# 2 Defence procurement and industry assistance

Defence asset purchases are not a simple matter of acquisition from the market, in the same manner as most other purchasing. The nature of defence purchases inherently includes (amongst a variety of strategic and risk-management factors) consideration of their use in circumstances where normal markets may not be operating, such as in time of war.

Vital as they are, these considerations do not limit the need for effective analysis of the cost of obtaining and maintaining capability. Australian Government outlays on defence capability represent one of the largest discretionary items in the budget.

Concerns over the delivery of defence capabilities on time and on budget to specified technical requirements have led successive governments to initiate reviews of the management of capability development and its implementation.

Much of the focus of these reviews has been on decisions on what equipment to procure and the management of its delivery, with less attention paid to the industry assistance implications of procurement programs. By varying the size, nature and timing of local defence purchases, government significantly shapes the defence industry and the location of its activities.

Preference for domestic supply over less costly competing foreign supply confers industry assistance. A key policy question is whether the magnitude of *additional* costs (premium) associated with domestic supply is commensurate with any *additional* security and operational benefits. The data are not available to make this judgment, one way or the other. Or at the very least, it is not available to the community, who will ultimately pay for it.

In a similar vein, proposals to build more ships than planned, in order to fill a downturn in shipbuilding before any new future project commences, also has industry assistance implications. These extend beyond the capital costs (which may be in the billions) to the operating and maintenance costs (which for a large naval vessel may be of a similar order of magnitude as the acquisition costs). While exaggerated for clarity, it is possible that simply paying the workers to do nothing could be cheaper than building and operating a ship for which there is no apparent current need, or budget.

Failure to conduct analyses of any additional cost premiums associated with domestic supply relative to any security benefits, increases the risk that decisions about defence expenditures are conflated with other, often ill-defined objectives such as ‘regional development’. Likewise, any decision to provide a continuous flow of work purely to retain a critical mass of workers between major projects must be considered in the context of the opportunity cost of the funds expended and the resource (mis)allocation effects of artificially holding resources in an activity at the expense of other activities competing for those resources.

Other forms of support to Australian based suppliers of defence equipment include grants for technology development, grants for skill development, export marketing and promotion on behalf of industry, government conducted research and development (R&D), and small and medium sized business development services.

This chapter first outlines the nature and extent of defence procurement activity and the findings of recent performance reviews. Against this backdrop the chapter identifies the industry assistance aspects of defence procurement. Some concluding remarks suggesting areas that may warrant further examination complete the chapter.

## 2.1 The nature and extent of defence procurement

The acquisition and sustainment of the Australian Defence Force’s military equipment and supply requirements is undertaken by the Defence Materiel Organisation (DMO).[[1]](#footnote-1) This organisation was established in 2000, consolidating the activities of three units — the Defence Acquisition Organisation, Support Command Australia and the National Support Division.

The 2013‑14 budget for the Defence Materiel Organisation is $9.7 billion — about 38 per cent of the overall Defence budget and approximately 0.6 per cent of Australia’s Gross Domestic Product (DMO 2013). The 2013‑14 budget provided for a further $37.9 billion for acquisition and sustainment, over the three-year forward estimates period 2014‑15 to 2016‑17. Longer-term expected expenditure on yet to be approved projects (as outlined in the 2012 Defence Capability Plan) is for around $153 billion for 111 projects over 10 or more years.

New acquisitions account for about 40 per cent of the Defence Materiel Organisation’s expenditure while sustainment (repair, maintenance and disposal) accounts for about 55 per cent. Policy advice and management services accounts for the remainder.

An estimated 3000 local firms (24 000 employees) supply defence equipment and related services. Purchases from these firms by the Defence Materiel Organisation account for about 38 per cent of acquisitions and 70 per cent of sustainment.

Although the Defence Materiel Organisation currently manages about 180 major and 70 minor capital programs, a small number of projects account for a large proportion of total expenditure — with the 10 largest approved acquisitions in progress at 30 June 2012 having a budget of $34.2 billion and accounting for about 43 per cent of total approved acquisition budgets (ANAO 2012, pp. 14–15). The largest single project is $7.9 billion for phase three of the Air Warfare Destroyer ships build, almost double the cost of the second largest project (figure 2.1). More recently, the purchase of 58 more Joint Strike Fighter (JSF) planes has been approved at a cost of $12.4 billion (Abbott and Johnston 2014). Australia had already paid for two JSFs and approved $2.3 billion for 12 more.

### Deciding what to buy

Deciding what to buy is guided by the strategic directions articulated in the Government Defence White Paper. Following a White Paper, the defence capability development process commences. This involves the identification of a current or future capability gap — that is, a shortfall between what the Australian Defence Force has the capacity to do and what government wants it to be able to do. Once developed and installed, capability systems routinely remain in service for 20 to 30 years.

Figure 2.1 Size of 29 largest current defence projects, at 30 June 2012a

$ billion (nominal)

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a More recently, the purchase of 58 more Joint Strike Fighter (JSF) planes has been approved at a cost of $12.4 billion (Abbott and Johnston 2014). Australia had already paid for two JSFs and approved $2.3 billion for 12 more.

*Source*: ANAO (2012).

As part of the defence capability development process a Defence Capability Plan is formulated. This is a costed, 10-year equipment plan for the delivery of identified capabilities. The Plan is subject to ongoing review and change in response to strategic, technological and economic developments (figure 2.2). The full operational version of the Plan is not public and the equipment proposals are not specific in scope and detail at this stage. The Defence Capability Plan is formulated by the Capability Development Group (within the Department of Defence). The Group is separate from the Defence Materiel Organisation and is responsible for developing and gaining approval from government for capability proposals.

Figure 2.2 Identification, approval and execution of defence equipment procurementsa

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| Figure 2.2. Identification, approval and execution of defence equipment procurements. This picture presents a summary of the identification, approval and execution procedures involved in the procurement of defence equipment. This figure is described in the surrounding text. |

a The most recent White Paper was released in May 2013 which replaced the 2009 edition. The current Government has commenced development of a new White Paper. The current public version of the Defence Capability Plan was released in 2012 and reflects the 2009 White Paper.

A public version of the Defence Capability Plan — the Public Defence Capability Plan — is periodically released to provide industry with guidance regarding Defence’s capability development priorities and with information on project cost, project schedule and local industry content. The latest public plan was released in 2012 (reflecting the 2009 White Paper (Department of Defence 2009)) and provided a four year account of proposed major capital equipment acquisitions that are scheduled for government consideration over the budget forward estimates cycle. Previous public capability plans had provided a 10 year outline.

In 2012, a new, annual, public document — the Defence Capability Guide — was introduced to complement the four year Public Defence Capability Plan. The Defence Capability Guide was intended to inform industry of the general direction of projects over the six year period that follows on from the four year forward estimates period covered in the Public Defence Capability Plan. The level of information on each project in the Guide is less definitive than in the Public Defence Capability Plan.

Approval of projects in the Defence Capability Plan is obtained through a two‐pass process. First‐pass approval is in‐principle authorisation where the government considers the capability need or gap and the broad range of options (with indicative costs and schedules) that might address that gap. Following first-pass approval, Defence develops preferred options into more specific proposals (with more rigorous costs) for consideration at second pass.[[2]](#footnote-2) Developing a project to second-pass approval can sometimes take several years. Currently, projects with a cost of $100 million or more require the approval of the National Security Committee of Cabinet. Projects from $20 million to $100 million require the approval of the Ministers for Defence and Finance (with either minister able to refer projects in this category to the National Security Committee of Cabinet). Projects below $20 million require the approval of the Minister of Defence.

Once second-pass approval is obtained, the Defence Materiel Organisation commences the purchase process, which involves further decision making through three broad stages — tendering, selection of supplier(s) and management of the contract.

Overall, major Defence procurements involve many important sequential decisions, through the identification, approval and execution stages. These decisions take place over extended periods against a backdrop of changing strategic, technological and economic circumstances. The extended decision-making periods and multi-decision process has strengths and weaknesses. On the one hand, it provides scope for reconsideration along the way in light of new information and needs. On the other hand, significant decisions at the early stages may unduly lock-in and constrain future courses of action, adding to costs.

## 2.2 Indications that defence procurement could be improved

Over the last 20 years, there has been a series of reviews relating to defence procurement (box 2.1).

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| Box 2.1 Key reviews relating to defence procurement |
| Broad reviews of defence procurement   * The Industry Commission (IC) (1994) inquired into the effectiveness and efficiency of defence procurement for achieving value for money, with a focus on Australian industry involvement. * The Defence Efficiency Review (1997) recommended merging the three single-service (Air Force, Army and Navy) Support and Logistics Commands to form Support Command Australia. * KPMG (2000) examined the performance of Support Command Australia and supported Defence’s proposal to merge Support Command Australia and the Defence Acquisition Organisation to form the Defence Materiel Organisation. * Kinnaird (2003) investigated systemic failures that had caused delay and cost increases in a number of major defence acquisitions projects. * Mortimer (2008) evaluated the effectiveness of ongoing reforms to the Defence Materiel Organisation which were implemented following the Kinnaird 2003 review. * The Senate Committee on Foreign Affairs, Defence and Trade (SCFADT 2012) investigated procurement procedures for items identified in the Defence White Paper 2009 as well as the effectiveness of the Defence Materiel Organisation. * The Australian National Audit Office (ANAO) (2013) conducted an audit of progress concerning the implementation of reforms relating to defence capability development.   Project specific reviews   * McIntosh and Prescott (1999) examined concerns with the cost, timing and technical performance of the Collins Class submarine. * Rizzo (2011) developed a plan to reform ship repair and management practices. * Coles (2011) provided a study into the business of sustaining Australia’s strategic Collins Class submarine capability. * ANAO (2012) reviewed the status of 29 major defence acquisition projects at 30 June 2012. This was the fifth project status report in a series, which started in 2007‑08 with a sample of nine projects.   Other reviews of defence activities with implications for defence procurement   * Pappas (2009) provided an audit of the defence budget, so as to advise Ministers on its effectiveness and efficiency, and future risks. * Black (2011) investigated accountability and governance arrangements in the Department of Defence, which had been identified as one of the major problems in defence procurement. The review also identified other problems with the capability process. |
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The reviews identified many aspects of defence procurement that could be improved and can be grouped into two categories:

* those relating to the formulation of defence capability plans (by the Capability Development Group in the Department of Defence) and subsequent specific project proposals for government approval, including with respect to the assessment of technical risks, acquisition and whole-of-life cost estimates, and the relative merits of off-the-shelf options against bespoke systems; and
* those relating to the delivery and governance of approved projects (principally by the Defence Materiel Organisation), particularly the cost, timing and delivery of technical capability.

### Concerns over capability plans and proposals to government

The Kinnaird (2003) and subsequent reviews emphasised the need for more robust cost and risk analysis before projects are entered into the Defence Capability Plan — not least, because a project attracts authority and momentum once it appears in the Public Defence Capability Plan, raising industry expectations of what is to come. Black (2011) noted poor cost forecasting and assessment of technical risk when entering projects in the Plan. Subsequently, the ANAO (2013) recognised that while better information on acquisition costs is now being provided, this was not assuring the affordability of planned projects because work on estimating the longer-term operating and personnel costs — costs that generally exceed the initial equipment costs — had typically not been undertaken.

The merits of acquiring off‐the‐shelf versus Australian‐designed or adapted defence equipment have also long been discussed, and examination of this issue formed an explicit part of the Kinnaird (2003) review’s terms of reference.[[3]](#footnote-3) Under the strengthened two‐pass system proposed by Kinnaird, the review’s expectation was that at least one off‐the‐shelf option must be included in each proposal to government at first pass. Moreover, any option that proposed the ‘Australianisation’ of a capability would need to fully outline the rationale and associated costs and risks. The intention was to provide government with the requisite information to weigh the relevant costs, the strategic advantages and other benefits and the risks associated with a project, before deciding which option or options to pursue.

The Mortimer (2008) review found limited progress with implementing the Kinnaird proposal for off-the-shelf options. That review stated that experience shows that setting requirements beyond that of off‐the‐shelf equipment generates disproportionately large increases to the cost, schedule and risk of projects and recommended:

Any decisions to move beyond the requirements of an off‐the‐shelf solution must be based on a rigorous cost‐benefit analysis of the additional capability sought against the cost and risk of doing so. This analysis must be clearly communicated to government so that it is informed for decision-making purposes. (p. xii)

The ANAO (2013) audit of progress with implementing review recommendations since 2003 concluded that:

Routine inclusion of adequate advice on off-the-shelf options in submissions to government [has] yet to be achieved for all projects. (p. 209)

### Performance measures of cost, timing and technical capability

The Senate Committee report included detail of several completed projects that had encountered significant problems (box 2.2). Although a number of examples related to projects approved in the 1990s, before the Defence Materiel Organisation was formed, the Committee Report noted:

… these particular [pre-2000] projects, often dismissed as legacy projects, cannot be ignored, even those that have been cancelled … [as] more recent projects are showing similar symptoms of failure. (SCFADT 2012, para. 2.2)

ANAO (2012) reviewed the status of 29 major defence acquisition projects *in progress* at 30 June 2012. This was the fifth project status report in a series, which started in 2007‑08 with a sample of nine projects. This status review found:

* 18 projects had experienced schedule slippage (p. 24), averaging about 32 per cent, with the largest slippage generally being for projects approved pre-2005 and of a developmental nature (p. 71);[[4]](#footnote-4) and
* 27 of the projects will deliver all of their key capability requirements — however, this is based on Defence’s own assessment and the ANAO stated that for some projects this is overly optimistic (p. 20) and that the capability measures data system lacks rigour (p. 82).[[5]](#footnote-5)

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| Box 2.2 Examples of cost and schedule problems with developmental projects |
| * The Super Seasprite helicopters project was approved in 1996 and cancelled in 2008 without any result, having cost about $1.4 billion. The Super Seasprite was to be a developmental upgrade of an existing helicopter in service with the United States navy at the time. * The Landing Watercraft project was approved in 1997 and cancelled in 2011, without any result, having cost about $40 million. This was a new design that had not been tested or proven and aspired to deliver a capability better than anywhere internationally. It was to be built by a company that had never built a landing craft using aluminium. * The Wedgetail airborne early warning and control aircraft capability project was approved in 1997 and due for delivery in 2006. Delivery and achievement of Initial Operational Capability, however, occurred in November 2012. The system, though based on Boeing’s 737, was highly developmental as it required modifications to accommodate sophisticated mission parts, and had never previously been integrated into an operational system. * The Tiger Armed Renaissance helicopter was approved in 1999. The Final Operational Capability was originally planned for June 2009, but had not been achieved by early 2014. This acquisition was deemed to be an off-the-shelf procurement, with some modifications (Australianisation) of French and German Tiger helicopters. However, the precise requirements represented a more developmental project and, moreover, the French prototype had, at the time, yet to receive full certification and design acceptance by the French Government. (French certification occurred in 2004). * The Guided Missile Frigate upgrade (of the Adelaide Class boats) commenced in 1999 and was completed in 2011, having involved delays across the four ships of between 67 and 84 months. |
| *Source*: SCFADT (2012). |
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The ANAO examination also reported that projects are operating within approved budgets, in the sense that the proportion of expenditure is commensurate with the maturity of the project. However, this measure does not provide a complete picture of cost effectiveness and economic efficiency. Other reports have provided further insight, such as the following:

* While an Australian developmental project may be delivered within the set budget, it nonetheless involves an additional opportunity cost if off-the-shelf options could have been effective. For example, Pappas (2009) found that developmental platforms can carry a cost premium of 50 to 100 per cent over existing military off-the-shelf options. Specific examples cited by Pappas included: the Wedgetail airborne early warning and control aircraft cost about 50 per cent more than the Japanese configuration; and the Australian variant of the Super Seasprite helicopter was 100 per cent more expensive than the variant purchased earlier by New Zealand (albeit the NZ craft were of lower capability).
* Pappas (2009) also gathered evidence which suggested that building military equipment in Australia can cost a significant amount more than having the *same* equipment built overseas.
* In considering differences between original budgeted expenditures against updated estimates, Mortimer (2008) reported an Australian Strategic Policy Institute analysis which found that costs had risen 76 per cent from initial estimates for the 25 projects approved since 2000 and, moreover, had risen 61 per cent for yet to be approved projects (and that costs typically rise further after approval).

Another budgetary consideration is whether there are additional (net) costs associated with project slippage. Although a project may be delivered within the *ex-ante* direct cost budget, schedule slippage gives rise to overhead and transition costs (not accounted for in the original *ex-ante* budget) such as extra years of salaries and administration, costs of Australian Defence Force (ADF) personnel that have been deployed for training and introduction of the equipment, any additional net costs of sustaining the old equipment longer (rather than operating new equipment), ancillary equipment that has no current alternate use, and warranty rundown.[[6]](#footnote-6) The ANAO (2009) estimated these additional costs for the Super Seasprite at around $500 million (on top of about $1 billion spent directly for the acquisition). Pappas (2009) estimated the schedule delays for the Wedgetail were costing US$1.5 million per month and, moreover, the project’s additional exposure to inflation to be AU$15 million over the next five years. The Senate Committee (SCFADT 2012) concluded:

… the simple assertion made by Defence that costs do not increase as the result of slippage is not credible. (para. 2.74, p. 33)

Performance measurement of sustainment programs also appears to have received less attention compared to acquisition cost, timing and capability, even though whole-of-life sustainment and disposal costs can exceed the acquisition cost. One study of sustainment revealed scope for significant budgetary and technical improvement. The Coles (2011) review compared the performance of the Collins Class submarine sustainment program from 2006‑07 to 2010‑11 with the average performance of comparative fleets of other navies. It found that: availability of the Collins Class had been slightly over half that achieved by the comparable international programs; the time in planned maintenance was about one third greater than other navies; and the maintenance overruns and the percentage of days lost due to defects were approximately double that of the comparators. The situation is understood to have improved since this 2011 report, but the history is still instructive.

## 2.3 Defence procurement and industry assistance

### Overview of local industry

As noted, an estimated 3000 local firms (24 000 employees) supply defence equipment and related services. While about half of these firms are small and medium enterprises (SMEs) (less than 200 employees), about 70 per cent of procurement is contracted to ‘prime contractors’. There are seven foreign owned and one Australian owned prime contractors. These businesses in turn subcontract about 30 per cent of their work (to both local and foreign businesses). Australian defence sales of the foreign prime contractors account for between 0.5 and 3.5 per cent of their parent companies’ global revenue (Department of Defence 2010).

Within the manufacturing sector, defence equipment purchases are concentrated in five main areas of activity: shipbuilding and repair; aircraft assembly, modification and repair; electronics and computing; vehicles; and clothing. The defence and non-defence production of these five activities account for about 14 per cent of the Australian manufacturing sector. However, defence shares are quite varied; for instance, expenditure of the Defence Materiel Organisation represents 63 per cent of the output of the domestic shipbuilding and repair industry, but only a small share of the output of the electronics, vehicle and clothing industries (table 2.1). Overall, the majority of defence purchases (in 2006‑07) accounted for just 1.3 per cent of total Australian manufacturing industry sales. Nevertheless, the regional significance of some defence activity may be substantial.

Table 2.1 Defence expenditure by sector

per cent

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| Industry | ANZSIC 2006  Industry Code | Defence procurement sharea | Industry share of manufacturing 2006‑07 |
| Shipbuilding | 2391 | 63 | 0.7 |
| Aircraft | 2394 | 31 | 1.4 |
| Electronics, Vehicles and Clothing | 1351, 1352, 231, 2419, 242, 243, 2299 | 3 | 12.3 |

a The Defence Materiel Organisation does not indicate to which year(s) the expenditure relates.

*Source*: Department of Defence 2010 (pp. 27–28) based on 2006‑07 industry data in ABS catalogue 8221.0.

### Identifying and measuring defence industry assistance

Selective assistance to the defence industry has not traditionally been included in the Commission’s effective rate of assistance estimates, despite it having essentially the same economic effects. Along with government expenditures relating to public administration, health, education, social security programs and community services, such expenditures have not been classified as industry assistance, as the majority of the expenditure relates to the functions of government or is primarily for the benefit of individuals. Nevertheless, support provided to commercial businesses in these service sectors by general (multi-industry) assistance programs, such as the R&D tax concession and export market development grants, is included in the core assistance estimates.

This section explores the nature and scale of selective assistance to defence businesses.[[7]](#footnote-7) The Commission will pursue the incorporation of industry support afforded by these measures in its future reporting of industry assistance.

Selective assistance to defence businesses includes direct grants for technology development, funding of foreign prime contractors to include Australian suppliers in their global supply chains, export marketing and promotion on behalf of industry, skill development grants, government conducted R&D, and local purchasing preferences (appendix B). In addition to these direct assistance measures, decisions to maintain workloads also have assistance implications.

#### Budgetary support to industry

In 2012‑13, the Defence Materiel Organisation identified discretionary grants totalling $19.3 million, under four programs: Skilling Australia’s Defence Industry; Priority Industry Capability Innovation; Industry Skilling Program Enhancement; and New Air Combat Capability Industry Support. Expenditures since 2005 together with future commitments for these programs amount to over $300 million.

Grants under the Capability and Technology Demonstrator program have totalled over $250 million since the program commenced in 1997, but unlike the above grant programs, individual grants and yearly amounts are not published (with only the name of recipients reported by the Defence Materiel Organisation).

There are also budgetary outlays on the Rapid Prototyping Development and Evaluation program, the Defence Industry Innovation Centre, and the Global Supply Chain program, which confer assistance to industry. However, the Commission has not been able to identify the level of this expenditure from public sources.

In 2012‑13, the Australian Government also spent in the order of $500 million on programs that afford direct support to industry and public R&D that may indirectly benefit industry including through the Defence Science and Technology Organisation (DSTO) ($434 million),[[8]](#footnote-8) the Defence Materials Technology Centre and the Defence Export Unit[[9]](#footnote-9) (within the Defence Materiel Organisation). The Commission’s research report on Public Support for Science and Innovation(PC 2007) observed in respect of DSTO that the scope for Australia to competitively source overseas state-of-the art defence equipment, rather than developing itself, might warrant further review. Consistent with this, in its submission to the 2013 White Paper process, the Australian Industry Group Defence Council (2013) recommended it would be timely to undertake a detailed survey of defence-related R&D, to establish what money is being spent on R&D, what (specifically) it is being spent on, and how closely it accords with guidance on Defence’s needs of industry.

#### Local purchasing preferences

The Australian Industry Capability (AIC) program potentially leverages work for local suppliers by including in tender requirements a definition that, for tenders to represent value for money, tenderers must describe how their proposed approach will enhance defence industry capabilities. The ‘Defence Capabilities’ are a set of pre-determined activities that must be resident within Australia or enhance self-reliance (box 2.3). However, addressing a capability in a tender document does not guarantee winning a competitive process against overseas bids.

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| Box 2.3 Defence Capabilities |
| There are three levels of Defence Capabilities.   * Priority Industry Capabilities (PICs) are those deemed to confer an essential strategic advantage by being resident within Australia and that, if not available, will significantly undermine defence self-reliance and ADF operational capability. There are currently 12 designated PICs, including, acoustic technologies and systems, in-service support of Collins Class submarine combat systems, and ship dry docking facilities. * Strategic Industry Capabilities (SICs) are those that provide Australia with enhanced defence self-reliance, ADF operational capability, or longer term procurement certainty. There are currently 12 designated SICs, including, for example, composite and exotic materials, guided weapons, naval shipbuilding and repair, maintenance and upgrading of armoured vehicles and aircraft. * Project/Product Specific Industry Capabilities (PSICs) are those determined by procurement sponsors as being required to enhance the capability being delivered through inclusion of Australian industry. PSICs are determined on a case by case basis. |
| *Source*: DMO (2014). |
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The AIC program evolved out of earlier schemes from the 1970s and 1980s that mandated explicit levels of local activity (such as requiring local work for Australian industry of 30 per cent of the value of foreign contracts, though not necessarily tied to the actual purchase) and preference margins for local bids (such as tolerance of a 20 per cent cost premium). Whilst moving away from quantified local content rules, successive White Papers and Defence Industry Statements have signalled the intention to ‘intervene’ so as to increase local activity more than may otherwise occur under a price-only based acquisition approach. For instance, the 2007 Defence and Industry Policy Statement mentioned the Australian Government’s firm expectations of suppliers to utilise Australian companies and that maintaining a local presence and the transfer of technology and intellectual property would be assessed favourably for those defence companies who invested in Australia. The current ‘intervention’ arrangement is to state Priority Industry Capabilities (since 2009) and Strategic Industry Capabilities, which could act to influence the choice between local and overseas supply. Over time, the ‘priorities’ for local work appear to have increased. The 1994 White Paper identified four capabilities as most important for Australia’s defence self-reliance. In 2009, 12 Priority Industry Capabilities were listed and the concept of Strategic Industry Capabilities was also adopted, introducing a further 12 activities where it was ‘desirable’ to have local activity.

In the absence of the Priority Industry Capabilities (and the thrust towards Australian self-reliance in some capabilities), it is likely that there would be less use of Australian suppliers by contract tenders. The amount by which the program increases returns to local suppliers is, however, difficult to quantify as the situation that would prevail without the program (the counterfactual) is not observable. The finding of Pappas (2009) that building military equipment in Australia can cost considerably more than having the *same* equipment built overseas suggests that the level of assistance provided to industry via the AIC programs is substantial. Any such cost differentials would need to be justified by clear strategic or other public benefits that outweigh the associated additional costs. The Commission does not presume there are no additional benefits to the defence of Australia. However, such benefit and cost information is not publicly provided following Government purchasing decisions.

#### Purchasing more than necessary so as to maintain workload

Some large-scale purchasing decisions can be lumpy in nature and there may be substantial gaps between them. If there is a lull in demand, a decision to order work to fill the interim between large purchases can confer a pecuniary benefit to the contractors (and their employees) without a commensurate benefit in capability.[[10]](#footnote-10)

In recent years, there has been mounting concern about the downturn in naval shipbuilding between the completion of the current Air Warfare Destroyers and the commencement of the next major naval shipbuilding program. About 3000 workers are currently employed in shipyards on government contracts, winding down (assuming an on-time performance, which cannot be taken for granted) to almost no one required in 2017, but then returning to around 3000 in 2020 and a peak of around 6000 in 2027 (Davies 2013). Accordingly, there have been proposals to build more vessels in the near future (whether needed or not) in order to avoid an interim ‘valley of death’.

The principal concern expressed about the interim ‘valley of death’ is the loss of skilled workers necessary for a future submarine build and the additional costs and lower productivity arising from the need to re-skill after a lull in work. Considerations of work continuity have also been complicated by claims of other benefits that might arise from filling a possible work void such as ‘bolstering economic growth’, ‘reviving’ Australian manufacturing, and the ‘location of jobs’. Balanced against such claims is the possible competitive advantage afforded incumbent contractors and other opportunities for the deployment of resources. The direct and indirect costs of retaining capacity at a time of lower demand has prompted a number of commentators to express concern (box 2.4).

## 2.4 The employment and multiplier effects of local defence production

When considering the economic implications of large defence projects, proponents commonly emphasise the direct employment and output effects and apply a ‘multiplier’ to estimate flow-on benefits. It is less usual to identify the direct and indirect resource costs, so as to calculate an overall net impact.[[11]](#footnote-11) Multiplier analysis only measures the gross flow-on effects and *is always* positive for a new project. This is because gross multiplier analysis fails to take into account constraints on the availability of land, labour and capital and the productive efficiency with which those resources are used — which for large defence projects, are of national as well as regional consequence. Moreover, the financing costs (whether in the form of reduced expenditure on other public services, increased taxes, or higher debt) must be taken into account. These costs have negative multiplier flow-on effects themselves.

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| Box 2.4 Some views about the ‘valley of death’ and a local defence shipbuilding industry |
| Davies (2012) from the Australian Strategic Policy Institute commented:  … absent a dramatic and unexpected decision in the very near future, there’s no escaping a very significant downturn in the quantity of work. The options available for remediation — such as building a fourth air warfare destroyer (which, at this stage, is likely to incur a substantial cost penalty because parts of the design and build process are already winding down) or using the air warfare destroyer hull as a basis for the future frigate — look a bit more like make work exercises than solid ‘bang for the buck’ prospects.  In a follow-up piece to Davies (2012) in the Australian Strategic Policy Institute Blog, Henry Ergas (2012), Professor of Infrastructure Economics at Wollongong University, identifies other options besides ‘doing nothing’ and ‘bringing forward additional procurement’. For example, if the goal is to ensure skills remain available, experienced personnel could be offered payments to keep their skills intact. Equally, experienced personnel could be given certification, with those retaining certification over time being offered higher wages on subsequent programs. Assessment of such options requires a better understanding of whether higher levels of productivity depend on cumulative experience, continuity of experience, or both, and how costly it is to maintain skills out of the direct shipyard situation. Ergas also cautions whether workforce continuity (primarily) benefits the employee rather than taxpayers, as experience and improved productivity will tend to increase remuneration, at least for transferable skills, in a competitive labour market.  Commenting on the 2013 Future Submarine Industry Skills Plan, Thomson (2013) also from the Australian Strategic Policy Institute observed:  … it seems to take as the goal the development of a healthy and permanent naval shipbuilding industry in Australia, irrespective of the cost of doing so. It proposes establishing a continuous rolling production line for submarines without asking whether the more leisurely delivery schedule suits Australia’s demand for submarines or acknowledging the additional cost of such a program. |
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This failure to identify that spending money comes at a cost of some other economic activities is not a factor limited to the defence industries. It is common in assessments of most large infrastructure projects, a recent area of scrutiny by the Productivity Commission in its report on Public Infrastructure, which is yet to be tabled by the Government.

In defence, as in other purchasing decisions, domestic costs to industries and taxpayers can vary between bespoke versus off the shelf designs on the one hand, and between local build and foreign build options on the other. For instance, Costello and Davies (2009) identified options for a replacement of the Collins Class submarine fleet ranging from a domestic build of a bespoke design (costed at an estimated $36 billion) to a lower cost off-the shelf but lower functionality imported model (costed at an estimated $8.8 billion) (box 2.5).

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| Box 2.5 Cost estimates for potential future submarine options |
| The 2009 White Paper announced that the future submarine fleet would consist of at least twelve submarines with significant improvement in capabilities over the existing Collins Class submarines. The Australian Strategic Policy Institute (Costello and Davies 2009) estimated the cost of four options for 12 new submarines (table).   * First, building 12 more Collins Class submarines, foregoing any capability upgrade, was estimated to cost around $12 billion. * Second, building a larger 4000 tonne vessel to accommodate extra capabilities, at the same unit cost per tonne of the Collins Class, would cost around $16.8 billion. * Third, building the larger 4000 tonne vessel, but based on historical trend data of unit costs for new naval fleets, was estimated to cost $36.5 billion, inclusive of project overheads and infrastructure. Costello and Davies (2009) also note that the US Congressional Budget Office, in a review of Pentagon cost estimation, observed that cost estimates based on historical data trends are more accurate than projections based on current project costs. * The fourth illustrative option was an off-the-shelf fleet of the lower-specification German Type 212/214 vessels for about $8.8 billion, based on average sales prices over the last decade.   Cost estimates for the future submarine fleet, 2009   |  |  |  | | --- | --- | --- | | Submarine |  | Cost of 12 submarines | |  |  | $ billion (2009) | | New build 3050 tonne Collins Class submarine |  | 12.0 | | 4000 tonne submarine at Collins cost/tonne |  | 16.8 | | 4000 tonne submarine at historical trend |  | 36.5 | | Type 212/214 equivalent in 2020 |  | 8.8 |   a Assumes an exchange rate of A$1 = US$0.75  *Source*: Australian Strategic Policy Institute (Costello and Davies 2009).  More recently, at the 2014 ASPI submarine conference, the chairman of the largest builder of conventional submarines (ThyssenKrupp Marine systems) stated that 12 large state-of-the-art boats would cost around $20 billion (Bergmann 2014). |
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A full analysis in which resource constraints are recognised would be a more appropriate approach than a gross multiplier analysis for the meaningful assessment of the economic impacts of such large defence purchases. Such an analysis would take account of the economic costs of additional capability of bespoke designs relative to those of lower capability off-the-shelf options, and the implications of a domestic versus a foreign build. The cost differences between the options (including flow effects on other industries and taxpayers) would provide a ‘threshold’ or ‘breakeven’ value against which to justify the additional strategic and operational benefits of bespoke design or domestic build options.

## 2.5 Closing remarks

Improving the cost effectiveness of defence procurement has the potential to deliver large benefits, not just in cost savings in the use of scarce resources, but in improving the availability of effective military equipment.

There are two types of monetary ‘premium’ that Australia has paid, at times, for major defence equipment. First, on average there has historically been a disproportionate increase in cost over-runs the more a project involves fundamental new designs or modification of existing off-the-shelf options. Developmental projects and modifications also tend to experience schedule slippage and difficulties in delivering all the intended capabilities, which results in direct and indirect costs (including those related to lower capabilities through having to keep older equipment longer). The second monetary ‘premium’ is that locally built equipment can be more expensive than foreign built equipment with an equivalent level of functionality.

Past attempts at minimising unwarranted and excessive premiums do not appear to have been successful. In particular, as noted by the ANAO, implementation of recommendations to include adequate advice on off-the-shelf options in submissions to government is yet to be achieved for all projects. At present there is no mechanism to ensure compliance with this requirement, other than the government insisting on ‘adequate’ advice. To further increase the discipline on giving attention to off-the-shelf options, there would be merit in considering whether the estimated premium (for non-off-the-shelf and local build choices) should be made public soon after the government procurement decision. To date, the lack of transparency of cost options has hampered adequate public assessment of the cost-effectiveness of purchasing decisions.

Against this, the supporters of ‘local build’ will undoubtedly cite commercial confidentiality. However, the size of the cost to taxpayers and the continuing examples suggest that such a counter-argument is not acceptable. Mechanisms can be designed to support transparency while respecting confidentiality. The Commission has outlined these in its 2014 report on Public Infrastructure.

To minimise any undue premium incurred by using local supply there may also be merit in publicly re-examining the list of 12 Priority Industry Capabilities and 12 Strategic Industry Capabilities and the appropriateness of the levels of activity ‘reserved’ for domestic supply. An examination of this area might consider which capabilities have generally cost the most to maintain and what have been the strategic benefits that have accrued from the additional outlays.

Cost effectiveness also could potentially be improved in respect of the design and level of defence industry assistance programs. Annual expenditure on defence industry assistance and technology support programs in 2012‑13 was around $500 million. Although substantial compared with assistance provided to other industries (chapter 4), the defence industry assistance programs do not appear to have been reviewed (externally and using an economic framework) to the same extent as many other industry assistance programs. To the extent that they have not faced such scrutiny, there may be merit in reviewing the efficiency and effectiveness of the suite of defence industry assistance and related programs.

All defence programs with material industry assistance objectives, explicit or not, should be separately reported to Parliament, and from time to time reviewed to ensure relevance to strategic and government priorities.

Finally, the cost effectiveness of defence procurement is fundamentally influenced by the strategic direction and capability aspirations outlined in Defence White Papers and Defence Capability Plans. One view is that the present practice (in formulating White Papers and Defence Capability Plans) of prescribing narrow equipment solutions risks locking the government into courses of action long before the information needed to make an informed judgment is available. Suggestions for better aligning aspirations with the realities of allocated budgets, timing capacity and the state of technology development, include: focussing on broad capabilities in the White Papers and Defence Capability Plans; engaging industry earlier in the capability development process to better understand what is available technologically; and reintroducing contestability into capability development (as was the case until the late 1990s). Consideration could be given to whether these suggestions are worth pursuing.

1. The Defence Materiel Organisation is a buyer from suppliers, not a producer. Until the mid-1980s defence employed about 20 000 civilian and uniformed personnel to manufacture and maintain warships and aircraft, fabricate small arms and produce ammunition and military clothing. One supply activity that is still publically provided is defence housing. The Australian Government- owned Defence Housing Australia (DHA) supplies housing and related services to [Australian Defence Force](http://en.wikipedia.org/wiki/Australian_Defence_Force) members and their families. [↑](#footnote-ref-1)
2. The two‐pass process of government approval for major capability development projects was originally introduced as a result of the Defence Governance, Acquisition and Support Review in 2000. Two‐pass approval was intended to give government greater control over capability development. Further changes to the two-pass process arose out of the Kinnaird (2003) and Mortimer (2008) reviews. [↑](#footnote-ref-2)
3. The Industry Commission’s 1994 inquiry into defence procurement discussed the additional costs (or premiums) for local military construction. It found that Defence rarely made any estimate of the extent of the local construction premium before government proceeds to a decision and, in particular, made no local build premium estimates for the Collins Class submarines and ANZAC frigates. In the case of the F/A-18 fighter acquisition where a premium was estimated by Defence, the estimate was so significantly lower than the amount actually paid that it could have bought 14 more fighter aircraft (or put the funds to other defence and non-defence uses). [↑](#footnote-ref-3)
4. Mortimer (2008) reports Defence Materiel Organisation analysis of the reasons for schedule slippage in 2006‑07, which attributed 50 per cent of delays to contractor non-performance, 16 per cent to delays in finalising negotiations and payments to foreign governments, 12 per cent to delays within the Defence Materiel Organisation’s own processes and 10 per cent due to extended contract negotiations. [↑](#footnote-ref-4)
5. Defence Materiel Organisation capability assessments of projects contained in project data sheets was also recently questioned by a retired Air Commodore, who had 35 years engineering experience with the RAAF (Bushell 2011). [↑](#footnote-ref-5)
6. Schedule slippage not only increases monetary costs but also results in lost capability costs. It has been suggested that the slippage of the Multi-role Tanker Transport Aircraft — approved by government in 2003 and planned to be operating in 2008 — meant the airforce had no air-to-air-refuelling capability from the retirement of the previous aircraft in 2008 until declaration by the airforce of initial operating capability for the replacement craft in 2013 (Australian Aviation 2013). [↑](#footnote-ref-6)
7. Other assistance exploratory exercises have included in relation to tourism (PC 2005), carbon emission reduction measures (*Trade & Assistance Review  2007*‑*08*), assistance to the finance industry (*Trade & Assistance Review 2008*‑*09*), state government industry assistance (*Trade & Assistance Review 2009*‑*10*), and adjustment assistance (*Trade & Assistance Review* *2010*‑*11*). [↑](#footnote-ref-7)
8. Not all the expenditure of the DSTO is likely to be classified as industry assistance. For example, DSTO undertake a range of other activities such as risk assessments and technical advice to decision makers and support for national security and intelligence operations. The balance between such expenditures and expenditures that are industry-assistance-related is not clear. [↑](#footnote-ref-8)
9. The Industry Commission’s inquiry into defence procurement (IC 1994) considered that Defence should investigate charging for some export promotion services where non-generic help is provided to particular firms, having noted this practice by Austrade. [↑](#footnote-ref-9)
10. During the early 1990s the Australian Government paid around $75 million in grants under the Defence Required Support Capability program to cover certain costs associated with establishing or maintaining capabilities in industry for which there were little or no commercial markets (IC 1994). [↑](#footnote-ref-10)
11. The Commission’s evaluation of the Pharmaceutical Industry Investment Program (PC 2003, pp. 6.1-6.3) provides a detailed discussion and demonstration of the net benefit (efficiency) approach compared with gross multiplier analysis. The ABS discontinued the publication of input-output multipliers in 2002 against a backdrop of their misuse in seeking support for industry and project assistance. In 2013, the Commission released a note outlining the limitations of the use of input-output multiplier analysis (Gretton 2013). [↑](#footnote-ref-11)