



Innovation Canada: A Call to Action

Special Report on Procurement

Review of Federal Support to Research and Development – Expert Panel Report

Canada

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Introduction

One of the areas identified by the Expert Panel as meriting particular attention in its Review of Federal Support to Research and Development is the use of federal procurement to support business innovation. Procurement can be important in promoting business innovation because it is a complementary demand-pull instrument with greater direct business impact than supply-push programs. This view has been reinforced during consultations with stakeholders and in discussions with policy-makers in other countries.

The Panel has also focussed on procurement because of the unique and unprecedented opportunity of using the federal government's expenditure of \$240 billion (publicly stated amount) on defence and security to increase the technological capabilities of Canadian industry. In this connection, the Government of Canada made a commitment in Budget 2011 to develop "a procurement strategy, in consultation with industry, to maximize job creation, support Canadian manufacturing capabilities and innovation and bolster economic growth in Canada."

As follow-up to this commitment, the Minister of Public Works and Government Services has asked the Minister of State for Science and Technology to task the Panel, in consultation

with the business community, for advice specifically on better leveraging of the government's defence procurement spending in order to help achieve these objectives. There is therefore an opportunity to develop a defence industry strategy that takes advantage of major equipment purchases, while at the same time putting in place a complementary, more broadly based, long-term system of support for small and medium-sized enterprises (SMEs) seeking to integrate themselves into global value chains.

The main current and planned purchases for the Canadian Forces include the maritime helicopter project, the F35 Joint Strike Fighter, Arctic/offshore patrol ships, frigate life extension, strategic and tactical airlift fleets, medium-to-heavy-lift helicopters, medium-sized logistics trucks, joint support ship, tank acquisitions, armoured vehicle acquisitions, and land combat vehicles.

The Case for the Use of Procurement to Stimulate Business Innovation

The use of federal government procurement to support business innovation is an important and timely question for a number of reasons.

- From an opportunity perspective, federal procurement spending has been growing in recent years and will continue to grow into the future, based largely on significant defence-related equipment purchases. In 2009, federal procurement amounted to about \$27 billion or 2 percent of gross domestic product, up substantially from an average of \$22 billion annually in the 1999–2008 period. During that same period, Department of National Defence (DND) procurement averaged about 30 percent of the total, but rose to 46 percent in 2009–10 and will be sustained at a high proportion of the total by planned expenditures over the next several decades.
- From a policy perspective, procurement is the major demand-pull instrument available to governments to stimulate business innovation relative to the vast array of supply-push instruments and, as such, dollar-for-dollar, provides potentially more valuable, market-driven support to individual companies.
- From a program perspective, procurement has the potential to be tailored toward high-growth firms, mainly SMEs, or to particular emerging technologies, such as green tech, information and communication technologies (ICTs) or to specific sectors like defence and

aerospace, as a complement to supply-side programs. The federal government has been increasingly active in the field in recent years by fine-tuning existing programs and by experimenting with new ones.

- From a financial perspective, “smart procurement” policies and practices, based on life cycle costs and benefits, can result in superior outcomes for given levels of expenditure, while enhancing Canadian innovation, productivity and growth.

At the same time, there are a number of important caveats to bear in mind with respect to opportunities for greater or better use of procurement as an innovation policy instrument.

- The practical scope for the use of procurement to stimulate innovation is only a fraction of the total annual expenditure. Some of the top categories in federal procurement include real property (7.6 percent), travel (5.5 percent), advisory services (3.6 percent) — areas not particularly ripe for technological innovation. Most science-based departments and agencies represent a small proportion of the total value of federal contracts, leaving DND at 46.4 percent and Public Works and Government Services Canada (PWGSC) at 24.1 percent as the common service agencies to take the lead on any significant initiatives.



- The long-standing federal procurement policy, led by the Treasury Board and implemented by PWGSC, has as its central tenet “value for money,” which is criticized by industry as more often than not being “lowest price through competition among qualified bidders.” This practice is aided by a culture within government that favours off-the-shelf, known-technology products and is further reinforced by renewed pressures to reduce costs in response to the current federal budget deficit. Notwithstanding these industry views, government officials state that, for complex procurements such as sophisticated military equipment, technical merit is often more heavily weighted than price.
 - Federal procurement is also constrained by international trade agreements — Agreement on Government Procurement under the World Trade Organization (WTO); the North American Free Trade Agreement (NAFTA) — that require bidding to be open to foreign suppliers for most goods and services above various contract thresholds, with relatively few exceptions regarding entities or product categories. The main exceptions relate to defence and security procurement and to set-asides for small businesses. Canada has not invoked small business set-asides but has a specific exemption related to Aboriginal businesses.
 - The Agreement on Internal Trade (AIT) requires non-discriminatory treatment among jurisdictions in Canada and affects mainly procurement by the provinces and territories, which account for 86 percent of total procurement, or six times that of the federal government. The federal government is constrained by the AIT from directing procurement to a specific province or territory. Like international agreements, the AIT contains a national security exception.
 - As a practical matter, even where possible to derogate from obligations for open, competitive bidding, there is always the question of what premium the government is paying for the perceived benefits of more restricted procurement. This is often very difficult to measure, but it raises the question of whether an amount equivalent to the premium could have been spent more cost-effectively through a different program instrument.
 - A central tenet of economic and business literature is that intense competition among suppliers, combined with demanding customers, drives business innovation. The Report of the Expert Panel on Business Innovation (Council of Canadian Academies 2009, *Innovation and Business Strategy: Why Canada Falls Short*, p. 109 [available online at: [http://scienceadvice.ca/uploads/eng/assessments_and_publications_and_news_releases/inno/\(2009-06-11\)_innovation_report.pdf](http://scienceadvice.ca/uploads/eng/assessments_and_publications_and_news_releases/inno/(2009-06-11)_innovation_report.pdf)]) devoted a whole chapter to the role of competition, noting that “competition is one of the most potent incentives for innovation.” Indeed, the underlying premise behind the procurement provisions of international and domestic trade agreements is that, like other forms of trade liberalization, open competition for government purchases spurs business productivity and provides economic benefits to all participating jurisdictions.
- In light of these considerations, why would governments want to restrict competition in their purchases of goods and services, particularly in a small economy such as Canada’s where domestic competition is naturally limited in many product areas? The answer is that government has a huge, ongoing need for an array of goods and services in a broad range of innovative activities. Canadian SMEs can potentially meet these requirements but may



need to be nurtured by government until they reach a point of scale and sophistication at which they can compete without special assistance.

Such support has traditionally been made available to SMEs through various supply-push programs. Procurement has the advantage of impacting more directly on business innovation as a demand-pull instrument. The benefits to business of the use of procurement as an instrument of choice are generally as follows.

- Governments can be demanding and sophisticated customers for innovative solutions to their needs.
- At the same time, because of the potential for broader spillover effects, governments are prepared to provide a support element in their initial purchases of innovative products, thereby reducing commercialization risks to firms.
- Such purchases and the prospects for follow-on sales facilitate equity and debt financing for firms.

- Firms supplying governments as lead users can more effectively market those products to private sector customers domestically and abroad.
- Successful initial purchases are key to ongoing public and private sector procurement and the building of critical mass for production economies and future growth.

All governments, within international rules, have used procurement to support domestic industry, and indeed many have exploited flexibility in their trade obligations much more than Canada. Based on this international experience, there is therefore scope for the greater use of procurement of innovative goods and services to support Canadian industry. Indeed, the federal government's increased use of procurement as a policy instrument will help "level the playing field" with international competition in both domestic and foreign markets.

The Case for Leveraging Defence and Security-Related Procurement

The case for preferential defence and security-related procurement is somewhat different. While it varies by country, there is often a perceived need by governments for some level of a domestic defence industry base, and this trumps the potentially lower cost of open competition in defence and security-related procurement. Accordingly, defence and security procurements are generally exempt from international trade obligations, and countries are able either to source domestically or seek industrial offsets for major procurements sourced from foreign suppliers.

Unlike other countries, including middle powers like Australia, Canada has not explicitly sought to develop a defence industry base through varying combinations of procurement restrictions and industry support. After several “Made in Canada” major defence procurements in the 1950s and 1960s, the federal government over the past 30 years has largely relied on offsets — industrial and regional benefits (IRBs) — for major equipment procurements from foreign prime contractors based in NATO partner countries.

This approach has been modified in recent years in the case of two specific procurements: the Joint Strike Fighter (JSF) aircraft acquisition whereby Canada joined a number of partner countries in codevelopment of the aircraft, with ensuing co-production opportunities; and the National Ship Procurement Strategy (NSPS),

currently under way, which will designate two Canadian shipyards, one civilian and one military, as the bases for future ship procurement.

The JSF program involves the development, production and support of a family of multirole fighter aircraft. Canada is one of nine countries partnering in the program, joining in 1997. In each phase, participant countries have made contributions to development. Canada’s US\$168-million contribution to date has resulted in \$370 million in contracts to companies, research labs and universities. Under industrial participation plans, Canadian industry is positioned to compete for the production of goods and services currently valued at \$12 billion.

The NSPS will establish a strategic relationship with two Canadian shipyards. One yard will be a lead source of supply for combat vessels, and the other yard will be a lead source of supply for non-combat vessels, such as offshore fisheries science vessels and a polar icebreaker for fisheries and oceans and the Coast Guard. Smaller ship construction and ship repair, refit and maintenance will remain subject to broader competitive procurement.



Notwithstanding recent changes, Canada is generally an outlier internationally with respect to the use of defence procurement to promote an industrial base. This results in an unlevel playing field internationally, Canadian-based companies do not have the explicit support of their government through guaranteed purchases or defence support programs while at the same time being excluded from many foreign markets by domestic procurement

restrictions in those countries. Further, even in foreign markets that are open, the lack of “first buyer” support from the federal government hinders Canadian companies’ marketing efforts against highly supported foreign competitors.

In light of the \$240-billion opportunity, it is timely to revisit Canada’s position on defence and security-related procurement.

The Scope for Using Procurement to Enhance Innovation

In Canada, the federal procurement system has fairly diffuse responsibilities. The Treasury Board is responsible for policy and oversight. PWGSC is responsible for the administration of the system, and it formally contracts for about 89 percent of the total value of annual procurement representing 11 percent of all contracts. In other words, PWGSC provides contracting services on large contracts constituting a minority of the volume but a majority of the value. The Minister of Public Works and Government Services delegates authority for procurement of smaller and routine requirements. PWGSC also offers a number of tools like standing offers for these routine purchases that departments may use. Notwithstanding PWGSC's role in terms of value, the system leaves individual departments considerable leeway in defining their procurement strategies.

Within the Government of Canada's procurement regime, there are, however, a number of areas where policy direction could be altered in order to stimulate innovation.

Making Innovation a Specific Procurement Objective

The main objective of federal procurement policy is to achieve value for money. The policy also has a number of subobjectives: supporting SMEs, improving environmental outcomes and

promoting Aboriginal business. Promoting innovation is not on this list of subobjectives as policy direction to departments and agencies, nor is there any clear direction on how to achieve such a result through procurement.

In this regard, one promising avenue to encourage innovation would be through specifying requirements in terms of their performance or functional characteristics, rather than their design characteristics. This would leave greater scope for new ways of achieving or surpassing requirements and open the door to innovation. While performance specifications are mentioned in the federal government's contracting policy, it does not focus on this, stating only that the "best value may be promoted if performance specifications are stressed."

Optional performance specifications are not likely to be used as frequently as desirable, since their use can involve greater risk and administrative cost than known, off-the-shelf design specifications. It does not necessarily follow, however, that performance specifications involve higher price, since that approach implies a potentially larger pool of competitors and the enhanced prospect of transformative, cost-effective innovation. In this regard, some departments such as DND are increasingly adopting performance-based specifications for large projects.

Increasing Contracting Out of R&D to Industry

Another avenue is to enhance contracting out of R&D required by government departments and agencies. Science-based departments and agencies tend to keep research required to inform their regulatory function in-house, but they also tend to keep research related to their social and economic mandates largely in-house, more for historical than any detailed cost-benefit analysis.

According to Statistics Canada, federal intramural R&D amounted to \$2.7 billion in 2009–10, while R&D contracted to business amounted to \$0.8 billion (about half that amount again is contracted to academic institutions). Much of the extramural R&D to business is accounted for by a few agencies: the Canadian Space Agency (\$250 million), the NRC (\$150 million) and DND (\$100 million). There is no government-wide policy mandating, or even promoting, contracting out.

It bears noting that the rules in international trade agreements exempt R&D contracts and “first product or service” and “prototype development” from open bidding. This means that there is considerable scope to ensure that contract R&D is undertaken by Canadian-based suppliers.

Even when contracting out takes place, the government’s policy on title to intellectual property, namely to have it rest with the contractor, is often not followed. This long-standing policy, designed to encourage commercialization, was revised in 2000 at the instigation of Industry Canada to achieve higher levels of compliance. However, exceptions continue to be the rule, and the Auditor General found in a 2009 report that more than half of the contracts reviewed had intellectual property ownership retained by the Crown. Again, however, as is the case under the general contracting policy, the policy serves to provide

guidelines, with no systematic incentives and disincentives to promote compliance.

Improving Support for SMEs

Governments support SME innovation through various tax and direct expenditure programs favouring SMEs. Procurement is also a potentially powerful instrument. Canada has not made use of specific small business set-asides, as permitted by trade agreements.

The federal government has experimented with the use of procurement as a tool for innovation, with SMEs as the target group. The most notable example is the Canadian Innovation Commercialization Program (CICP), a \$40-million pilot program announced in Budget 2010 and managed by the Office of Small and Medium Enterprises in PWGSC. The program was created to help Canadian SMEs bridge the “precommercialization gap.” Following matchmaking trade shows between industry and government departments, the program invited proposals not exceeding \$500 000 from SMEs for near-commercial products with no less than 80 percent Canadian content in four priority areas of interest: environment, safety and security, health, and enabling technologies.

CICP is consistent with trade agreements, since the purchase and testing of precommercial goods and services are exempt. Follow-on purchases would be subject to open bidding by foreign-based companies under WTO and NAFTA, unless Canada invoked a small business exemption, which it has heretofore not chosen to do.

The CICP had its antecedent in the Unsolicited Proposals Program, which ran from 1974 to 1994. That program funded proposals from the private sector for the development of products and services of potential long-term interest to federal departments and agencies.



The only other federal program that is somewhat similar to CIGP is Sustainable Technologies Development Canada (SDTC), a \$1.5-billion fund targeted at helping late-stage development and precommercialization demonstration of clean technologies. Although SDTC does not have an explicit procurement objective, it does consult extensively with federal departments with respect to first use of technologies. The more likely market for most of its products, however, is at the municipal level.

Leveraging Defence and Security Procurement

Defence and security-related procurement constitutes an important opportunity for the support of business innovation because it is such a large proportion of total procurement and because state-of-the-art technological sophistication is required in modern equipment. Indeed, one of the key drivers of the US innovation system has been the civilian adaptation of military technology.

In 2008, the federal government announced the Canada-First Defence Strategy designed to strengthen key military capabilities and to facilitate Canadian industry participation, particularly high-value-added technology sectors, in forthcoming defence procurement requirements. There are three main industrial components of the strategy: the development of critical (short term) and strategic (longer term) technologies, industrial and regional benefits, and sector-specific procurement.

Critical and Strategic Technologies

DND's overall expenditure on science and technology was in excess of \$400 million in 2009–10 and, of that amount, Defence R&D Canada (DRDC), the department's R&D arm, has an annual budget of about \$340 million, with 1700 staff in nine research centres across

Canada. According to DND officials, the department contracts out about 40 percent of its R&D requirements to business and academic partners through partnership programs such as the Defence Industrial Research Program and the Technology Demonstration Program. Another new program set to stimulate early engagement of industry and academia in generating innovative solutions to defence procurement needs, Project ACCORD, was launched this year. The program was inspired by successful models from Australia and the United Kingdom. With this recent launch, there is clearly scope to expand R&D partnerships with industry.

Industrial and Regional Benefits

Much of Canada's major equipment procurement is undertaken through foreign prime contractors and, as a result, the federal government has had in place for many years an IRB policy that requires prime contractors to allocate business to Canadian industry equivalent to 100 percent of the contract value. Currently there are about \$20 billion in IRB obligations from existing major procurements. Industry Canada estimates the potential for IRB obligations on a go-forward basis to add up to a cumulative total of more than \$40 billion.

The IRB policy, under Industry Canada's mandate, was reviewed in 2009 and implemented in 2010. It retains its essential feature of 100-percent benefits through commitments related directly to the acquisition in question or indirectly in other areas of the prime's activities. IRB policy also retains the feature of proposals being evaluated on a pass–fail basis rather than as an explicitly rated element of the overall bid and, consequently, specific transactions within IRB plans are left to the discretion of foreign primes, with monitoring by federal officials.

The main changes in the IRB update relate to incentives for greater Canadian participation in technology development. For example, under the former policy, 60 percent of IRBs needed to be identified prior to contract award. This has now dropped to 30 percent for large contracts, but within a long-term strategic plan to allow time to identify and negotiate high-value-added contracts. There are also incentives: up to five times “multipliers” (i.e., credits worth five times the nominal amount) for the creation of public-private consortia, investments in Venture Capital Funds, and investments in academic and non-profit R&D institutions. Some elements of the revised IRB policy are still conceptual, such as targeting transformational technologies for future needs as well as investment in firm-level R&D and commercialization.

Although these changes are a significant step in the right direction, implementation is clearly a work in progress, and Industry Canada should actively review the pace and extent of uptake in order to make adjustments that would maximize the benefits from \$20 billion of IRBs under active implementation and up to a total of \$40 billion anticipated.

Sector-Specific Procurement

In 2010, the federal government announced a new National Shipbuilding Procurement Strategy (NSPS). The strategy is driven by the economic opportunities presented by ship procurement spending over the next 30 years of about \$35 billion and represents a Canada-first, strategic approach to a sustainable industrial capacity.

The NSPS seeks to provide for the long-term support of two Canadian shipyards, one for combat vessels and the other for non-combat vessels. According to federal officials, although Canadian shipyards will be designated, contracts may be led by foreign primes, thereby also involving IRB offsets as part of the overall package.

In addition to traditional offsets, bidders are required to propose a “value proposition” equivalent to 0.5 percent of the contract price for the long-term capacity development of strategic partners in the Canadian marine sector in the following priority areas: human resources development, technology investment and industrial development. Unlike current IRB policy, the value proposition is a rated requirement in bid evaluation. The NSPS is a potentially useful model for other sector-specific or technology-specific, Canada-first procurement designations.

Views Expressed to the Panel on the Use of Procurement

In responding to the Panel's consultation paper, some 88 submissions commented on procurement. Many of the views were positive on government as a first user, especially from the business community. On the other hand, a significant number of stakeholders had a negative or guarded view, expressing concerns about government buying unproven technologies or products that it did not really need, with the initiative becoming a grant by another name and skewing market drivers. Some stakeholders suggested a middle road, focussing only on specific areas such as SMEs or technologies that involve high capital cost and risk.

The industry associations most enthusiastic about the greater use of procurement to promote business innovation were the Canadian Association of Defence and Security Industries (CADSI), the Aerospace Industries Association of Canada (AIAC), which saw opportunities for early-stage industry involvement in meeting government's future technology needs and consequent building of the defence industry base, and the Information Technology Association of Canada (ITAC), which saw opportunities for greater partnering and pilot projects that could lead to government as a reference customer.

Overall, there was broad support in principle for the use of procurement to spur business innovation. However, there was no clear consensus on how best to implement the principle.

With respect to defence and security issues, there was little specific input through the general consultations. Accordingly, the Panel undertook a supplementary series of consultations with Canadian business leaders involved in various aspects of the defence industry base, focussing on the question of how the federal government could more effectively leverage forthcoming major defence and security procurements to promote innovation, productivity and sustainable employment. Some twenty-six business people, broadly representative of that community, were involved in round-table and bilateral discussions. The following is a composite of views expressed at these events as well as through written submissions.

The starting point for most participants was that defence procurement is "managed trade," with many of our competitors engaging in highly restrictive practices, excluding foreign suppliers and nurturing domestic suppliers with sole source procurement and strong technological support. Even where Canadian companies could bid, examples were provided in which they lost contracts in NATO partner countries after heavy lobbying by less competitive local firms. It was acknowledged that Canada's lack of size and scale precluded wholesale adoption of such an approach, but significant improvements over the *status quo* were possible.

Such improvements would be very timely in light of the unprecedented opportunity of the planned \$240-billion defence and security procurement. Although participants were not unanimous on details, there was a clear consensus that the federal government needed to seize the opportunity with a more aggressive “Canada first” set of policies and programs, not necessarily with legislative change but smarter use of existing instruments.

The common vision centred around the need for a strategy implemented over a ten-year time frame that would steadily build the defence industry base to the point at which an increasing number of Canadian companies, particularly SMEs, could become world-class suppliers in the global value chains of large foreign prime contractors.

The general view among business stakeholders was consistent with the 2009 report by the Canadian Association of Defence and Security Industries (CADSI) 2009, *Canada’s Defence Industry: A Vital Partner Supporting Canada’s Economic and National Interests — Industry Engagement on the Opportunities and Challenges Facing the Defence Industry and Military Procurement* [available online at: https://www.defenceandsecurity.ca/UserFiles/File/IE/Military_Procurement_Main_Report_March_09_2010.pdf], which was sponsored by PWGSC. This report’s main recommendation was for the creation of a “defence industrial policy [that] would define the industrial capabilities Canada holds to be essential to its strategic defence and economic interests” providing “a roadmap for industry to make R&D investments, build new capabilities, establish human resource strategies, establish partnering relationships and plan strategies to win business internationally.”

In terms of translating the vision into specific policies and programs, the consultation participants envisaged starting with a pragmatic assessment of Canadian capabilities, possibly through a sorting into three broad categories: areas of existing world-class capabilities, areas of strong potential and areas of “not-being-in-the-game.” Each of these categories would have its specific set of policies and programs.

Although the first category may currently be limited, examples such as remote sensing and light armoured vehicles highlighted the importance of government as “first user” as a critical entree to export markets. The success of Canada-first munitions procurement was cited as an example of long-term payoff in terms of military readiness and export sales.

Many participants pointed out that they were kept out of foreign defence markets by sole or domestic sourcing in areas where they were highly competitive but needed to compete with foreign companies for Canadian government procurement, suggesting a “boy scout” attitude on the part of decision makers. They noted further that defence procurement is “trade proof” and that in this area the Canadian government should adopt reciprocity as its operating principle.

The second category, strong potential, was not explicitly defined, but examples came up in discussions. Perhaps the most notable was the National Shipbuilding Procurement Strategy (NSPS). This was seen as a good prototype for a Canada-first approach, involving competitive designation of Canadian shipyards for military and non-military construction, and the first ever rated requirement for a “value proposition” in competitors’ bids as a spur to broader, long-term Canadian technology development. Other areas cited as having strong potential were soldier systems and in-service support. The latter area is often a major life cycle cost element of defence equipment procurements, which arguably could be Canadianized over time.



through negotiations with foreign original equipment manufacturers, including the transfer of intellectual property.

The third category, namely technologies beyond Canadian capabilities such as weapons systems, would be left to foreign original equipment manufacturers, and the main policy instrument in leveraging economic value would be a more engaged IRB policy.

Indeed, with respect to policy instruments, the most criticized was IRBs. Although it was acknowledged by some that “build-to-print” offsets were suitable for SMEs starting up the value chain, there is still little real incentive for foreign original equipment manufacturers to promote innovative technological capacity among Canadian suppliers and their subsequent integration over the long term into global value chains. The approach favoured by many participants was for the government to identify areas of priority capability interest, provide serious incentives to respond to those priorities, evaluate the quality of IRB packages as part of the overall bid consideration process and then actively monitor compliance.

Participants also broadly agreed on the need for tailored programs to help build the defence industry base as a necessary but insufficient element of success, noting that initial procurement from Canadian companies was

more important than direct support in providing the incentive to invest in innovation. Indeed, direct support programming needed to be better coordinated, with procurement driven by specified priority capabilities. Suggestions for support programs ranged from establishing precompetitive centres of industrial excellence to codevelopment and subsequent fixed-price sole sourcing to enhanced technology demonstration programs. In addition, various practical suggestions were made, such as formal training programs for federal defence contracting personnel and placement of military personnel on secondment with industry.

One issue highlighted repeatedly was the difficulties faced by SMEs. Major defence contracts tend to be bundled, giving SMEs little opportunity to participate in niche areas where they excel, often at lower prices than primes will charge. Further, after contracts are awarded, primes have little incentive through IRBs to nurture Canadian SME suppliers. Contracts are also periodic, thereby creating gaps and straining capability continuity in smaller companies.

Selective International Practices

The use of procurement to stimulate innovation has been a long-standing practice in other countries, particularly the US with its enormous defence expenditures. The US has also led the way internationally with respect to promoting small business with vigorous programs, including procurement set-asides.

Small Business Procurement

The quintessential small business program is the US Small Business Innovation and Research Program (SBIR), now almost 30 years old. A legislative mandate requires federal agencies that contract out more than \$100 million annually in R&D for technologies to set-aside 2.5 percent for small businesses. This translates into annual expenditures of \$2–3 billion, with the Department of Defense and National Institutes of Health as the largest users.

SBIR also has a sister program, Small Business Technology Transfer (STTR), now 20 years old, which applies a 0.3-percent set-aside by agencies with over \$1 billion in extramural R&D budgets for small business R&D partnerships with academic institutions. The programs provide fully funded contracts for phase 1 proof-of-principle studies (\$150 000 for SBIR over six months and \$100 000 for STTR over one year), and for phase 2 R&D work (\$1 million for SBIR and \$750 000 for STTR, both over two years). The programs do not fund phase 3

commercialization, which is financed through conventional sources (i.e., equity, debt and retained earnings).

SBIR–STTR implementation varies widely in practice among US federal agencies. For some, like the National Institutes of Health, they are mainly a source of R&D funding. For others, like Defense and Energy, they can become the actual first-user procurement of products developed with SBIR funding should the research be successful.

Other countries, such as the UK, Sweden, the Netherlands, Finland, Japan and the Republic of Korea, have adopted SBIR-type programs. In the case of the UK, building on a 2008 white paper that required departments to develop innovation procurement plans, in 2010 the government set a goal of 25 percent of procurement going to SMEs, followed by a series of measures to enhance transparency and access by SMEs (especially ICT procurement). Perhaps the most important tool, however, is the Small Business Research Initiative (SBRI) originally launched in 2001. Like SBIR, the program provides fully funded development contracts between SMEs and government departments, but on a voluntary basis, not mandatory as in the US. The value of contracts in the case of SBRI was the equivalent of about \$50 million in 2009.



Defence and Security Procurement

Most countries face a considerable challenge in developing their defence industry. In the past two decades, globalization and the end of the cold war gave way to important consolidations in the international defence sector. The defence industry is now concentrated in the US and major economies of Europe, with affiliates of large suppliers established in smaller markets such as Canada and Australia. It is more difficult than ever for small economies to develop a defence industry base in a globalized defence industry dominated by a few very large defence companies. For many countries, a solution has been to integrate into the global supply chain, as Canada is promoting with the JSF.

Some countries have chosen to adopt a formal defence industry strategy while some, like Canada, have not. Some countries have thriving defence industries and equally impressive exports. Others choose niche priority areas and depend on international trade to meet their overall military needs. Many countries have chosen to have formal industrial offset programs similar to Canada where 100 percent of the contract value must be met, while some leave room for negotiation in the bid process for their offset practices. Still others, like the United States, do not condone offset practices at all, although in the case of the latter the purchase overseas of defence-related goods is a rarity. While each of the countries exist in a unique context, their study is useful to determine what does and does not work in their specific cases, so that we can arrive at a better understanding of our own.

A report on this issue (Grover Report) was prepared for the Treasury Board Secretariat in 2008. It compared key defence procurement policies and practices of Australia, Denmark, the Netherlands, the UK, the US and Canada. It noted that, while not all countries have a formal defence industry strategy, "all the countries

except the U.S. have an offset requirement, and they all refer to it by some euphemism: industrial participation, industrial co-operation or, in the case of Canada, Industrial and Regional Benefits." The report concluded that "given the very significant investments being made in new defence equipment, and the resultant increase in defence industry activities, it may be worth investigating the value of renewing Canada's defence industrial policy."

Australia, the United Kingdom and the United States are worth examining because of their close ties and foreign and defence policy similarities. Australia is often referred to as Canada's strategic cousin, the two countries sharing some demographic, cultural and economic similarities. Several other countries are also worth examining: France, with its strong economic and defence industrial base, and the Netherlands, having made significant investments to its military, are both NATO members who have strong defence ties with Canada. Sweden, for its size, maintains a very healthy defence industry base and has been a very successful exporter of military equipment.

Australia

Australia is an important comparator because it is also a middle power with a small domestic market and limited scope for competing directly with major military supply countries. In recent years, it has made significant changes to its approach to defence procurement.

A new approach to defence procurement was put into action with the 2007 Defence Industrial Policy statement and its follow-up in 2010. The primary goal of the strategy is to ensure the cost-effective delivery of equipment and support to defence in line with Australia's strategic circumstances. This goal is to be achieved through nine strategies:

- a strategic approach to equipping and sustaining the ADF
- maintaining local priority industry capabilities

- securing value for money through best-practice procurement
- creating opportunities for Australian firms
- encouraging SMEs
- supporting development of skills in the defence industry
- facilitating exports
- driving innovation in defence technology
- defence and industry working together.

Like other countries reliant largely on foreign prime contractors for their major defence procurement requirements, Australia has had a history of using industrial offsets to increase domestic participation in such contracts. However, in the defence procurement review (Australian Government Department of Defence 2010, *Building Defence Capability: a Policy for a Smarter and More Agile Defence Industry Base*, p. 57 [available online at: http://www.defence.gov.au/dmo/id/dips/DIPS_2010.pdf]), a new approach was taken.

“In general, offsets and quotas do not work. They provide a revenue stream only for the period of the acquisition contract and related only to the goods being procured at the time. Instead of protecting local defence firms from foreign competition, Defence now seeks to increase the opportunities for them to win work in global programs. This represents a fundamental move away from offsets. Under this policy, there will be no local industrial participation targets. Any nominated local industry activities will be individually costed and will only be funded as part of the Defence procurement process if they are deemed to represent value for money.”

Australia's new approach to defence procurement is based on the overriding objective of integrating Australian SMEs into the global supply chains of large international primes and their major subcontractors, while competing on a value-for-money basis. There are no specific offset requirements, but foreign firms are required to address domestic participation in their bids on all major contracts. In practice this means defence contractors' providing SME domestic firms with subcontracting opportunities and technology transfer, and helping them develop in-service support capabilities.

The core of the policy is the establishment of a list of Priority Industry Capabilities (PICs) that confer an essential strategic advantage by being resident in Australia and, if not available, would undermine its defence and self-reliance capability. The list is regularly reviewed and updated. It currently includes the following specific capabilities: acoustic technologies and systems, anti-tampering capabilities, combat uniform and personal equipment, electronic warfare, system and system of systems integration, high frequency and phased radars, infantry weapons and remote weapons stations, in-service support of submarine combat systems, ballistic and munitions explosives, ship dry dock facilities, signature management, and support of mission-critical and safety-critical software.

Based on a ten-year, forward-looking capability plan, companies are encouraged to submit innovation proposals relating to PICs for direct funding as development contracts under the PIC Innovation Program with a view to having good prospects for driving additional work in Australian industry or providing cost savings for future defence contracts. The plan is supported through a Capability Development Advisory Forum, which allows industry to communicate regularly with Defence, as well as web-based information and business access offices in major cities.



Australia has also established a number of collaborative government–industry–academic research institutions, such as the Defence Science and Technology Organisation, and a Defence Industry Innovation Centre, as well as specific programs such as Rapid Prototyping, Development and Evaluation Program, similar to Canada's new Project ACCORD.

United Kingdom

While it is difficult to compare the Canadian and British contexts because of size differences in defence expenditures, the UK, like Australia, has taken a number of steps in a long process to improve defence procurement. With roots in the 1980s and 1990s, the reform effort has sought to tap expertise available in the private sector and reduce public expenditures. Cost overruns and delays had become rampant in the wake of the cold war, and these failures were brought to the surface in a 1997 report by the UK National Audit Office.

The Defence Industrial Strategy dates back to 2005. It has two essential features: setting out those industrial capabilities required in-country (while recognizing other capabilities will be sought through international collaboration and competition), and explaining more clearly the factors that will influence procurement decisions. Its overall aim is to retain in the UK those industrial capabilities (infrastructure, skills and knowledge) needed to ensure appropriate sovereignty.

The strategy has three interlinked components:

- the defence capability requirements going forward (e.g., new projects, upgrade and modifications to existing equipment) that it seeks to retain in-country
- a review of different industrial sectors and crosscutting capabilities (in the context of future needs, including how mismatches between the two can be filled)

- an outline of how the strategy will be implemented (i.e., the principles and processes that underpin procurement and industrial decisions) and the implications for Defence and industry as a whole.

Although it is a major defence exporter (an average of \$8.5 billion a year), the Ministry of Defence recognizes that British companies attempting to export directly from the UK frequently face barriers to trade in the form of protectionist measures or stringent offset regimes. It views “industrial participation” as a flexible response to these barriers and encourages offshore companies to work with the UK's defence industry without some of the negative effects sometimes found in more restrictive offset policies. Firms must, however, indicate the level and nature of domestic participation as part of their proposals, and all proposed work must be defence related.

In terms of direct support, the Defence, Science and Technology Program Office of the Ministry of Defence invests about two thirds of its annual research budget in projects delivered by industry and academia. Further, there is a greater emphasis, through a program called Niteworks, on collaborative project work between government and industry. Other programs involve establishing a Centre for Defence Enterprise that funds innovations that have potential defence applications, and INSTINCT, a program that engages business and academia in technology demonstrations for security application.

United States

If it is difficult to compare Canada and the United Kingdom in terms of defence expenditures, it is even more difficult to make comparisons with the United States. The US military is unique in terms of the funding allocated to each branch, the independence of each branch in military acquisitions, and the very hands-on role of Congress in military procurement. Meanwhile,



each service of the armed forces is so large that they are individually responsible for their procurement programs. It would in fact be more useful to compare each branch of the US armed forces with those of a given country.

The US has a clear, if not explicitly labelled, defence industry policy, with a deputy undersecretary of Defense responsible for all decisions regarding: mergers and acquisitions, domestic and foreign, affecting the US defence industry; the department's relations with NATO defence and aerospace industries; and the overall health of the US defence industrial base. The US officially opposes industrial participation policies and practices, viewing them as distortions of free and open markets.

The Grover Report noted that "The US has numerous defence industrial policies: assuring sources of supply for critical items; protecting key technologies; and generally ensuring a domestic defence industrial base capable of supporting the nation's national security interests."

The US government procures about \$600 billion worth of goods and services annually, and defence procurement is about two thirds of the total. The scale of defence procurement has a pervasive impact on US technological capabilities. In planning its acquisitions, however, the Department of Defense identifies promising technologies from all sources, domestic and foreign. There is therefore significant potential for Canadian-developed innovations reaching more than a domestic defence procurement market. Canadian access to the US defence procurement market is governed by a long-standing bilateral agreement and is assisted by the Canadian Commercial Corporation (CCC).

One of the key R&D facilitators for the US defence effort is the Defense Advanced Research Projects Agency (DARPA). Unlike Canada's DRDC, DARPA does not run its own research laboratories but funds project teams drawn from

business and academia. It has historically focussed on high-risk investment in radical innovation for identified defence needs, from research through to prototyping. For example, the JSF began as a DARPA-funded project. DARPA's annual budget is about \$3 billion or ten times that of DRDC. Much of the US defence research effort, however, amounting to up to \$60 billion, is performed in-house by the various services of the armed forces.

In recent years, the concept of national security has been broadened to include energy, and the US government has established the Advanced Research Projects Agency–Energy (ARPA-E) as an important civilian counterpart to DARPA. ARPA-E is similar in concept to Canada's SDTC and funds projects aimed at "transformational innovations" with explicit attempts to promote follow-on procurement by federal agencies.

France

France is a unique case when examining military industrial bases because of the enormous degree of state control in defence companies, often as a majority or joint partner in major suppliers. The French Defence Industrial Strategy aims to "rationalize the European Defence Industrial and Technological Base (DITB) around centres of excellence which include a reasonably ambitious French component." The Department of Defence has a 30-year Prospective Plan for its military needs.

The French strategy seeks to maintain know-how in mature sectors and develop know-how in emerging or growing sectors. France also strives to develop export markets for its defence industry to reduce dependency on domestic defence acquisitions. The strategy also takes explicitly into account the impact of the defence procurement cycle. Mitigating the risk of losing or lacking industrial capability because of economic downturn or overcapacity, for instance, constitutes an important element of the French approach.



State ownership and control is an important feature of the French procurement experience. The *Direction générale de l'armement* (DGA) is directly involved in the governance of aerospace and defence. It holds majority and minority shares in companies involved in ships and submarines, explosives and aerospace. The French government, through the DGA, works in the interest of these companies and promotes the development and reinforcement of industrial capabilities deemed necessary to its strategic autonomy. The DGA is an active member in the implementation of the French government's economic strategy and also has a regional economic action policy to promote the development of industrial capacity, namely among SMEs.

Overall, France has managed to preserve a broadly based defence industry to meet its future requirements. This has been achieved through pursuing a coherent, if not formally stated, defence industrial strategy. Despite France's new emphasis on collaborating with other European nations in the development and production of defence equipment, it appears to be a policy of collaboration *à la carte*, allowing it to maintain a foothold in all major defence industrial sectors, particularly at the systems level.

Sweden

Sweden's days as a military power with a successful defence industrial base date back for centuries in support of its position of armed neutrality. The backbone of the current Swedish defence industrial base is its aerospace sector, where Saab AB is the leading contributor, enjoying a healthy export market. Apart from the aerospace sector, which has been a strategic priority for its defence industrial efforts, Sweden has also found success in domestic and export markets for shipboard gunnery, armoured vehicles and anti-tank systems and submarines. These are all indications, along with the absence

of public cost overruns and delays, of a thriving and successful defence industry for both domestic needs and export potential.

Sweden does not have a formally stated policy related to the sustainment and development of its defence industrial base. Successive parliamentary spending Bills on Defence and Security, however, have referenced the importance of maintaining industrial capability in support of foreign, defence and trade policy.

More recently, there has been special focus on the aerospace sector through a special working group that presented to the government a vision for the Swedish aerospace (defence) industry and a strategic program of enabling actions by companies, research institutions and the government to realize the vision. In response to the working group's submission, the Swedish government adopted a comprehensive strategy to guide actions directed at the technological leadership and international competitiveness of its aerospace industry.

For industrial offsets, the responsible authority is the Ministry of Defence and the program's policy objectives are to support the long-term protection of essential Swedish defence and security interests, secure the participation of the domestic defence industry, promote the transfer of advanced technology to the defence industry, and increase the export of Swedish defence-related products, systems and advanced technology. These offsets are required for projects at a threshold of €10 million and must equal a minimum of 100 percent of the contract value.

The Netherlands

The Dutch defence industrial strategy, similar to the policies of the UK and Australia, is premised on the recognition of the importance to the nation of having a domestic defence capability and is predicated on the assumption that its defence industry can be successful only if



companies form part of international networks focussing on the development, production and maintenance of equipment supply chains.

The strategy seeks to harness international opportunities and to promote synergy between the needs of the Dutch armed forces and those in the civil market due to the relatively small size of the Dutch defence industry. This relatively small size has led the Dutch government to prioritize certain areas for specialization. From this context, the strategy identifies fields of technology where Dutch industry has the capability to excel and consolidate its position in the global (primarily European) defence market. The six priority technology areas in the Dutch DIS are: C4I (command, control, communications, computers and intelligence); sensor systems; integrated platform design, development and production; electronics and “mechatronics”; advanced materials; and simulation, training and synthetic environments.

The strategy also accords the defence ministry an important role in acting as lead customer for specific new technologies. In doing so, it recognizes the need for it to take part in multinational development and production programs from their earliest start phase, as is the case of participation in the JSF.

The most important financial instrument is the National Technology Project (NTP) under which proposals can be submitted by one or more research institutes, by industry, or by both. In principle, the NTP covers 100 percent of the cost incurred in carrying out the technology development. Specific defence R&D-related projects are carried out by the National Defence Research Organization and its three laboratories.

This technology orientation reflects the view that, whereas the Dutch industry may lack the range and depth of industrial resources necessary to develop and produce major weapons systems other than naval ships, it possesses the requisite skills and expertise to be a strong participant in a wide variety of international programs from their development to their life cycle maintenance. In some cases this includes final assembly and testing of major weapons systems that it procures.

The Netherlands pursues a policy of “compensating” Dutch companies when defence materiel is purchased from foreign suppliers. Orders may be placed only with foreign suppliers on condition that the Dutch industry is involved in carrying them out or that Dutch companies are given orders for goods or services that are not directly connected with the project. In practice, the policy results in a 100-percent offset commitment.

A Potential Set of Procurement Initiatives

The creation of new initiatives that seek to make better use of procurement to stimulate innovation would signal that the federal government is aware of the potential opportunities to promote business innovation using this tool. There are also a number of possible complementary policy directions and potential improvements to the recent initiatives still in start-up mode (PWGSC's CICP, DND's Project ACCORD, and Industry Canada's revised IRB policy) that could be put in place. These initiatives fall under three areas: general procurement, strategic civilian initiatives and defence procurement.

General Procurement

The federal government's contracting policy could be made more supportive of innovation with a few changes. First, supporting innovation could be listed explicitly as an important subobjective of the overall value-for-money objective. Second, the policy could cite the use of performance specifications or outcomes as the first choice in developing requests for proposals, with justification required for the use of design specifications in other than housekeeping purchases.

Another area of unrealized potential relates to contracting out of R&D. In the 1970s and 1980s, a major push was mounted in the federal government to contract out R&D as a means of boosting business capacity. It floundered along with its chief proponent,

the Ministry of State for Science and Technology, because government departments and agencies could ignore the optional policy. As outlined previously, that situation continues today to the extent that the large science departments conduct a majority of their R&D in-house.

The option of early adoption of a US-style SBIR program, whereby a percentage of extramural contracts is set-aside for small business, would be unlikely to bring about fundamental change in the Canadian context, because the underlying problem for most departments is an overall lack of contracting out regardless of business size. For systemic change to be brought about, the level of extramural R&D will need to rise, especially among departments and agencies with a business orientation. The use of annual targets would help catalyse this process.

Strategic Civilian Initiatives

A potential avenue for changing the procurement culture from one that is risk averse to one that seeks to manage risk for superior results is to undertake a series of pilot procurement initiatives in select areas. Highly selective initiatives by their nature would contain risk while demonstrating the benefits of an innovation-based approach. Areas could include health care (military hospitals, shared-funding vaccine programs), ICTs (emerging federal requirements), environment (demonstration of SDTC technologies) and construction (federal "green" requirements).

As new sectoral pilot initiatives are developed, there is also opportunity for existing innovation programs to be better aligned to provide support.

The fact that sectoral pilot initiatives would result in leakage to foreign suppliers because of trade rules should not constitute a deterrent to deploying them. Open competition stimulates innovation among all players in an industry, and the real long-term goal is to develop a state-of-the-art mindset among acquiring government departments and agencies.

Pilot programs along these lines would complement the CICP or could be incorporated into an updated and expanded program. They would be quintessentially demand-pull initiatives, promoting innovation in fulfilling existing government-wide and department-specific needs. The current CICP is arguably more of a hybrid initiative, with a supply-push from industry trying to create demand for future products through a brokerage process. It is actively being assessed with a view to making recommendations to government on future directions.

Defence Procurement

The government's existing suite of initiatives and potential augmentations in civilian procurement pale in comparison with the opportunities emanating from the sheer magnitude of forthcoming defence and related security procurement.

Many of the benefits to Canadian industry will be through industrial offsets, since the preponderance of major contracts will still be led by foreign prime contractors. The recently updated IRB policy has attempted to improve incentives to prime contractors to promote long-term innovation capacity in Canadian industry. It is not clear at this point whether those incentives will be sufficient to leverage

activity designed to integrate Canadian companies into global supply chains over the longer term.

Although IRBs are set at 100 percent of the value of contracts (with only Canadian value-added credited), the real issue on a go-forward basis is not quantitative but qualitative in terms of guiding foreign primes on specific desired industrial capabilities to support Canada's vital defence and security interests.

Part of the challenge is that IRB packages are evaluated as pass-fail rather than as a rated element of the overall contract. As such, their implementation is at the discretion of the prime contractor. The use of "value propositions," essentially a type of offset, in the NSPS as a rated element, could present a useful model for more widespread use.

For IRBs to be more oriented toward leading-edge technology development and commercialization rather than traditional build-to-print work, government needs to identify the industrial capabilities essential to Canada's defence and security. This suggests that Canada would be well served to emulate countries like Australia in defining "priority industry capabilities" and aligning its defence procurement practices and support programs to develop those capabilities in anticipation of emerging defence and security needs. The NSPS constitutes a step in that direction, and Canadian industry has no shortage of ideas on what other capabilities should be promoted. An important caveat, however, is that care must be taken to be highly selective in defining desired industrial capabilities, recognizing that such choices will alter the competitive landscape in Canadian industry, and also recognizing the potential trade-off between higher costs in the short-term and long-term security of supply and self-sustaining export capability.



At the present time, DND's main instrument in promoting long-term industrial capability, Project ACCORD, has only recently been launched and its potential therefore remains untested. What is clear, though, is that about 60 percent of DND's R&D requirements are still met internally. Contracting out an increasing proportion of R&D requirements should therefore be a feature of the evolving Project ACCORD.

Support for the commercialization of defence technologies developed directly and indirectly through procurement appears to be a missing link in the value chain. Such a commercialization mandate could be tied in explicitly to Project ACCORD's and the Technology Demonstration Program's priority technology areas, and it could be funded in part through further leveraging of offset packages amounting to billions of dollars in the coming years.

Conclusion

In principle, procurement is attractive as a tool in supporting business innovation because it is a demand-driven, near-market complement to supply-side innovation support. For various historical reasons, it has proven difficult in practice to mobilize procurement for innovation. We can, however, learn from other countries and develop a set of policies and practices suited to the Canadian context, building incrementally on recent improvements.

The most immediate challenge is to take advantage of planned defence and security procurement by taking bolder steps in directions already established: identifying additional strategic industrial capabilities, mobilizing resources to support technology development in those areas and better using the procurement system writ large to provide business

opportunities to Canadian companies on a more expansive value-for-money basis that takes into account long-term, life cycle benefits to the government as purchaser as well as to the broader Canadian economy.

There is also the need to put in place more general measures that will change the procurement culture over the longer term away from lowest cost to best value based on leading-edge innovation. If well planned and well executed, the modest investments contemplated by the measures outlined in this report should not result in higher procurement costs to the government relative to the benefits of superior goods and services, while providing critical innovation support to Canadian industry, especially SMEs.

Annex: Text of Procurement Recommendations

Recommendation 3

Make business innovation one of the core objectives of procurement, with the supporting initiatives to achieve this objective.

The Vision of the Panel

The government's procurement and related programming must be used to create opportunity and demand for leading-edge goods, services and technologies from Canadian suppliers, thereby fostering the development of innovative and globally competitive Canadian companies while also stimulating innovation and greater productivity in the delivery of public sector goods and services.

Getting There

To realize this vision, the government should incorporate the following practices in its procurement initiatives.

3.1 Innovation as an objective — Make the encouragement of innovation in the Canadian economy a stated objective of procurement policies and programs.

In practice, this broad recommendation requires the government to regard any significant acquisitions of goods and services as opportunities to build SME innovative capabilities, and thus to strengthen both the base of suppliers for future procurement and,

more generally, the innovation capacity of the Canadian economy. This will require the government over time to undertake a comprehensive review of procurement policies and activities to ensure that they are supporting innovation and that departments have the flexibility to work with private sector solution providers and then acquire and deploy the resulting solutions. As first steps for action, the Panel further makes the following recommendations.

3.2 Scope for innovative proposals —

Wherever feasible and appropriate, base procurement requests for proposals on a description of the needs to be met or problems to be solved, rather than on detailed technical specifications that leave too little opportunity for innovative proposals.

The use of procurement to foster the innovation capacity of Canadian companies requires a revised approach to value-for-money based on outcomes-oriented specifications. Procurement on the basis of the outcomes desired sets a challenge for industry and thus motivates innovative solutions from potential suppliers. This has the dual benefit of bringing forward better products for the buyer and developing an innovation-focussed mindset in the supplier communities. The use of an outcome-oriented procurement specification does not need to be an invariable rule, since there will be cases

where more detailed technical specifications for a particular procurement would be clearly appropriate and would not be inconsistent with the intent of this recommendation.

3.3 Demand-pull — Establish targets for departments and agencies for contracting out R&D expenditures, including a subtarget for SMEs, and evolve the current pilot phase of the Canadian Innovation Commercialization Program (CICP) into a permanent, larger program that solicits and funds the development of solutions to specific departmental needs so that the government stimulates demand for, and becomes a first-time user of, innovative products and technologies.

Federal departments and agencies, including those of major industry relevance, such as the Department of National Defence, undertake most non-regulatory R&D internally. According to Statistics Canada (2010, *Federal Scientific Activities 2010/2011*. Cat. no. 88-204-X. Table 1-7, p. 16 [available online at: <http://www.statcan.gc.ca/pub/88-204-x/88-204-x2010001-eng.pdf>]), federal in-house R&D is projected at \$1.9 billion in 2010–11, while R&D contracted to businesses is projected to amount to \$272 million (Statistics Canada 2010, Table 1-9, p. 17) or only about 15 percent of the in-house R&D total. More than 80 percent of the amount of R&D contracted to businesses is accounted for by two agencies — the Canadian Space Agency at \$167 million and the Department of National Defence at \$59 million (Statistics Canada 2010). Setting specific department-by-department targets for external R&D contracts would promote business innovation while potentially improving outcomes for contracting departments and strengthening their ability to deliver on their mandates.

The current CICP pilot is “supply-push” in the sense that the applicants submit proposals to provide innovative solutions for trial and testing, though not as responses to explicitly identified

needs of a particular department or agency. A new pilot element is needed that would provide incentives for solving operational problems identified by departments. Making the revised CICP a permanent program, once performance of a revised pilot can be evaluated, would help change the procurement culture.

3.4 Globally competitive capabilities — Plan and design major Crown procurements to provide opportunities for Canadian companies to become globally competitive subcontractors.

The currently planned procurement of defence and security-related equipment and services presents a significant opportunity to greatly increase the technological readiness of Canadian industry. There is a need for the Department of National Defence to be more proactive in promoting a defence industrial capability domestically. The key is to implement a long-term technology capability plan for each major procurement, jointly developed by government and industry and supported by tailored programs. For the Department of National Defence, this would mean accelerating its Project ACCORD with industry as well as Defence Research and Development Canada’s Technology Demonstration Program. As the experience of other countries has shown, even concerted efforts to promote global supply chain participation take many years to produce results. Canada therefore needs to start immediately. It is emphasized that incremental investment for such improved long-term capability is scalable. Decisions on amounts should be relative to opportunities.

While the recent Industrial Research Benefits (IRB) policy enhancements — with multipliers for investments in innovation — are largely untested, an additional incentive to invest in technology commercialization would help increase global value chain participation for forthcoming defence purchases, especially by SMEs. (The commercialization model developed



by Sustainable Technology Development Canada might be emulated.) There is urgency in this since, if Canadian capabilities were to remain underdeveloped at the time of contracting, IRB offsets would be directed more toward traditional “build-to-print” work, rather than leading-edge technology development and commercialization. In order to achieve critical mass quickly, the government could consider some form of matching formula with the prime contractors. It is emphasized that taking full advantage of Crown procurements depends on government and business investments early on, in order to get the desired innovation capacity-building leverage from an IRB, whose costs are borne by prime contractors. This might involve sharper focus of existing programs, rather than additional resources.

3.5 Working collaboratively — Explore avenues of collaboration with provincial and municipal governments regarding the use of procurement to support innovation by Canadian suppliers and to foster governments’ adoption of innovative products that will help reduce the cost and improve the quality of public services.

Annual procurement by provinces and municipalities across Canada substantially exceeds federal procurement because of their responsibilities for health care, education and transportation infrastructure, among other public services. All orders of government should collaborate to develop and share best practices in the use of procurement to foster innovative Canadian companies and, where feasible, to develop joint strategies to enhance the leverage of public procurement in certain sectors.