

The Future of Defence Made in NSW



About Australia

The Australian economy has outperformed the country's peers for more than two decades. Now in its 27th year of consecutive growth, Australia's economic resilience and strength are unsurpassed among major advanced economies. The nation offers a smart, multicultural workforce with an enterprising mindset and the skills to drive innovation and grow international business.

Australia prides itself on stable institutions and good governance, making it one of the safest places in the world to do business. It boasts a globally integrated economy that plays a key role in shaping Asia's dynamic economic future.

There is no better business partner than Australia.



27 years of uninterrupted economic growth



2.9% economic growth, one of the highest industrial economic growth rates for developed countries globally



4th largest economy in the Asia-Pacific region



13th largest economy in the world



Ranked No. 1 smartest country in the Asia Pacific and 4th smartest country in the world



AAA credit rating Higher in credit quality than the US, UK, France, Japan, Hong Kong, Republic of Korea and New Zealand

About Sydney and New South Wales

New South Wales (NSW), with its iconic capital city of Sydney, is Australia's most populous state and largest economy. A cosmopolitan and regional powerhouse, the state seamlessly blends business strength, access to Asia, and one of the world's most enviable lifestyles. Boasting a AAA credit rating, NSW is experiencing Australia's largest infrastructure boom and is home to a highly skilled, innovative and creative workforce.



ABOUT NSW:

Capital city:	Sydney
NSW population:	7.9 million
Sydney population	5.1 million
NSW time zone:	GMT +10:00
Climate:	Sub-tropical and Mediterranean
Sydney summer temperature average:	18-27 °C
Sydney winter temperature average:	7-18 °C
Coastline:	2,007 kms
Official language:	English
Currency:	Australian dollars (AUD)
International airport:	Sydney Airport

NSW is Australia's leading source of highly skilled and diverse talent



Sydney is **No. 1 in the Asia Pacific** and **No. 3** globally for top 100 ranked universities



NSW is home to **three of Australia's top five** highest ranked research universities

NSW is Australia's most innovative state with a strong culture of entrepreneurship



Sydney is the **2nd highest ranked city in the Asia-Pacific** region for innovation



NSW is the **startup capital of Australia**, home to more than 40% of all startups

NSW is Australia's most secure and liveable place to do business



Sydney is the **highest-ranked capital city** in Australia for quality of life



NSW is set to deliver on the **biggest infrastructure program in Australian history**, with a **A\$87.2 billion** pipeline of infrastructure

NSW is Australia's largest market



Home to **7.9 million people**, more than Singapore and Hong Kong



The state is **Australia's largest economy: A\$500 billion**, larger than Malaysia, Singapore and Hong Kong

Introduction

New South Wales (NSW) has the strongest defence¹ presence and the most sophisticated defence-related industrial base and research institutions of any state in Australia.

NSW has been the leading enabler of national defence since before federation in 1901, and has the greatest concentration of defence assets in the country.

NSW's position is enhanced by being Australia's economic, financial and educational powerhouse, contributing one-third of the country's gross domestic product and enjoying an AAA credit rating and record business investment.

The defence industry in NSW has core strengths and expertise in the most critical capabilities. These include advanced and subsystem manufacturing, sustainment of major systems, complex project management, complex systems integration, cyber security, and composite materials research, design and production.

As a result, all the major defence primes either have their headquarters in NSW or have a substantial presence in the state.

Today, NSW is also home to the majority of Australia's leading tertiary research and development institutions with significant experience in delivering on defence capability priorities and attracting international investment.

1 Department of Defence, the Australian Defence Force and related entities.



NSW attracts the highest annual defence investment across acquisition, sustainment and operations

Defence sector overview

NSW is home to more than one-quarter of Australia's military and defence civilian personnel, with 25,000 people including permanent members, reservists and civilians.

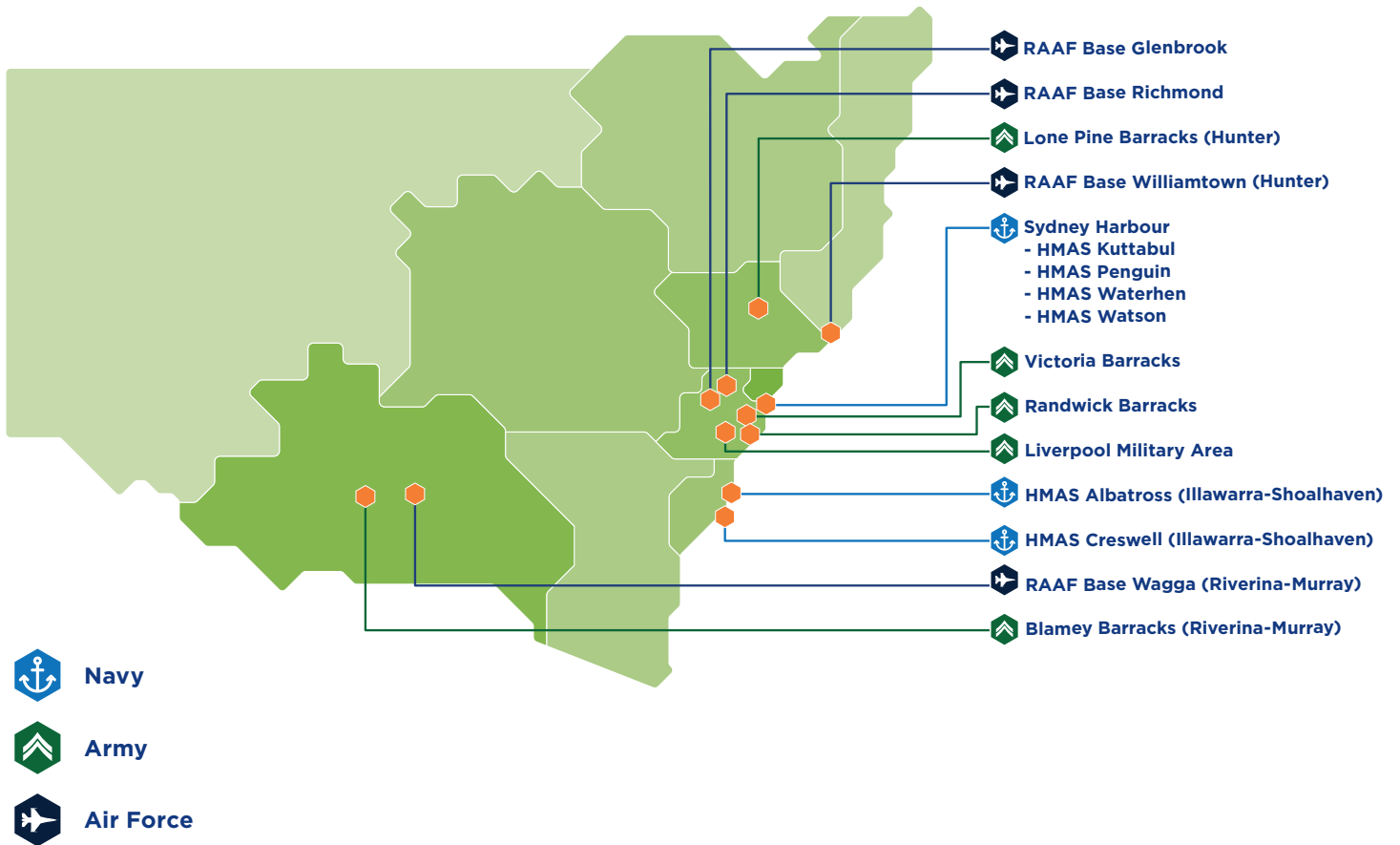
The state hosts more than 80 facilities, including 21 major defence bases and training sites—more than any other Australian state or territory. The operational headquarters for the Royal Australian Navy, the Australian Army and the Royal Australian Air Force, as well as the Joint Operations Command, are located in NSW. All three services have their strategic headquarters in the Australian Capital Territory—the ACT.

Additionally, NSW hosts major sustainment hubs for the Royal Australian Navy at Garden Island Defence Precinct, the Australian Army at Holsworthy Barracks, and the Royal Australian Air Force at RAAF Base Williamtown.

Supporting the greatest concentration of defence assets, NSW is home to the largest defence industrial workforce (6,500 direct and more than 29,000 indirect workers).

NSW also attracts the highest annual defence investment across Australia in acquisition, sustainment and operations (valued at approximately A\$9 billion per annum).

Major defence bases in NSW



Sector capabilities and enablers

NSW's strong industrial base underpins our defence capability

The defence sector is underpinned by a deep and complex industrial base with capabilities in materials research, industrial design, information and communication technology, and complex systems integration.

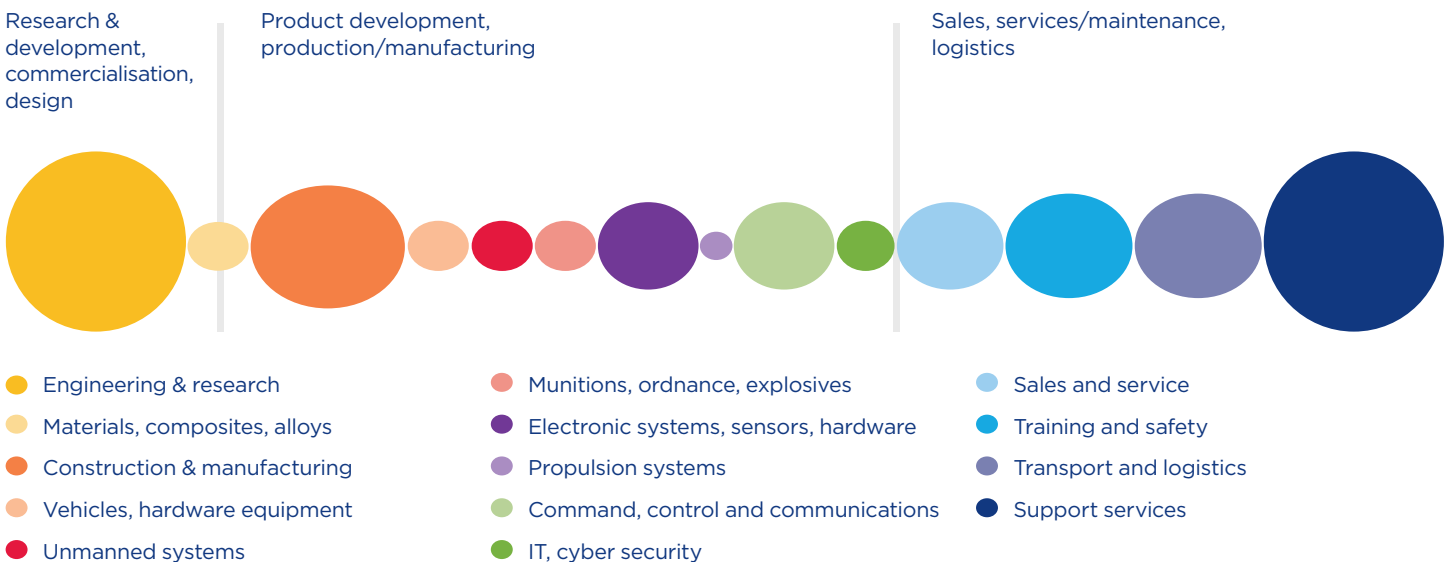
NSW offers these capabilities, positioning it well to meet current and future workforce skills needs.² For example, the industrial base for the defence sector in NSW includes highly innovative, competitive and world-leading manufacturers that are using state-of-the-art technology and highly skilled staff.

These manufacturers are vital to the diversity and strength of the Australian economy. Overall, manufacturers in NSW produce almost 30% of the country's total output in the sector, generating around A\$30.18 billion annually and accounting for one-third of manufacturing jobs.^{3 4}

Sector supply chain

NSW has strong capability across the defence sector value chain. The state's largest capacity is in support services including ground operations; training; emergency response; maintenance, repair and operations (MRO); project and data management; and engineering (including test and calibration).

Relative strengths of industry capability



2 Department of Industry NSW, 2017, *New South Wales: Strong, smart and connected - The NSW Government Defence and Industry Strategy 2017*, industry.nsw.gov.au/_data/assets/pdf_file/0011/98624/NSW-Strong-smart-and-connected-defence-strategy.pdf, accessed 8 June 2018.

3 Australian Bureau of Statistics, 2017, *Australian National Accounts: State Accounts, 2016-17*, cat no. 5220.0.

4 Australian Bureau of Statistics, 2018, *Australian Industry 2015-16*, cat no. 8155.0.



Image courtesy of Department of Defence image library.

Critical industry capabilities

Industry capability is spread throughout NSW but is generally close to defence presence and infrastructure in Sydney, including Western Sydney, and several specific regions.

Areas of Industry Capability in NSW

Capability	Sydney	Hunter- Newcastle	Illawarra	Western Sydney	Rest of NSW
Support services
Engineering & research
Construction & manufacturing
Training & safety
Transport & logistics
Sales & service
Electronic systems, sensors, hardware
Command, control & communications
IT, cyber security
Materials, composites, alloys
Unmanned systems
Vehicles, hardware equipment/platforms
Munitions, ordnance, explosives	.		.		
Propulsion	.	.	.		
Security, access control	.			.	

Key: ... Significant capability .. Developed capability . Some capability

Greater Sydney region

The Greater Sydney region—incorporating Sydney Harbour, Western Sydney and the Blue Mountains—hosts a significant number of Australian Defence Force (ADF) bases, facilities and personnel. This defence presence is complemented by the concentration of prime contractors and specialist small and medium-sized enterprises (SMEs) working in both defence and the wider industry.

Sydney hosts a number of industry clusters that are vital to the defence sector. These include acoustic technologies and systems; complex systems integration; cyber security; advanced materials and optics; helicopter and jet engine maintenance; simulation; intelligence, surveillance and reconnaissance; electronic warfare; space technologies; and small arms manufacturing.⁵

One vital industry is the sustainment of naval vessels. Directly and indirectly, the naval presence in Sydney contributes around A\$1.83 billion annually to the economy and supports more than 12,000 jobs.

The NSW Government is developing an aerospace and defence industry precinct at the future Western Sydney Airport. Northrop Grumman, a leading global aerospace and defence technology company, has committed to being an anchor tenant. The precinct will position NSW to continue its role as Australia's leading state for delivering complex defence systems.

The Western Sydney Aerotropolis defence and aerospace precinct offers the opportunity to create leading capabilities in industrial technology, including complex systems design and integration, logistical support and cyber security.

⁵ Department of Industry NSW, 2017, *New South Wales: Strong, smart and connected - The NSW Government Defence and Industry Strategy 2017*, industry.nsw.gov.au/__data/assets/pdf_file/0011/98624/NSW-Strong-smart-and-connected-defence-strategy.pdf, accessed 8 June 2018.

Critical industry capabilities

Regional NSW

The Hunter Region, including Newcastle, Williamstown and Singleton, hosts key Air Force and Army establishments, such as RAAF Base Williamstown, Australia's premier jet fighter base. Key defence industry capabilities include sustainment of major aircraft platforms, advanced electronics and infantry training, and maritime sustainment.

The South Coast Region includes the Shoalhaven and Illawarra. The Shoalhaven is home to the Navy's Fleet Air Arm, and is renowned as Australia's centre for naval aviation. Key defence industry capabilities include design, manufacturing and in-service support for mechanical and electrical systems, test regimes, and simulation and training services.

The Illawarra has a sophisticated innovation ecosystem that is at the cutting edge of research and industry collaboration.

Leading research and development institutions include the Defence Materials Technology Centre and the Centre for Computer and Information Security Research.

The Murray–Riverina Region, including Wagga Wagga, Albury and Mulwala, plays host to defence's presence at RAAF Base Wagga, and the Blamey and Latchford barracks. The region is also home to military training and specialised contract engineering, as well as propellant and explosives manufacturing.

The North Coast Region, including the towns of Yamba, Port Macquarie and Taree, has numerous defence industry capabilities, including small-vessel design and manufacturing; maritime sustainment and disposals; and the design, manufacturing and support of specialist defence products.

The Capital Region, including Queanbeyan and Goulburn, adjoins the ACT. The ACT is home to the Australian Government departments that formulate policies on defence and security, and make decisions on national defence acquisitions and sustainment. The ACT–NSW Memorandum of Understanding for Regional Collaboration signed in 2016 underpins the strengthening relationship between the two jurisdictions.

NSW Defence and Industry Strategy

The state government launched the NSW Defence and Industry Strategy, *NSW: Strong, smart and connected*, to support defence industry development, and increase investment and innovation in NSW. The whole of NSW government strategy prioritises the defence sector as a key driver of growth, especially in regional NSW, and aims to further cement NSW as the heart of Australia's defence sector.

The strategy is built around five key themes: building stronger relationships; leveraging critical strengths; growing the future workforce; sustaining regional industry; and driving research and innovation.

The NSW Department of Industry formed a dedicated team, Defence NSW, to execute the strategy by creating the conditions for sustainable, technologically advanced and globally competitive defence industries across the state. Defence NSW provides whole of NSW government leadership, advocacy and engagement with the defence sector.

Defence research organisations focus on enhancing capabilities

NSW has well developed R&D capability across the defence sector including significant capability across the nine defence priority technologies. There has been significant investment in centres of excellence, infrastructure and training in NSW.

NSW universities receive 30% (A\$3.2 billion) of national university R&D expenditure, and 18% (A\$16 million) of national university defence R&D expenditure.

The presence of NSW capability across the entire value chain coupled with strong R&D capability makes NSW an ideal 'test bed' for innovation. Primes have the opportunity to partner with NSW universities on R&D projects and then work with NSW companies to test, commercialise and build a supply chain prior to global roll out.

The NSW Defence Innovation Network

The NSW Defence Innovation Network (DIN) was launched in 2017 to strengthen research and development in defence priority areas such as quantum technologies, trusted autonomous systems and cyber security. This state-sponsored partnership between the Defence Science and Technology Group (DSTG) and seven world-class universities is enhancing collaboration with industry to enable faster development and commercialisation of technologies.

The network's founding universities are:

- Macquarie University (MQ)
- University of New South Wales (UNSW)
- University of Newcastle (UoN)
- University of Sydney (USYD)
- University of Technology Sydney (UTS)
- University of Wollongong (UoW)
- Western Sydney University (WSU).

Summary of relative R&D strengths across the Defence Innovation Network

Defence Priority Technologies	Macquarie Uni. (MQ)	Uni. Of NSW (UNSW)	Uni. Of Newcastle (UoN)	Uni. Of Sydney (USYD)	Uni. Of Tech. Sydney (UTS)	Uni. Of Wollongong (UoW)	Western Sydney Uni. (WSU)
Advanced sensors and intelligence
Autonomous systems
Communications, electronics and digital technology
Cyber and IT security
Enhanced human performance and protection
Hypersonics				
Material sciences and manufacturing
Quantum technologies	
Space technologies

Capability: . Some .. Developed ... Highly developed

Table excludes Australian Catholic University, Southern Cross University and University of New England as defence relevant capability was assessed as limited. Assessed with reference to ERA Report 2015, ARC Grants Database, State of Research in Australian Universities Report (Barlow, 2015), League of Scholars Research Database, NSW Defence Innovation Network capability database, NSW Cyber Security Network capability map, NSW Smart Sensing Network capability database, independent research.

NSW also boasts numerous leading defence industry-related research institutions, including:

- The Centre for Quantum Computation and Communication Technology at UNSW, which is making one of the largest combined and focused efforts in quantum computation and communication in the world⁶
- The Centre for Autonomous Systems at UTS, an internationally acclaimed robots research group⁷
- The SMART Infrastructure Facility at UoW, an international leader in applied infrastructure research⁸
- The Steel Research Hub at UoW, which is providing innovative solutions and breakthrough technologies in the steel industry.⁹

Commonwealth policy and strategies

The Australian Government's 2016 Defence White Paper outlines programs and acquisitions worth more than A\$200 billion over the next decade. The Australian Government has since developed federal policy and plans that align with the national approach to defence challenges adopted in the NSW Defence and Industry Strategy, *NSW: Strong, smart and connected*. These include an integrated investment program, defence industrial capability plan, naval shipbuilding plan and a defence export strategy.¹⁰

6 Centre for Quantum Computation and Communication Technology, 2018, cqc2t.org/research

7 University of Technology Sydney Centre for Autonomous Systems, 2018, uts.edu.au/research-and-teaching/our-research/centre-autonomous-systems

8 University of Wollongong Australia, 2018, smart.uow.edu.au

9 Steel Research Hub, 2018, steelresearchhub.uow.edu.au

10 Department of Industry NSW, 2017, *New South Wales: Strong, smart and connected – The NSW Government Defence and Industry Strategy 2017*, industry.nsw.gov.au/__data/assets/pdf_file/0011/98624/NSW-Strong-smart-and-connected-defence-strategy.pdf, accessed 8 June 2018.

Case study: Thales and Raytheon

The world-leading underwater systems facility at Rydalmere in Western Sydney is an example of the outstanding complex systems development and sustainment capabilities available in NSW. The recent selection of Thales Australia, in partnership with combat system integrator Raytheon Australia, to deliver new sonar systems to the Navy's current fleet of submarines is a testament to this capability. It also highlights the depth of the extensive defence industry ecosystem of smaller supporting companies, such as Sonartech Atlas in Macquarie Park, and the potential for continued development of sovereign sonar capability for our new Hunter Class frigates and Attack Class submarines.

Case study: Australian Munitions

Thales also owns Australian Munitions, the only manufacturer of explosives, propellants and concentrated acid products for defence applications in Australia. The Mulwala Propellant Facility in regional NSW manufactures high-quality propellants and explosives that perform at consistent velocities over an extended temperature range—a fine example of sovereign defence industry capability. Australian Munitions is the largest supplier of explosive ordnance to the ADF and has world-class propellant research and development capabilities.¹¹

¹¹ Department of Industry NSW, 2017, New South Wales: Strong, smart and connected - The NSW Government Defence and Industry Strategy 2017, industry.nsw.gov.au/__data/assets/pdf_file/0011/98624/NSW-Strong-smart-and-connected-defence-strategy.pdf, accessed 8 June 2018.



Image courtesy of Department of Defence image library.



Case study: BAE Systems Australia

The Joint Strike Fighter program will meet the country's air combat needs beyond 2040. Under the program, Australia will acquire 72 Lockheed Martin F-35 Lightning aircraft. It will also deliver facilities, weapons and new support systems to meet fifth-generation requirements.

BAE Systems Australia in Williamstown will deliver the sustainment facilities and servicing to maintain, repair, overhaul and upgrade the aircraft.¹²

The workforce is being transitioned to have the high-technology skills needed to operate and sustain the fleet as

part of a global network and to create a regional sustainment hub for the Asia Pacific.¹³

Former Prime Minister Malcolm Turnbull described the program as 'an example of how our Defence Industry Plan is not simply securing our Air Force and our Army and our Navy with the capabilities they need to keep us safe in the 21st century, but it is driving the advanced manufacturing, the jobs, the advanced technology that Australians need to make sure our children and grandchildren have the great opportunities in the years ahead'.

¹² Australian Financial Review, 2017, "Australia wins huge maintenance program to support F-35 aircraft", afr.com/news/special-reports/defence-and-national-security/huge-maintenance-program-to-be-put-in-place-to-support-f35-20170303-guq4u3

¹³ Department of Defence, 2018, Joint Strike Fighter Division, defence.gov.au/casg/aboutcasg/ourstructure/air/jointstrikefighterdivision

Case study: Bisalloy Steels

Unanderra-based specialist steel finishing company Bisalloy Steels has won a contract to work on the add-on armour range for armoured fighting vehicles being built by Rafael Advanced Defense Systems.

The deal is evidence of NSW's sovereign defence industry capabilities in military-grade armour steel production. It also shows that SMEs in regional Australia can successfully compete for and win global supply chain contracts with big defence companies.

Welcoming the contract, former Minister for Defence Industry Christopher Pyne said: 'This contract demonstrates Australian defence industry's world-class capabilities, creating and securing jobs and opportunity in regional areas as well as urban ones.'





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How we can help

The NSW Government's Industry, Trade and Investment Team can help you establish, innovate and grow your business in Sydney and NSW. Our dedicated team works with experts across all levels of government (local, state and federal) and business networks to provide customised information for businesses. This service is free and confidential.

We can provide:

- market intelligence and investment opportunities
- support for business case development
- identification of suitable investment locations and partners in NSW
- facilitation of familiarisation visits to NSW
- advice on NSW government programs and approval processes
- connections with government contacts including the Defence NSW Team and the local business network.

Contact us

The NSW Government is here to help you. If you need assistance, or have any questions, please contact NSW Government's Industry, Trade and Investment team.

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The Future Made Here

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The information contained in this publication is based on knowledge and understanding at the time of writing (February 2019). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Department of Industry or the user's independent adviser.

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