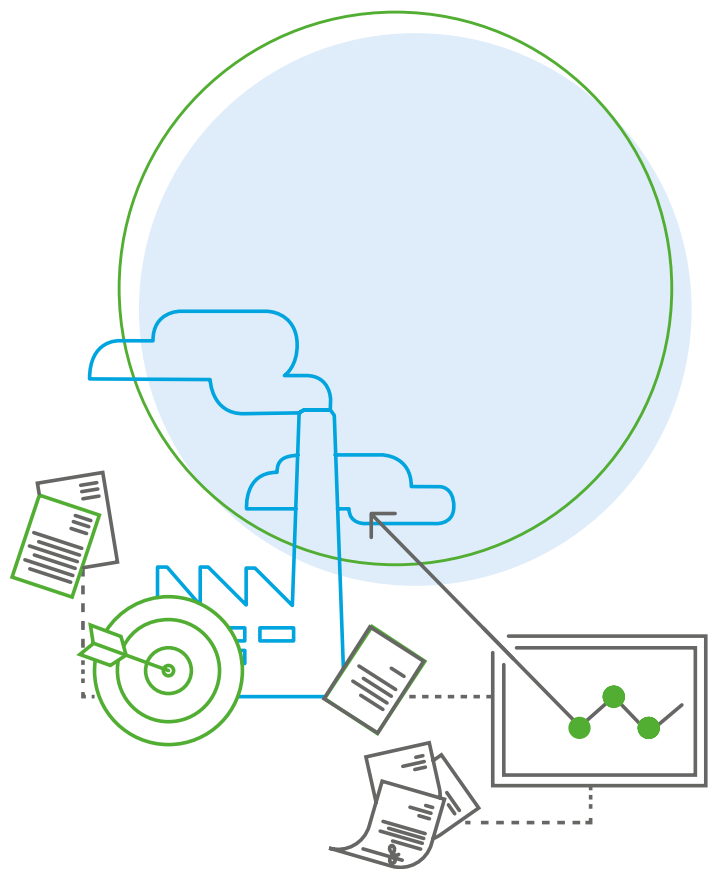
RSM is helping Omega Manufacturing Group take significant strides in advancing their business. Their proactive approach includes tapping into the R&D tax incentive since FY20, as well as securing successful grant applications for both the Made in Victoria Manufacturing Growth Program (in 2023) and the Victorian Technology Adoption and Innovation Program (in 2021). These initiatives are centred around strategic investments in additional capital equipment to facilitate the transition towards automation, bolstering the workforce and maintaining a steadfast commitment to ongoing research and development. Notably, a substantial R&D project is underway, enabling a direct performance comparison between their product and the leading US market counterpart. "With the right product, and data-driven validation, we have the ability to compete on a global scale," she said.

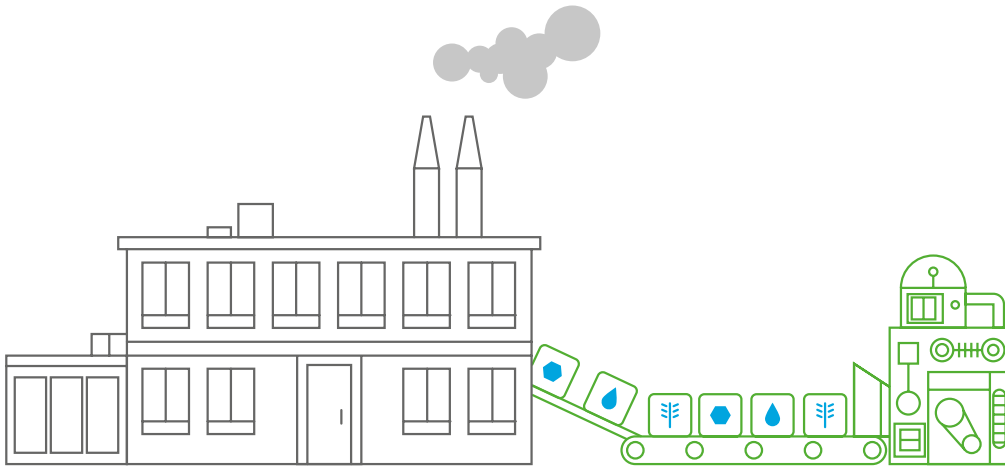
Technology in manufacturing

Technologies are rapidly shaping the way manufacturing is conducted in Australia. Innovation and the productivity gains possible from digitisation have become critical to ensure global competitiveness. According to the Advanced Manufacturing Growth Centre: "Being advanced is not **what** a manufacturer makes, but **how**. A manufacturer is more advanced when it uses advanced knowledge, advanced processes and advanced business models." From automation and artificial intelligence to additive manufacturing and the Internet of Things (IoT), technology is revolutionising every aspect of the manufacturing process.

The widespread adoption of automation and robotics has the potential to spur significant technological advancements. Automation is changing traditional practices, reducing manual labour and making systems more efficient and safer. It is also considered a cost-saving measure instead of a revenue generator. Automation is also increasing quality and accuracy, and allowing for the remote handling of machinery in distant locations. Robots are ideally suited to "dirty, dangerous and dull" jobs, freeing up human capital to focus on creativity, improving processes and innovation. Where once there were technological advances through a single machine, now the innovations are aimed at connecting all processes through 'Industry 4.0'.

Additive manufacturing, commonly known as 3D printing, is also changing the sector. It allows manufacturers to create complex and customised components with precision accuracy using plastics, polymers and metals. By layering materials to build objects from the ground up, 3D printing has significantly reduced waste, minimised material costs, and facilitated faster prototyping and production processes. On-demand production also offers a solution to the challenge of long lead times and can allow original equipment manufacturers to source parts more easily. Breakthrough Australian companies such as [SPEE3D](#) use a cold spray technique to make metal parts that are now being utilised in defence, oil and gas, mining, rail and marine applications. And large-scale metal parts are being made through wire additive manufacturing by [AML3D](#). Additive manufacturing has found applications across various sectors, including aerospace, healthcare, automotive and consumer goods. Its versatility and efficiency have not only reduced lead times but also fostered innovation, enabling businesses to develop groundbreaking products that were previously unattainable using traditional manufacturing methods.





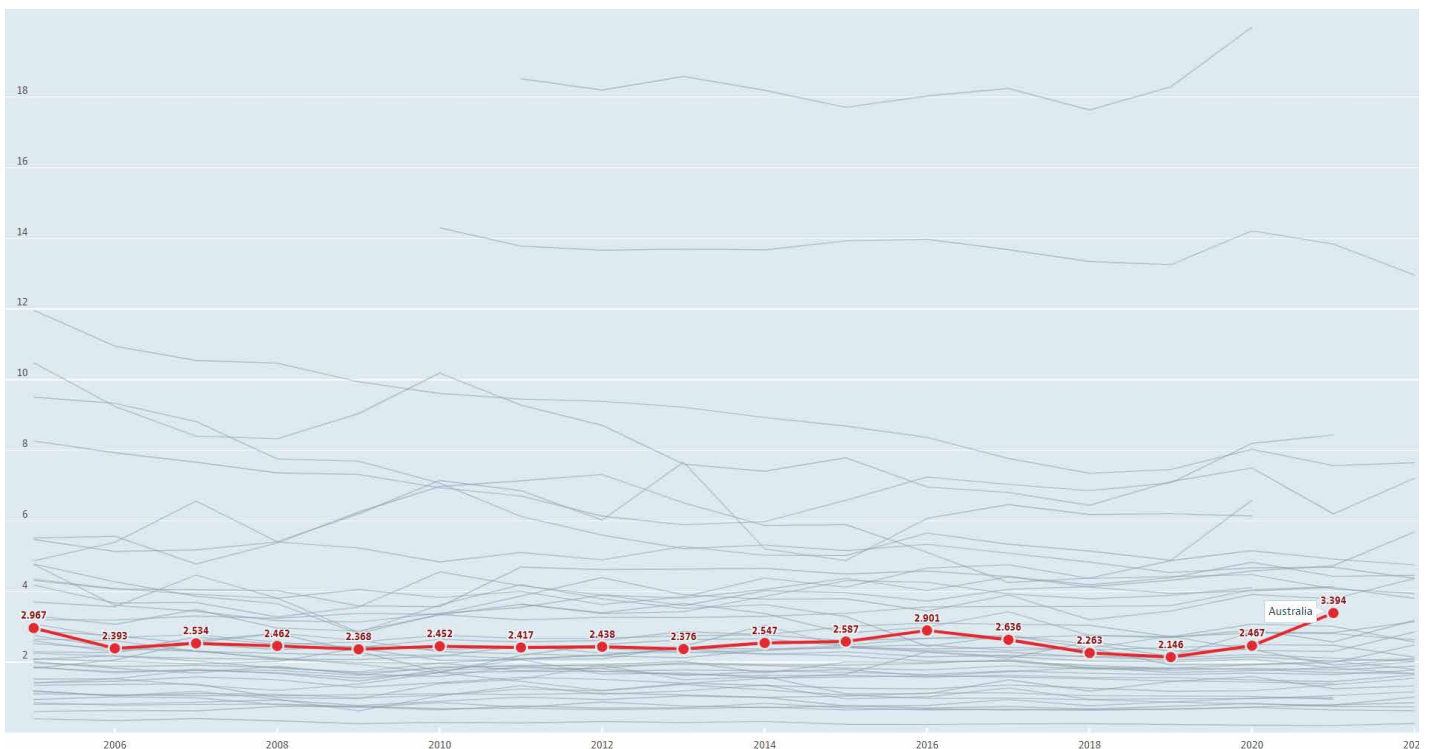
However, there is concern that Australian manufacturers are not investing in these processes, and that governments are not incentivising them sufficiently. The Advanced Manufacturing Growth Centre (AMGC) said many companies had "considerable room to grow in developing advanced characteristics." "Manufacturers should closely examine their current business models, strengths and growth prospects," they said in a recent report. "AMGC's

qualitative and quantitative research further indicates that [manufacturers] would do better to concentrate on improving their performance on a small number of advanced metrics, rather than progressing on all characteristics simultaneously. Currently, just 5% of firms drive 94% of the sector's entire capital spending, and 54% of its entire R&D spending. This group are responsible for virtually all the nation's manufacturing exports."

Value added by activity

Source: National Accounts at a Glance

Agriculture, forestry, fishing, % of value added, 2005–2022





ifm is a global manufacturer that specialises in industrial automation and sensor solutions. It has transformed as a company from being a manufacturer itself, and now helps others do the same. Australia Managing Director, Dave Delany said traditionally they had manufactured other products, but moved to creating products to solve process problems. "We had the same problems that all other manufacturers had, and that's why we went into the software, to solve the problems we saw in our own production," he said. "Then we turned that into a saleable product. We still manufacture all our sensors." With a strong focus on technology and quality, the German-headquartered ifm offers a range of smart products to improve efficiency, helping to support increases in safety and sustainability at the same time. Their sensors have been employed in plants and machinery around the world, in infrastructure, defence, energy, agriculture and health.



In Australia, ifm worked with a port operator at the Port of Melbourne to improve the efficient operation of cargo loading and unloading. Specifically, the operators introduced the use of ifm sensors on cranes to monitor and detect hazards, reducing the risk of collisions and raising safety and productivity. Most of their work, however, is providing smart solutions, which provide data-based insights to small and medium end users. ifm has also worked with a globally leading machine manufacturing company to provide automation devices.

ifm's office in Melbourne – the ifm group of companies has subsidiaries, development and production sites in more than 70 countries

Managing Director Dave Delany said Australian SME manufacturers were in a good position to capture the opportunities of emerging and changing global markets, given their flexibility and capacity for innovation.



"Because of Industry 4.0, it has given us the ability to be competitive and to make the savings to be more efficient," he said.

"The Australian manufacturing industry is very innovative. They can tap into markets that are new, or be a lot more flexible than some of the big organisations that are overseas. Some of the companies overseas are so large and they're just geared up to do one thing.



"Consumers are wanting a lot more customisation. So that flexibility, to be able to cater more to people's personalised needs, as smaller manufacturers we are more flexible.

Sectors

Medtech

MedTech is emerging as one of Australia's most advanced and critical sectors for manufacturing, with keen competition from governments to attract facilities. From the world-leading household names such as CSL, Cochlear and ResMed, to emerging innovations like the needle-free vaccine patch by developer Vaxxas or the bioabsorbable polymer bandage from PolyNovo, MedTech is said to contribute \$5.4bn to GDP. According to the Medical Technology Association of Australia, sector value has increased **5.9%** compounded over the last two years. The sector covers innovation in the detection, diagnosis, treatment and management of healthcare conditions. "From implantable devices such as pacemakers, personal devices for the management of diabetes, X-ray machines and MRI scanners to uncover cancer, or surgical robots to aid surgery, to personal technologies that enable patients to effectively manage their chronic disease, the devices and equipment used in healthcare ensure Australians can live their life to its fullest," the MTAA said. Of the surveyed MedTech companies, 71% indicated their products had some level of local development. "Since 2002, Australia has hosted over 2300 MedTech clinical trials. Interestingly, more than 60% of surveyed companies indicated they have trials starting in the next 12 months."

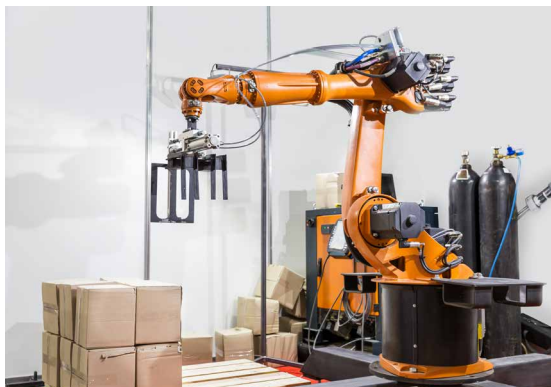
Medical manufacturing is built on a strong foundation of health research. Australia ranks **eighth globally** for life sciences research. One of the key advantages is the cost of clinical trials. A 2016 paper using data from [Frost & Sullivan](#) said local clinical trials were 28% cheaper than in the US and when tax incentives were factored in, the overall cost was nearly 60% less than in America. Director of the Peter Doherty Institute for Infection and Immunity, Professor Sharon Lewin, said there were outstanding clinical trial facilities. "There is a far simpler regulatory environment for clinical trials in Australia allowing for more rapid implementation of phase 1 and 2 studies," she told [Bloomberg](#).

The Victorian Government's [MedTech Manufacturing Capability Program](#) is targeting businesses to develop and expand the industry. Businesses can receive matched grants from \$100k up to \$500k for new projects, scaled up production and equipment upgrades for manufacturing in the state. Recipients have included Global Kinetics, which devised a continuous monitoring solution for Parkinson's Disease, and PolyNovo's medical-grade polymers.



While there is a renewed focus on the development of small and medium-sized enterprises, Australia is not retaining the major companies to international designations. The [Australian Medical Manufacturing Exporters Coalition](#) pointed to the announcements of two of the last remaining multinational pharmaceutical manufacturers in 2020, GSK's Boronia, Victoria blow-fill-seal plant and Pfizer's Perth plant. AstraZeneca's Sydney facility was operating at 30% capacity in mid-2023. "It is simply no longer possible to ignore that unless the business environment is made more internationally competitive, Australia will struggle to be able to retain, attract or resurrect Australian medical manufacturing at any significant scale," the Coalition said. "This erosion of Australia's medical manufacturing base is occurring at a time when the benefits the sector can offer Australia – the creation of highly paid jobs, export opportunities, skills development and medical supply sovereignty – are the very things Government sees as priorities."

Defence



Australia is ramping up its defence manufacturing capabilities. Amid a shifting geopolitical landscape, there are significant opportunities for domestic production of munitions, defence tech and integrated air and missile defence systems. Australia is prioritising this sector like never before, with an unprecedented \$270bn government investment in defence capabilities, including the flagship AUKUS nuclear-powered submarine pathway and the Joint Strike Fighter program. The 2023 [Defence Strategic Review](#) outlined the whole-of-government and industry approach to spur manufacturing and supply chain resilience and capacity. The [Skilling Australia's Defence Industry Grant Program](#) seeks to upskill and train people in small and medium enterprises. Defence has additional controls for businesses around worker citizenship requirements and cybersecurity.

As government seeks to improve their Defence planning and collaboration, industry has called for greater transparency around the capability requirements to meet these needs. "By providing clear and predictable requirements, industry can align its investments and develop relevant capabilities, fostering better preparedness for future defence needs," an Ai Group submission to the Senate Inquiry said. "This emphasis on long-term planning will facilitate better alignment of industry investments and capabilities with ADF (Australian Defence Force) needs, as well as identification of technology trends, emerging threats and strategic priorities." They have also called for streamlined procurement and program design, to encourage small and medium enterprises to pivot to defence.

"By establishing this type of sovereign manufacturing capability now, Australia has the opportunity to lay a foundation for future defence, intelligence and national security applications".

Michael Junger, Senior Vice President of Advanced Technology, Vaxxas

Aerospace



Australia is keen to join the space race. With technological advantages and a strategic location in the world, space has become a key interest. The Australian Space Agency oversees a decade-long plan to grow the space economy and lift broader capacity through seven key priority areas. As the Australian Government pairs with the United States for space operations and exercises, it is also incentivising space supply chain. Companies are producing new capabilities that are smaller, less expensive and less complex. However, there remains concern among industry that the Australian Government is yet to update the Space Strategic Update following its cancellation of the National Space Mission for Earth Observation in the 2023 Budget.

Space Industry Association of Australia CEO, James Brown, told 2023 a 2023 Senate inquiry the sector could be a strategic enabler but business was awaiting information. "Australia is currently crawling in the global space economy whilst our friends and competitors are sprinting," he said. "Private investment into Australian space has stalled due to uncertainty regarding government policy. The NRF (National Reconstruction Fund) is an excellent opportunity for government to signal a multi-partisan, strategic, long-term commitment to sovereign space capability."

Some initiatives are proceeding. The Australian Space Manufacturing Network (ASMN), a collaboration of more than 30 businesses and research organisations led by Gilmour Space Technologies, received a \$52m grant to establish three space facilities. These will develop a common test and manufacturing centre that can be utilised by members, an advanced manufacturing facility for building commercial rockets and satellites and an orbital spaceport in North Queensland to propel the products to space.

"Space is one industry where we can create national champions. It's a multibillion-dollar, soon to be a trillion-dollar, industry. It's new. It's been around for a long time but new technologies are giving a lot of different countries a competitive advantage to participate in the space industry. It's a global industry".

Adam Gilmour CEP and Founder Gilmour Space Technologies



Clean energy

As the world transitions to a net-zero economy, Australia is fast-tracking its investment and capabilities in clean energy. Currently heavily reliant on existing fossil fuel electricity production and exports, Australian governments are seeking to transition to low-emissions supply chains. Significant work programs such as the Integrated System Plan (ISP) and the National Hydrogen Strategy envision energy generation and a rejuvenated transmission system.

However, there are delivery challenges for these plans. Infrastructure Australia's Infrastructure Market Capacity report 2022 noted the nation faces a "severe shortage of steel fabrication capacity" that may constrain the delivery and benefits of projects. "Domestic production will not satisfy construction demand between 2022–23 and 2023–24," the report said. "While a respite in demand is forecast for 2024–25 and 2025–26 it is likely due to the completion of existing known projects and a lack of longer-term pipeline visibility than a genuine drop in demand." Further, the market is "arguably at capacity" and project delays are inevitable.

The Australia Institute think tank has called for new incentives for sustainable manufacturing, especially for the production of batteries, electric vehicles, generation and transmission, to match the US Inflation Reduction Act. It says a matching investment would total \$83bn to \$38bn over 10 years, excluding the capital costs of the projects. "There is a vast range of industrial benefits to be captured from the energy revolution: both in producing manufactured inputs to renewable energy projects, and in developing a new, sustainable generation of manufacturing that uses renewable energy as a clean power source."



Food and agriculture

Agriculture has been a cornerstone of the Australian economy since the earliest days of federation. Food and grocery manufacturing accounts for almost a third of all Australian manufacturing activity, while agriculture is now a \$76bn export industry thanks to consumer demand in Asia for products like meat and wheat. However, the hangover from the COVID-19 pandemic is still challenging food and grocery manufacturers, who are battling labour shortages, supply chain disruptions and lagging capital investment. Analysis from the [Australian Food and Grocery Council](#) (AFGC) says cost pressures remain high after repeated natural disasters, the war in Ukraine and COVID-19 disruptions. "Just like anyone doing their weekly shopping is feeling the effects of higher inflation, Australian manufacturers are also battling higher costs in areas including freight, labour and energy," AFGC CEO Tanya Barden said in the August 2023 State of the Industry report.

"We've also seen a shift away from 'just in time' supply chains to 'just in case' since the pandemic and manufacturers are now holding higher inventory levels to maintain supply which pushes costs higher. These are significant challenges for an industry that must attract new capital to embrace new technologies and remain competitive with offshore competitors after more than a decade of stagnant investment." The National Farmers Federation (NFF) believes there is enormous scope for growth in the sector and its [2030 Roadmap](#) calls for greater investment in Australia's food manufacturing sector from "paddock to plate". The NFF model would co-locate food manufacturing precincts in key growing regions with access to export facilities.



Boutique ice creamery Gelista may list vanilla as its top-selling product by volume, but its innovation in production and global aspirations are anything but.

The South Australia-based premium food manufacturer recently opened its high-tech, integrated factory and warehouse that features digitally-interconnected refrigeration systems.

Managing director Peter Cox said Gelista developed its own smart refrigeration system to be significantly more energy efficient and eliminate water coolant use.

"Our new factory now utilises a central refrigeration system, which will supply refrigerant on demand as assets require it," he says.

"As different assets switch on and off, the central refrigeration system varies capacity to supply refrigerant services to whichever part of the plant is being used."

Gelista was founded by fourth-generation dairy farmer Mr Cox 14 years ago, when he saw a gap in the market for an artisan product at wholesale scale.

Their ice creams, sorbets and sherbets are now available around the country at premium hospitality venues, restaurants and cafes.

Gelista has also developed a retail product range that trades in independent supermarkets, specialty grocers and delis. This business now contributes 40% of revenues.

Mr Cox says they are exploring the international market, and have a customer ready in Malaysia, but the expansion has been held up by compliance requirements.

"It's more time, money and effort", he says. But Gelista is an aspiring Australian manufacturer with a vision to send products overseas. "We're committed to the process."

He acknowledges there is a range of government support, but says the costs of business and inputs remain challenging. "The most beneficial thing governments could do is to try and reduce our costs in manufacturing," he says. "One thing that is helpful is the R&D concessions."

And as the National Reconstruction Fund takes shape, Mr Cox says Australia has significant capacity to develop advanced manufacturing and add value to resources.

"We have some great people and an enormous amount of energy resources, however soaring energy prices are a major barrier for manufacturing," he says.



Cyber security

Cyber threats to manufacturing are accelerating. In line with the rising digital integration and technological dependence, this has exposed more weaknesses. Manufacturing is the target of about [one in four](#) cybercrime attacks globally. High-profile attacks include one on beverage giant Lion, which produces Dairy Farmers, Pura and XXXX Gold among a range of brands. They experienced a major cyberattack in mid-2020 that forced them to shut down their IT systems. Processor JBS Foods also ceased operations following a ransomware attack that impacted national food supplies. In mid-2021, the FBI and Australian Cyber Security Centre warned of ongoing ransomware campaigns in many countries that targeted a range of industries, including manufacturing. [Chinese hackers](#) were also believed to be behind attacks on medical manufacturers at the height of the COVID-19 crisis in March 2020.



RSM Australia's cyber expert, Ashwin Pal, said the sector had to catch up to other industries in terms of protection, given the rise in cyber crime. "The probability for them getting through is going to be a lot higher because manufacturing is arguably behind a lot of other industries in terms of cyber security," he explained. "The impact is much greater as well – when the factory floor shuts down, the cost is much greater because of all the inventory and raw materials involved."

He said the equipment used to great effect to increase productivity in manufacturing was also inadvertently opening the door to cyber risk.

"A lot of the equipment which comes in hasn't been set up to be secure. The operational workers who set it up aren't security focused, they are focused on making sure that robotic arm for welding is working. They might not have changed the default administrative password. All it takes is someone to set up a wireless network from the factory floor and they have access to that robotic arm, which in turn can inject ransomware into the network and kill all the robotic arms."

However, these risks can be mitigated and managed. Ideally, a risk analysis using the appropriate standards is performed in conjunction with penetration testing, providing insights into vulnerabilities. Then an appropriate transformation program is devised for steady implementation. This is particularly important for the operational technologies, which have not traditionally been secured to the level of IT. "Having no security on the factory floor opens the door for ransomware attacks locking up operations, costing far more money than an attack on the IT system," Mr Pal said. "For manufacturers, remaining operational and getting inventory out the door is all that matters."

Developing sustainable manufacturing

Leading manufacturers are increasingly embracing Environmental, Social and Corporate Governance (ESG) approaches to align their operations with sustainable development. With these non-balance sheet factors in the sights of investors, markets and stakeholders, manufacturing businesses are stepping up their efforts on decarbonisation, waste, water and communities. RSM Australia's National Sustainability Lead, Nicole Mohan, says sustainability has evolved into a strategic business imperative for manufacturers. "To fund new projects and to grow businesses, it will be important for companies to demonstrate their sustainability credentials and performance to potential lenders and insurers, as we are now seeing that interest rates can be linked to this performance and KPIs," Mohan said.

She said despite a knowledge gap for many industries, there was help available to access support, data and processes. "If a company has the required resources and a formalised ESG and sustainability governance structure, they can often take the lead in driving activities and initiatives themselves and we can help guide the company, where required," Ms. Mohan said. "However, if companies lack those resources or structure, we can provide support to embed a structured approach for ESG and sustainability as the business continues to grow. With a mix of sustainability, risk management and reporting knowledge skills to assist, we ensure that the development of any deliverables is fit-for-purpose for the company's operations. We understand that each company is slightly different, and no two companies have the same needs and desires. Accordingly, each will require its own unique ESG Roadmap, Strategy and Framework."

To start the process, manufacturers should consider the measurement and monitoring of their emissions and impact. Then set targets, both near-term and longer-term, and a climate governance framework that includes Board-level oversight of sustainability-related issues. To achieve these, many organisations develop a transition plan, with management incentives and growth opportunities from the decarbonisation initiatives.

Manufacturers are adopting practical strategies to reduce their impact. One of the key strategies is through the adoption of sustainable sourcing practices. This involves checking the supply chain to procure raw materials and components from suppliers who adhere to appropriate standards on deforestation, pollution, or human rights abuses. Energy efficiency is also critical. As an energy-intensive sector, this is a key focus to reduce energy inputs and lower emissions. Implementing energy-efficient technologies, such as LED lighting, efficient machinery, and smart automation systems, can significantly lower energy use and operational costs. Manufacturers are also aiming at waste reduction and the development of circular economies. Reducing water use, or switching from freshwater to recycled water sources, is also an important step in conserving resources.

One company that has achieved strong sustainability rankings with international not-for-profit organisation, CDP, is packaging company Amcor. It pledged that all packaging will be recyclable, reusable, or compostable by 2025 and has a net zero by 2050 commitment. Last year, together with Coles, iQ Renew, LyondellBasell, and Nestlé, Amcor conducted the Advanced Recycling Feasibility Study. The results highlighted the benefits of establishing a local circular economy for flexible plastic, with a focus on advanced recycling to capture plastics underserved by existing recycling infrastructure, such as food packaging.

"As many countries around the world are now realising, decarbonisation and a shift away from fossil fuel does not just mean a decline in jobs; it is an unprecedented opportunity to develop green manufacturing capabilities and new economies around the country."

“We want, and need, Australia to continue to be a productive and prosperous nation. We need to develop our own workforce, not just to simply sustain what Australia has built to date, but to confidently tackle new challenges and new frontiers. Our current workers, including those in the last third of their careers, are valuable commodities worthy of our investment. The upcoming next generation is gold.”

Ai Group Chief Executive Innes Willox

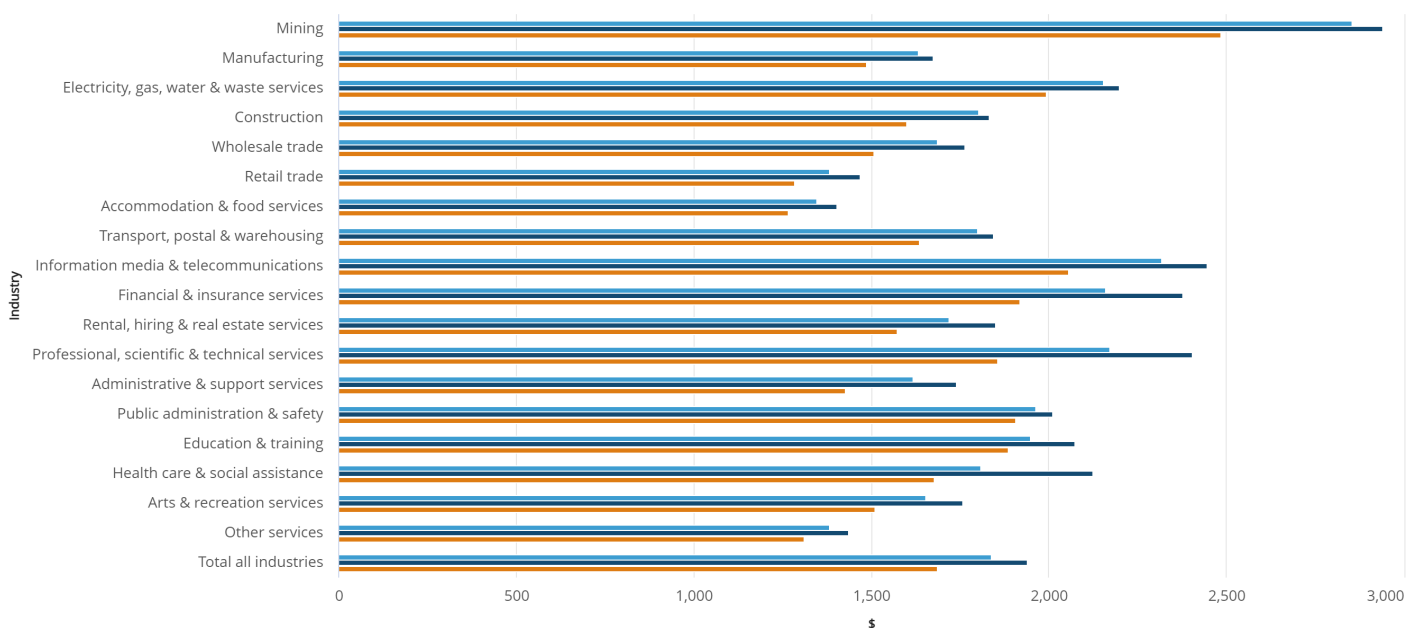
Skills shortages and the changing workforce

The availability and cost of skilled workers is one of the key issues impacting Australian manufacturing. The Australian Industry Group’s most recent Skills Survey found 90% of businesses expected shortages in 2023, and 36% of those skills shortages were inhibiting their growth. This resulted in leaders focusing on upskilling their workers, with the CEO Survey identifying staff training as the top priority for investment in 2023. “This skills development and utilisation focus is due to businesses facing the tightest labour market since the 1970s,” the report found. “[Almost 40%] (39%) of businesses are also willing to employ people with similar skill sets and further train them to fit their role. With only 8% reporting that they don’t expect to be affected by staff shortages in 2023, businesses instead need to ensure they can get the most from the workforce skills base that they already have or can realistically hire.” Many of the

manufacturers reported that recruiting trades and technicians was particularly difficult, as was professionals and people with digital skills.

Australia is not alone facing these human resources challenges. The [US Chamber of Commerce](#) has revealed that the American manufacturing industry lost about 1.4m jobs at the start of the pandemic, but people did not return. “Since then, the industry has struggled to fill job vacancies,” the report said. “As of March 2023, there were 693,000 open manufacturing jobs. Even if every unemployed person with experience in the durable goods manufacturing industry were employed, the industry would fill only around 75% of the vacant jobs.” Similar experiences are being reported in Europe and the United Kingdom.

Average weekly ordinary time earnings, full-time adults by industry, original



Source: Australian Bureau of Statistics, Average Weekly Earnings, Australia May 2023



Adopting Industry 4.0

Industry 4.0 is set to be a significant shift in the processes of manufacturing. Also known as the Fourth Industrial Revolution, the concept is based around interconnected digital technologies that use data analytics to optimise operations. It marks a step up from single machines and processes, to integration across the entire production procedure. This occurs through the use of sensors, data, the Internet of Things, mobile devices, location detection, cloud computing and data visualisation and virtual and augmented reality. Industry 4.0 could be borne out through an automated system of machines, products and services that operate independently but are interconnected. Adding to this could be the use of machine learning to identify anomalies in production or analyse large datasets.

An Australian Growth Manufacturing Centre report argues that every manufacturer – and notably small businesses – have the capacity to achieve Industry 4.0. The report contends that education and training, additional funding for specific innovation grants, collaboration across industry and government, and the facilitation of cybersecurity and data exchange uplift will all boost digitisation and connection. “This means gradually digitalising, automating and interconnecting all machines and processes,” it said. “Adoption then extends from production activities to the entire value chain, including functions such as design, engineering, procurement, marketing and finance, and final customer engagement. This allows business owners to enjoy real-time visibility into the entire network of value creation, and to make decisions based on intelligence and data.”

However, the process requires a shift in thinking. It could mean adding online product selection, or sensors to a filtration system that alert when levels are non-compliant and ensure ongoing maintenance. One idea is the [‘Smart Enough Factory’](#) in which manufacturers build up their capacity over time through small investments, either in plant and equipment, or monitoring, or skills.

ifm Managing Director Dave Delany on starting the process of Industry 4.0

ifm Managing Director Dave Delany understands that it can be daunting for manufacturing businesses to take their first steps to integrate new technologies into their processes and operations.

But, he says, starting on the road to Industry 4.0 should be a staged approach.

“Understanding how to start is a big obstacle for people,” he says.

“It’s not a lack of willingness to try, it’s knowing where to start and how it would fit for them.

“A lot of people don’t know how to start and the topic is quite big, and people often making the decisions are not computer engineers or electrical engineers.”

Mr Delany recommends implementing a single sensor, software or automation, testing it out and achieving a return on investment, before rolling out the next advance.

However, he says the transformation that will be delivered through data-driven insights will drive efficiency, productivity and optimisation.

“What Industry 4.0 does and what we do is we can provide live insights to predict what is happening, and what is going to happen in the future, and avoid things and save,” he says.

“Industry 4.0 is more real-time and gives you insights. That is the biggest thing that has changed, that we can offer as a company.”

Acknowledgements

Thank you to the following individuals for their valuable input:

Dave Delany *Managing Director, ifm*

Peter Cox *Managing Director, Gelista*

Emma Forbes *Finance Manager, Omega Technical Engineering*

For further enquiries, contact our team:

Jessica Olivier *National Leader, Manufacturing*

Ashwin Pal *Partner, Cyber Security & Data Privacy Services*

Nicole Mohan *National Sustainability Lead*

RSM's expertise in supporting Australian manufacturers

We are passionate about working with Australian manufacturing businesses, with a focus on helping businesses and the communities in which they operate to build capability and thrive in a postpandemic economy. At RSM, we act as the trusted advisors for a range of manufacturers, from small manufacturing businesses who are looking to commercialise new products or expand into new local and global markets, through to established listed and global manufacturing businesses looking to further enhance and streamline their operations. Combining our global industry knowledge, deep resources and personalised service, we offer solutions to help manufacturers reduce costs, increase efficiency and maximise profitability. RSM can help your organisation strategise around the right systems to accelerate growth, gauge the impact of automated technologies on the makeup of your workforce, and find solutions to issues you face around revenue growth, risk management, global operations and more.

[» Click here to find out more](#)

[rsm.com.au](https://www.rsm.com.au)

RSM Australia Pty Ltd is a member of the RSM network and trades as RSM. RSM is the trading name used by the members of the RSM network.

Each member of the RSM network is an independent accounting and consulting firm, each of which practices in its own right. The RSM network is not itself a separate legal entity of any description in any jurisdiction. The network is administered by RSM International Limited, a company registered in England and Wales (company number 4040598) whose registered office is at 50 Cannon Street, London EC4N 6JJ. The brand and trademark RSM and other intellectual property rights used by members of the network are owned by RSM International Association, an association governed by article 60 et seq of the Civil Code of Switzerland whose seat is in Zug.

© RSM International Association

Liability limited by a scheme approved under professional standards legislation