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November 2018

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EXECUTIVE SUMMARY

BAE Systems Australia (henceforth BAE Systems) is critical to the nation’s defence capabilities, providing cutting edge technological solutions and contributing to the country’s domestic security and military influence. BAE Systems’ history in Australia dates back 65 years, during which it has been a critical supplier of military, communications, surveillance, mission support and intelligence systems to the Australian Defence Force (ADF). The company utilises its rich experience of managing complex engineering projects to deliver cutting-edge defence and security technological solutions. It also continues to invest heavily in research and development (R&D), to ensure it remains at the forefront of what the industry can offer.

As well as its significance to the Australian defence industry, BAE Systems makes a major contribution to the Australian economy. Through its day-to-day activities, BAE Systems sustains activity across the economy—most obviously on-site, but also through its supply chain and in consumer-facing industries as employees spend their wages. This contribution is measured through the effect it has on Gross Domestic Product (GDP), employment and tax contributions. In addition, BAE Systems makes substantial long term investments in the national economy through R&D and capital spending.

In 2017, BAE Systems made a total contribution to Australian GDP worth AUD 1.2 billion, and sustained 7,200 jobs. This economic contribution covers the direct activities of BAE Systems, the business generated through its supply chain, and the activity sustained as employees spent their wages. Of this total footprint, BAE Systems’ direct activities accounted for an annual contribution to GDP worth AUD 600 million and 3,200 full-time equivalent (FTE) jobs. The company is highly productive: this report finds BAE Systems’ labour productivity was nearly 20 percent higher than the economy-wide average, and nearly 50 percent higher than for the manufacturing sector as a whole.

BAE Systems also makes important contributions to the economy’s broader skill base and Australian exports. Half of the company’s 3,200 FTE employees are employed in engineering roles. Moreover, BAE Systems employees are spread across all mainland States, with some 30 percent of the total headcount based in South Australia alone. This highly skilled labour force not only contributes to the company’s high productivity but helps support Australian exports. These totalled AUD 150 million in 2017, or 15 percent of the firm’s total revenues.

Beyond 2017 itself, BAE Systems is also making longer term commitments to the development of Australia’s defence and defence industry capabilities through the Hunter Class Frigate Program. The Program will involve BAE Systems building nine anti-submarine warfare frigates for the Royal Australian Navy (RAN). BAE Systems’ involvement with the Program has potential to contribute a total of $17 billion to national GDP over the project lifetime (2018-19 to 2047-48). At the Program’s peak in 2028, BAE Systems involvement is estimated to make a total contribution of over 6,300 FTE jobs and just under $1 billion in GDP to the national economy. Not only will the Program provide...
extensive support to Australian defence and other industry suppliers, it will help develop deeper industry skills and technical know-how.

**BAE Systems’ long term commitment to the economy is also evidenced by its heavy investment in R&D, with spending totalling AUD 295 million since 2012.** Measured as a share of the company’s direct GDP contribution, investment in R&D was some five times the economy-wide average (with the company investment equating to 9.6 percent of its GDP as against the economy-wide average of 1.9 percent of GDP). In addition, the company invested AUD 12.1 million in capital projects, with around 60 percent spent on upgrading its production processes and software.
1. INTRODUCTION

As one of Australia’s leading defence contractors, BAE Systems is an essential supplier of products and services to the Australian Defence Force (ADF). The company has had a presence within Australia for more than six decades, and currently operates in 30 different sites around the country—15 of which it manages or owns. BAE Systems supports the ADF by producing a range of military, communications, surveillance, mission support, and cyber security solutions. This support is reinforced through the company’s constant drive for innovation, investing heavily to ensure it remains at the industry’s technological forefront.

BAE Systems delivers products and services throughout the defence sector. For years, it has provided cutting-edge solutions across air, land and sea, winning major contracts with all arms of the ADF. The company sustains this through a range of programs which maintain BAE Systems’ position as one of the nation’s leading defence and security contractors. This includes the Future Technologies program, which sees it partner with a range of academic and industrial leaders, helping the company to drive innovation and enhance the capabilities it can deliver to customers.

In recent years, the company has risen to the challenges and opportunities of an increasingly digital society through BAE Systems Applied Intelligence. This arm of the organisation provides information intelligence to both the public and private sectors in Australia, through the collection and management of data. It supports clients across a range of needs, including cyber security, risk management, compliance, data analytics and innovative software and hardware solutions.

This report quantifies the significant economic contribution of BAE Systems in 2017. It begins by documenting the company’s contribution to GDP and tax revenue, before assessing its employment footprint—including an analysis of the locations of jobs within Australia, and employees’ different occupations. This builds on our previous analysis, based on the 2015/16 financial year, by quantifying how the company’s economic contribution has changed over the intervening period. Further this report also examines the investment that BAE Systems made in R&D and capital expenditure in 2017.

It also points to the longer term contribution. BAE Systems is making to the development of Australia’s defence and defence industry capabilities through the Hunter Class Frigate Program. The Program will involve BAE Systems building nine Future Frigates for the Royal Australian Navy (RAN). Not only will the Program provide extensive support to Australian defence and other industry suppliers, it will help develop deeper industry skills and technical know-how as well as providing new export opportunities for local industries. The construction of the Hunter Class Frigates will involve advanced digital design techniques with the vessels themselves providing the RAN with technologically sophisticated Anti-Submarine Warfare (ASW) capabilities.
MODELLING THE ECONOMIC CONTRIBUTION

The economic contribution of a company or industry is measured using a standard mode of analysis called an “economic contribution assessment”. In this study, we model the contribution of BAE Systems to the Australian economy. The report quantifies the three “core” channels of contribution that comprise the organisation’s total “economic footprint”:

- **Direct contribution**— the economic benefit of BAE Systems’ operations and activities in Australia;
- **Indirect contribution**— the economic benefit and employment supported in the company’s supply chain, as a result of the procurement of goods and services;
- **Induced contribution** — the wider economic benefits that arise when BAE Systems’ employees and those employed within its supply chain spend their earnings, for example in local retail establishments.

These contribution channels are illustrated in more detail in the Technical Appendix (Chapter 7) at the end of this document. From these channels, BAE Systems’ total economic footprint in Australia is presented, using three key metrics:

- **GDP** — or more specifically, BAE Systems’ Gross Value Added (GVA) contribution to GDP;
- **Employment** — the total number of people employed, measured on a full-time equivalent (FTE) basis;
- **Tax** — representing the tax receipts paid to Australian Federal, State and Local governments.

In addition to the core economic impacts, this report examines some of the wider effects of the company’s services or products in boosting economic activity and developing capability elsewhere in the economy. The benefits detailed in this report come from the investment that BAE Systems makes in the form of R&D and capital spending.

The modelling on which this report is based computes the economic footprint of BAE Systems in 2017, the latest year for which full economic data were available at the time of publication. Economic contributions are quantified for the whole economy of Australia, with employment, procurement and investment expenditure also presented individually for the Australian States and Territories: the Australian Capital Territory; New South Wales; the Northern Territory; Queensland; South Australia; Tasmania; Victoria; and Western Australia.
2. CONTRIBUTION TO GDP

This section of the report describes the contribution that BAE Systems made to Australian GDP in 2017. It details the different channels of contribution that make up the organisation’s total economic footprint, its labour productivity, the industries it supports, and how its contribution has increased since 2015/16.

2.1 TOTAL CONTRIBUTION

BAE Systems made a total contribution to Australian GDP worth almost AUD 1.2 billion in 2017 (Fig. 1). The largest portion of this came from the company’s direct activity, worth AUD 600 million.\(^1\) An indirect contribution of AUD 230 million was made through its supply chain, with a further AUD 350 million coming from induced consumption activity.

This analysis reveals that BAE Systems had a multiplier of 2.0 in 2017. This means that, for every dollar of output, the Australian economy was boosted by a total of two dollars (including BAE Systems’ direct contribution). This is seen in how the company’s contribution increases from AUD 600 million to nearly AUD 1.2 billion when accounting for supply chain and induced spending effects.

Fig. 1. BAE Systems’ contribution to GDP in 2017

2.2 LABOUR PRODUCTIVITY

BAE Systems is a highly productive company: in 2017, it produced a direct contribution to GDP worth AUD 187,000 per FTE employee. As Fig. 2 illustrates, this compared favourably with the rest of the economy: BAE Systems’ employees were nearly 20 percent more productive than the economy average (AUD 159,000 per FTE employee), and 50 percent more productive than workers in the manufacturing sector (AUD 127,000 per

\(^1\) Full details of how this was calculated are given in the Technical Appendix.
The Economic Contribution of BAE Systems in Australia

FTE employee). Furthermore, its productivity is comparable to key components of the service sector, including the business services and information services sectors.

**Fig. 2. Labour productivity of BAE Systems in context in 2017**

<table>
<thead>
<tr>
<th>Sector</th>
<th>'000s AUD per FTE employee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information services</td>
<td>228,000</td>
</tr>
<tr>
<td>BAE Systems Australia</td>
<td>187,000</td>
</tr>
<tr>
<td>Business services</td>
<td>169,000</td>
</tr>
<tr>
<td>Whole economy</td>
<td>159,000</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>127,000</td>
</tr>
</tbody>
</table>

Source: Oxford Economics

**2.3 SUPPLY CHAIN ANALYSIS**

BAE Systems’ activities support a large supply chain in Australia, producing a significant amount of economic activity in a range of sectors. This activity amounted to an AUD 230 million indirect contribution to GDP in 2017. It was driven by the company’s purchases of goods and services from Australian suppliers, which amounted to AUD 330 million in 2017.

The largest beneficiary was the combined professional, engineering and ICT services sector. In 2017, BAE Systems made AUD 94 million in purchases from this sector, resulting in a total contribution to GDP across the whole supply chain worth AUD 80 million (Fig. 3). The next largest economic contribution came through the property and other leasing services sector, which supported an AUD 28 million contribution to GDP. The transport and communications sector supported a further AUD 27 million contribution to GDP, while a further AUD 22 million was delivered by the distribution sector, which includes both wholesale and retail.
In 2017, BAE Systems made purchases from all States in Australia, sustaining activity across the nation. As Fig. 4 illustrates, the largest share of this consumption was made in Victoria, with purchases totalling AUD 78 million, 22 percent of the total. Purchases from South Australia totalled a further AUD 71 million (20 percent), with AUD 65 million from New South Wales (20 percent), and AUD 59 million from Queensland (18 percent).

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2 This analysis does not represent a full description of the total economic contribution within each State; however, looking at BAE Systems’ purchase patterns gives a strong indication of where it generated this value.
2.4 CONSUMER SPENDING ANALYSIS

Spending out of wage income sustained a further AUD 350 million contribution to GDP. The primary beneficiaries of this spending were consumer-facing sectors. Of these, real estate netted the largest windfall, worth AUD 84 million (Fig. 5). The financial services industry benefitted from this activity to the sum of AUD 49 million, with a further AUD 42 million generated in the distribution industry across both wholesale and retail. Together the education and health sectors saw a AUD 37 million boost to their contribution to Australian GDP from the induced contribution.
The robust contribution BAE Systems makes to the Australian economy is responsible for a large tax footprint. In 2017, this involved a total tax contribution of AUD 335 million. More than half of this (AUD 187 million) came from BAE Systems’ direct activities. A further AUD 65 million was derived from the indirect supply chain activity that BAE Systems’ purchases support. An estimated AUD 83 million in tax was generated through the induced economic activity as employees spent out of their earnings.

3 This figure includes both taxes paid by BAE Systems and indirect taxes paid out of their employees’ earnings in the form of sales taxes.
2.6 BAE SYSTEMS’ EXPORTS

While BAE Systems’ core objective is to support the needs of the ADF, its growing export base represents a key additional revenue stream. Developing this part of its business gives the company additional revenue with which to sustain both its workforce and investments in R&D. In 2017, BAE Systems’ exports totalled AUD 150 million—15 percent of the firm’s total revenues. This represented significant growth since 2015/16, when exports accounted for six percent of its revenues.

2.7 CHANGE IN CONTRIBUTION TO GDP SINCE 2015/16

Since Oxford Economics’ previous analysis of the 2015/16 financial year, BAE Systems’ contribution to Australian GDP has risen. As Fig. 7 illustrates, the company’s direct contribution to GDP rose by AUD 20 million, an annualised nominal growth rate of 2.5 percent. Taking into account changes in the supply chain (indirect) and consumer driven (induced) effects, the total economic contribution made by BAE Systems rose by AUD 10 million in 2017 relative to the 2015/16 financial year.
Fig. 7. Comparison of BAE Systems’ contributions to Australian GDP in 2015/16 and 2017

![Graph showing comparison of BAE Systems' contributions to Australian GDP in 2015/16 and 2017.](image)

Source: Oxford Economics

BAE Systems also achieved increased labour productivity in 2017. Labour productivity has grown from AUD 175,000 per FTE employee in 2015/16 to AUD 187,000 per FTE employee in 2017, representing an annualised productivity growth rate of 4.6 percent.
3. EMPLOYMENT SUPPORTED

In the previous chapter, we examined how BAE Systems contributed to GDP through its activities on-site and via the expenditure it sustained in the rest of the economy. Now we turn our attention to how this activity supported jobs throughout the economy, with a deeper focus on BAE Systems’ own workforce.

3.1 TOTAL EMPLOYMENT

Overall, we calculate that BAE Systems’ activities in Australia in 2017 were responsible for supporting a total of 7,190 FTE jobs. Of this, 3,200 were supported internally across BAE Systems’ 30 locations in Australia (Fig. 8). An additional 1,630 FTE jobs were sustained in the supply chain generated by the company’s purchases of goods and services, and a further induced contribution of 2,360 FTE jobs was supported as BAE Systems’, and its suppliers’ employees consumed out of their earnings.

This means that for every 10 FTE employees of BAE Systems, a total of 22 jobs were supported around the Australian economy (including the direct employment contribution by BAE Systems): a multiplier of 2.2.

Fig. 8. BAE Systems’ contribution to employment in Australia in 2017

For every 10 direct FTE employees of BAE Systems, a total of 22 jobs are supported nationwide.

3.2 EMPLOYMENT STRUCTURE

As a leading defence company, BAE Systems employs a large number of engineers and other professional staff, with a small reliance on administrative or executive positions. In 2017, of the 3,198 individuals working at BAE Systems, half (1,597) worked in engineering. A further 45 percent (1,426) worked in a range of other professional roles, with significant technical responsibilities.\(^4\) Across all of these job roles, BAE Systems employs

\(^4\) Due to data availability, these figures reflect BAE Systems’ headcount, rather than its full time equivalent employment, and includes agency workers.
a highly skilled workforce, reflected in the high level of labour productivity highlighted in the previous chapter of this report.

BAE Systems' employees are based across a range of sites, giving the company a direct footprint across the whole of mainland Australia.\(^5\) Fig. 9 illustrates this pattern in 2017, with the largest share of its headcount based in South Australia—the site of its Edinburgh headquarters, where 956 staff were based (30 percent of the company’s total headcount). New South Wales was home to a further 917 employees (29 percent), with Victoria supporting 614 (19 percent) and Western Australia 522 (16 percent).

Fig. 9. BAE Systems' headcount employment, by State, in 2017

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\(^5\) These figures reflect BAE Systems’ headcount, rather than its full-time equivalent employment, due to data availability.
3.3 SUPPLY CHAIN JOB CREATION

BAE Systems’ supply chain supported a total of 1,630 jobs in Australia in 2017. The sector that benefitted most—by far—was the professional, engineering and ICT services sector, which saw a total of 630 people employed as part of BAE Systems’ supply chain (Fig. 10). A further 177 people were employed in transportation and communication services, with property and other leasing services supporting 133 jobs, and the distribution sector seeing 130 people employed in BAE Systems’ supply chain.

Fig. 10. Supply chain employment supported, by sector, in 2017

FTE jobs

<table>
<thead>
<tr>
<th>Sector</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional, engineering and ICT</td>
<td>630</td>
</tr>
<tr>
<td>Transport and communications</td>
<td>177</td>
</tr>
<tr>
<td>Other services</td>
<td>174</td>
</tr>
<tr>
<td>Other manufacturing</td>
<td>145</td>
</tr>
<tr>
<td>Property and other leasing services</td>
<td>133</td>
</tr>
<tr>
<td>Distribution</td>
<td>130</td>
</tr>
<tr>
<td>Transport manufacturing</td>
<td>110</td>
</tr>
<tr>
<td>Other industry</td>
<td>101</td>
</tr>
<tr>
<td>Financial services</td>
<td>84</td>
</tr>
</tbody>
</table>

Source: Oxford Economics

3.4 CONSUMER SPENDING JOBS CREATION

A broad range of sectors saw jobs sustained by the induced consumer spending that BAE Systems’ activities support. The distribution sector benefitted by 414 FTE jobs from this activity, and there were a further 379 jobs in the combined education and health industries (Fig. 11). The real estate industry was another significant beneficiary, with 299 jobs supported, while the accommodation and food services industry sustained 227 jobs from this induced consumer spending.
3.5 CHANGE IN EMPLOYMENT FOOTPRINT SINCE 2015/16

BAE Systems’ employment footprint has contracted since 2015/16, as the company has adjusted its focus and its supporting industries have seen their labour productivity increase. The total footprint contracted by 370 FTE jobs, an annualised rate of decrease of 3.2 percent (Fig. 12). Direct employment contracted by 100 jobs (2.0 percent per year), indirect employment grew by 40 jobs (1.9 percent), and induced employment contracted by 330 jobs (7.8 percent).

Fig. 12. Comparison of BAE Systems’ contribution to Australian employment in 2015/16 and 2017

Source: Oxford Economics
4. CATALYTIC BENEFITS

So far this report has examined the contributions BAE Systems makes to the economy through a conventional economic contribution framework. However, the company’s activities also have implications for the economy’s productive capacity, known as “catalytic benefits”. These benefits include its R&D and capital investments, and are examined in this section of the report.

4.1 INVESTMENT IN RESEARCH AND DEVELOPMENT

Within BAE Systems, a significant focus is placed on developing new technologies and driving innovation in its processes—supported by a substantial investment in R&D. In 2017, this investment totalled AUD 37 million, bringing the company’s total spending on R&D since 2012 to AUD 295 million. This investment is designed to ensure that the company maintains its position at the frontier of defence technology, and continues delivering the cutting-edge products essential to the operations of the ADF.

This drive for innovation stimulates an intensity of investment in R&D considerably higher than is seen in the rest of the Australian economy. BAE Systems’ investment in R&D represented 9.6 percent of its direct contribution to GDP in 2017. This is higher than the rate of investment in the whole economy (1.9 percent of GDP) and the manufacturing sector (3.9 percent GDP). Fig. 13 illustrates the scale of this investment relative to these and other key sectors.

Fig. 13. BAE Systems’ R&D investment as a share of its contribution to GDP, in context

![Bar chart showing BAE Systems' R&D investment as a share of GDP compared to other sectors.]

Source: Oxford Economics/ABS

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6 Source: Australian Bureau of Statistics.

7 BAE Systems figures represent 2017, with other figures using 2015/16 financial year, the most recent data.
BAE Systems’ R&D activity primarily takes place within customer-funded projects. A total of AUD 35 million of its R&D investment in 2017 was through consumer-funded research, whereby the research takes place in the process of delivering a specific product for a client. Such an approach ensures that product design is shaped and influenced by active collaboration with final users, and means that research is tailored to delivering realisable outcomes.

The R&D investment that BAE Systems made in 2017 was centred in South Australia. As Fig. 14 illustrates, this State made up more than half of the company’s total R&D activity, worth AUD 20.2 million. Victoria saw a further AUD 14.5 million, with AUD 1.8 million in New South Wales and AUD 0.5 million in the Australian Capital Territory.

Investment in R&D offers BAE Systems benefits beyond the immediate applications of its innovation. The returns to R&D are often broad, mirroring that of many other investments in that their benefits are felt for a number of years. In addition to this, they are likely to be seen across different parts of the business as BAE Systems incorporates the innovations into other products and production processes. These benefits have been established through academic evidence, which finds that shareholders feel large and sustained benefits of R&D in the form of increased returns.8

Furthermore, the benefits of this R&D investment are enjoyed broadly, as returns spill over into other parts of the economy. These spill-over effects are seen through a number of mechanisms, including when other organisations adopt these innovations; when competitors seek similar solutions from their

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own research, or when employees leave to work for other companies. These combine with the private returns to generate a larger total ‘social return to investment’, a benefit which has also been captured in academic research.⁹

4.2 CAPITAL SPENDING

Alongside its sizeable investment in R&D, BAE Systems develops its capabilities through significant levels of capital spending. Such investment enables it to enhance its research and production processes, to incorporate the best-available technologies, and to maintain the smooth running of existing plant equipment. In addition to the private benefits captured by BAE Systems from such investment, the spending also supports activity across the economy in a manner analogous to the supply chain effects reported previously.

BAE Systems’ capital expenditure totalled AUD 12.1 million in 2017. A total of AUD 7.3 million of these investments represented upgrades, split between upgrades to production equipment (worth AUD 3.8 million) and upgrades to software (AUD 3.5 million). A further AUD 4.6 million was spent on repairs and maintenance of existing property, which is critical to the smooth operation of BAE Systems’ manufacturing processes. In addition, AUD 0.2 million was spend on other capital items, including investment made by BAE Systems Applied Intelligence.

Fig. 15. BAE Systems’ capital spending by use in 2017

Source: Oxford Economics

5. HUNTER CLASS FRIGATE PROGRAM

The preceding chapters have largely detailed BAE Systems activities in 2017. However BAE Systems is also making longer term commitments to develop Australia’s defence readiness and defence industry capabilities through specific design and construction programs.

On the 29th June 2018, BAE Systems Australia was selected as the preferred tenderer for the Hunter Class Frigate Program to deliver nine Future Frigates to the Royal Australian Navy (RAN). The design of the Hunter Class Frigates will be based on the UK’s Type 26 frigate, specifically designed for Anti-Submarine Warfare (ASW). The Australian version will incorporate a variety of advanced technologies including the Aegis combat management system and the Australian designed CEA Phased Radar (CEAFAR). The vessels will replace the eight existing Anzac class frigates and will begin entering service in the late 2020’s.

The vessels will be constructed at the Osborne Naval Shipyard, in South Australia. The Program will make a major contribution to the local and national skills and employment base within the defence industry through the development of a continuous naval shipbuilding capability.

Beyond this, the Program will create jobs and opportunities across South Australia and the nation as a whole, as goods and services are procured from a wide variety of suppliers in every State and Territory within the defence industry and beyond. Over 500 Australian companies have pre-qualified to be part of the Program’s supply chain, 100 of which are located in South Australia.

Moreover, the Program’s demand for a highly skilled workforce will boost advanced technology skills and know-how in South Australia and nationwide. This will assist in developing Australia’s defence industry capabilities as well as potentially supporting innovation and skills across Australia’s industrial landscape as a whole. The Program also holds potential for industry and university partnerships. For example, BAE Systems plans to collaborate with Flinders University as a part of the Program. The partnership will see Flinders receive access to BAE Systems’ digital shipbuilding tools. This knowledge sharing, in turn, will be used for the training of the Future Frigates workforce and to assist in the development and integration of vessel operating systems. BAE Systems will also work closely with the Naval Shipbuilding College to increase the engagement with education providers across the nation with the aim of creating industry training programs essential to providing a trained shipbuilding workforce.

Related collaboration could see R&D into autonomous underwater vehicles – a technology that holds considerable submarine detection potential.

The contribution of the Program to the economy was modelled using a similar methodology to the estimations undertaken for BAE System’s total economic
The Economic Contribution of BAE Systems in Australia

This modelling indicated that, at the project’s peak, in 2028, it will make a total contribution of over 6,300 FTE jobs and just under $1 billion in GDP to the national economy. Of these, some 2,400 jobs will be contributed directly through employment at BAE Systems, while nearly 1,800 will be contributed indirectly through the supply chain, as BAE Systems purchases goods and services from companies across Australia. The remainder comprises of employment arising from purchases by project and supply chain workers (induced effects).

These figures indicate that Hunter Class Frigate Program is anticipated to have an employment multiplier of approximately 2.7 in that year: for every 10 Program jobs directly contributed by BAE Systems in that year, a total of 27 jobs will be contributed in the broader Australian economy (including the 10 directly contributed by BAE Systems).

Likewise, the Program will have broader effects on Australian GDP. While BAE Systems’ involvement in the Program is estimated to contribute some $420 million in GDP in 2028, a further $233 million will be contributed through the Program supply chain, with consumption-driven effects making up the rest of the total GDP contribution of $980 million. This suggests a GDP multiplier of 2.3 in that year: for every dollar of GDP contributed by BAE Systems through the Program, the Australian economy will be boosted by a total of 2.3 dollars (including BAE Systems direct contribution). These effects are illustrated in the figures below.

**Fig. 16. BAE Systems contribution to Australian employment in 2028 through Hunter Class Frigate Program**

![Bar chart showing contributions](chart.png)

Source: Oxford Economics

Note that all cited figures subject to rounding.
The effects of the supply chain contributions to jobs and GDP can also be considered. The Program is expected to involve significant purchases from the transport manufacturing, other manufacturing, professional engineering and ICT services and transport and communications sectors in particular. This is illustrated through the following figures which provide a breakdown of the supply chain FTE jobs and GDP contributed by the Program.

**Fig. 17. BAE Systems contribution to Australian GDP in 2028 through Hunter Class Frigate Program**

![Graph showing BAE Systems contribution to Australian GDP in 2028](image)

Source: Oxford Economics

**Fig. 18. Supply chain employment supported through the Hunter Class Frigate Program, by sector, in 2028**

![Pie chart showing supply chain employment](image)

Source: Oxford Economics
As the project spans some 30 years, its effects will also be felt over the longer term. We estimate that BAE Systems’ involvement with Hunter Class Frigate Program will contribute a total of $17 billion to national GDP over the project lifetime, as a whole (2018-19 to 2047-48). Of this, some $7.1 billion will be contributed by BAE Systems direct activities, while the procurement chain will contribute an additional $4.4 billion. The remainder will be contributed through consumer driven induced effects, as BAE Systems and supply chain staff spend their money within the broader economy. This suggests an overall project GDP multiplier of 2.4.

As is the case for the peak year effects, the main procurement impacts are expected to be felt in the transport manufacturing, other manufacturing,
professional engineering and ICT services and transport and communications sectors, as illustrated in the figure below.

**Fig. 21. Supply chain GDP supported through Hunter Class Frigate Program by sector: 2018-19 to 2047-48 total**
6. CONCLUSION

BAE Systems is a pillar of Australia’s defence and security industry. Throughout its long history within the country, the company has been an integral supplier to the ADF, playing a critical role in defence and security activities. Today, BAE Systems maintains this tradition while also incorporating new capabilities such as cyber security, which ensures that it maintains its position at the forefront of the industry.

Alongside this core function, BAE Systems is also a significant contributor to the Australian economy. In 2017, it generated a total contribution to GDP worth AUD 1.18 billion. This footprint was responsible for sustaining 7,190 FTE jobs across a broad range of industries, and supporting tax revenues worth AUD 335 million.

BAE Systems’ position is sustained through a large amount of investment in equipment and technology. The consequence of this is that the company is a highly productive manufacturer. In 2017, this amounted to a direct contribution to GDP worth AUD 187,000 per FTE worker it employed—meaning it is significantly more productive than the economy-wide average. Furthermore, BAE Systems has benefitted from its long history of investment; this is demonstrated by its rise in productivity since our previous analysis (in 2015/16), with its contribution to GDP per FTE employee increasing at a rate of 4.6% per year.

Alongside these economic contributions, BAE Systems has invested significant amounts in its future potential—supporting the economic value it can produce in the medium and long term. Intensive investment in R&D is at the core of how BAE Systems keeps at the frontier of the defence industry, allowing it to further develop the technological solutions it can offer. The company’s AUD 37 million investment in R&D in 2017 meant that it invested five times as much of its contribution to GDP as the economy-wide average. This was complimented by AUD 12.1 million of capital spending, which is instrumental in raising BAE Systems’ production potential going forward—as illustrated by the large share of this investment which targets upgrading production processes and software.

BAE Systems is also making a long-term commitment to the development of Australia’s defence and defence industry capabilities through the Hunter Class Frigate Program with a total of $17 billion contributed to national GDP over the project lifetime (2018-19 to 2047-48) and over 6,300 FTE jobs in its peak year of 2028.

Together, these activities generate a large and sustained contribution to the Australian economy. Through both BAE Systems’ economic contribution in 2017 and the investments it is making for the future, this large contribution to Australia’s manufacturing sector is set to continue for many years to come—complementing the major role it plays in the Australian defence industry.
7. TECHNICAL APPENDIX

MODELLING THE ECONOMIC CONTRIBUTION

The analysis in this report utilises economic contribution modelling. This is a tool often used in order to assess the value of the economic contribution made by a business, industry or investment. The contribution that such an entity or activity has is analysed through three distinct channels:

- **Direct contribution** — includes all activities carried out by BAE Systems in 2017;
- **Indirect contribution**— concerns the activity carried out in the supply chain that supplies BAE Systems’ purchases of goods and services from within Australia. The indirect contribution of capital and non-capital purchases that BAE Systems made in 2017 were analysed in aggregate; and
- **Induced contribution** — consists of the economic activity that stems from the spending of direct and indirect employees of BAE Systems that are residents of Australia.

Fig. 22. Structure of direct, indirect, induced and total economic contribution
Direct Contribution

The direct contribution made to the Australian economy is estimated using data provided by BAE Systems.

- **Gross value added** contribution to GDP (referred to as GDP, for simplicity, in this report) is calculated as the total of the cost of employment (including wages, benefits and employee taxes), the company’s EBITDA and other taxes on production. This relates to activity within Australia and therefore might not be the same as annual accounts figures which can follow different accounting rules and practices.

- **Full-time equivalent (FTE) employment** is estimated based on the number of BAE Systems employees working full time and part time, with each part time worker judged to be equivalent to half of one full time worker.

- **Labour productivity** is measured as the firm’s gross value added per FTE employee, with the same approach.

- **Tax contributions** were also made available by BAE Systems. This covers taxes on employment, corporate profits and production. It excludes goods and sales tax on BAE Systems products and services as this is not paid by the company itself. However, it includes consumption taxes paid by the BAE Systems and supply chain workforce, as these are indirect taxes on their income. These are derived based on individuals’ propensity to consume out of their income and the relevant tax rates.

Indirect and induced contributions

The indirect and induced impacts that BAE Systems are estimated using an input-output model, which gives a snapshot of the interactions in the economy at a specific time. This details the spending flows which make up “final demand” (i.e. consumer spending, government spending investment and exports to the rest of the world); intermediate spending patterns (i.e. what each sector buys from every other sector – the supply chain in other words); how much of that spending stays within the economy; and the distribution of income between employment compensation and corporate profits.

An input-output model uses a matrix representation of a nation’s interconnected economy to calculate the effect of expenditure shocks by consumers or by an industry on other industries and therefore on the economy as a whole. The input-output model ultimately measures “multiplier effects” of an industry by tracing the effects of its inter-industry transactions – that is the value of goods and services that are needed (inputs) to produce each dollar of output for an individual sector. These models can be used to measure the relationship between an economic change or “shock,” and the final outcome across the whole of the economy.

In essence an input-output model is a table which shows who buys what from whom in the economy. The figure below provides an illustrative guide to a stylised input-output model.
Fig. 23. A stylised input-output model

![Input-output model diagram]


Modelling for the Hunter Class Frigate Program project was carried out based on data supplied by BAE Systems using the above supply and use table and modelled in a similar way to the approach described above. While the structure of the economy will inevitably change in the future, the modelling is intended to provide a broad-level indication of the scale and nature of the Program's economic contribution.

NOTE ON REVISIONS TO 2015-16 ANALYSIS

Our previous analysis of BAE Systems' contribution to the Australian economy quantified the value that the company generated in the 2015/16 financial year. However, data used in that analysis misrepresented some of the uses of turnover during that period. A portion of turnover was incorrectly allocated to employment costs, resulting in a "double counting" effect. Instead, this should have been attributed to sales, based on "work in progress" (WIP), which does not represent value generated within that financial year.

The consequence of this error in the data release is that the direct contribution to GDP was exaggerated by AUD 128 million. This correction had no implications for the indirect or induced contributions, and did not influence the employment or tax calculations that were made. The figures given for BAE Systems' labour productivity during this period were, however, exaggerated. The revised total contribution to GDP by BAE Systems in 2015-16 is $1,170 million (as opposed to the originally estimated $1,298 million).