



The Illawarra Shoalhaven 10-year defence industry strategy

ACKNOWLEDGEMENT OF COUNTRY

KPMG acknowledges Aboriginal and Torres Strait Islander peoples as the First Peoples of Australia. We pay our respects to Elders past, present, and future as the Traditional Custodians of the land, water and skies of where we work.

At KPMG, our future is one where all Australians are united by a shared, honest, and complete understanding of our past, present, and future. We are committed to making this future a reality. Our story celebrates and acknowledges that the cultures, histories, rights, and voices of Aboriginal and Torres Strait Islander People are heard, understood, respected, and celebrated.

Australia's First Peoples continue to hold distinctive cultural, spiritual, physical and economical relationships with their land, water and skies. We take our obligations to the land and environments in which we operate seriously.

We look forward to making our contribution towards a new future for Aboriginal and Torres Strait Islander peoples so that they can chart a strong future for themselves, their families and communities. We believe we can achieve much more together than we can apart.



We would like to thank Business Illawarra, together with its partners the Illawarra Shoalhaven Joint Organisation, Shoalhaven City Council and the Illawarra Shoalhaven Regional Defence Network.

We also wish to acknowledge the members of the Illawarra Shoalhaven Defence Industry Development Strategy Working Group, which include:

- Department of Regional NSW
 - Illawarra Innovation Industry Network (i3net)
 - Wollongong City Council
 - Shoalhaven Business Chamber
 - University of Wollongong
 - AusIndustry
 - Office of Defence Industry Support
 - Investment NSW
 - Regional Development Australia – Illawarra
 - Industry Capability Network – Illawarra/South East NSW
-

Front cover: HMAS Hobart's embarked MH-60R helicopter "Carnage" conducts deck landing practice as the ship transits through the Indonesian Archipelago during a Regional Presence Deployment. Credits: LSIS Daniel Goodman.

His Majesty's Australian Ships Armidale, Larrakia, Bathurst, Albany and Broome sail in formation through the waters of Beagle Bay, off Darwin, Northern Territory, during a patrol boat fleet concentration period. Credit: POIS Peter Thompson.

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A long exposure shot at sunrise near Kiama blow hole. Wologshan Photography - Getty.



The Illawarra Shoalhaven can leverage defence industry growth to deliver wider regional economic uplift. The most value will be realised through the region's traditional defence manufacturing and sustainment base combined with capabilities at the intersection of the Sovereign Industrial Capability Priorities, adjacent industry priorities and export market demand.

The Illawarra Shoalhaven region

The Illawarra Shoalhaven is a growing defence region with unlocked potential. Its strengths lie in steel manufacturing, naval aviation and R&D.

Sydney 95kms

Canberra 115kms

UNIVERSITY OF WOLLONGONG

World leading university with prominent R&D organisations:

- Defence materials Technology Centre
- SMART Infrastructure facility
- Steel Research Hub
- Centre for Computer and Innovation Security Research
- Defence Science and Technology Group

TAFENSW

High end vocational technical training.

\$1.4bn

Direct contribution of Defence

2,166

Direct Defence employees



Sydney

Illawarra Shoalhaven region

Wollongong LGA

Port Kembla



HMAS Albatross

Home of the RAN's only Air Station and is the largest operational Naval establishment. Primarily supports RAN's 5 naval air squadrons.



Connected to HMAS Albatross is the Albatross Aviation Technology Park which supports the Defence and aviation industries

HMAS Creswell

Located in Jervis bay, it is a key Navy asset focused on training and development.



Consists of:

- Royal Australian Naval College
- The School of Survivability and Ship's Safety
- The Beecroft Weapons Range

Regional Defence stakeholders



Executive summary

The Illawarra Shoalhaven can grow its contribution to the state and national sovereign defence supply chain over the next decade and benefit from the unprecedented increase to the Defence budget and spend on capability. A strong manufacturing sector combined with a growing information economy provides the region with the skills and capacity to transform into a domestic and internationally significant defence industry player.

This ambition will be realised through the region's traditional defence manufacturing and sustainment base, combined with supporting capabilities at the intersection of the Sovereign Industrial Capability Priorities (SICPs), adjacent industry priorities and export market demand. In doing this the region will not only grow its direct contribution to the defence industry, but provide wider regional economic and social uplift.

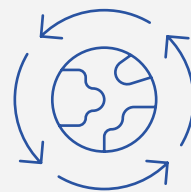
Delivering on this 10-year defence industry strategy will require an all of region collaborative effort. In line with the imminent release of the Defence Strategic Review and the acknowledgment of a rapidly changing regional and global security environment, securing Australia's sovereign defence capability also requires the region to act with a sense of urgency.

Leveraging existing skills and capabilities and developing clear governance and accountability, the strategy will support practical outcomes for the region.

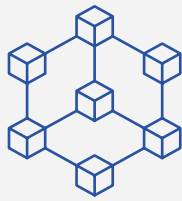
By focusing on six key strategic focus areas, the strategy will drive the growth of local prime-capable medium sized businesses and create the mechanisms for greater engagement and innovation.



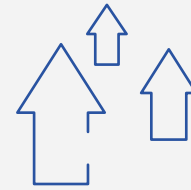
Through the transition of initiatives into a new Illawarra Shoalhaven defence industry alliance, existing stakeholders will lead an organisation that will advocate on behalf of the region's defence industry and connect local businesses into supply chain opportunities.



The Illawarra Shoalhaven can align itself to the SICPs, increase defence spend and access emerging markets and global supply chains through a sustained focus on building capability across AI, robotics, autonomous systems, ICT, cyber security and quantum technology.



Promoting the region as a highly capable ecosystem of defence industry innovation will create a visible symbol of local defence capability. Formalising partnerships across the spread of existing assets will support greater collaboration and innovation and become a mechanism to attract and engage with opportunities from defence primes, government, academia, sources of capital, other regions and overseas markets.



Leveraging the existing defence industry base and complimentary skills from adjacent sectors, the region can win a greater allocation of defence spend across major inflight and planned acquisition and sustainment programs.



Growing the number of major primes in the region will provide significant supply chain opportunities, connect the region into export markets and validate the Illawarra Shoalhaven as a major contributor to the Australian sovereign defence value chain.



Supporting a pipeline of highly skilled workers trained in STEM will provide the region with the talent required to execute on the long-term defence agenda, while creating opportunities in adjacent industries and export markets.



01 Introduction

As the complexity of the global defence landscape continues to evolve, regional centres such as the Illawarra Shoalhaven will continue to play an increasingly important role in helping the Australian Defence Force (ADF), the broader defence community and those in the defence industry to deliver on their mission to protect Australia and its national interests.

Competition for strategic influence in the Indo-Pacific, along with increasing conflict in Eastern Europe is expected to continue to drive geopolitical instability. In addition, the re-emergence of great power competition (USA, Russia and China) and a fight for technological supremacy is also likely to be a major influence on the defence arena over the near-term. As the defence landscape evolves in this way, emphasis will continue to shift from the rogue state and the counter terrorism agenda of the past decade, toward the development and maintenance of a superior military capability and technology advantage as a means of conflict deterrence.

The future battle space will continue to become increasingly dependant on a wide range of interoperable technologies, weapon systems and platforms. These will need to seamlessly support rapid deployment and redeployment of systems and assets and be informed by highly effective battlespace awareness in order to swiftly align with mission intent and minimise the possibility of unintended applications.

With so much at stake, today's defence forces are in a race to transform. In Australia, a recalibration is currently occurring as the ADF looks to accelerate its push to modernise its air, land and maritime capability in alignment with the 2016 Defence White Paper and subsequent 2020 Defence Strategic Update.

This systematic modernisation is driving an on-going need to fast-track digital adoption, explore new and innovative battle space and weapon systems, prepare for conflict in the emerging space and cyber domains and secure sovereign supply chains. All of which will require greater working relationships with alliance partners and commercial providers.

Regional centers such as the Illawarra Shoalhaven are critical in supporting the successful delivery of these strategic Defence priorities. A significant proportion of Defence's capability development, supply chain logistics and service delivery relies on coordination and delivery through regional centers.

The Illawarra Shoalhaven region has a long and proud history of supporting Australia's national security and the ADF. The region's defence sector has an annual output of AU\$1.4 billion and a diverse and productive industry who are actively engaged in the defence supply chain.

Regional capabilities are shifting from traditional heavy industry into advanced and smart manufacturing, as well as emerging technologies to support a growing digital economy. There is an opportunity for the region to continue to build on these strong foundations and help position a technologically advanced ADF that can react effectively to a multitude of scenarios.

This strategy, centered around six key strategic focus areas offers one potential view for what a more defence focused Illawarra Shoalhaven regional center could look like. The defence industry can be used as a key enabler as the region continues to transform from its industrial and steel-making roots into a region with a highly developed innovation, technology and research led economic base.

Strategic context

The national picture

Geopolitical instability is on the rise within the Indo-Pacific. The region is undergoing a significant shift towards increased hostility and escalating strategic competition for global influence, which is predicted to reach its highest level since the Cold War.

Not only is geopolitical instability high, but military tension and risk are rising at an alarming rate. The 2020 Defence Strategic Update deemed the traditional ten-year strategic warning time as inappropriate, as regional military capabilities, grey-zone activities and cyber-attacks grow in prominence. High-speed technological advancements, advanced military systems and more aggressive tactics have shortened warning times and increased the likelihood of conflict. This has been demonstrated by the Russian invasion of Ukraine, which serves as a reminder that large-scale war remains a possibility. In addition, China, drawing strategic lessons from the Ukraine war may well advance its timeline for action against Taiwan or lean even further forward into the development of operating bases in our region.

As a result, while the Indo-Pacific has historically been characterised by a cooperative environment based on the common ideals of economic and political liberalism, this is rapidly being challenged by growing strategic competition. As the defence landscape evolves in this way, emphasis will continue to shift from the rogue state and counter terrorism agenda of the past decade toward the development and maintenance of a superior military capability and technology advantage as a means of conflict deterrence.

Australia will play a crucial role in addressing these challenges and ensuring security within the Indo-Pacific. However, the effectiveness of these efforts will largely depend on the actions of established alliances such as NATO and newer ones like AUKUS (UK, US, Australia) and QUAD (US, India, Japan, Australia). These alliances aim to enhance security and capabilities in the region by collaborating on innovation and intellectual property, conducting joint training and operations, investing in infrastructure and capabilities and implementing interconnected systems.

Nations will also require more agile and responsive procurement approaches, as speed becomes a paramount consideration to address the reality of medium-term threats. In order to meet heightened readiness requirements, Defence is expected to undertake procurement more rapidly, funded by increased budget allocations. Over this decade, Defence's total Government funding in Australia will exceed \$575 billion, with over \$270 billion being invested into defence capability and defence industry. This will be driven by a spike in acquisition costs as Defence accelerates its push to modernise air, land, and maritime capability.

There will likely also be a build-up of sovereign defence capabilities to reduce reliance on challenged global supply chains and boost domestic industries. Governments will increasingly take a whole-of-country (and associated alliances) focus in firming up the critical inputs to their defence forces. On-shoring and near-shoring will be on the rise, with new agreements between allies and neighbours. Locally, the Sovereign

Industrial Capability Priorities (SICPs) will be the focus of Australia's efforts to ensure this critical resource control. These fourteen priorities are a clear indication of where the ADF will draw its competitive advantages from and where industry should focus if they are to be a significant beneficiary of Defence funding.

There will also be a focus on improving the way capability requirements are linked with Australian defence industries. The Australian Government will aim to strengthen Defence's collaboration with the local defence industry, cutting red tape and investing in new technologies to support the Australian defence industry's competitiveness, create economic opportunity and support the nation's defence capabilities. As a result while geopolitical and geostrategic pressures are accelerating and testing the nations' resilience, they are also creating new opportunities.

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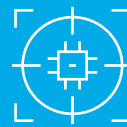
The future of defence



DIGITAL MODERNISATION

Defence forces are under increasing pressure to accelerate investment in digital modernisation, which has become a key driver of defence capability and effectiveness.

Multi-domain connectivity that seamlessly connects complex weapon systems, command and control systems, coalition partners and critical elements of the supply chain will provide decision makers with more accurate and actionable information. Robotics, automation and nanobots will augment and in some cases replace humans entirely¹ Data analytics and quantum computing are making it possible to process and analyse thousands of inputs simultaneously, helping to dramatically improve decision-making.



WEAPON AND BATTLESPACE SYSTEMS

In the next decade, any potential conflict is likely to take place in a highly connected, intelligent battle space. The range, lethality and speed of weapon systems will continue to increase and will be informed by highly effective battlespace awareness and command and control capabilities. Advances in fields such as artificial intelligence, robotics and autonomous systems are already changing the way militaries operate and are likely to have an even greater impact in the future. Additionally, there will likely be a continued focus on developing hypersonic weapons with increasing speed and range, directed energy weapons such as laser and microwave systems, and swarm capabilities that allow for mass concentration of weapon platforms operating autonomously. There will also be a trend towards greater interoperability as defence forces invest in ensuring these assets can integrate with legacy and allied partner platforms.

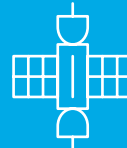


CYBER SECURITY

As technology becomes more deeply embedded in military operations, protection against cyber threats is becoming crucial to mitigate the risk of attacks on critical infrastructure and sensitive data.

Whilst connectivity and interoperability are critical, challenges such as security of data held in other countries and differing cyber security standards will lead to vulnerabilities in supply chains. As advanced weaponry becomes more prevalent, defence organisations will require a more holistic approach to assessing and managing the risks of cyber attacks, both the systems and their human operators.

Governments and defence forces will continue to invest heavily in technologies, professionals and infrastructure to protect their networks and systems from these threats.



SPACE DOMAIN

The space domain is becoming increasingly important as nations invest in space-based technologies for military purposes. Satellites traditionally used for surveillance and communications will be increasingly militarised and as technology advances, space will increasingly become a domain of operation and competition.

Defence organisations will need to rethink the way they attract, train and retain their workforce, as the skills required across the space domain are some of the most in-demand Science Technology, Engineering and Mathematics (STEM) capabilities globally.² To acquire the depth of innovation and talent required to build effective space operations of significant influence, defence forces will continue to form meaningful partnerships with academic institutions.



SOVEREIGN CAPABILITY

Amidst geopolitical turmoil and the COVID-19 pandemic, governments have had to reassess their domestic industrial capabilities as a potential alternative to offshore supply chains.³ There is now a growing desire for increased local production and support, a trend that is expected to persist to meet broader strategic objectives. With supply chain interruptions potentially hindering access to vital components, supplies, and systems, onshore and near-shore sourcing is gaining momentum, with new partnerships being formed between nations and their neighbours. Collaborating with established defence suppliers and industry leaders can enhance compatibility and communication with allies while also enhancing cost efficiency and strengthening sovereign capacity.



INDUSTRY AS A FUNDAMENTAL INPUT TO DEFENCE CAPABILITY

Industry plays a crucial role in providing the necessary inputs for defence capability development. The relationship between defence and industry will continue to strengthen as defence organisations continue to rely on industry partners as a fundamental input to capability, and in Australia, to fulfil their AIC requirements.

Capability development must move quickly in order to continue to outpace adversaries.

Defence organisations will look to industry to finance research and development, engineer new products quickly and efficiently and then sell them to their Government partners with minimal customisation. Defence organisations, in turn, will appropriately reward companies that take on risk and development costs for the technology they build.



SUPPLY CHAINS

The supply chain disruptions that began during the COVID-19 pandemic have caused defence forces and defence organisations to reconsider their manufacturing footprint and improve the reliability of supply. Traditional linear supply chain models will no longer be able to adapt to the dynamic and rapidly changing nature of modern warfare. As a result, supply chains, must allow for flexibility and rapid adaptation, enabling the defence industry to respond quickly to changing requirements and unexpected disruptions.

Defence must continue investing in sovereign industrial capabilities in response to the challenges of regional competition and vulnerabilities exposed by the pandemic.



FUTURE WORKFORCE

The defence workforce of the future must be able to adapt quickly to the rapidly evolving technological landscape. This requires a closer integration of humans and machines, ongoing re-skilling and a culture that values creative and flexible thinking to anticipate and respond to various situations.⁴ Individuals with technical-creative expertise in fields such as space, artificial intelligence, and cyber will be highly valued and increasing their supply to market will depend on supporting greater participation in STEM educational pathways.

SMEs that want to enter the defence market must find innovative ways to attract new talent and provide current employees with new training and re-skilling opportunities.



00 Regional profile

The Illawarra Shoalhaven

The Illawarra Shoalhaven, the traditional home to the Wodi Wodi, Dharawal, Wandandian, Yuin, and Murramarang Aboriginal peoples, comprises the four Local Government Areas of Wollongong, Shellharbour, Shoalhaven and Kiama. The region is the third-largest regional economy in New South Wales (NSW), contributing AU\$26.3 billion in gross regional product.⁵ The region's diverse economy and relaxed coastal lifestyle make it an attractive place for people to live, work and visit. Its proximity to Sydney and Canberra also allows for industry, business and residents to easily connect with metropolitan economic and employment opportunities.

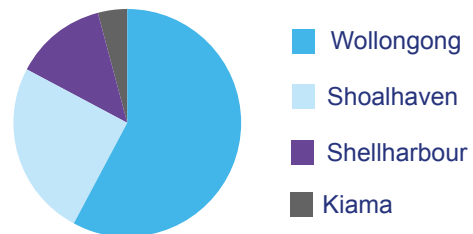
The traditional drivers of economic growth have been the construction and manufacturing sectors, particularly steel making. The Port of Port Kembla is vital to the output of the region and a key piece of the local economic infrastructure. The deep seaport is one of the busiest in Australia, handling a wide range of cargo including coal, petroleum, iron ore and general cargo. It is a major gateway for trade and commerce, connecting the region to domestic and international markets. Holding undeveloped spare capacity, the port is a critical asset for continued regional growth.

In the last two decades, the region has diversified from this industrial base into a region that also boasts innovative service, health, and digital capabilities. With 45% of the working population holding a bachelors degree or higher, above that of the Australian average, the region is steadily moving towards a value-added information economy. Information and Communication Technology (ICT) is playing a key role in this development, supporting a growing high-tech industry in areas of software development, data analytics and communications. Along with attracting a growing number of start-ups, the region is home to several larger ICT players including the Wollongong unicorn Scalapay.

The Illawarra Shoalhaven has a growing and diverse economy, with a range of industries contributing to its economic growth. Combining its heavy industry base with a growing information and knowledge economy, the region is supported by a number of tailwinds making it an attractive option to live, work and invest in.

\$26.3bn
Gross Regional Product⁶

Illawarra-Shoalhaven's GRP contribution share by LGA⁷



162,238
Employed Persons⁸

45.1%
Have a bachelors degree or higher⁹

422,558
Residents¹⁰

Case study:

University of Wollongong

Through the formation of strong partnerships with the NSW Government and defence industry players, the UoW has been successful in promoting innovation and creating opportunities in the Illawarra Shoalhaven region. Throughout the years, the University has maintained a consistent presence in defence-related research, development, innovation and training and has provided cutting-edge defence technology and services to Australia's defence industries. UoW has expertise in materials engineering, IT for defence-related cyber security projects and automation.

UoW is also a founding member of the Defence Materials Technology Centre (DMTC). The DMTC is a Department of Defence supported national research centre that partners with defence industry to provide materials and manufacturing solutions. Through DMTC, UoW has developed innovative solutions to materials engineering, particularly in steel research, welding and joining which has resulted in improved armoured steels for a range of defence uses.

One of UoW's most notable achievements in defence technology is its contribution in the manufacturing of the Bushmaster protected mobility vehicle. UoW developed the technology to automate the welding of the frame to extremely high-levels of precision, improving the protective capacity for passengers. This technology was also later used to weld the Hawkei light four-wheel drive protected mobility vehicle. The software developed by the UoW simplifies the programming of the welding robot, making the manufacturing process more efficient while increasing the safety of the vehicles.


As the defence industry continues to evolve, progressing towards digital modernisation reliant on automation, cloud computing and the Internet of Things, the University continues to apply its expertise in these areas. The UoW has an international reputation as being at the forefront of cyber security research through its Institute of Cyber Security and Cryptology, working closely with the Australian Signals Directorate and the DST Group. The University is also developing a strong pipeline of talent in ICT, graduating more than 1,000 students each year.

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Additionally, the UoW offers post-graduate training for members of the ADF through their Faculty of Business and the Australian National Centre for Ocean Resources and Security (ANCORS). ANCORS is Australia's only multidisciplinary university-based centre dedicated to research, education and training on ocean law, maritime security and natural marine resource management.

The University continues to make significant contributions to the defence industry of Illawarra Shoalhaven through promoting innovation, research and training for both defence industry players, along with Defence personnel.



The University of Wollongong (UoW) has established a strong reputation as a key player in linking Defence with industry and academia.

Royal Australian Navy sailor Able Seaman Marine Technician Hamish Scott demonstrates the marine technical console in destroyer HMAS Sydney to Madeleine Devitt, a candidate from Defence Force Recruiting Wollongong during the Indo Pacific 2022 conference in Sydney.
Credits: LSIS Matthew Lyall.

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Case study:

BlueScope

BlueScope has been operating in the Illawarra Shoalhaven region for almost a century and has been a key player in the region's economic growth and development.

The company operates a steelworks plant at Port Kembla, which is the largest single-site steel production facility in Australia, and one of the largest in the world. The plant employs over 4,000 people and contributes significantly to the local economy by providing jobs and supporting local businesses.

BlueScope has made significant contributions to defence in Australia. The company has been a supplier of steel products to the ADF for many years and has played a crucial role in supporting the country's defence capability. BlueScope provides a great example of how an industry player collaborating with a university, defence prime and local industry can produce innovative solutions for Defence while increasing revenues and creating local opportunities.

A demonstration of this includes BlueScope's work with Bisalloy, the UoW and Rheinmetall Defence Australia. BlueScope has partnered with Bisalloy, providing them with the steel that they finish into high performance armour steel for a variety of defence platforms. UoW provides expertise in the areas of welding, automation and materials. Vehicles are then manufactured by Rheinmetall Defence Australia, one of the largest suppliers of military vehicles to the ADF.

BlueScope has also collaborated with the UoW and Defence Science and Technology Group (DSTG), co-ordinated through the DMTC, to produce an Australian-made steel

with improved performance and enhanced blast resistance.

The success of this research, led BlueScope and UoW to win the Defence Science and Technology Enterprise Collaboration award for 2022, which celebrates the achievements of organisations, teams and individuals who consistently collaborate, innovate and contribute to enhancing science and technology outcomes for Defence.

BlueScope also has a long-standing partnership with BAE Systems, a leading global defence and security company that provides a range of products and services to the global defence industry. The partnership between the two companies has allowed BlueScope to further ingrain themselves within the defence industry by leveraging BAE Systems' depth of expertise and experience in the defence sector. BlueScope has established itself as a one stop shop for BAE Systems, providing extensive project management capability to ensure they can source all of the steel and aluminium required for their defence projects. This includes manufacturing, supply chain solutions and product storage.

The culmination of a strong history of collaboration between BlueScope, local industry, primes and the UoW has ultimately led to BlueScope Steel's AU\$217 million Advanced Steel Manufacturing Precinct around the Port Kembla steelworks. In 2022, the Government announced a AU\$55.5 million grant for the precinct, under the Collaboration Stream of the Modern Manufacturing Initiative.

\$55.5m

Grant for the precinct announced by the Federal Government

The precinct is a collaboration between BlueScope and its partners Keppel Prince, Bisalloy and the UoW. It includes a new facility that will be able to produce plate steel for armoured vehicles and ocean vessels, as well as steel used to create wind turbine towers and large-scale solar installations. The precinct is expected to reduce the need for overseas imports and secure Australia's sovereign capability in steel fabrication. It is estimated that more than 200 people will be employed directly in steel manufacturing once the precinct is up and running, adding a further 1,000 more workers in adjacent industries.

BlueScope has illustrated the potential impact and economic uplift successful partnerships and collaboration between local industry, primes and universities can create. The company has made significant contributions to the Illawarra Shoalhaven region through strong collaboration and continues to be a key player in the region's economic growth and development.



BlueScope has been operating in the Illawarra Shoalhaven region for almost a century and has been a key player in the region's economic growth and development.

Worker in a steel factory - stock photo. Credits: Buena Vista Images.

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Flight deck team prepare to conduct a recover assist with HMAS Arunta's embarked MH-60R helicopter "Athena" during a Regional Presence Deployment. Credit: LSIS Susan Mossop.

Objectives and guiding principles

COLLABORATION



Ensuring there is community and industry engagement and buy-in throughout the strategy's development and execution. Early and intentional engagement with the community, key industry players, government and defence primes will be prioritised to ensure their input is captured to help shape implementation. This is expected to facilitate early buy-in and support success.

LEVERAGE EXISTING CAPABILITIES



Avoiding unnecessary duplication of effort and maximising existing capabilities within the region. The strategy was developed with the goal of leveraging and building on existing resources and previous advocacy work to achieve desired outcomes more efficiently. There will be an emphasis on leveraging the collective capability of the existing ecosystem to execute the strategy.

CLEAR GOVERNANCE



Establishing leadership and accountability for the strategy, combined with strong management principles will enable its effective implementation. This approach is intended to guarantee the most efficient regional economic uplift via defence industry growth.

OUTCOME DRIVEN



Emphasising the need for a practical and results-oriented strategy and action plan. This means that all actions are developed with the end-goal in mind and tasks are practical and realistic for all stakeholders involved in order to drive execution. In addition, there is a focus on delivering short-term wins and long-term value.

The economic opportunity

Over this decade, Defence's total government funding in Australia will exceed \$575 billion, with over \$270 billion being invested into defence capability and defence industry. The unprecedented expansion of the Defence budget will support the onshoring of inputs that are critical to achieving long-range regional deterrence. The Government has provided clear guideposts as to where the bulk of this investment will be deployed through the acknowledgement of the Sovereign Industrial Capability Priorities (SICPs). An all of government approach will ensure that Australia has control or easy access to the resources that underpin these fourteen priorities.

Additionally, the AUKUS Agreement is a watershed moment for further developing Australia's sovereign defence capabilities. The agreement will deliver Australia eight nuclear powered submarines, providing a significant long range deterrence capability. With Port Kembla one of three potential sites for the submarines, this presents a significant opportunity to grow a new industry and workforce around the submarines. AUKUS will also usher in a once in a generation opportunity for defence industry collaboration, particularly for those developing emerging technologies. Together this presents an enormous economic opportunity for defence industry players to realise government investment,

private funding, prime collaboration, employment and export opportunities through alignment to these critical capabilities.

The Illawarra Shoalhaven can play a key role in the state and national defence landscape, helping to firm up the sovereign capability. In the near-term it can leverage its traditional industry base to provide the armoured steel required to protect sea and land platforms and win a greater number of sustainment opportunities. There is also profound potential for the region in the emerging technology space, where a developing digital economy and highly regarded research university can position the region to capture significant future demand.

The highest value opportunity for the region could be in playing in the supply chains of products and services that not only connect into the SICPs but also have demand in other markets. Growing the region's contribution in AI, robotics, autonomous systems, ICT, cyber security and quantum technology will not only increase its defence contribution but also provide opportunities in adjacent sectors, with the highest value being in financial services, government, professional services, retail, mining, education and manufacturing.

A twofold approach that leverages the existing industry base of the Illawarra Shoalhaven while investing further into its digital contribution will not only increase its participation

in the defence industry but also support wider economic uplift across the region.

The Illawarra Shoalhaven has maintained a long history within the defence industry, with capability historically focused on naval aviation sustainment and heavy manufacturing. The region is well regarded for its ability to design and produce world leading armoured steel plates for naval ships and submarines as well as army protected mobility vehicles. Additionally, companies in the region have provided Defence with high-end ICT equipment across communications, data solutions and ruggedised platforms. A strong training and consulting services sector supplements these capabilities to offer Defence a significant and diversified offering. This has seen the region grow its direct contribution from the defence industry to AU\$1.4 billion, supported by 2,166 workers.

AUKUS

Port Kembla one of three potential east coast sites to base the nuclear powered submarines

However, there is significant opportunity for the region to leverage these existing skillsets and expertise further to capture a greater proportion of defence spend. Across the current major Defence projects the Illawarra Shoalhaven maintains the skills and expertise to participate further in at least sixteen. Based on the total value of contracts awarded by the Department of Defence that link into these projects (that have end dates after 2024), this represents a total market of approximately AU\$32 billion.¹¹ It also presents a significant opportunity for the region to partner with the primes that hold these contracts and enter their supply chains to provide goods and services across both acquisition and sustainment.

An analysis of the taxonomies of the products and services associated with the contracts that feed into these major projects show strong alignment with regional industry expertise. 91% of contracts have the following requirements:

- Marine craft systems, subassemblies and marine transport
- Aircraft acquisition, aircraft equipment and aircraft maintenance and repair services
- War vehicles
- Aerospace engineering and related systems, components and equipment
- Software, computer equipment, communications devices and accessories
- Vehicle acquisition, maintenance, repair and related services.

Of these contracts, Rheinmetall Defence Australia holds the largest share, followed by Airbus Australia and Raytheon Australia. This presents opportunities for local businesses to engage further with these contract holders to collaborate and enter their supply chains.

MAJOR CURRENT PROJECTS THAT ILLAWARRA SHOALHAVEN MAINTAINS THE SKILLS AND EXPERTISE TO PARTICIPATE IN FURTHER INCLUDE:

PHASE 1

AIR6502: Medium Range Ground-Based Air Defence

PHASE 1

AIR3024: Woomera Range Remediation

PHASE 1B

AIR 7000: Triton Remotely Piloted Unmanned Aircraft System

PHASE 3

LAND 400: Combat Reconnaissance Vehicle

PHASE 2

LAND 400: Land Combat Vehicle System (Infantry Fighting Vehicle)

PHASE 4

LAND 121: Protected Mobility Vehicle – Light

PHASE 3

SEA 4000: Air Warfare Destroyer

PHASE 3

SEA 1439: Collins Class Submarine reliability and sustainability

CAF35: P-8A Poseidon

CN35: MH-60R Seahawk Romeo Weapon System

CN34: Canberra Class (LHD) Sustainment

CA17: G-Wagon Fleet

CA48: Multi Role Helicopter

CN02: Anzac Class Frigate

CN03: S-70B-2 Seahawk Weapons System

CN01: Adelaide Class Frigate

The Commonwealth Government has been telegraphing the increased contribution that artificial intelligence (AI), robotics, autonomous systems, cyber security, quantum technology and Information and Communications Technology (ICT) will play in creating comparative Defence advantages. In line with this strategic intent, the value of Defence contracts that align to these capabilities has also increased. As of December 2022, the number of open contracts awarded by the Department of Defence (that have end dates after 2024), that align to these capabilities sits at 835 with a total value of approximately AU\$18 billion.¹²

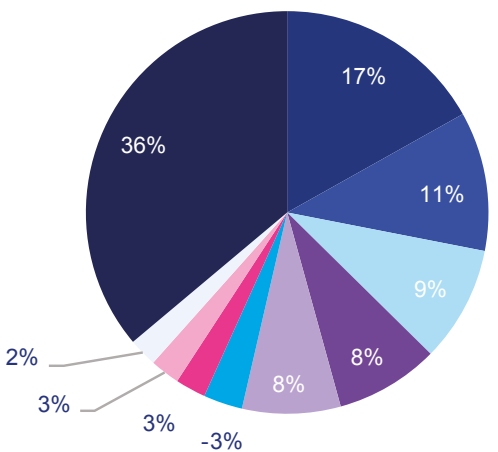
Defence is looking to industry partners for the delivery of solutions across these capabilities, however while support will be provided, industry must be resilient and diversified into other markets and sectors. With defence income often volatile, innovation will only occur if businesses have ongoing and reliable revenue streams to support research and development. An innovative defence industry is therefore dependent on organisations being self-reliant outside of defence contracts, exposed to adjacent sectors, export markets and alternate revenue streams.

With the region’s output for digital activities sitting at \$AU1.83 billion and supported by 3,770 jobs the Illawarra Shoalhaven maintains an already strong industry base that can diversify and support Defence objectives.¹³ With the UoW also providing world leading research across many of these capabilities, the region is well placed to increase defence participation and take a larger proportion of this AU\$18 billion defence market.

Outside of the defence market, domestic demand for these technologies (collectively AI, quantum technology and ICT) will be characterised by explosive growth over this decade. The AI market is forecast to realise a compound annual growth rate (CAGR) of 24.4% over the period 2020-25 to reach AU\$3.6 billion.¹⁴ The domestic market for quantum computing is expected to realise a CAGR of 10.5% to reach a total quantum market of AU\$2.2 billion by 2030.¹⁵ The Australian ICT market being larger and more mature, is forecast to grow by a CAGR of 2% to AU\$132.4 billion by 2028.¹⁶ Adjacent to Defence there will be significant demand from the financial services, government, professional services, retail, mining, education and manufacturing sectors.

\$32bn

Total value of Defence contracts that offer the region supply chain opportunities



\$32bn supply chain opportunity - contract owners

- Rheinmetall Defence Australia
- Airbus Australia
- Raytheon Australia
- Luerssen Australia
- Boeing Defence Australia
- Hanwha Defence Australia
- Thales Australia
- BAE Systems Australia
- Lockheed Martin Australia
- Other

ACROSS ALL RECENT DEFENCE STRATEGIES:



International trade across these capabilities will also likely accelerate as the AUKUS Agreement ushers in a much deeper science and technology partnership with Australia, the UK and the US. The partnership will support unprecedented collaboration across scientists and industry to expand and innovate military capabilities and critical technologies. This will not only increase defence industry opportunities but provide a path to market, particularly in the US for Australian products and services in adjacent sectors. AUKUS has the potential to accelerate exports across these capabilities, contributing to the creation of 80,000 highly skilled jobs and US\$24 billion in incremental capital investment by the end of the decade.¹⁷

835
Awarded open contracts

\$18bn
Approx. total value

80,000
Highly skilled jobs created with the contribution of AUKUS

US\$24bn
incremental capital investment by the end of the decade

The Australian Market Opportunity

A strong domestic market across AI, quantum technology and ICT will provide local business with tailwinds to realise significant growth while servicing both defence and adjacent sector demand.

\$3.6bn

The AI market by 2025

\$2.3bn

The quantum market by 2030

\$132.4bn

The ICT market by 2028

The US Export Opportunity

Under a scenario accelerated by the AUKUS partnership, KPMG models exponential growth in Australian exports to the US across AI, quantum technology and ICT. Australian exports to the US alone for products and services across these emerging tech capabilities could generate US\$24 billion by 2030.

US\$24bn

Australian exports by 2030

Domestically and in the US there is strong growth expected across AI, quantum technology and ICT.

The economic opportunity cont.

AUKUS will significantly reduce barriers to entry for Australian businesses entering the US, especially across these emerging technologies. Whilst the US will be the most attractive market for Australian emerging tech, there will be other export opportunities for the local defence industry.

The Indian market presents another attractive option for Australian exports. India has raised its defence budget to above US\$70 billion amid tensions with China. The Indian government is committed to domestic manufacturing of defence equipment, but it is still heavily reliant on imports, especially for advanced technologies and systems. As a member of the QUAD (US, India, Japan, Australia) this provides opportunities for Australian businesses to access this significant market.

The alliance has the potential to benefit Australian exports to India through the following:

INCREASED ECONOMIC COOPERATION

The QUAD alliance is committed to promoting economic cooperation and development in the Indo-Pacific region. This includes efforts to improve infrastructure and trade links, which could provide new opportunities for Australian exporters to access the Indian market.

DEFENCE COOPERATION

The alliance is also focused on enhancing regional security and defence cooperation. This could lead to increased demand for Australian defence equipment and technology.

STRATEGIC ALIGNMENT

QUAD represents a shared commitment to promoting a free, open, and rules-based order in the Indo-Pacific region. This alignment could provide a platform for Australian exporters to work more closely with Indian partners to address shared challenges in the region.

As a result QUAD could provide the following opportunities in India for the Australian and Illawarra Shoalhaven defence industry:

NAVAL SYSTEMS

India has ambitious plans to modernize and expand its naval fleet. There are opportunities for Australian companies to supply advanced naval technologies, including sensors, communication systems, and propulsion systems.

AEROSPACE

India is investing heavily in its aerospace industry, and there are opportunities to provide advanced components and systems for military aircraft, helicopters, and unmanned aerial vehicles.

CYBER SECURITY

With the increasing digitisation of military operations, cyber security is a crucial area of focus for India's defence sector. Australian businesses with expertise in cyber security can provide solutions to protect India's critical infrastructure and networks.

LAND SYSTEMS

India is also investing in modernising its land systems, including tanks, artillery, and infantry fighting vehicles. Australian businesses with expertise in these areas can provide components, systems and advanced manufacturing to upgrade and modernise India's land forces.



JS Oumi (centre) conducts a dual Replenishment at Sea with HMAS Arunta (left) and USS Milius during Exercise Malabar 2022. Credits: LSIS Susan Mossop.

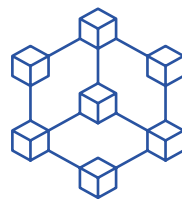


Strategic focus areas

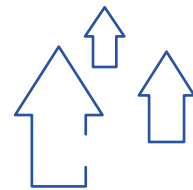
Summary



Transition existing initiatives to an Illawarra Shoalhaven defence industry alliance



Formalise partnerships and promote the region as a defence industry innovation ecosystem



Play a greater role in planned and inflight programs



Develop the region's emerging technology contribution to defence



Grow the number of major primes



Support a pipeline of highly skilled workers



Transition existing initiatives to an Illawarra Shoalhaven defence industry alliance

The region should transition existing initiatives into a defence industry alliance with a dual mandate of advocacy and education. This new organisation will bring together existing groups and advocate for the region's defence industry, formalising partnerships across assets, connecting local SMEs with key stakeholders and promoting the region's defence innovation ecosystem.

The Illawarra Shoalhaven has an existing defence industry ecosystem that can be reshaped and strengthened through the merging of capabilities to create a new all-of-the-Illawarra Shoalhaven defence industry alliance. The alliance will leverage the skills of existing organisations and further strengthen the local defence industry through a dual mandate of advocacy and education. Through this process it will support the growth of existing businesses entering defence and their contribution to a sovereign supply chain.

Its primary role will be to act as a principal advocate for the Illawarra Shoalhaven defence industry, using events and seminars as platforms to align and connect local SMEs with key defence stakeholders. Working with existing organisations, this will be an opportunity to bring together SMEs, primes, academia, other regions and Defence to drive collaboration, becoming a key enabler of capability development and supply chain opportunities. In this capacity,

the alliance will also take responsibility for coordinating the region's response if it is selected as the east coast base for the nuclear powered submarines.

It will also play a key leadership role in the defence industry innovation ecosystem, responsible for generating stakeholder buy-in to more formalised partnerships. Once these regional defence assets are better connected, it will promote this collaborative ecosystem to key defence industry stakeholders.

Its other key role will be to educate SMEs on defence opportunities and entering the defence supply chain. There are numerous barriers to entry for businesses looking to supply for Defence and navigating the complex defence ecosystem is prohibitive to many organisations. Through a program of formalised education, the alliance will work with local SMEs to make them defence ready.

The opportunity for the region

A UNIFIED APPROACH BRINGING THE BEST OF THE REGION'S ESTABLISHED ORGANISATIONS TOGETHER

The region has a strong history of government and industry bodies working to promote the local defence industry. Unifying these organisations through a defence industry alliance will enable greater cooperation and collaboration that promotes all-of-the-Illawarra Shoalhaven's regional comparative and competitive defence industry advantages. This alliance will be a mechanism to focus stakeholder input into projects of highest collective value across the region.

INCREASED VISIBILITY TO DEFENCE AND THE DEFENCE INDUSTRY

The local defence industry has maintained a low profile outside of HMAS Albatross and HMAS Creswell. A new defence industry alliance will provide a resource to promote the region to key prime and government stakeholders through a range of outbound business development activities. Additionally the alliance will be responsible for developing and hosting a capability directory which will provide primes with ease of visibility over local SMEs to fulfil their AIC commitments.

IMPROVED AVAILABILITY OF ADVICE, INFORMATION AND EDUCATION TO THE REGION'S SMES

Attracting SMEs into the defence supply chain requires a twofold approach to education. Firstly, SMEs need to be educated on the opportunities that exist. Often SMEs associate defence work with more kinetic aspects of defence and fail to recognise the abundant opportunities in other areas. Secondly, there are considerable barriers to entry that SMEs often need support with navigating. Developing a curriculum that provides participants across maturity levels with the knowledge and skills to enter the defence supply chain will increase participation across the region.

A SINGLE TOUCH-POINT FOR MAJOR PRIME CONTRACTORS, DRIVING IMPROVED ATTRACTION AND ENGAGEMENT

The permanent basing of additional prime contractors within the region would significantly improve the defence profile of the Illawarra Shoalhaven, generate significant investment and support greater industry participation. Having one organisation with a specialist understanding of the local defence industry and regional economy, that can engage with the major primes and effectively market the region against their industry, R&D and infrastructure requirements has shown to be the most effective means of attracting a prime to establish a regional headquarters.

CONNECTION BETWEEN THE INDIGENOUS COMMUNITY AND SUPPLY CHAIN OPPORTUNITIES

Increasing Indigenous participation in the defence industry is a way to create economic and social uplift within the community. The alliance can be leveraged as a conduit between local Indigenous businesses and defence opportunities to support Indigenous Procurement policies. The alliance can use its platform to promote and showcase Indigenous businesses locally and to sub-prime and prime contractors. This can include spotlighting local businesses online as well as hosting networking events and trade shows to specifically connect Indigenous businesses with potential defence customers.

The alliance will also act as a champion of Indigenous Procurement policies regionally, encouraging industry to prioritise Indigenous businesses in their procurement processes.

The alliance will provide business support services to Indigenous businesses, with a focus on education, mentorship, and helping to align capability to defence supply chain opportunities.

Key to success will be building relationships with the local Indigenous community through ongoing outreach. The alliance will engage with Indigenous leaders, participate in cultural events, and actively support Indigenous community initiatives.

Case study: Geelong Defence Alliance

THE GEELONG DEFENCE ALLIANCE (GDA) HIGHLIGHTS THE IMPORTANCE OF A DEFENCE INDUSTRY ADVOCATE IN SECURING PRIME INVESTMENT.

The GDA brings together industry and key defence stakeholders to advocate for increasing participation from SMEs and primes in the local Geelong defence industry.

The importance of defence prime engagement is critical to developing local defence supply chains. The permanent basing of a prime contractor provides not only recognition of local defence credentials but also attracts investment and supports greater industry participation.

GDA played a key role in attracting Hanwha Defence Australia to the Region and highlights the importance of having a defence industry advocate to coordinate prime opportunities. Hanwha did not initially consider Geelong for its Australian facility, rather was looking to base itself out of either Townsville, Newcastle or Wollongong. GDA was able to make contact, establish itself as the main relationship manager for the region and drive the necessary industry engagement that ultimately led to Hanwha deciding on Geelong as its Australian base of operations. GDA was able to effectively market the region against Hanwha's industry, university and infrastructure requirements for the centre, driven by its unique understanding of the local defence industry and regional economy.

The result is that Hanwha is building an AU\$170 million Armoured Vehicle Centre of Excellence at the Avalon Airport Industrial Precinct. It will also use the facility to manufacture AS9 self-propelled howitzers and AS10 Armoured Resupply Vehicles to deliver the AU\$1 billion LAND 8116 program. Hundreds of highly skilled jobs will be created as a result and an expected AU\$200 million in flow-on investment will be generated for the local economy. Hanwha is also one of the final two bidders to deliver the LAND 400 Phase 3 Infantry Fighting Vehicle program, and if successful will generate a further 1,000 jobs and AU\$5.7 billion for the local economy over 12 years.¹⁸

\$170m

Armoured Vehicle Centre of Excellence

1000 jobs + \$200m

expected flow-on investment will be generated for the local economy

Case study: Hunter Defence

HUNTER DEFENCE PROVIDES A STRONG EXAMPLE OF AN EFFECTIVE DEFENCE INDUSTRY ADVOCATE, UNDERPINNED BY AGILE LEADERSHIP AND DIVERSIFIED FUNDING.

Hunter Defence is a dynamic organisation that represents a diverse group of over 100 companies based in the Hunter region, operating within the defence industry. Hunter Defence provides these companies with guidance in preparing for opportunities and support in articulating their unique value propositions to government and major defence industry players.

Key to much of the success of Hunter Defence has been the Hunter Defence Task Force and a governance model that brings together key defence stakeholders. The task force, which is chaired by Tim Owen AM also includes representation from fourteen other industry, government and academic stakeholders. This provides overall strategic support to the organisation, ensuring all key areas across the local defence industry are represented. Tim Owen AM leads the day to day operations

of the organisation, leveraging his defence background and strong connections into government and defence primes to advocate for the region and support opportunity generation.

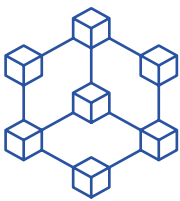
The organisation has effectively applied a unique funding model to support its activities. The model is an aggregation of multiple sources of backing, consisting of member funding, government funding, sponsorship, and project-based funding. Its funding partners include:

- HunterNet
- Business Hunter
- Regional Development Australia – Hunter
- NSW Government
- Newcastle Airport
- Astra Aerolab
- The University of Newcastle
- Master Builders Newcastle



Australian Army soldiers from the 7th Battalion, Royal Australian Regiment, stand with Hanwha Defence Australia Redback Infantry fighting vehicle (left) and Rheinmetall Lynx KF4 Infantry Fighting Vehicle (right), during user evaluation trials at Puckapunyal, Victoria. Credits: SGT Jake Sims.

Formalise partnerships and promote the region as a defence industry innovation ecosystem



The region should formalise frameworks of partnership amongst all of the region's key defence assets to support a shared vision of creating opportunities through defence industry innovation. The defence industry alliance will position a stronger network across industry, academia, government and defence, underpinned by a more collaborative approach to regional defence industry support, research and development and advocacy.

The Illawarra Shoalhaven region has a number of existing assets and future plans contributing towards greater innovation in the defence industry. Current assets include the University of Wollongong (UoW), the Albatross Aviation Technology Park and the East Australian Exercise Area. Additionally, scope for future defence industry innovation is being provided through the design of the Shellharbour Airport Aviation Business Park.

The region should connect all key assets into a highly visible and collaborative defence industry ecosystem coordinated through the defence industry alliance with support from the UoW and a defence prime. Formalising partnerships across the spread of these assets will position the Illawarra Shoalhaven as a highly collaborative network of defence industry innovation, improving the attractiveness of the region for investment and growth.

The defence industry alliance can be leveraged to bring together and encourage greater communication amongst existing local stakeholders

in the advanced manufacturing, aviation and maritime sectors. Additionally, with support from the UoW the alliance can encourage the development of an Illawarra Shoalhaven defence science and technology hub and connect into this broader defence industry ecosystem. This hub (primarily focused on emerging tech capabilities in AI, robotics, autonomous systems, ICT, cyber security and quantum technology) will bring together industry and academia and align these technologies with the SICPs and sources of supply chain opportunities.

With advocacy centralised out of the defence industry alliance, the region can market itself to Defence and coordinate opportunities across these key regional capabilities. The ecosystem this creates also positions the region as a highly visible symbol of local defence capability and becomes a mechanism to attract and engage with opportunities from defence primes, the Commonwealth Government, academia, sources of capital and overseas markets.

The opportunity for the region

ACHIEVING SCALE IN REGIONAL ADVOCACY

Across the Illawarra Shoalhaven, there are a number of bodies that have been successful in promoting the local defence industry. However, there are significant scale advantages that can be achieved through a more unified approach to defence advocacy that promotes the capabilities of both regions and their specific sector capabilities. An all-of-the-Illawarra Shoalhaven regional approach, strengthened through more formalised partnerships across all stakeholders will increase collaboration and provide more attractive defence opportunities.

A PLATFORM TO TEST AND INCUBATE BUSINESS MODELS AND COLLABORATION STRATEGIES

The Commonwealth Government has made it clear that Defence needs to innovate and that this will be facilitated through increased collaboration across industry, science and academia. A more connected regional defence industry ecosystem will support greater innovation through exploring new partnerships, frameworks and sharing best-practices.

CONNECTING MORE INDIGENOUS BUSINESSES INTO THE ECOSYSTEM

A more formalised ecosystem also creates more opportunities for Indigenous businesses to access the defence industry. The alliance can be leveraged to raise awareness amongst Indigenous businesses to the benefits of the ecosystem and then support connecting them into opportunities. This could include introductions to key stakeholders, facilitating collaborative projects and mentoring programs as well as workshops and events to promote Indigenous businesses across the network of defence assets. A more connected and aware defence industry ecosystem can be used as a mechanism for greater Indigenous participation and economic development.

POSITIONING LOCAL INDUSTRY AND ACADEMIA TOGETHER AS DEFENCE PIVOTS TOWARDS EMERGING TECHNOLOGIES

Standing up and connecting a defence science and technology hub into the wider defence ecosystem will align the region to the increasing importance Defence is placing on technology innovation to create battlefield advantages. In particular the Defence Science and Technology Strategy 2030 encourages a national network of regional hubs to coordinate local industry and academia to the STaR Shot mission set. Developing a local hub integrated and connected into this defence industry ecosystem will support greater government sponsorship and connect local industry into critical research, best practice, prime contractors, government and other defence stakeholders.

The UoW can also support stronger links into this ecosystem through supporting paths to security clearances for cohorts of students. This will enable the more efficient transfer of local research into prime and local industry capability.

IMPROVED ENGAGEMENT AND COLLABORATION WITH AUKUS STAKEHOLDERS

AUKUS is a broad and deep science and technology partnership designed to increase the interoperability of the defence forces of Australia, the UK and the US. In doing this AUKUS will trigger meaningful collaboration across academia, science and industry to innovate in the mission critical areas of AI, cyber and quantum. Promoting the region as a highly capable ecosystem of defence industry and science and technology innovation will be an important mechanism for engaging and benefiting from the AUKUS Agreement.

Case study:

The Tonsley Innovation District

THE TONSLEY INNOVATION DISTRICT IS A PRIME EXAMPLE OF HOW A DEDICATED INNOVATION PRECINCT CAN SUPPORT THE GROWTH AND DEVELOPMENT OF ADVANCED MANUFACTURING AND TECHNOLOGY-BASED COMPANIES, PARTICULARLY IN THE DEFENCE INDUSTRY.

The district was established in 2014 on the site of the former Mitsubishi Motors manufacturing plant in the southern suburbs of Adelaide, South Australia. It covers an area of around 100 hectares and is home to a diverse range of businesses, research institutions, and government agencies. The district is designed to foster collaboration and innovation among its tenants, and it provides a range of services and facilities to support the growth and development of new ventures.

One of the key strengths of Tonsley is its focus on the defence industry. The district is home to a number of companies that are involved in the design and manufacture of unmanned systems for the ADF, as well as the development of advanced materials and manufacturing processes for defence applications. Additionally, the district is home to a number of research and development organisations connected into the Defence Science and Technology (DST) Group that are focused on developing new technologies and capabilities for Defence.

The Innovation District also hosts the Line Zero - Factory of the Future, a collaboration between the South Australian Government, Flinders University and industry partners including the prime contractor BAE Systems Australia. It is a state-of-the-art manufacturing facility that serves as a testbed for advanced manufacturing technologies and techniques. The facility is equipped with a range of cutting-edge technologies, including 3D printing, robotics, and automation. Serving as a hub for innovation, collaboration and knowledge sharing, it provides industry partners with access to the latest technologies and expertise to develop new products and improve manufacturing processes.

The innovation precinct also forms part of the Global Network of Innovation Districts (GNID), an association of precincts working together to share best practices and promote innovation and economic development. The network aims to foster collaboration and knowledge sharing among its members, and to promote the development of innovation districts as key drivers of economic growth and competitiveness.

South Australia's defence industry is a key contributor to the state's overall economy, and the Tonsley Innovation District is working to advance its contribution through the GNID. By collaborating with other members, the district leverages their expertise and resources to support the further development of local industry players. This includes connecting defence-related companies with potential partners and customers, providing access to capital and other resources and promoting the development of new technologies and capabilities.

The Tonsley Innovation District is an excellent example of how a dedicated innovation precinct can support the growth and development of the defence industry. The district's focus on industry collaboration and innovation has enabled it to attract a number of leading companies and research institutions, which are working together to develop new technologies and capabilities for the ADF.

100 hectares Hosts the Line Zero

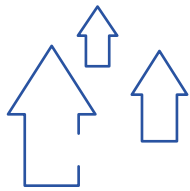
South Australian Government, Flinders University
and industry partners collaboration



Activity, Alloy, Automated, CNC Machine, iStock. Credits: Fertnig.

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Play a greater role in planned and inflight programs

The region should seek a greater allocation of defence spend across major inflight and planned acquisition and sustainment programs that align to the region's current capability and industry strengths. This will include collaborating with prime and sub-prime contractors to deliver (in part or in full) programs using regional businesses throughout the supply chain.

There is an opportunity for the Illawarra Shoalhaven to take a larger share of inflight defence spend through its existing defence industry base and by leveraging complimentary skills from adjacent sectors. Based on contracts that link into the major Defence projects most aligned to the region's skillset, there is an estimated AU\$32 billion market opportunity for businesses to access as suppliers to prime and sub-prime contractors.

Tapping further into this market will rely on the region's traditional heavy industry, naval sustainment, ICT, training and consulting defence capabilities. Already connected into Defence opportunities, a larger proportion of spend could be realised through greater engagement with prime contractors to deliver major Defence projects and engaging opportunities outside of the Illawarra Shoalhaven region.

There is also an opportunity for the region to leverage the skills and expertise of businesses operating in adjacent sectors. The region has a strong construction, manufacturing and mining sector, that with further education of defence opportunities, have the skills necessary to pivot and compete for supply chain contracts.

A collaborative approach that leverages the defence industry alliance to educate and connect businesses into defence opportunities will be key to increasing defence spend. The alliance can be leaned on to create greater awareness within the region and advocate on behalf of the region to connect local skills with inflight opportunities. This will include engaging more with other regions (such as the Hunter, Murray Riverina) and more widely throughout NSW to add leverage to each other's unique skillsets and collaborate on defence opportunities. Through greater collaboration, the NSW sovereign defence industry will be strengthened to the benefit of all, growing each's share of defence spend.

The opportunity for the region

IMPROVED ACCESS TO THE STRONG PIPELINE OF INFLIGHT AND PLANNED PROGRAMS

The Department of Defence has awarded approximately AU\$32 billion in contracts that the existing defence industry have the skills to participate in. There are opportunities to engage with prime and sub-prime contractors to integrate into their supply chains to deliver these major projects for Defence.

SUPPORT AND FRAMEWORKS FOR LOCAL INDUSTRY TO IDENTIFY OPPORTUNITIES AND BECOME 'DEFENCE-READY'

With clarity around the size, scope and timeframes for relevant in-flight programs, local industry will have a greater chance to engage the necessary support to prepare their businesses to become 'defence-ready'. Having a clear understanding of the size and scale of these opportunities will help local industry make informed decisions that balance their required investment with the size of potential opportunities.

CONNECT EXISTING AND NEW BUSINESSES INTO DEFENCE OPPORTUNITIES

Through coordinating the efforts of existing organisations, the defence industry alliance can provide local industry with greater opportunities to partner with prime and sub-prime contractors. Through both regional advocacy and SME education there will be a great ability to identify opportunities and facilitate introductions to key players in the defence ecosystem. This will accelerate the region's ability to tap into this AU\$32 billion market.

BETTER DELIVER AGAINST THE SICPs BY LEVERAGING THE REGION'S CURRENT CAPABILITIES AND SKILL BASE

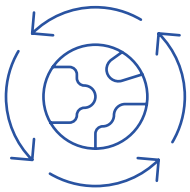
With the SICPs channelling a significant proportion of defence spend, the Illawarra Shoalhaven is well positioned to capture demand from businesses operating in adjacent sectors. The maturity of these sectors indicates that the region has the skills available to capture demand and compete for more contracts aligned to several SICPs. The region maintains significant capability (adjacent sectors with complimentary skills contribute collectively more than AU\$3 billion in annual revenue and provide a talent pool of more than 5,000 workers) in the following areas:

- Collins class submarine maintenance and technology upgrades
- Land combat and protected vehicles and technology upgrades
- Continuous shipbuilding program (including rolling submarine acquisition)
- Advanced signal processing capability
- Robotics, autonomous systems, and artificial intelligence

SUPPORT A GREATER INDIGENOUS SHARE OF INFLIGHT AND PLANNED PROGRAMS

With a number of Indigenous businesses maintaining skills aligned to the much of the inflight and planned market, this provides an opportunity for greater participation. Through outreach and education, the alliance can help to educate local organisations on where there are supply chain opportunities aligned to their skillsets. The alliance can then help to navigate connecting Indigenous businesses into prime or sub-prime supply chains.

Develop the region's emerging technology contribution to defence



The region should look for opportunities to maximise both government and private investment in organisations across the region through a sustained focus on building capabilities at the intersection of the Defence SICPs, adjacent industry priorities and export potential into global supply chains. This includes leading dual purpose technologies such as AI, robotics, autonomous systems, ICT, cyber security and quantum technology.

The Illawarra Shoalhaven region will realise the greatest economic uplift, maximise participation, prime collaboration, employment and export opportunities by focusing investment into industries that not only align with the SICPs but also offer significant export potential.

The Commonwealth Government is delivering an unprecedented amount of investment over the coming decade into Defence and is committed to supporting local industry onshore critical capabilities. However, whilst support is forthcoming, the Government has made it clear that the sovereign defence industry must be resilient and self-sustaining.

This is an acknowledgement that defence revenues are seasonal and survival and ongoing innovation is dependent on participants being diversified into other markets and industries.

The Illawarra Shoalhaven region can capture defence spend while smoothing out its seasonality through focusing investment to develop its AI, robotics, autonomous systems, ICT, cyber security and quantum technology capabilities.

The opportunity for the region

ALIGNING TO THE WHOLE OF GOVERNMENT COMMITMENT TO DEVELOPING A SOVEREIGN ADVANTAGE

Beginning with the 2016 Defence White Paper, the Commonwealth has been regularly communicating its strategic intent for local industry to develop AI, robotics, autonomous systems, ICT, cyber security and quantum technology capabilities. The Government has committed to provide support through investment, grants and other incentives to organisations and businesses focussed on these capabilities.

AUKUS WILL PROMOTE MUCH DEEPER TECHNOLOGY SHARING AND COOPERATION

The AUKUS Agreement will precipitate unprecedented collaboration across scientists and industry to expand and innovate military capabilities across emerging technologies. A key focus will be the critical dual use defence and industry areas of AI, cyber and quantum technologies. Regional organisations and businesses who align themselves with these dual use capabilities will gain early mover advantages, increased access to lines of funding and the ability to help shape future Defence programs

THE MARKETS FOR THESE TECHNOLOGIES ARE CHARACTERISED BY EXPLOSIVE GROWTH, WITH STRONG DEMAND IN AUSTRALIA AND OVERSEAS

In this decade the domestic market for AI, quantum technology and ICT will exceed AU\$3.6 billion, AU\$2.3 billion and AU\$132.4 billion respectively.

Under an accelerated growth model supported by the AUKUS Agreement, these dual defence and industry technologies represent a US\$24 billion export opportunity for Australia (in the US alone) and could generate 80,000 jobs within 10 years.

ILLAWARRA SHOALHAVEN HAS A STRONG EXISTING INDUSTRY BASE THAT CAN BE LEVERAGED TO SUPPORT GROWTH

The current output of the region's digital activities (inclusive of AI, quantum technology and ICT) is AU\$1.83 billion and is supported by 3,770 jobs. The region maintains a significant existing skills base that can be exploited further to promote growth across these three capability areas.

THE UNIVERSITY OF WOLLONGONG (UoW) IS A LEADER ACROSS ALL THREE CAPABILITIES

The Illawarra Shoalhaven can leverage UoW's Centre for Artificial Intelligence, Institute of Cyber Security and Cryptology and Centre for Quantum Devices, Optics and Solids to drive research, innovation and commercialisation across the three capability areas. The University can exploit its history of Defence and defence industry engagement to drive collaboration and ensure alignment to the relevant SICPs.

A FOCUS ON THESE CAPABILITIES WILL OPEN THE ILLAWARRA SHOALHAVEN TO GREATER PRIVATE FUNDING

These capabilities, being aligned to the SICPs will attract some government funding and support, however to be truly competitive the region will also need to activate more local businesses through private funding. Defence industry has long held numerous barriers to entry for private equity and venture capital and as a consequence they have been underinvested. By pivoting away from more capex heavy manufacturing to technology-focused innovation with applications across multiple industries and markets, the region will align itself to the private markets model that demands rapid growth and exit opportunities typically within reduced timelines.

INCREASE THE NUMBER OF INDIGENOUS OWNED TECHNOLOGY COMPANIES

Connecting Indigenous students and businesses into the defence science and technology hub will support greater participation in the information economy. The hub can be used as a key enabler of developing local Indigenous capability across emerging tech through partnerships and mentoring, as well as provide a mechanism for engaging export markets.

Case study: QuintessenceLabs

QUINTESSENCELABS PROVIDES A STRONG EXAMPLE OF AN AUSTRALIAN ORGANISATION WHICH HAS POSITIONED ITSELF AT THE INTERSECTION OF THE DEFENCE SICPS, ADJACENT INDUSTRY PRIORITIES AND EXPORT DEMAND INTO GLOBAL MARKETS.

Founded out of Canberra, QuintessenceLabs specialises in quantum-based cyber security solutions. They have developed a suite of products that use quantum key generation and distribution to provide unbreakable encryption for data communication.

One of their key products is the Quantum Key Distribution (QKD) system, which uses the principles of quantum mechanics to generate a secure encryption key. This QKD system has been adopted by various defence agencies and organisations around the world as a means of securing sensitive information and communications. In 2018 the Australian Government chose QuintessenceLabs to provide a QKD system to secure communication between Government agencies, allowing the Government to encrypt data transmitted over long distances, integral for defence applications.

Benefiting from the whole of government commitment to developing sovereign advantages in cyber security and quantum technologies, the company received an initial grant of AU\$1.1 million from the Department of Defence. This was followed by a further AU\$3.3 million grant in 2017.

Highlighting its applicability within industries outside of defence, QuintessenceLabs has also generated significant venture capital interest. Since 2014, the company has raised AU\$48.7 million from investors including Westpac and Telus Ventures.¹⁹ This funding has allowed the company to expand into international growth markets, with a footprint now in the United States, Switzerland and Canada, servicing the government, defence, financial services, healthcare, telecommunications and technology sectors. As regulatory pull and reputational risk continue to drive explosive growth in the private sector, QuintessenceLabs is well positioned to benefit from ongoing demand.

QuintessenceLabs also demonstrates the integral role that research universities play in developing technologies for commercial applications. Vikram Sharma founded the company after completing his PhD in quantum physics at the Australian National University. Now a channel partner along with the University of Queensland, these relationships allow the company to continue to access world leading expertise and resources to improve and optimize their technology.

QuintessenceLabs clearly highlights the opportunities for organisations that can commercialise research that sits at the intersection of both defence and industry priorities. Through this diversified positioning, QuintessenceLabs has been able to benefit from both government and private funding, access domestic and international defence and non-defence markets, building a resilient and diversified company.

\$48.7m

from investors since 2014

\$1.1m

from the Department of Defence

+\$3.3m in 2017



Australian Defence Force Cyber Gap Program participants compete in a 'capture the flag' cyber skills challenge in Canberra from 24 to 30 May 2021. Credits: CPL Julia Whitwell.



Grow the number of major primes

The defence industry alliance should actively pursue sustainable and long-term investment into the region from additional defence prime contractors with strategic interests in the region. This should include advocating for the establishment of major facilities (including office space, R&D and manufacturing facilities) and the relocation of personnel to within the region.

The Illawarra Shoalhaven should proactively engage and market the region to major defence primes as a play to attract long-term investment through the basing of operations in the region.

The permanent basing of additional defence primes in the region will provide greater visibility of the local defence industry and validate the region as a major contributor to the Australian sovereign defence value chain.

This will create an uptick in economic activity as prime contractors' partner with local businesses to fulfill their AIC commitments. Large defence contracts will trickle down into the community as small businesses are integrated into the prime's supply chains. Integrating into the prime's supply chains will also enhance the

capabilities of existing businesses. Collaboration and partnerships with primes will expose local businesses to defence industry best practices, facilitating the specialist transfer of knowledge to help further grow the number of prime-capable medium sized businesses.

The permanent basing of additional primes will also support greater industry participation, further raising the profile of the region and encouraging greater competition and innovation.

Additionally, primes being based in the region will connect the region into export markets and the sharing of information that will be precipitated by the AUKUS Agreement.

The opportunity for the region

ILLAWARRA SHOALHAVEN MAINTAINS A STRONG AND DIVERSIFIED DEFENCE INDUSTRY

Illawarra Shoalhaven makes a crucial economic contribution to NSW, with output exceeding AU\$26.3 billion in gross regional product from a strong labour force of 162,238 employed persons. It maintains a strong manufacturing sector with demonstrated experience supplying Defence with market leading armoured steel plates and engineered plastics. The region also provides significant operational sustainment for the Royal Australian Navy.

In the last two decades Illawarra Shoalhaven has transformed from this traditional industrial and steel-making base into a region that also maintains an innovative service, creative and digital economy. In line with this transformation has been an uptick in industry providing defence with complex ICT equipment, systems testing, simulation and training and consulting.

This provides prospective primes with local skills to fulfill major manufacturing contracts as well as the ability to draw from the highly skilled professional, scientific and technical services and education and training sectors.

THE ILLAWARRA SHOALHAVEN IS STRATEGICALLY POSITIONED NEAR KEY DEFENCE ASSETS

The Illawarra Shoalhaven is strategically located on the east coast housing a number of key Defence assets including HMAS Albatross and HMAS Creswell. It is also located in close proximity to a number of other Defence assets in Sydney and Canberra. If Port Kembla is selected as the East Coast naval base for the nuclear powered submarines then significantly it is also in close proximity to Australia's Nuclear Science and Technology Organisation (ANSTO).

THE UOW PROVIDES A WORLD-LEADING R&D CAPABILITY

Proximity to a world-leading research academic institution is often viewed by defence primes as a key determinant in site selection. Defence is a highly dynamic and disruptive industry that can quickly render existing products redundant and constant innovation is required through strong R&D capabilities. The UoW is well placed to support primes across a number of key sovereign defence priorities including material sciences and manufacturing, AI, ICT, digital and quantum technologies.

THE REGION'S EXISTING INFRASTRUCTURE MEETS INDUSTRY, HEALTH, EDUCATION, EMPLOYMENT AND LIFESTYLE NEEDS

The Port of Port Kembla provides a deep water port with quick access to the continental shelf and a 24/7 maintenance capability, providing ease of access and logistics for local industry. Additionally there are significant adjacent parcels of land available or underutilised, offering greenfield growth opportunities.

The region maintains strong health and education facilities, employment opportunities and with numerous beaches and a thriving tourism industry is one of the most liveable regions in NSW.



Support a pipeline of highly skilled workers

The region should look to assist the businesses operating in the region to enter the Defence supply chain and create high value-added jobs through advancing education, training and skilling in science, technology, engineering and mathematics.

The Illawarra Shoalhaven region can support the needs of Defence and industry through promoting education, training and skilling in the science, technology, engineering and mathematics (STEM) sector.

Ongoing digital modernisation is key to the Defence strategy as the requirement for a faster, more agile, better connected and more lethal force is required to meet the challenges of future conventional as well as grey-zone activities. The ADF is looking to partner with industry to provide a digitally empowered force, enabled through data analytics, AI, machine learning, autonomous vehicles, robotics, quantum computing and secure and resilient ICT.

The Illawarra Shoalhaven can position itself to capture greater defence spend and adjacent industry demand through:

- Further developing the pipeline of STEM workers through the UoW and TAFE
- Promoting the defence industry as an attractive career path for STEM graduates
- Facilitating pathways into defence industry employment through increased academic and industry engagement
- Attracting and retaining talent through promoting the research capabilities of the UoW and local employment opportunities.
- Providing greater hands-on learning opportunities and industry exposure in local schools

The opportunity for the region

SUPPORTING GREATER PARTICIPATION IN THE STEM SECTOR WILL TRANSLATE TO IMPROVED ECONOMIC OUTPUT

By further developing its STEM sector, the Illawarra Shoalhaven will align itself to the Defence strategy and SICPs, capturing an increased proportion of defence spend. It will also allow the region to benefit from the growth in demand for these technologies in adjacent industries. This is important from an economic viewpoint given the additional value that this sector contributes to the local economy.

The Illawarra Shoalhaven's traditional defence industry base of steelmaking and plastics contributes AU\$111,704 and AU\$154,095 per worker to the local economy.²⁰ However, the further along the digital and information curve, the greater the per-worker contribution to the local economy is realised. For the Illawarra Shoalhaven, data processing and electronic information workers contribute AU\$498,511 per worker, with an AU\$306,935 contribution for the telecommunications sector, and AU\$230,447 per worker across professional, scientific, computer and electronic equipment manufacturing.²¹

STEM CAN BE USED AS AN ENABLER FOR GREATER INDIGENOUS PARTICIPATION IN THE INFORMATION ECONOMY

Increasing participation in STEM can be used as an enabler to greater social and economic uplift for the local Indigenous community. Increasing education rates across STEM will provide pathways into the higher value added and remunerated information economy. There are opportunities to leverage STEM to demonstrate its relevance and importance in an Indigenous context, such as environmental conservation, health, and resource management. This can then be leveraged to promote defence industry opportunities.

Once awareness and interest are generated there is an opportunity for greater participation through encouraging Indigenous STEM role models. Highlighting the contributions of scientists, engineers, and other STEM professionals, will provide opportunities for Indigenous students to meet and interact with these role models, helping to inspire STEM careers and support removing barriers to entry.

THE UoW IS A WORLD LEADING RESEARCH UNIVERSITY WITH A STRONG STEM CURRICULUM

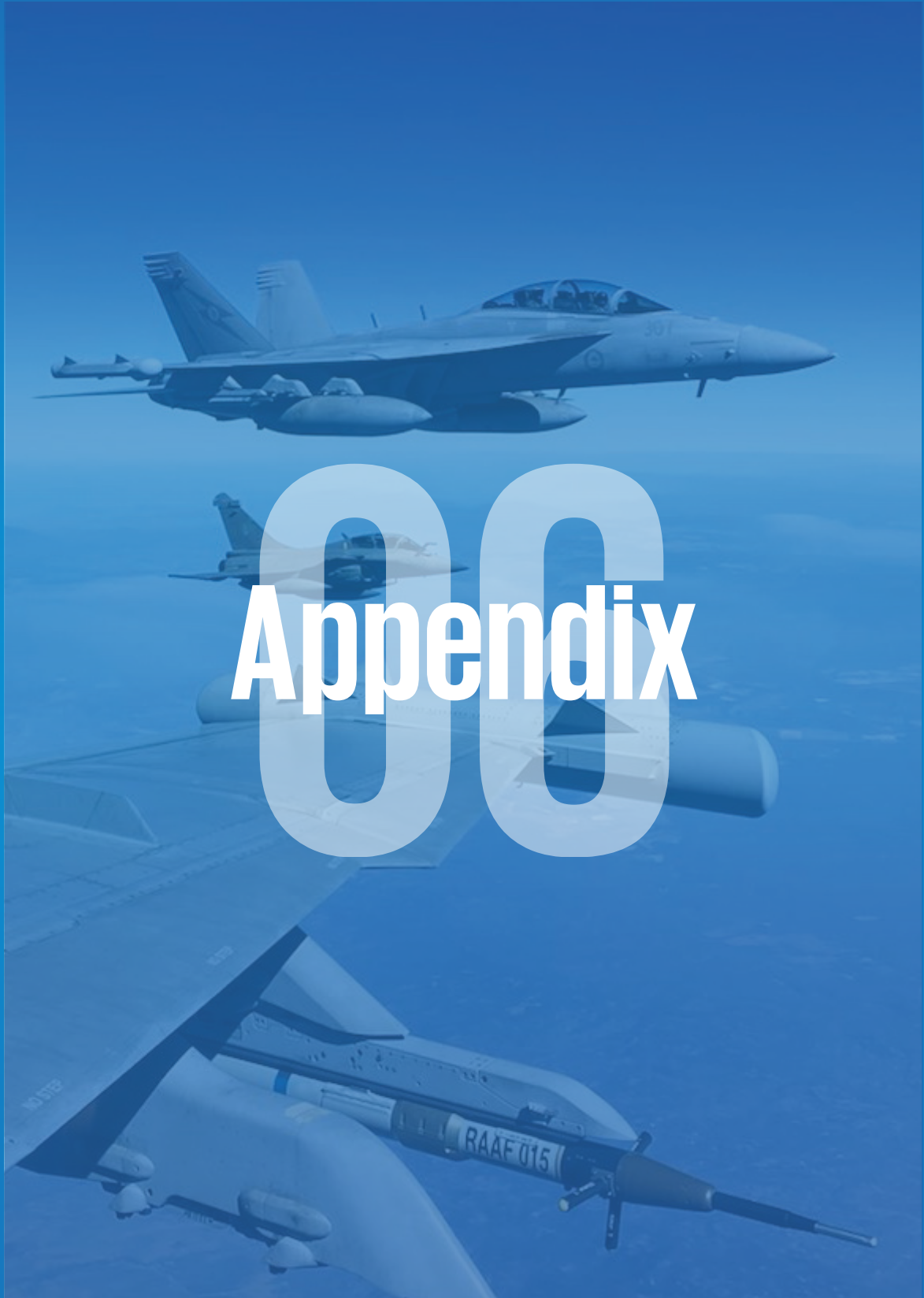
The UoW provides the region with a significant capability to generate the highly skilled workers required to execute on Defence's digital modernisation pathway. Across the Faculty of Engineering and Information Sciences, the UoW offers a number of courses aligned to defence requirements.

Additionally, the UoW maintains a significant research capability that can be leveraged to further educate and upskill workers while providing a key input to industry for commercialising new products. Its research capability is aligned to defence requirements through the following groups:

- Decision Systems Lab
- Institute for Mathematics and Its Applications
- National Institute for Applied Statistics Research Australia
- Centre for Quantum Devices, Optics and Solids
- Centre for Artificial Intelligence
- Institute of Cyber Security and Cryptology
- Power, Energy and Autonomous Systems
- Signals, Information and Communications Research

EDUCATION IS FURTHER SUPPORTED THROUGH TAFE CAMPUSES IN WOLLONGONG, NOWRA AND SHELLHARBOUR

TAFE NSW provides a number of vocational education and training courses that can be leveraged to support digital modernisation across defence. In particular it is well placed to provide continued education and training across ICT.



Royal Australian Air Force EA-18G Growler aircraft from No. 6 Squadron refuel with French Air and Space Force Dassault Rafale and A330 Multi-Role Tanker Transport aircraft over the Coral Sea on 17 August 2022. Credit: Royal Australian Air Force

Action plan

| FOCUS AREA | | OUTCOMES |
|--|-----|--|
| Transition existing initiatives to an Illawarra Shoalhaven defence industry alliance | 1.1 | Organise interim leadership |
| | 1.2 | Transition to the defence industry alliance |
| | 1.3 | Define funding model |
| | 1.4 | Develop target operating model |
| | 1.5 | Recruit staff |
| | 1.6 | Develop regional capability directory |
| | 1.7 | Develop stronger partnerships across defence industry assets |
| | 1.8 | Engage primes |
| | 1.9 | Develop defence ready curriculum |
| | 2.0 | Ongoing advocacy and education |
| Formalise partnerships and promote the region as a defence industry innovation ecosystem | 2.1 | Engage key stakeholders |
| | 2.2 | Define governance model |
| | 2.3 | Develop the defence science and technology hub |
| | 2.4 | Foster a culture of innovation |
| | 2.5 | Promote the region as an innovation ecosystem |
| Play a greater role in planned and inflight programs | 3.1 | Educate local businesses on defence supply chain opportunities |
| | 3.2 | Engage primes |
| | 3.3 | Support businesses in adjacent industries with entering the defence supply chain |
| Develop the region's emerging technology contribution to defence | 4.1 | Grow the region's domestic output |
| | 4.2 | Access overseas markets |
| Grow the number of major primes | 5.1 | Consolidate prime engagement |
| | 5.2 | Develop a regional defence industry prospectus |
| | 5.3 | Initial engagement |
| | 5.4 | Ongoing engagement |
| Support a pipeline of highly skilled workers | 6.1 | Create more STEM opportunities in local schools |
| | 6.2 | Promote STEM career opportunities including within the defence industry |
| | 6.3 | Engage with the community |
| | 6.4 | Provide access to technology |
| | 6.5 | Foster partnerships and collaboration |

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Lieutenant Josh Gorrie aircrew member from 808 Squadron HMAS Albatross, Nowra, showcasing the Navy MRH90 at Wings Over Illawarra Airshow 2021, in New South Wales. Credits: CPL Kylie Gibson.

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