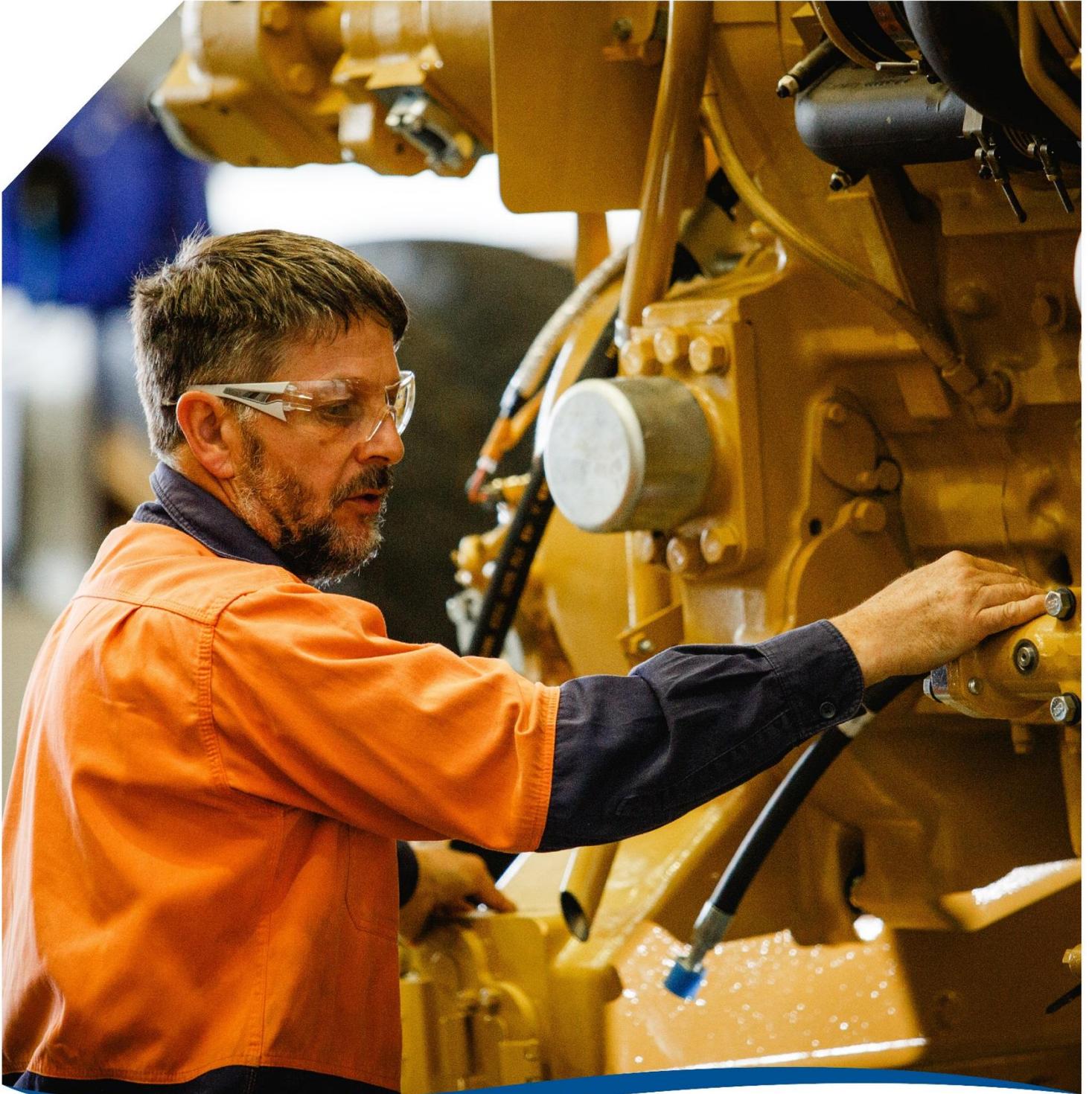


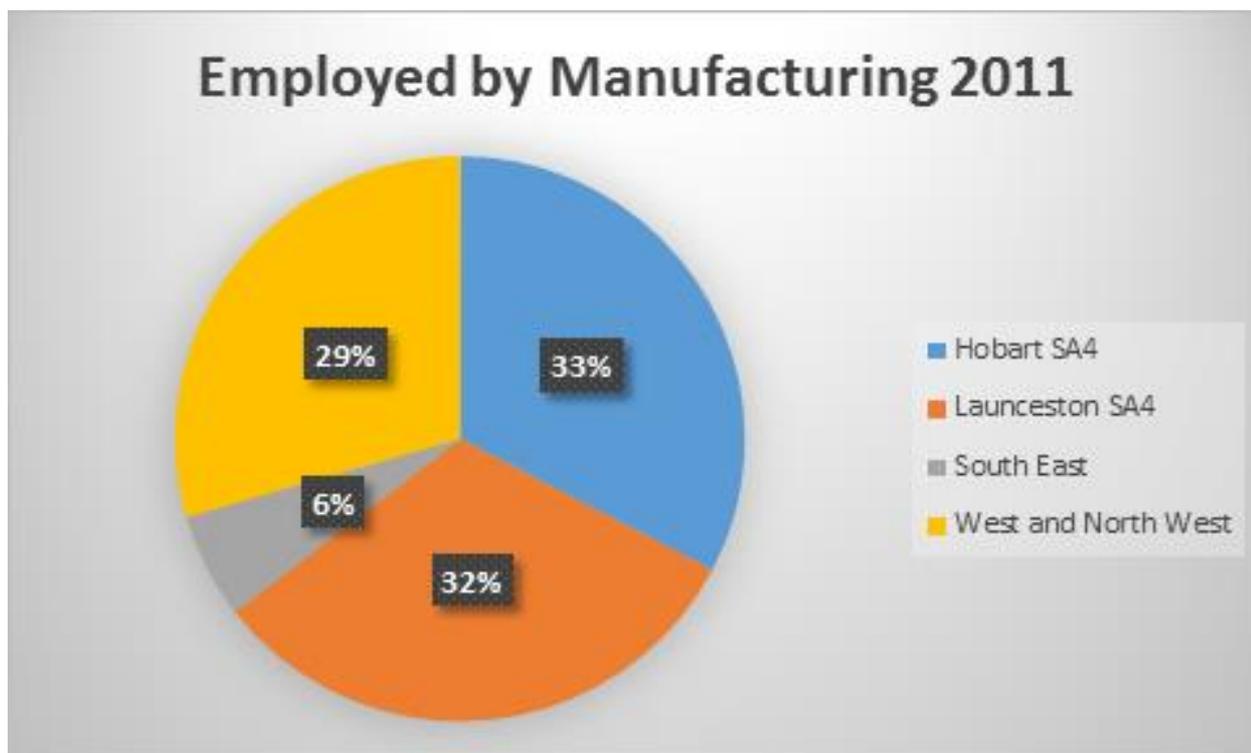
Manufacturing in Tasmania



The Tasmanian manufacturing sector is made up of an incredibly diverse range of businesses - small and large, and across a range of subsectors. Advanced manufacturing as a subsector is not measured by the Australian Bureau of Statistics (ABS). However sector engagement indicates that advanced manufacturing is only a small subset of the overall manufacturing sector.

The total number of manufacturing businesses in 2013 was 1 649¹. In 2014-15 this represented 7.4% of the state's Gross Value Added² and in 2016 represents 7.7% of employment³. The 2011 Census showed that the industry employed 18 905 people. ABS data as reported by the Australian Government Department of Employment indicates that this is currently 18 400 jobs⁴.

The proportion of manufacturing employment by region is shown in the diagram below. It reflects that there is a reasonably even split of manufacturing jobs for the sector as a whole across the state by region, being slightly higher in Hobart.



However the reliance on manufacturing as a major employer is significantly higher in the north and north west than the south. In terms of manufacturing's share of total employment in each region, manufacturing in the north west is 12.2% followed by the north at 10.1%, south east at 7.9% and Hobart at 6.4%.⁵

Supply chain dependency is a major concern in Tasmania and the sector faces a high dependency on relatively few primes. This is why the Tasmanian Advanced Manufacturing Action Plan has a focus on helping industry to diversify.

The following figure is from a 2013 north west mapping exercise undertaken by the Australian Government Department of Industry's Enterprise Connect. It demonstrates the reliance that some companies have on a small number of primary manufacturers.

¹ ABS data by region 2013

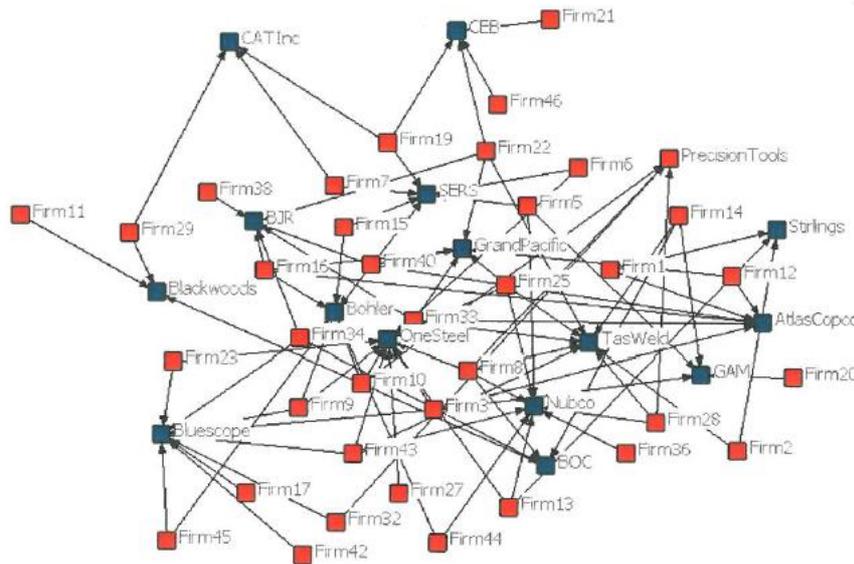
² Economic Policy Unit (Treasury) State Accounts 2014-15

³ Australian Government Department of Employment (2016)

⁴ Australian Government Department of Employment (2016)

⁵ ABS data by region 2011

Figure 4.5: Links with suppliers reported by three or more Engineering/Engineering Services Participants



Source: Interviews with North West Engineering Mapping participants

On the above diagram the blue boxes reflect the primaries and the red boxes reflect those connected in the supply chain to the primary. The primary in this case is also the product or parts manufacturer (intermediary) for some larger national and international based firms where purchasing decisions are often dictated by a corporate area not located in the region. This impacts discretion to use local firms and the obvious reliance on a few firms for supply and drives the need to expand market and supply opportunities.

This issue was further reinforced during mapping work undertaken in the north of the state, which highlighted a strong dependency of several businesses, including in some instances BOC an almost complete reliance, on a single major manufacturer.

In order for manufacturing to remain globally competitive it must transition from traditional assembly line manufacture to advanced manufacturing incorporating a range of activities beyond the production process itself. Advanced manufacturing includes the entire chain of activities - from research to design and development, to distribution, logistics, operations, maintenance and other related services.

These activities are not necessarily captured as manufacturing under official statistics, which can lead to an under-estimation of the growth, size and importance of manufacturing.⁶

There is little available data regarding advanced manufacturing in Tasmania. However, some understanding can be extrapolated from general manufacturing statistics and engagement with industry.

In 2011, 48% (603) of manufacturers were non-employing businesses (owner operated, sole trader); 46% (572) were SMEs employing between one and 19 employees; 6% (75) businesses employed 20 -199 people; and only six manufacturing businesses employed more than 200 employees.

It is estimated that the top six businesses employ over 2 000 people in total and each supports major supply chains in their own right.

⁶ Australian manufacturing: Redefining manufacturing August 2013 Publication No. 13-03

The situation is also very dynamic, with the manufacturing sector undergoing significant transition in response to changes across nearly all sectors.

The advanced manufacturing sector is predominantly focused on low volume, higher quality, or niche, manufacturing. Management capabilities and workforce skills are vital factors in business performance and competitiveness.

There is a high level of adaptation within the Tasmanian advanced manufacturing sector. Many businesses have changed what they produce or the way they make products in response to changing market and economic circumstances. This has included purchasing new machinery and adopting new technology.

Context

On 19 May 2015 the Tasmanian Advanced Manufacturing Summit brought industry and government together in Burnie to progress the shared goal of securing a strong sustainable and globally competitive future for advanced manufacturing in Tasmania.

Around 140 decision makers from the sector and 20 senior government and stakeholder representatives were in attendance.

Professor Goran Roos, an internationally recognised authority on global manufacturing, presented on the day, affirming the importance of the sector to Tasmania with the following key messages.

- Manufacturing enables prosperity in any economy.
- Manufacturing is the biggest spender of applied research and innovation, and the key driver of productivity improvement, with spill over effects into the rest of the economy.
- Manufacturing makes up the biggest share of world trade and hence is critical for export earnings that pay for the cost of imports.
- Manufacturing is the largest driver of high value services and therefore critical for the high end of the service economy.

The Summit was an important opportunity to hear direct from the sector about both the challenges and opportunities that are currently present.

It was evident at the Summit that while the sector recognises that significant challenges exist, there is every reason to be optimistic about the future of advanced manufacturing in Tasmania. The sector made it clear that to maximise opportunities and support growth it wants world-class skills; greater collaboration across the state; and a partnership approach between industry, government and the training sector.

Opportunities and challenges for the sector were identified during the development of this Action Plan through feedback from the Summit, engagement with the sector through the Caterpillar Transition Task Force, the trade mission to Thailand, and from extensive one-on-one business engagement and visitations.

Tasmanian opportunities

Engagement with advanced manufacturing firms has clearly indicated a strong desire by most to grow their businesses and explore new opportunities. Some are actively pursuing new ventures and others are considering options, although at an early stage.

Many businesses are already obtaining work from interstate and are keen to explore more opportunities that may exist. A number of businesses are selling their products interstate and some have opened branches or factories interstate to be closer to their market and to diversify and spread risk.

Organisations included in the Australian Government Department of Industry's 2015 northern mapping project indicated that the sectors viewed to have the most opportunities were in: mining and resources, water and energy, or commercial and industrial projects. However, only a small number indicated they were actually pursuing growth opportunities.

A low Australian dollar is likely to assist a number of our manufacturers in their quest to remain globally competitive.

Some of the specific areas that firms have identified as likely to provide opportunities include:

- new product manufacturing (for example, value added food products)
- defence opportunities
- maritime
- oil and gas.

New product manufacturing

There are a range of businesses that have expressed a desire to look at opportunities pertaining to their own product development. In some instances products have been identified through collaboration with external stakeholders and clients and opportunities exist to commercialise those innovative ideas.

To support commercialisation within Tasmania we need to improve access to venture capital and support the development of new products - through research and development, prototype development, marketing and manufacturing. These are all areas that can be expensive. Given that the majority of Tasmanian manufacturing firms are quite small and have limited resources, this can be an area of focus through the Innovation and Growth Voucher system (Action 1) and Market Assistance Program (Action 9).

With the Tasmanian training and education system focusing on enabling the advanced manufacturing sector, developing an available, skilled workforce and providing access to specialist skills will significantly improve opportunities.

Defence

In February 2016 the Australian Government released the 10 year Defence Capability Plan.

In March 2016 the Tasmanian Government released the *Our Fair Share of Defence* strategy.

In the Australian context, Tasmania's defence manufacturing is quite small with an estimated 30 Tasmanian businesses active in defence support and contracting (with some of this being for international, rather than national, defence forces). In the context of the Tasmanian sector, 30 businesses is a small proportion of the approximately 800 businesses in the advanced manufacturing sector.

Through the *Our Fair Share of Defence* strategy and an already active element of the Tasmanian advanced manufacturing sector, there is significant effort towards increasing exposure to Australian Defence Force contracts. In February 2016 the Caterpillar Transition Taskforce funded a submission by a Tasmanian advanced manufacturing firm into a Request for Information process for Phase Three of the Land 400 defence procurement project.

The Australian Maritime College which supports the training for the Pacific Patrol Boat Program and the Defence Science and the Technology Organisation's (DSTO) nutrition research facility at Scottsdale are the two most visible defence focussed organisations in Tasmania.

With a skilled workforce, extensive marine and maritime industrial base and innovative capability, Tasmania is well-placed to have a greater role in delivering products and services to the Australian Defence Force. In fact, Tasmanian shipbuilding and repair services businesses represent 5.1% of the total industry in Australia.

It is important to note that for many of these businesses, defence work is just a part of their overall activity. Many of the issues that pertain to gaining increased defence work apply equally to other work being contested by the advanced manufacturing sector.

Maritime

Tasmania has had a long tradition of boat building and there is now an extensive group of companies servicing the maritime sector including those from the Tasmanian Maritime Network. These companies offer a range of services including manufacturing, engineering, logistics, training, clothing, safety equipment and shipping for both the commercial and military markets.

The maritime sector includes companies such as Apco Engineering, Cawthorn Welding, CBG Systems, Crisp Bros Haywards, Incat, Liferaft Systems Australia, Moonraker, Muir Engineering, Pivot Maritime International, Plastic Fabrications, Richardson Devine Marine, RIMS Engineering, Southern Marine Shiplift, Stormy Lifejackets and Taylor Brothers.

The maritime sector is supported by the Tasmanian Maritime Network whose membership includes a wide range of different maritime related business producing a diverse range of products, services and advice.

Resources, oil and gas

Australia's oil and gas industry offers potential opportunities for Tasmanian manufacturers. The expansion of the oil and gas industry in Australia, particularly offshore operations, has attracted the attention of a growing number of maritime-based businesses in Tasmania.

There are currently more than 40 companies active in the oil and gas offshore and sub-sea sector in Tasmania. These companies provide a range of services, including construction of work boats and ferries to service offshore structures, modular accommodation units and refits of rigs, non-destructive weld testing of components, ocean port simulators for expansion feasibilities, oceanography and meteorological services, and bio-fouling remediation for semi-submersibles.

Many have been successful in defence, polar support and other niche sub-sectors. These companies will continue to operate in the highly competitive international markets of defence, offshore exploration and maritime services. Tasmanian enterprises offer expertise in such areas as:

- instrumentation and control systems
- subsea equipment and offshore commercial diving
- met ocean services and equipment
- high speed offshore support vessels

- maritime education, training and consultancy
- lightning and surge protection equipment
- environmental marine support services
- protective/ safety footwear and clothing
- consultant engineering, scientific and management services
- offshore support services, rig maintenance and equipment installation
- accommodation units and
- stainless steel and aluminium fabrication.

Several businesses are active around Bell Bay, Launceston and Hobart and the majority supply equipment and provide repair and modification services both nationally and internationally. There has been a collaborative approach by Tasmanian businesses to 'export' their valuable services to dry-docking providers in Australia and overseas.

Key challenges and requirements for growth in Tasmania

Different subsectors of advanced manufacturing have their own opportunities and issues. The 2015 Advanced Manufacturing Summit highlighted some of those challenges that need to be addressed or understood to support growth in the sector.

Technology

Tasmania has some challenges in technology-based businesses stemming from distance, lower connectivity with similar businesses and a lower level of business support services than that experienced in larger, interstate cities. At the same time the sophistication level within firms varies dramatically, whether referring to technology, processes, management or governance; and there are Tasmanian firms that have a level of sophistication that is equal, if not superior, to mainland and overseas counterparts.

Innovation and collaboration

Innovation is a fundamental requirement for a thriving manufacturing sector and can be a key component of competitive advantage, growth and positive change.

Innovation and collaboration are critical to progressing advanced manufacturing in Tasmania. Some of the important elements of a regional innovation system have been outlined as:

- knowledge which is new to the firm, the industry or the world
- competent people
- an environment conducive to innovation.

These, along with at least the following three further criteria, create the dynamic flow of innovation activity:

- the innovation must be desired by the market
- a high level of value creation must be achieved through the innovation
- a high proportion of the value must be captured by the innovating firm.⁷

Collaboration is an intrinsic part of innovation, and one which has been repeatedly identified as a key opportunity by Tasmanian manufacturers.

⁷ Roos, G & O'Connor ed., Integrating Innovation: South Australian Entrepreneurship Systems and Strategies, Adelaide University, www.adelaide.edu.au/press, 2015, p12

This is important in the Tasmanian context given issues associated with scale and isolation of Tasmanian manufacturers, which are primarily SMEs. The ability for these businesses to collaborate and access joint financial and other resources creates a stronger position when competing off-island.

In practical terms, product development requires manufacturers to work with their customers to 'pull' through solutions and avoid unnecessary 'blue sky' research. Manufacturers need to be able to utilise their own in-house expertise and inherent innovation as a building block for product development in collaboration with researchers.

Supporting the sector to enjoy ready-access to specialist institutions such as CSIRO's Lab22, QCAT and other resources which are available interstate will improve Tasmanian firms' ability to compete, innovate and grow. The initiative in March 2016 for the Government to co-host with CSIRO the Industrial Manufacturing Technology Showcase and roundtables was the first stage towards developing awareness for the sector about some of these services available across Australia.

Improving the connectivity of businesses within Tasmania will expose firms to further opportunity and create awareness of capability and capacity of the Tasmanian sector. These relationships can also be broadened interstate and overseas through initiatives such as the trade mission to Thailand in 2015 and the Manufacturing Insights into Excellence Tour of Victoria in 2016. These are two examples of where the Government can create opportunity to promote our brand; develop awareness of opportunities to work with firms nationally and internationally; expose industry to best practice and technology; offer a collaborative learning environment; and foster stronger relationships across Tasmanian firms.

Tasmanian manufacturing firms are actively pursuing collaboration with other manufacturers in response to transitional issues. An example of this is collaboration in relation to Caterpillar suppliers transitioning to supply to Thailand and other parts of Caterpillar's global organisation.

Increasing the level of collaboration will assist with a range of issues including awareness of new developments in technology; business practices and industrial processes; and market and product development opportunities. These are fundamental issues behind Insights into Excellence Tours and international trade missions, which are supported as a key initiative under the Action Plan.

Collaboration and developing relationships and local sector knowledge will also assist with fully utilising spare capacity including equipment, skilled staff and design and engineering capability, as raised by the sector during the northern mapping exercise.

Collaboration may also assist with supplier issues, including logistics and freight, through consolidation or shared resources.

Strengthening ties between the sector and research institutions, including universities, is a vitally important objective. It should be recognised that this is already occurring in a range of instances and particularly so with UTAS and its Australian Maritime College. At the same time there is room for improvement, especially improving the ties with SMEs and research institutions. One instance of this could be greater utilisation of undergraduate and postgraduate capacity on industry driven projects.

Government can play a role in supporting collaboration and addressing barriers to collaboration. This can include facilitating supply chain integration and partnering, supporting innovation and technology diffusion along with knowledge sharing, benchmarking and logistics partnering.

Access to finance

Access to capital remains a concern for Tasmanian manufacturers.

Venture capital access is limited within Tasmania, as is the case for most regional areas outside of Australia's major capital cities. Costs associated with developing product, including research and development (R&D), prototype development, marketing and manufacturing can be prohibitively expensive.

For smaller firms particularly, capacity to grow can be very capital-intensive. Traditional lending can provide significant challenges for smaller firms due to security requirements and lending parameters.

Government programs such as the Advanced Manufacturing Transition Fund and the Tasmanian Jobs and Investment Fund occasionally become available and can assist.

Australia's export credit agency, Export Finance and Insurance Corporation (EFIC), can provide support such as export contract loans, guarantees, and bonds in certain circumstances. It has been utilised by a small number of Tasmanian operators with a focus on export outside Australia.

Given that the majority of Tasmanian manufacturing firms are quite small with limited resources, accessing working capital to fund growth can pose a significant challenge. The new Innovation and Growth Voucher System and Manufacturing Market Assistance Program can provide support to these firms to access professional expertise in developing business and/or marketing plans, thereby assisting in accessing finance.

Global competitiveness

Tasmanian manufacturers face increasing pressure from overseas competitors, placing emphasis on the need to adopt new technology and processes in order to retain markets. Although Tasmania's industry is made up primarily of SMEs, this creates the advantage of being nimble and therefore able to adjust to market pressures quickly.

Facing rising input costs, the ability to remain lean and nimble, and to focus on value-adding products and services will be critical for the future of the sector.

Collaboration is also important to offset some of these issues. Once again, the smaller scale of the Tasmanian sector offers the opportunity to build sustainability and strength from relationships. Sharing resources, having knowledge of what resources can be shared, partnering in new developments, and sharing supply chains and customer introductions can build the sector as a whole.

Increasing downward pricing pressure is particularly challenging for commodity processors. Where the sector can work as a collective to improve input costs and remain lean will support the viability of these processors.

Marketing/branding

There are numerous examples of where Tasmanian manufacturers have strong brands and market development activities.

There is an opportunity to raise the profile of the Tasmanian sector as a whole by leveraging the existing Tasmanian brand and reputation for high value, quality products.

Tasmanian firms are often complimented on their capability and entrepreneurialism by people that have had exposure to them. However there would be benefit to raising awareness of the Tasmanian sector's capabilities more widely. The Action Plan has multiple initiatives to make this a key focus. These include creating a web portal which promotes capability; hosting outward and inward trade missions and events; representing and supporting the sector at key trade shows; and developing promotional material such as the recently produced promotional video on Tasmanian advanced manufacturing. www.stategrowth.tas.gov.au/home/sectors/advanced_manufacturing

This new video visualises end-to-end manufacturing in Tasmania without focusing on specific businesses, providing a promotional tool for the sector, government and stakeholders within and outside Tasmania.

When Tasmanian firms were asked to rate a range support initiatives in terms of importance and adequacy, access to market intelligence was one of the highest rated activities that could be provided.

While ongoing engagement has highlighted that most manufacturing businesses are keen to explore new opportunities for growth, there is a marked difference in the capacity of firms to do so. Currently, a considerable number of manufacturers, including some firms that have more than 20 employees, have little or no online presence.

The Government can provide support to develop a professional and effective online presence through the Digital Ready Program. Also, advanced manufacturers will have the opportunity to participate and be promoted on the new web portal. The content for this site will be validated through an independent capability and capacity audit supported under the Action Plan.

Promotion and marketing is particularly important for those businesses that have evolved as part of larger supply chains where there has been a high dependency on a small number of end customers. This Action Plan will provide an opportunity for them to expand their brand, opening new markets and developing new supply chains.

Knowledge acquisition, skills and technology transfer

Skills and capabilities are crucial elements of a successful manufacturing sector. This includes not just trades training but management and leadership skills along with technical and specialist skills.

There are a wide range of areas where Tasmanian manufacturers have identified that they are seeking to obtain knowledge. Some of these are technical skills and some are business and management orientated. Specific areas include:

- implementing competitive systems and practices (lean manufacturing, lean production)
- workforce development, succession planning, supply chain management
- export strategy development and market analysis
- innovation and design, including innovative systems, business model innovation, market design, branding and marketing
- new product development, R&D, and business and strategic planning.

The recent Mapping Capability and Connections report in northern Tasmania reiterates this point:

“The majority of firms interviewed identified process improvement within their businesses as a key mechanism for further growth, however few were actively engaging in formal processes of continuous improvement and quality assurance. Firms tended to run internal programs. Business advice and strategy development was generally conducted in-house with few firms accessing Government programs or private consultancies for assistance. Lack of formal networks within the region limits access to knowledge sharing and support for business improvement.”⁸

⁸ Mapping Capability and Connections: Northern Tasmania Manufacturing, Department of Industry and Science, July 2015.

There are also limited opportunities for firms to obtain experience with disruptive technologies, which will undoubtedly have a significant impact on the future of manufacturing. Examples of this are additive manufacturing and the 'internet of things'⁹.

Many Tasmanian manufacturers are committed to obtaining world-class skills and it is imperative that State Government frameworks are closely connected to sector requirements.

Offering opportunities to link businesses to: innovation and research institutes; first-hand experience of best practice processes; and latest technology will support the sector in knowledge acquisition, skills and technology transfer.

Business operators lack time to continually research new technology and stay abreast of new training opportunities and industry developments. The new industry association will seek to provide currency of sector and global knowledge that can be disseminated across its members.

Industry engagement also flagged concern regarding the availability of suitably skilled employees and apprentices.

In some cases the sector is concerned that some specific training is not available at all within Tasmania, raising issues of cost and time in obtaining that training from providers outside Tasmania.

Collaboration, coordination and workforce planning can support participation to justify the delivery of specialised training. Skills Tasmania is focusing on supporting the needs of the sector to undertake an industry wide workforce planning exercise.

The Innovation and Growth Voucher could subsidise specialised training where it results in innovation and growth outcomes for a firm.

The sector will also need to take ownership in this area, placing a priority on workforce planning.

Skills Tasmania is working with independent Tasmanian training providers and TasTAFE to ensure the quality and relevance of the training provided is appropriate.

Through the Caterpillar Transition Taskforce, UTAS was funded to offer a tailored program in Business/Design and Technology in the north west, where a need for local training was identified.

⁹ The Internet of Things (IoT) is a computing concept that describes a future where everyday physical objects will be connected to the Internet and be able to identify themselves to other devices. Source: <https://www.techopedia.com/definition/28247/internet-of-things-iot> accessed on 9 September 2015.

Connecting Tasmania to the National Innovation and Competitiveness Agenda

To accelerate growth, the Tasmanian manufacturing sector needs the right capabilities and structure to offer effective products and services, in a timely manner to deliver to a global market.

To support Tasmanian manufacturing business to focus on innovative processes, systems and products to grow their business and develop new opportunities, the Tasmanian Government will offer the Innovation and Growth Voucher system (Action 1).

The Tasmanian Government will work in partnership with the new manufacturing industry association to help connect industry and individual firms to the five national Growth Centres:

- advanced manufacturing
- food and agribusiness
- medical technologies and pharmaceuticals
- mining equipment, technology and services; and
- oil, gas and energy resources.

The Growth Centre initiative is intended to facilitate national action on key issues by identifying opportunities to reduce regulatory burden, increase collaboration and commercialisation, improve capabilities to engage with international markets and global supply chains, and enhance management and workforce skills.

Through the Tasmanian Government's *Our Fair Share of Defence* strategy and the Australian Government's 2016 Defence White Paper there is increased focus and investment on facilitating innovation within SMEs, providing an opportunity for businesses to build closer engagement with defence and attract new defence supply opportunities.

Tasmanian businesses will also be assisted in accessing other current Australian Government programs such as:

- Research and Development Tax Incentive - A targeted entitlement program that helps businesses offset some of the costs of doing R&D. The program aims to help more businesses undertake R&D and innovate.
- Industry Skills Fund - assists industry on a co-contribution basis to invest in training (which is not funded elsewhere) and support services, and to develop innovative training solutions. The fund will help build a highly skilled workforce that can take advantage of new business growth opportunities and adapt to rapid technological change. The fund is targeting SMEs, including micro businesses, which are preparing to take up growth opportunities outside of their normal day-to-day business operations.
- Export Finance and Insurance Corporation (EFIC) - provides financial support to Australian based companies that are exporting, in the global supply chain or seeking to grow internationally. EFIC's primary purpose is to facilitate and encourage Australian export trade on a commercial basis.



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