The Economic Contribution of Lockheed Martin to Australia

May 2018

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Key findings

Over $60 Million
invested to partner with and grow over 30 Australian small and medium sized enterprises through the Global Supply Chain Initiative.

Over $2 Million
invested in sponsorships, partnerships and memberships in 2017.

LMA activities combined with current manufacturing and integration activities on Lockheed Martin products and programs contributed an estimated $340 Million to Australian GDP in 2016.
Over $25 Million
invested in new Lockheed Martin Australia (LMA) facilities and locations over the past two years.

Over 4,000 Australian jobs as a result of Lockheed Martin products and programs*

At the end of 2016, KPMG estimates that 1,215 skilled manufacturing and systems integration jobs existed in country to support Lockheed Martin Products and Programs.

Parts manufactured by Australian small and medium sized companies are exported and integrated into every F-35 aircraft built globally.

* Figure Provided by Lockheed Martin and calculated based upon publicly available data on Lockheed Martin’s products and programs in-country. See e.g. Press Release by Minister for Defence, Senator the Hon Marise Payne, ‘Joint Strike Fighter Program Creating Australian Jobs’, 4 March 2017.
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To be Australia’s partner of choice for defence, aerospace, sustainment and technology solutions
1. Introduction

Lockheed Martin Australia is an Australian company that is engaged in research, design, development, integration and sustainment of advanced technology systems, products and services.

Lockheed Martin Australia is best known for its defence and national security capabilities. The company currently provides a range of products and services to the Australian Defence Force including next generation pilot training, combat systems integration, rotary wing systems and sustainment, 5th generation air combat capability, radar systems sustainment and surveillance across the air, sea, land and space domains. Lockheed Martin also has a growing footprint in Australia providing civilian products and services as well as capabilities for Australia’s space industry. Further, Lockheed Martin has invested significantly in Australian led research and development (R&D) and education, in addition to the support Lockheed Martin provides for Australian community organisations and its partnerships with Australian suppliers.

Lockheed Martin Australia’s (LMA’s) vision is “to be Australia’s partner of choice for defence, aerospace, sustainment and technology solutions”. As this report articulates, LMA is working across a variety of industries and with a variety of partners to realise this vision. To better understand the impact this work is having, LMA has engaged KPMG to examine and detail LMA’s current economic footprint and provide an updated picture of LMA’s contribution and activity since the last KPMG report in 2015.

1.1 Scope

The scope of this report is to provide an analysis of the economic contributions of LMA to Australia. This latest KPMG analysis updates and extends the initial base lining of the impact of LMA on the Australian economy undertaken in 2015.

Firstly, this update and extension includes an updated estimate of the value of LMA’s direct activity within the economy. It also identifies LMA’s contribution beyond the macroeconomic – with these impacts spanning a spectrum of activities like philanthropy, provision of scholarships, community sponsorships, and support for other businesses and Small to Medium Enterprises (SMEs).

Secondly, this report also includes an estimate of the current level of Australian business activity and employment that supports current manufacturing and systems integration activities on Lockheed Martin products and programs. These activities are in addition to training, logistics, sustainment, and other activities which LMA undertakes in Australia.

1.2 Report Structure

As such, the remainder of this report is organised in two parts.

- Section 2 describes LMA’s investment in Australia’s future across the following areas:
  - Contribution to Australia’s Defence and Security;
  - Contribution to Australia’s Commercial and Energy Industry;
  - Commitment to Australia’s Space Industry;
  - Engagement with the Australian Community;
  - Commitment to further developing Australian Defence Industry and Australia’s High-Tech Industrial Capabilities; and
  - Investment in Research and Development in Australia.

- Section 3 builds on this, providing an assessment of the direct and indirect (flow-through) contribution of the above LMA activities to employment and to economic activity in Australia.
2. Lockheed Martin’s Investment in Australia’s Economic Future

2.1 Lockheed Martin’s Contribution to Australia’s Defence and Security

LMA is a prime supporter of, and contributor to, Australia’s defence and national security. Lockheed Martin’s diverse programs in-country significantly support Australia’s current and future defence capabilities. These programs include next generation pilot training, maritime combat systems integration, rotary wing systems, 5th generation air combat capability, radar systems sustainment and surveillance across the air, sea, land and space domains. In addition to providing important capabilities to the Australian Defence Force (ADF), Lockheed Martin’s presence in-country generates jobs across the continent in advanced manufacturing and high technology industries, providing Australia with a sovereign capability edge.

Despite its breadth of programs in-country, Lockheed Martin is perhaps currently best known in Australia as the producer of the Joint Strike Fighter (JSF) F-35 Lightning II. The F-35 is the world’s most advanced 5th generation fighter and is integral to Australia’s future Defence and national security operations. As a partner of choice, LMA has established an Australian F-35 program that will increase Australia’s Defence capability, industry participation and provide further economic benefits over the long term. Over 50 Australian companies have already contributed to the F-35 program, representing a contracted value of over AUD $1 Billion thus far and growing.

The F-35 program supports thousands of high-tech manufacturing jobs across Australia, and will support many more still in the future as F-35 production ramps up globally.

Importantly, LMA is engaged in both the production and in sustainment and training for the F-35. With the delivery of the F-35s to the RAAF Williamtown Base in 2018, LMA expects to expand its presence in the region further. More specialty jobs for supply chain, training and support are planned, with LMA also establishing a prime contractor presence at the F-35 Airframe Maintenance Repair Overhaul and Upgrade facility at Williamtown in New South Wales (NSW).

1 See, for example, 2016 Defence White Paper and Royal Australian Air Force (RAAF) – Air Force Strategy 2017-2027.
LMA is also at the forefront of cutting-edge innovation and technology – a thought leader in 5th generation technologies. This is evident with the Lockheed Martin Aegis Combat System – enabling the integration of commercial off-the-shelf maritime technology through an open architecture. The open architecture allows new capabilities to be added and integrated at significantly lower marginal costs, a non-trivial concern with the ever-increasing rollout of technology upgrades. The Aegis Combat System has already been installed on Australia’s first Hobart-class destroyer, which was commissioned in September 2017, and is being installed on the other two ships in this class.

LMA is also very active in the area of training, logistics and sustainment. In 2015, LMA was awarded an initial seven-year contract worth approximately $750 million to train the next generation of Australian Defence Force pilots. This represents a comprehensive partnership with Australia’s Defence Department to deliver the training and capability required to prepare Australian pilots for 5th generation platforms. Other LMA contributions to the sustainment and training of Australia’s Defence Force (ADF) include the Jindalee Operational Radar Network (JORN) and Tactical Air Defence Radar System (TADRS).

In 2015, Sikorsky became a Lockheed Martin company. Sikorsky is a company with an already long and successful history of delivering key products and programs to the Australian Defence Force. Sikorsky has added to the capability of LMA and has enhanced LMA’s contribution to Australia’s Defence and national security capability as well as its presence in Australia. The MH60R program, for example, delivered the next generation helicopters to the Royal Australian Navy and has established new maintenance and logistics facilities to support these helicopters.
There are a significant number of Lockheed Martin products presently in use by the ADF, these include the AP-3C Orion maritime surveillance aircraft, C-130 Super Hercules military airlifter, Joint Air-to-Surface Standoff Missile (JASSM), Javelin anti-tank missile, Hellfire missile, Laser Guided Training Rounds (LGTRs), and Laser Guided Bombs (LGBs). LMA expects that as the ADF continues its modernisation programs, a number of new Lockheed Martin products, in addition to those already mentioned in this section, will enter service with the ADF over the coming decades.

Defence is Lockheed Martin’s primary business in Australia and, although LMA will continue to grow strongly in other areas including commercial infrastructure, energy, and space capabilities (which are explored in detail in the following pages), LMA remains focused on maintaining and developing its partnership with Defence and with Australia’s Defence Industry into the future.
2.2 Lockheed Martin’s Contribution to Australia’s Commercial and Energy Industry

Lockheed Martin is also an active participant in the commercial and civilian domains in Australia. This includes areas such as energy, transport, data analytics, quantum computing, signals and processing, and other enabling technologies for civilian and commercial utility, which have the potential to deliver significant benefits to the wider Australian community.

Energy storage has been a key focus for Lockheed Martin globally, particularly with the shift towards renewables and increasingly limited availability of traditional sources of energy generation. Lockheed Martin has been active in the early exploration of energy storage solutions and alternative energy sources, such as Lithium Ion batteries, tidal energy and bio energy.

An example of Lockheed Martin’s investment in energy is LMA’s Quantum Energy Storage Research Project with Griffith University in Queensland. This project aims to prove the viability of a quantum theoretical approach to harnessing waste energy that, if successful, has fundamental implications for future energy storage. LMA provided an initial investment into the research for this project with Griffith University, which was then leveraged into an Australian Research Council linkage grant.

Another area of LMA’s focus is the commercial and civilian transport space. In 2015, Sikorsky, an industry leader in aircraft, services and support, became a Lockheed Martin company. Sikorsky has given LMA a presence in Brisbane – one that dates back to the 1950s. Sikorsky’s Headquarters in Brisbane currently employs around 120 people and provides services in the commercial and civilian domains to both domestic and international clients in addition to Sikorsky’s work with the ADF.

Sikorsky in Australia supports a variety of commercial helicopter types that includes the S-92 and S-76 airframes with the former used significantly by the oil and gas industry in support of North West shelf activities. Sikorsky in Australia has a highly technical workforce and a number of the maintenance techniques carried out in the Brisbane plant can only otherwise be carried out in the U.S. on the actual production lines. This high level of technical expertise is in high demand within the South East Asian region and beyond. Recent activities have seen LMA Sikorsky staff conduct work in Saudi Arabia, Thailand, Indonesia, Singapore and China.
Sikorsky has embarked upon a repurposing of military helicopters for civilian use that will see, for the first time, Australian registered commercial Blackhaws flying in support of domestic aerial firefighting activities. Sikorsky also provides through life sustainment services for commercial and military helicopters in Australia, including across regional Australia (with a footprint in Nowra and Townsville), as well as providing maintenance and overhaul services across the globe.

LMA is utilising Australian engineering expertise, and part of Australia’s vast rail freight network to develop an intelligent rail system with export potential. LMA is developing the Advanced Train Management System (ATMS) in partnership with the Australian Rail Track Corporation (ARTC) which manages over 10 thousand kilometres of track in Australia. The ATMS delivers an increase in freight rail capacity and efficiency through enabling trains to run at closer intervals on a single track. The ATMS achieves this by using mobile telecommunications and GPS technology to communicate with trackside infrastructure, eliminating the need for fixed signals. The results are material transit time savings as well as increased safety and reliability benefits for rail operators and their customers. The ATMS is being developed in Australia, by Australians and has potential future applications on freight rail networks across the globe. The ATMS has already been the subject of export interest from countries including the USA, Brazil, South Africa and New Zealand.

Lockheed Martin is also exploring a number of other emerging technologies with the potential for application in civilian industry and business. These include the FORTIS Exoskeleton for use in industries like mining and engineering. The Exoskeleton technology provides new capabilities outside of the military realm. The FORTIS Exoskeleton transfers loads to the ground, allowing the user to operate heavy tools effortlessly. This ground-breaking design has the potential to increase industrial productivity and workplace safety (by reducing workplace injuries). Ongoing development and potential manufacturing in Australia is currently under consideration.

With demand for innovative energy, technology and automation set to increase in Australia, LMA expects its presence in these civilian sectors to grow significantly. LMA is investing in its partnerships with SMEs in Australia to help meet these demands.
2.3 Lockheed Martin’s Commitment to Australia’s Space Industry

The global space industry is growing rapidly and Australia is in a good position to benefit from this. In turn, Lockheed Martin is well-placed to assist Australia in building and developing its own space industry. Lockheed Martin has been at the forefront of the global space industry since 1950. This continues today, with Lockheed Martin’s development of the Orion Multi-Purpose Crew Vehicle and the Mars Base Camp for NASA.

Utilisation of space-derived information and data, as well as space-related products are now used in virtually every sector of the global economy. In tandem, Australia’s space industry is entering a new era with an increased reliance on space-enabled services for issues pertaining to national security as well as for civil and commercial purposes. Some key benefits of the use of space applications - highlighted in a recent Department of Industry, Innovation and Science report² - include improved productivity, better environment management, equity of access to information and services, and a safer and more secure Australia.

Critical to the growth of Australia’s space industry will be Australia’s space industry capability. Capitalising on the benefits of space-enabled services and applications requires the supporting physical infrastructure, research and development incentives, and human capital.

This is all-the-more relevant as a result of the Australian Government’s announcement, on 25 September 2017, of its intention to establish an Australian Space Agency. The aim of the national space agency is to provide a strategic long-term plan that supports the development and application of space technologies and the growth of domestic space capability.

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Although Australia’s space industry is still in the early stages of development, LMA is well-positioned to assist in this area. LMA seeks to be a long-term strategic partner in Australia’s space industry through its Lockheed Martin Space business in-country. Lockheed Martin Space seeks to build a sustainable business over time, building upon an annual turnover of approximately $20 million in 2016 and growing.

Highlighting Australia’s commitment to building its local space industry, Australia hosted the 68th Annual International Astronautical Congress in Adelaide in September 2017. The event, of which Lockheed Martin was an Industry Anchor Sponsor, brought together a network of global participants for a robust discussion on the advancement and progress of the space industry in its various applications.

The Satellite-Based Augmentation System (SBAS) is a prime example of collaboration between industry participants and government in the space industry. Lockheed Martin is one of three industry participants in this Australian Government-led trial through Geoscience Australia. This two-year, $12 million project seeks to develop a ‘second generation’ SBAS in Australia and demonstrate how the use of augmenting signals from multiple Global Navigation Satellite System (GNSS) constellations can enhance position, navigation and timing for a range of applications.

Specifically, LMA is providing the systems integration expertise in addition to operating the Uralla SBAS Test Control Centre.

The Space-Based Infrared System is another example of Lockheed Martin’s contribution to the industry and its commitment to global innovation and technology. This is a consolidated system designed to provide key capabilities in the areas of missile warning, missile defence, battle awareness, and technical intelligence. The system includes a combination of satellites and hosted payloads in Geosynchronous Earth Orbit (GEO) and Highly Elliptical Orbit (HEO) and ground hardware and software.

Working together, LMA and the Australian Government are well-placed to partner and build a strong and sustained relationship for the future of Australia’s space industry.
2.4 Lockheed Martin’s Engagement with the Australian Community

As an industry leader and a responsible corporate citizen, LMA’s contribution to Australia goes beyond the economic. The organisation plays an active role in supporting the Australian communities in which it operates. LMA strives to be a valued partner to the community and has initiated educational and charitable programmes as part of this ongoing effort. This includes support of Science, Technology, Engineering, and Mathematics (STEM) education, support for veterans and service members, and support for gender and ethnic diversity.

LMA is committed to a programme of philanthropy that invests in the community and promotes growth for all participants. This approach is diverse and spans across a wide spectrum of activity – from engaging with youth, to various education programs, through to support for Service Veterans.

Remount is an excellent illustration of LMA’s support for returned service personnel and their families. The program is designed to assist returned service personnel manage the impact of loss, combat stress and Post Traumatic Stress Disorder (PTSD), and to re-establish their lives post-service. This program was fully-subscribed in 2017 and LMA has committed to a further sponsorship of eight more programs for 30 personnel in 2018. LMA is also a privileged Benefactor to the Australian War Memorial – a cornerstone in recognition of Australian services personnel. Support provided allows for the preservation and conservation of the Australian experience of war for current and future generations to come.

Engagement with Australia’s community is multilayered, and another avenue by which LMA demonstrates its commitment to Australia is by investing in the youth of today. This commitment includes promoting STEM educational and career opportunities to high school students through Australia’s National Youth Science Forum (NYSF) which brings together over 600 high school students from all states and territories in a major science-focused student conference each year.

Lockheed Martin also maintains partnerships with Universities, working on cutting-edge developments and projects that have the potential to generate significant benefits for the wider community. LMA was also a sponsor of Aerospace Futures 2017 (held from 12-14 July in Adelaide) which brings together undergraduates, young professionals, academics and leaders from across Australia’s aerospace industry. These programmes are a key growth platform for the future generation of ‘innovators’ in Australia.

LMA is also a sponsor partner of Women in Aviation/Aerospace Australia (WA/AA), which promotes gender diversity and the participation of women within the aerospace and aviation sector. As part of this partnership, 60 spaces were provided by LMA for interested women to attend the conference in Queensland, Canberra and Victoria in 2017. This encourages diversity of thought and perspectives which are highly valuable and critical to an innovative and inclusive culture.

In 2017, LMA invested over $2 million in sponsorships, partnerships and memberships across the wider Australian Community as part of LMA’s commitment to growing its engagement with the Australian community. LMA is passionate about sponsoring scholarships for Australian students, as it understands that a highly-skilled workforce in Australia is required to meet the needs of the future global environment.

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5 LMA has been a sponsor of the NYSF since 2014.
2.5 Lockheed Martin’s Commitment to Further Developing Australian Defence Industry and Australia’s High-Tech Industrial Capabilities

Lockheed Martin is proactive in its engagement with industry in Australia. As part of LMA’s vision to be the ‘partner of choice’ in technology, equipment and sustainment solutions, LMA works closely with industry partners to form a strong and sustainable industry base in Australia. This fosters a long-term business and working relationships built on a history of credibility, performance and trust.

A sizeable portion of Lockheed Martin’s investment in local suppliers and companies comes from Lockheed Martin Corporation in the United States. This means that a considerable sum of Lockheed Martin’s global investment is made in Australia, generating economic activity and positive GDP impacts over and above the estimated $340 million contribution made by LMA alone. In Australia, this additional funding and investment from Lockheed Martin’s global business is made through a variety of programs.

For example, Lockheed Martin’s Office of Australian Industrial Participation (OAIP) assists Australian companies seeking opportunities in overseas markets by helping to identify and facilitate commercial opportunities. This includes opportunities in defence and non-defence areas, research and development, support and training. The OAIP supports Australian industry by providing specialised market assistance, regulatory compliance expertise, and other relevant training.

Examples of the OAIPs efforts in practice include Brisbane’s Ferra Engineering, which was contracted to provide weapons pylon kits for both Australian and other nations’ MH-60R naval helicopters. A further example is New South Wales-based Quickstep Holdings, which manufactures advanced fibre composite parts and components for Lockheed Martin’s LM-100J commercial freighter and the C-130J Super Hercules military airlifter.

Further, Australian Systems Integration SME Daronmont Technologies has delivered the sixth and final communications band Direction Finding (DF) System to Lockheed Martin Canada, completing a three-year delivery program on-budget and on-schedule. Daronmont CommSECA Communication Detection Systems will be fitted to the Royal Canadian Navy’s six new Arctic/Offshore Patrol Ships, the first of which is due to be launched in 2018.
Through the Global Supply Chain (GSC) program, Lockheed Martin’s OAIP is engaged in a multitude of projects and has awarded a total of over $60 million worth of contracts to local industry. These partnerships between Lockheed Martin globally and local Australian companies help build industry capability in advanced fields such as quantum computing, hypersonics, simulation and training, and radar and sensor programs. Along with Lockheed Martin’s sustained investment in R&D and other partnerships, this concerted effort will help raise the industrial base in Australia and promote industrial sovereignty to better-prepare Australian industry for future challenges.

Lockheed Martin’s commitment to Australian industry is also demonstrated in the provision of training, mentoring and support to Australian industry. Initiatives include the Centre for Leadership Excellence Program Management Institute, supporting Australian Trade Shows, co-development of Intellectual Property (IP), proposal-costing training (helping other companies become globally competitive in their bids), cyber security awareness training and Industrial Security Awareness training, among others.

LMA is the prime contractor to Australia’s Department of Defence as the Combat System Integrator (CSI) for the Future Submarine Program. LMA currently works with suppliers to support the design activities for the Future Submarine’s Combat System. LMA and Lockheed Martin globally will investigate applying a similar approach to engaging with local suppliers on future programs for example, installing the Aegis combat system into Australia’s future frigate fleet.

LMA assists Australian companies to grow by partnering with them. Partnerships fostered by LMA staff in-country can, and do, grow into contracts that give Australian companies access to further local opportunities as well as potential access to Lockheed Martin’s global supply chain. This approach has already led to Australian companies being contracted to contribute components to every F-35 aircraft manufactured, contracts which will grow in size as F-35 program progresses towards full rate production. Australian companies also contribute components to C-130J aircraft. Lockheed Martin hopes to extend similar supply-chain opportunities to other Australian companies in the future, and understands that to do this it must partner with, and help to grow, the innovative Australian companies of tomorrow.
2.6 Lockheed Martin’s Investment in Research and Development in Australia

The importance of research and development (R&D) to innovation, productivity, and the long-term improvement in Australia’s economic well-being cannot be overstated. The benefits of lower costs, higher productivity and better products through R&D can ultimately result in higher levels of GDP and growth. Knowledge transfer can also raise the local industry base and have further positive significant effects on the economy’s productivity.

R&D is an integral part of LMA’s contribution to Australia. Through its various programs, LMA has made significant investments in research and development in recognition of the vital role R&D plays in the long-term future and sustainability of Australia’s economy and people.

Lockheed Martin has a history of delivering world-class R&D capability and partnering with local universities and research organisations. To further capitalise on Australia’s cutting-edge R&D capability, it was announced in 2016 that the Lockheed Martin Corporation would fund the establishment of the Science, Technology, Engineering Leadership, and Research Laboratory (STELaRLab), a cross-disciplinary R&D facility in Melbourne, Victoria. Lockheed Martin committed $13 million to this facility over three years, representing a further investment by Lockheed Martin in Australia, in addition to those mentioned at the outset of this report.

The STELaRLab facility was designed by an Australian firm and has created over $1 million worth of construction work for local firms. The Lab plans to hire twenty researchers in its first three years of operations and is currently ahead of target, having employed 13 staff by the end of its first year. The primary areas of research include (but will not be limited to) data analytics, artificial intelligence, hypersonics, space systems, and advanced C4ISR (command, control, communications, intelligence, surveillance and reconnaissance) concepts. The utility of the technology developed from the research will be applicable in both the defence and non-defence applications.

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8 Information sourced from Director of STELaRLab, Dr. Tony Lindsay.
LMA has also established a submarine combat system laboratory in Adelaide to support the design, delivery and sustainment of the Royal Australian Navy’s Future Submarine project. Other strategic relationships include LMA’s research partnership with Australia’s Defence Science and Technology Group, under which Lockheed Martin successfully developed and fielded a system to prove next-generation Over the Horizon Radar concepts, as well as ongoing basic research into novel concepts for thermal management of hypersonic aircraft, and a range of other technologies for strengthening defence and national security.

Further, Desert Fireball is a research partnership with Curtin University, which commenced in 2017. The focus of the project will be to identify and develop advanced technologies for use in space. The research project will evaluate the existing Desert Fireball Network and seek to extend current capabilities. This is a one-year project with the possibility of a two year extension.

Lockheed Martin’s commitment to fostering the next-next generation of Australian defence industry capability is also evident through the Lockheed Martin’s Global Supply Chain program, which has, over the past five years brokered 25 contracts with 12 different universities with a value of over $6 million. The GSC program represents investment by Lockheed Martin globally into Australia, and generates economic impacts over and above the estimated $340 million contribution made by LMA. ⁹

Most recently Lockheed Martin’s GSC program partnered with the Defence Science Institute on a Meet the Technologist (MTT) program to connect local research organisations to leading Lockheed Martin technologists and their specific technology challenges. So far, this has led to five new research and development contracts, helping the University of Sydney to look at developing photonic-based filters for microwave radio frequency signal processing; RMIT to focus on advanced material improvements; the University of Wollongong to conduct research in the field of robotic planning and the University of Technology Sydney to investigate how fatigue changes autonomy in a variety of operational environments.

Fostering research and development in Australia is a key focus area for LMA precisely because both LMA and Lockheed Martin globally understand that the successful development of Australian industry partners of the future (especially Defence SMEs) depends upon sovereign R&D being done in Australian industry and academia today. Lockheed Martin is committed to helping raise the industrial base underpinning Australia’s Defence capability through university partnerships and engagement with smart, high technology companies. This helps raise their global profile and thus identify new research and development requirements to fulfil global needs and stay competitive.

⁹ See section 3 for more details on the $340 million estimate, which includes both LMA in-country activity and current in-country manufacturing and system integration on Lockheed Martin products and programs.
3. Lockheed Martin’s Economic Footprint in Australia

LMA’s contribution to the Australian economy can be split into three components:

- **LMA’s direct contribution** – which is measured through its direct employment and value-added. LMA’s value-added is effectively the value of LMA production less the inputs used from other industries, and is equivalent to its direct contribution to Australia’s GDP.

- **LMA’s indirect contribution** - through the stimulation of activity up and down the LMA supply chain. That is, LMA’s expenditure stimulates employment and activity in businesses supplying LMA with goods and services. LMA employees will also spend their wages and salaries on goods and services provided by other businesses.

- **LMA’s induced contribution** – the existence of LMA products and programs also provide opportunities for other businesses to also work on the manufacture, systems integration, training and sustainment of Lockheed Martin products and programs.

This section updates and expands the 2015 economic analysis of LMA’s contribution to the Australian economy. In this section, KPMG updates its previous estimate of the direct and indirect economic impacts of LMA’s contribution to the Australian economy based on the latest available data provided (financial data from December 2016 and employment data from December 2017).

This section also extends the 2015 analysis by including an estimate of the “induced” business activity that is currently involved in the manufacture and systems integration of LMA programs and products.

For the analysis of indirect and induced impacts, KPMG utilised its in-house General Equilibrium model to generate the flow-through or economy-wide results (see Appendix A for details on the CGE modelling).
3.1 Lockheed Martin’s direct contribution to the Australian economy

LMA contributes to the Australian economy through its operational activity and employment. In 2016, the company directly employed around 900 workers and spent almost $210 million on goods and services in Australia. The analysis looks at the impact of LMA’s activities in 2016, as this is the latest full year of financial data that is currently available.

LMA’s economic activity adds value to Australia’s economy. In particular, LMA directly added almost $103 million to Australian GDP in 2016, with over $95 million in wage payments to employees.

![Figure 1 Direct economic contribution of Lockheed Martin Australia’s operations, 2016](source: Lockheed Martin Australia and KPMG analysis)

The majority of LMA’s value-added continues to be in the “Professional, Technical and Support Services” (around 80 per cent). The remainder of LMA’s value added falls under the categories of “Manufacturing” and “Education and Training”. The strong skill and technical based focus of Lockheed Martin continues to support industry innovation and skills.

![Figure 2 Value-added of Lockheed Martin’s operations by ABS categories](source: Lockheed Martin Australia and KPMG analysis)
The figure below gives an estimated breakdown of the purchases that Lockheed Martin made in 2016 (as discussed above).

**Figure 3 Lockheed Martin’s direct expenditure in Australia, 2016**

<table>
<thead>
<tr>
<th>Industry</th>
<th>(000s AUD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>26,278</td>
</tr>
<tr>
<td>Electricity, Gas, Water and Waste Services</td>
<td>442</td>
</tr>
<tr>
<td>Construction</td>
<td>22</td>
</tr>
<tr>
<td>Wholesale and Retail Trade</td>
<td>44</td>
</tr>
<tr>
<td>Accommodation and Food Services</td>
<td>32,834</td>
</tr>
<tr>
<td>Transport, Postal and Warehousing</td>
<td>17,839</td>
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<tr>
<td>Information Media and Telecommunications</td>
<td>9,325</td>
</tr>
<tr>
<td>Financial and Insurance Services</td>
<td>788</td>
</tr>
<tr>
<td>Health Care and Social Assistance</td>
<td>24</td>
</tr>
<tr>
<td>Rental, Hiring and Real Estate Services</td>
<td>11,161</td>
</tr>
<tr>
<td>Professional, Scientific and Technical Services</td>
<td>43,626</td>
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<tr>
<td>Administrative and Support Services</td>
<td>34,432</td>
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<tr>
<td>Public Administration and Safety</td>
<td>129</td>
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<tr>
<td>Education and Training</td>
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<tr>
<td>Other Services</td>
<td>33,349</td>
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<tr>
<td><strong>Total Expenditure on Industry inputs</strong></td>
<td><strong>209,514</strong></td>
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<tr>
<td><strong>Wages</strong></td>
<td><strong>96,614</strong></td>
</tr>
<tr>
<td><strong>Profit/(Loss) before tax</strong></td>
<td><strong>-7,272</strong></td>
</tr>
<tr>
<td><strong>Total Expenditure</strong></td>
<td><strong>299,056</strong></td>
</tr>
</tbody>
</table>

*Source: Lockheed Martin Australia and KPMG analysis*

In 2016, LMA spent almost $210 million on goods and services from other industries in Australia. This expenditure stimulates activity in businesses supplying LMA with goods and services. That is, in providing these goods and services, these other businesses will, in turn, have employed workers and purchased goods and services from other parts of the economy. LMA and other employees will also spend their wages and salaries on goods and services provided by other businesses. Therefore, the impacts of LMA’s activities are not limited to their direct impacts, but also cascade up and down their supply chain and throughout the economy.

This means that the economic contribution of LMA should not be measured purely by the amount of activity it directly undertakes (as shown in the table above). The impact of LMA also includes the flow-on activity that occurs as a result of the inter-linkages up and down LMA’s supply chain. The following section examines these flow-on indirect impacts more closely.

Lockheed Martin’s products and programs also have a more significant impact on the economy that goes beyond the direct and indirect impacts discussed above. LMA estimates that there are over 3,200 non-LMA jobs that exist as a result of Lockheed Martin products and programs in Australia. This includes activity in businesses which have obtained their own contracts to provide manufacturing and integration services on Lockheed Martin products and programs directly to Defence or defence industry. Examples include contracts for the production of various mechanical assemblies that contribute to the JSF’s on-board electronic warfare system, awarded to firms including Micreo, Ferra

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10 This figure was directly provided by LMA in November 2017. LMA developed this estimate with support from external providers, and publicly available analysis to capture those Australians employed as a result of the existence of a Lockheed Martin product or program. In contrast, the employment estimates presented in this report narrow the scope to focus on those employed because of current manufacturing and systems integration activity on Lockheed Martin products and programs.
Engineering, TAE, AW Bell, Levett Engineering and SEC Plating.\textsuperscript{11} There was an estimated $165 million in export contracts awarded to Australian businesses for F-35 production and distribution in 2016.\textsuperscript{12} A further example is Quickstep’s contract to supply composite wing flaps for the military C-130J “Super Hercules” and commercial LM-100J transport aircraft.\textsuperscript{13} The following section also examines these \textbf{induced} business impacts that are directly related to current manufacturing and systems integration activity on Lockheed Martin products and programs.

Note that the induced impacts presented in the next section are limited to an estimate of the current manufacturing and integration activity on Lockheed Martin products and programs. This is likely to be an underestimate of LMA’s total impact on the economy. For example, there are a number of businesses that have developed skills and experience working on Lockheed Martin products and programs and are now applying these skills to other programs. Further there are also many businesses who are, or will be, involved in sustainment and training activity associated with Lockheed Martin products and programs. While both of these examples are beyond the scope of this analysis, they are or will likely be significant over the coming years, and are further examples of Lockheed Martin’s focus on industry and Australian partnerships.

\textsuperscript{13} http://www.quickstep.com.au/
3.2 Lockheed Martin’s indirect/induced contribution to the Australian economy

As discussed in the previous section, the economic contribution of LMA should not be measured purely by the amount of activity it directly undertakes. The impact of LMA also includes the flow-on activity that occurs as a result of the inter-linkages up and down LMA’s supply chain (indirect impacts). Australian business also benefit from opportunities to provide services to support Lockheed Martin products and programs (induced impacts). The following section examines these flow-on impacts more closely.

3.2.1 Lockheed Martin’s Impact on Australian GDP and employment

LMA’s operations stimulate economic activity and raise aggregate demand in the Australian economy. The current level of in-country spending and activity by LMA is estimated to have contributed around $185 million to Australian GDP when the indirect, supply-chain impacts are included. In addition, it is estimated that there has been another $155 million contributed as a result of current manufacturing and integration activity by other businesses on Lockheed Martin products and programs such as the F-35 and C-130J. This gave an overall contribution to GDP in 2016 of $340 million.

This impact is dominated by additional activity in the professional, scientific and technical services industry, and by a higher level of manufacturing and exports. In addition to boosting GDP, LMA’s activity in 2016 directly and indirectly supported 1,719 jobs in Australia. Another 1,215 jobs are as a result of other businesses providing manufacturing and integration services on Lockheed Martin products and programs. This gave an estimated 2,934 jobs in 2016 as a result of both LMA activity and current manufacturing and integration activity by other businesses on Lockheed Martin products and programs.

Figure 4 Lockheed Martin’s economy-wide impacts, 2016 (AUD million)

This can be compared to a broader estimate of 4,000 directly provided by LMA in November 2017. The LMA estimate was developed with support from external providers to capture those Australians employed as a result of the existence of a Lockheed Martin product or program. In contrast, the employment estimates presented in this report narrow the scope to focus on those employed because of current manufacturing and systems integration activity on Lockheed Martin products and programs.
As Lockheed Martin’s Australian activity continues to develop, its relative contribution to the Australian economy is expected to grow. In particular, future sustainment and training services, along with further manufacturing and integration work for Lockheed Martin products and programs indicate that LMA’s contribution to the Australian economy will rise.

3.2.2 Lockheed Martin’s Australian Industry Linkages

While Australia as a whole is expected to benefit from LMA’s economic activity, these impacts will vary across sectors.

Figure 5 Employment impact in Australia (jobs)

The figure above shows the industries that have additional activity as a result of direct and indirect LMA activity and/or because of current business manufacturing or integration services on Lockheed Martin products or programs, and how this is reflected in higher employment.

- The boost to professional, scientific and technical services reflect the direct activity of LMA in the Australian economy, as well as the additional demand by LMA for these services provided by other businesses.
- Additional business activity associated with manufacturing and integration services on Lockheed Martin programs and products support additional jobs in the manufacturing sector.
- This additional activity will also benefit sectors that support businesses, such as wholesale, construction and financial services. Activity in these sectors is stimulated by additional demand from the professional, scientific and technical services industry. Further, LMA has also invested over $25 million in new LMA facilities and locations over the past two years, which supported additional construction industry jobs.
• Industries that use professional, scientific and technical services also benefit from better access to these services. The professional services sector delivers services across a wide range of customers, and so this impact is widespread.

• Industries providing consumption goods and services to employees, such as the retail trade industry, will also benefit from increased consumption flowing from higher wages and employment.

• The increased economic activity and exports across the economy leads to an increase national wages and an appreciation of the exchange rate, as more demand is placed on inputs into production including labour. This has a slightly negative impact on labour intensive industries via their costs, and on export-dependent and import-competing sectors in terms of competitiveness. Sectors that are labour intensive and trade exposed bear the largest share of this constraint. These include other manufacturing, accommodation and transport industries.
Appendices
Appendix A. Modelling Approach

To model the economic impacts beyond those that directly relate to the LMA’s operations, it is necessary to employ a modelling technique that incorporates information about the linkages of the business within the broader economic context. The starting point for modelling these linkages is the input-output (IO) table published by the Australian Bureau of Statistics (ABS).

IO table data provides detailed information on the upstream and downstream linkages of each industry in the economy. **Upstream linkages** refer to the sources of inputs to the industry in question. These linkages may be in the form of the use of intermediate inputs produced by other domestic industries, imported intermediate inputs, labour and other factors of production. For example, the provision of radars may use inputs such as labour, machinery, fuel and services such as those of the transport industry. **Downstream linkages** refer to those of economic agents that purchase an industry’s output. For example, a construction business might purchase construction materials (e.g. sand) that it combines with other material inputs using labour and capital to build houses. Consequently, downstream linkages include sales to other industries that use the output of the resources sector as an intermediate input to their own production process or final users of the product like households, the government or foreigners.

An IO table is a useful tool as a snapshot of the economic flows in the economy. An IO table can be used to provide simplified estimates of the sensitivity of the economy (measured by employment, value added or turnover) to small shocks within industries. An example of such a shock might be a one per cent increase in mining export demand. This might lead to an increase in upstream activities, for example transport services or utilities that sell their output to the mining sector. This sort of analysis can be used at the industry-wide level to estimate IO multipliers – that is, the total economy-wide impact on employment or output resulting from a change in one industry, taking into account the change in demand for the outputs of other industries.

An IO table in itself is not an economic model, and IO multipliers are raw and ad hoc in nature. A major limitation of the use of IO multipliers when used to conduct impact analysis is that the relationship between industry inputs and outputs (the coefficients) are fixed, implying that industry structure remain unchanged by the shock to the industry (for example, a change in demand or prices). Furthermore, IO analysis imposes no resource constraints, and so industries can access unlimited supplies of inputs at fixed costs.

In reality, scarcity of availability of inputs (e.g. skilled labour, mineral deposits etc.) mean that these inputs are affected by and respond to prices (e.g. wages). The higher prices/wages, due to the increase in demand for labour to expand mineral extraction, will at the margin reduce demand for labour by some producers. So the result will be that these price impacts will then have an impact on activity levels which feed back into price effects (and so on).

In IO analysis, where all adjustments relate only to quantities produced, this type of feedback response does not to occur. Consequently, an IO model can result in an overstatement of the impacts on the economy. For these reasons, while the ABS did for some time publish IO multipliers, it has ceased publishing these estimates in recent years over concerns about their validity.

A computable general equilibrium (CGE) model makes use of an IO table in the construction of its database, but is extended to make more sophisticated economic assumptions.
In particular, CGE models have additional features that make them better suited for economic impact assessments including:

- recognising resource constraints and responses of businesses, workers through adjusting prices/wages;
- capturing employment/capital (and other factors inputs) substitution for example, by responding to higher wages by increasing the use of capital; and
- capturing a much wider set of economic impacts such as behavioural responses to price changes of consumers, investors, foreigners etc.

By introducing these additional economic assumptions we are able to model beyond the first round impact of an event or policy, account for scarcity and understand behavioural response to economic variables. This added sophistication means that a CGE model allows for feedback responses by producers, consumers, investors and foreigners and so the results are less likely to be overstated particularly over the medium to long run.
Appendix B. Disclaimer

Inherent limitations

This report has been prepared as outlined in the Scope Section. The services provided in connection with this engagement comprise an advisory engagement, which is not subject to assurance or other standards issued by the Australian Auditing and Assurance Standards Board and, consequently no opinions or conclusions intended to convey assurance have been expressed.

The findings in this report are based on a qualitative and quantitative study and the reported results reflect a perception of Lockheed Martin Australia and its impact on Australia but only to the extent of the data and information surveyed as approved by Lockheed Martin Australia.

No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by, Lockheed Martin Australia Pty Ltd’s management, personnel and stakeholders consulted as part of the process.

KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

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The findings in this report have been formed on the above basis.

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