

SUBMISSION TO THE

**New South Wales Department of Industry  
Draft New South Wales  
Advanced Manufacturing Industry  
Development Strategy Consultation**

JANUARY 2018

## NSW ADVANCED MANUFACTURING INDUSTRY DEVELOPMENT STRATEGY

The Australian Academy of Technology and Engineering (ATSE)<sup>1</sup> welcomes the opportunity to comment on the draft NSW Advanced Manufacturing Industry Development Strategy (the Strategy). ATSE commends the NSW Government for commissioning the Strategy and supports many of its key findings

ATSE endorses the Strategy's proposed change to the definition of *advanced manufacturing*. Concentrating on how companies produce goods rather than what is being produced is a significant and positive change, as it acknowledges the importance of industry advancement to all manufacturing businesses and not just sub-sectors such as medical devices and aerospace. ATSE recommends working with the ABS to change the official definition of advanced manufacturing to improve monitoring of the Australian manufacturing sector's progress towards an advanced manufacturing paradigm. Additionally, the Strategy should account for trend away from purely 'product industries' toward 'product plus service industries', i.e. manufactured products integrated with the services that must be delivered to the customer with the product. ATSE also supports the analysis framework including the three categories of Advanced Knowledge, Advanced Processes, and Advanced Business Models and the metrics/policy areas that sit within each category.

The revised strategy should clearly link the research and analysis undertaken by McKinsey to the proposed strategy and policy initiatives. As the document currently stands, the draft strategies identified for each of the focus areas do not appear to flow from the analysis and in some cases they revert to targeted sectors, rather than focusing on raising the levels of performance of all manufacturing sectors.

The NSW Government must investigate how current industry support initiatives could be streamlined, aggregated and/or reformed to have greater impact. The draft strategy notes that this may be appropriate but could go further. Specifically identifying which initiatives are relevant to each of the advanced manufacturing business metrics may be a useful first step to identify areas of unnecessary duplication or shortcomings of the suite of initiatives.

ATSE also recommends that the NSW Government revise the proposed KPIs to a sharper set of indicators that focus on outcomes rather than deliverables.

Feedback and recommendations related to specific sections of the Strategy and general comments on the draft KPIs are included in the tables below.

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<sup>1</sup> ATSE is an independent think tank that comprises the leaders in the fields of technology and engineering, who gain Fellowship to the Academy in a highly competitive process. ATSE is one of Australia's four national Learned Academies but uniquely its 800-strong Fellowship come from industry, government and research organisations, as well as academia. Our Fellowship develops trusted, informed and visionary views to persuade decision-makers to implement the most progressive policies on the development of technology for the betterment of Australia and its people. [www.atse.org.au](http://www.atse.org.au)

Focus Area	NSW Draft Strategy	Comment
<b>Advanced Knowledge</b>		
<b>1. Increase collaboration between government, industry and academia to information share and build industry capability</b>	Drive collaboration across the advanced manufacturing ecosystem	There are a number of initiatives underway at a national level to improve collaboration across the broader innovation ecosystem, with a particular focus on industry-research collaboration, and the Academy has played a lead role in a number of these initiatives (e.g. enhanced metrics to incentivise industry-research collaboration). ATSE encourages the NSW Government to continue to engage with these national efforts, especially via the Advanced Manufacturing Growth Centre and the other national Industry Growth Centres such as MTPConnect (med tech and pharma) and FIAL (food and agriculture).
	Investigate establishing advanced manufacturing Living Lab and/ or Hub in NSW in partnership with the Commonwealth Department of Industry and AMGC	ATSE supports investigation of the suitability of a Living Lab or Advanced Manufacturing Hub for NSW. The success of a Living Lab or Hub will depend on a broad number of factors and the Department should consider reviewing case studies from other jurisdictions and also any unique challenges or opportunities that may be presented in the local environment.
	Organise and support informal networking events for NSW-based manufacturers, researchers and large manufacturing companies that improve knowledge-sharing about market trends and business opportunities	ATSE broadly supports the strategies identified here to improved knowledge sharing. It is clear that information sharing opportunities (certainly for SMEs), will be critical, as manufacturing companies

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	<p>Organise and support open days/information forums at Australian universities and research organisations</p> <p>Best Practice speaker series, modelled on the successful Lean Manufacturing program in the Central West/Orange region of NSW (offering a series of workshops for local manufacturers)</p> <p>Academic speaker series (inviting leading Australian and global researchers to brief a select group of NSW manufacturers on latest projects and innovations), leveraging the Visitor Entrepreneur Program and the US Studies Centre, attached to the University of Sydney</p>	<p>themselves must embrace an appropriate change program to improve their performance on the advanced manufacturing metrics.</p>
<p><b>2. Skills for the advanced manufacturing jobs of the future – focussing on education, qualifications and increasing skills intensity</b></p>	<p>DoI (ID lead; with Training Services NSW, PEA, Department of Education) will work with key partners to identify the nature of the skills gap in NSW advanced manufacturing.</p> <p>Scope solutions that will help to minimise skills gap. These may include initiatives such as:</p> <ul style="list-style-type: none"> <li>• Informal workshops and developing tools, including online tools that will assist businesses in advanced manufacturing, in particular SMES, with the aim to aggregate demand for skills (“skills clustering”) (short/medium term); and</li> <li>• Investigate coordinating an industry – led mentoring/management capability building program,</li> </ul>	<p>ATSE supports the NSW DoI’s commitment to identifying the skills gap and scoping initiatives to address the education and skills needs of the future advanced manufacturing workforce.</p> <p>Broader efforts to increase the cooperation and engagement between universities and research organisations will play a role in addressing skill gaps. Providing opportunities for industry engaged research higher degrees and industry mentoring for doctoral candidates - through programs such as ATSE’s Industry Mentoring Network in STEMM (Science, Technology, Engineering, Mathematics and Medicine-IMNIS) - will support the development and transfer of advanced knowledge for the mutual benefit of research organisations and industry. Flexibility in university curricula will be essential to ensure that graduates are work-ready, with career relevant STEM and innovation based skillsets.</p>

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	<p>through formal or informal management training (short term).</p>	<p>There will likely be opportunities to leverage existing groups and initiatives in the education and training space to expand their impact. The Sydney School of Entrepreneurship is relevant initiative that has already seen investment from the NSW Government. Creating synergistic links between existing initiatives should help grow the NSW innovation ecosystem.</p> <p>In addition to the need for STEM-skilled employees, Australia’s manufacturing industry will need to further develop and deploy soft skills and capabilities for supporting innovation to create and capture value. The Australian Council of Learned Academies (ACOLA) has undertaken an interdisciplinary research project investigating how the technical and non-technical skills and capabilities for innovation are managed in high-performing Australian enterprises<sup>2</sup>. To improve its ability to compete on value rather than cost, the industry will also need to invest in service industry skills such as design thinking, customer experience management and software systems.</p> <p>The NSW Government could also consider developing programs that improve industry commitments to workforce enhancement and encourage employee participation in professional development programs.</p>
<p><b>Advanced Processes</b></p>		

<sup>2</sup> Cunningham, S., Theilacker, M., Gahan, P., Callan, V. and Rainnie, A. (2016). Skills and capabilities for Australian enterprise innovation. Report for the Australian Council of Learned Academies. Available at <http://acola.org.au/wp/saf10/>

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<b>1. Increase the adoption of advanced “smart factory” production techniques</b>	<p>DoI will work with key partners to deliver industry-led – “Industry 4.0” workshops state-wide that are focussed on enhancing state-wide uptake of Industry 4.0 by NSW manufacturers. Workshops will focus on key priority areas including big data/analytics; AI; augmented reality; digital supply chain; and security of things. The focus is on educating industry to lower production costs, creating an environment that fosters innovation.</p> <p>As part of this, NSW Government will deliver:</p> <ul style="list-style-type: none"> <li>• Training/information seminars and, including training modules for small and medium-sized businesses and tailored workshops for those businesses based in Western Sydney and Regional NSW</li> <li>• An online tool offering firms an “Industry 4.0 readiness check</li> </ul>	<p>ATSE broadly supports the NSW Government’s proposed efforts to increase adoption of advanced processes in industry. Collaborating with the AMGC and relevant Industry Associations may assist the design and delivery of Industry 4.0 Workshops and associated programs. This work should integrate with work going on nationally via the Prime Minister’s Industry 4.0 Taskforce and the development of communications, interoperability and security standards for networked systems. Enhancing interoperability through consistent standards will lead to greater industry collaboration.</p>
<b>2. Support the creation of customised, high-value goods for global markets</b>	<p>Facilitate keynote speaker series and seminars, featuring national and international manufacturing experts from global markets on global best practice</p>	<p>Producing customised high value goods is considered a key opportunity for advanced manufacturing but it is likely to be a very difficult activity to encourage through policy mechanisms. As such, it is not surprising that the strategy proposed is only loosely related to the focus area.</p>
<b>Advanced Business Models and Creating Demand</b>		

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<b>1. Attract foreign direct investment and grow industry presence</b>	DoI will lead a cross- government effort to encourage international businesses to choose NSW as their Asia-Pacific base by assessing NSW's current competitive position benchmarked against key competitors	
	DoI will lead a cross-government effort to continue to identify and develop precincts and industry clusters in strategic locations across the state	<p>ATSE supports the establishment of precincts and industry clusters where there is a business case for doing so. However fostering a broader ecosystem that supports advanced manufacturing and innovation more broadly is an essential prerequisite to a successful precinct.</p> <p>The NSW Government must consider the learnings from developing and established precincts, including local examples such as the Innovation Hub at Australian Technology Park and international successes. ATSE understands that the NSW Innovation &amp; Productivity Council has recently received draft advice on success factors for precincts from both its consultants and a UK-based cities expert. Considering these success factors will be necessary to maximise the chance of the proposed Western Sydney-based defence and aerospace precinct being successful.</p>
	DoI will continue to coordinate as well as develop and execute strategic projects state wide that create jobs and contribute to economic growth by revitalising local communities and activating underutilised government land	<p>A competitive manufacturing industry in Australia is only possible if labour costs in the sector are reduced e.g. via automation. In order to achieve the job creation outcomes desired by the Government, new companies and industry sectors will need to be established. The new jobs that may be created will not be of the same type or level as in previous generations, so emphasis will need to be placed on educating</p>

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		and training workers for new job categories, and support provided to those workers transitioning out of the industry.
<b>2. Globally promote and showcase NSW Advanced Manufacturing capabilities</b>	Working with, Austrade and Business Events Sydney, Promote NSW Advanced Manufacturing to other States and internationally through global showcasing and promoting through business events as well as inbound and outbound trade missions and delegations	
	DoI establishing a Western Sydney Investment Attractions Office that will focus on attracting investment, increasing trade and creating new jobs to support the growth of globally competitive and sustainable NSW industries, such as Advanced Manufacturing	
<b>3. Make it easier to do business in NSW – Government as a Customer</b>	The Department of Finance, Services and Innovation is currently undertaking a review of NSW Government procurement processes that will examine ways to streamline processes and look increasing participation of NSW businesses, including SMEs, in government procurement processes. This includes identifying an investing in initiatives that improve capabilities of NSW businesses to bid for government work.	<p>Government procurement programs can provide excellent opportunity to drive manufacturing innovation and competitiveness. ATSE is supportive of this review.</p> <p>The NSW Government may also find value in an initiative similar to the United States Small Business Innovation Research (SBIR) program, which has operated successfully for over 30 years and provides a mechanism for SMEs to address pressing government R&amp;D challenges. Similar programs have been implemented in Queensland and the United Kingdom, and are being piloted nationally in Australia as the Business Research and Innovation Initiative and SBIR for Defence.</p>



### General Comments on KPI's

The 17 KPIs listed in Section 4.4 are mostly soft and activity - rather than outcome - focused. ATSE recommends that the KPIs for the NSW Government be outcome oriented and address the 7 priority policy areas identified in Exhibit 26:

- Increasing R&D expenditure
- Increasing ICT intensity
- Promoting collaboration with research institutions
- Promoting collaboration with other firms
- Increasing STEM skill intensity
- Increasing the level of automation
- Boosting the degree of backwards linkages

Many of the current KPIs describe pieces of work that should be undertaken, rather than measures of performance. Clear outcome oriented KPIs based on the metrics associated with the priority areas described above will make it easier to measure the advancement of the NSW manufacturing sector.