Developing Key Industrial Capabilities for Canadian Defence Small and Medium Enterprises: Creating a Competitive Defence Industrial Base

Jonathan Holder, MPA Candidate
School of Public Administration
University of Victoria
21 April 2015

Client: Colonel (Ret.) Charles Davies
        Conference of Defence Associations Institute

Supervisor: Director Evert Lindquist, PhD
           School of Public Administration, University of Victoria

Second Reader: Professor Herman Bakvis, PhD
               School of Public Administration, University of Victoria

Chair: Professor Richard Marcy, PhD
       School of Public Administration, University of Victoria
Acknowledgements

I would first like to acknowledge and thank the staff at the Conference of Defence Associations Institute and its parent organization, the Conference of Defence Associations, for their patience, expertise and accommodations which have been extended to me during the research process of this Master's Project that they have made possible. Their tireless efforts to identify, discuss and address pressing security and defence policy issues in Canada have been a great source of both inspiration and a mark of excellence that this project aspires to.

I would like to extend equal gratitude to my academic supervisor, Dr. Evert A. Lindquist for his patience, insight, and proven commitment to realizing the defence of this project. His counsel and feedback have proven an invaluable and crucial component to the development of the research conducted from both first and second-hand sources.

I would also like to give thanks to the Examination Committee overseeing the defence of this project in their crucial role to both challenge and improve the quality of the research presented. Your dedication to academic excellence and effective policy solutions are lynchpin to the development of both innovative and thoughtful solutions to the ever-changing nature of public policy problems.

I would also like to thank my family and friends for their ongoing support of my efforts throughout all stages of this project as their words of wisdom and advice have shaped me into the man I am today, most especially my mother and father. Lastly, I would like to acknowledge and thank all members of the Canadian Armed Forces past and present for their service, duty and sacrifice. It is my sincerest and continuing hope that the research presented within this project will ultimately benefit and aid you in the defence of Canada and her interests.
Client Information: The Conference of Defence Associations Institute

The client organization for this Master's Project is the Conference of Defence Associations Institute (CDA Institute or CDAI). The CDAI represents the research component of its parent organization, the Conference of Defence Associations. The latter is a non-profit and non-partisan organization first created in 1932 that voices defence and security policy concerns of Canada and represents 52 associations nationwide. To date, the Conference of Defence Associations is the oldest defence and security advocacy group in Canada.

The client is the CDAI, a non-partisan charitable organization established in 1987 to research security and defence issues for the Conference of Defence Associations. It is composed of an extensive list of experienced Board members primarily composed of retired Canadian Forces officers, academic experts, and former political advisors. The CDA Institute also has a team of qualified analysts, directors and executives who tend to their key publications such as their Vimy Papers series, blogs, and roundtable discussion events.

The CDA Institute also hosts and conducts the Annual Ottawa Conference on Defence and Security, which is designed to gather policy experts and senior policymakers on issues facing Canada regarding security and defence issues. The Annual Graduate Student Symposium is another event that the CDA Institute actively participates in, as they evaluate, select and award graduate students for their research into the issues facing or affecting Canada’s security and defence policy. The CDAI’s other activities also include distributing award grants such as the Vimy Award and Ross Munro Media Award, as well as arranging speaking engagements.

Client Point of Contact

The point of contact for the CDA Institute is Colonel (Ret.) Charles Davies. Colonel (Ret.) Davies is a former Canadian Forces Logistics Officer and has held numerous posts in the Canadian Army and within the Materiel Group of the Department of National Defence. Past executive responsibilities included planning operations for the Materiel Group, defence acquisition and support policy, and land force structure. His combined experience in the military and civilian public service spans 42 years, retiring in 2013.
Executive Summary

Introduction

Defence procurement and its industrial policy has been a relatively forgotten policy issue in Canada, with the Harper administration being the first to take on its problems since 1994. Shrinking defence budgets and market consolidation (i.e. defence firm mergers, buyouts) exacerbate the problem as there is less room for smaller firms to participate in defence procurement contracts. The defence procurement process in Canada is unique from its allies in that multiple departments (Public Works and Government Services Canada, Industry Canada, and the Department of National Defence) decide what materiel is purchased for the Canadian Forces. This system employs a single-point-of-accountability contract approach, in which one defence firm is held responsible for the contract and thus would receive the bulk of a contract award to avoid past problems resulting from complications of accountability between buyer and contractor parties. Defence offset policies (e.g. the Industrial and Technological Benefits policy, formerly Industrial and Regional Benefits) add additional barriers due to the high contract value requirements.

Findings

Current approaches and policy regimes have come under much criticism from policy experts and industry representatives, often stating that the current system does not foster an environment for industrial development. Critics will state that the lack of a defence industrial policy removes market predictability that would help firms to develop products to government capability needs. Industry associations and policy experts also criticize current supports for technological development capabilities for aerospace and defence firms, especially small and medium enterprises (SMEs). Although the government has improved some defence procurement practices and defence offset policies to better assist smaller scale firms, there are still significant gaps to address concerning small and medium enterprise assistance in building their capacity to specialize in KIC-relative technologies and competitiveness.

To further research ways to improve competitiveness and KIC capacities for Canadian small and medium defence enterprises, a jurisdiction scan of the defence industrial policies of Australia, the United Kingdom, the United States, and Sweden was conducted. Of the jurisdictions scanned, Australia had the most comprehensive policy and program regime, as their approach addressed underinvestment and supply chain access to increase the competitiveness of their smaller domestic firms worldwide.

The United Kingdom Ministry of Defence’s approach expanded their defence industrial policy to balance industrial development, free competition, and smaller budgets. This was primarily seen through their 2012 White Paper and establishment of the Defence Growth Partnership Initiative, the former of which addressed small and medium enterprises concerns. This initiative aims to improve the British defence firm market presence worldwide. This mainly sought to maintain or improve domestic defence capabilities through providing business development services, supply chain access, and technological development.

The United States approach is one that focuses on the basic principle of free market competition. Of the jurisdictions scanned, the United States is the only government that explicitly states that it does not implement a defence offset policy nor will it. The United States Department of Defense (USDOD)
follows this principle of competition through the provision of assistance programs and funds on a competitive basis.

Sweden shares a situation similar to Canada, in that they are transitioning from a made-to-order approach of defence procurement to a more proactive stance that develops the industrial base for future defence capability needs. This was primarily driven by shrinking defence budgets and a focus on accessing international markets. Swedish offset policies leverage technology transfers, small firm participation, and research support. The long-term goal is ultimately to have a more innovative and competitive industry on a global scale.

Research interview feedback from Public Sector Informant (PSI) presented that firms must have a product (i.e. good or service) that matches buyer or end-user needs. These needs are subject to rigorous processes throughout the contract, which many smaller scale firms find difficult in terms of compliance. PSI also states that experienced and knowledgeable workforces in public sector contracting are another factor for a firm’s success, as PSI states that most small companies have little or no experience in government contracting or its processes.

Options

Based upon the research, the following options were developed for client action:
1. Recurring Roundtable Discussions with Key Defence Policy Players
2. Setting a Daily Agenda Topic to DSMEs and Defence Industrial Development at the 2016 Ottawa Conference on Security and Defence
3. Coordinating Recurring Research Publications with Partner policy advocacy organizations on DSMEs and Defence Industrial Policy
4. CDA Institute to Take a Broader Speaking Event Role with local policy advocacy organizations

Recommendations

Options 1 and 3 were recommended according to the evaluation criteria of effectiveness, efficiency, and sustainability. Chief concerns show the need for a long-term and sustained approach to changing current defence procurement and industrial policies to effect a more competitive defence industrial base among domestic firms, particularly DSMEs. Other advantages to these options were that the CDA Institute has previous experience in arranging and moderating roundtable discussion with pre-existent structures (e.g. Chatham House Rule), as well as their current research capabilities to produce recurring publications, such as the Vimy Paper series and ON TRACK quarterly reports. While Options 2 and 4 had particular strengths in effectiveness (e.g. issue visibility) and efficiency (i.e. low monetary costs) respectively, their scores in the other two criteria were relatively lower than Options 1 and 3.

Conclusion

This project concludes that Options 1 and 3 are the best courses of action. While Options 2 and 4 generate significant visibility, the issue of sustainability and competing policy issues make it difficult to maintain the long-term commitment and will (i.e. political, public) to effecting policy change in defence industrial policy that will improve Canada’s industrial capabilities, particularly among DSMEs. However, recent shifts in interests on research and development within government may change this and if sustained, it is likely that the recommendations will effect serious consideration from policymakers and senior management as a result of generating interest.
# Table of Contents

1. Introduction  8
   - Figure A: Anticipated Spending Changes in World Defence Markets  8
   - Figure B: Tier Structure of the Canadian Aerospace Industry  9
   - 1.1 Project Overview  10

2. Background  11
   - 2.1 Key Players, Programs, Processes, and Problems  11
      - Table A: List of Key Industrial Capabilities (KICs) outlined in the 2013 Jenkins Report  12
      - Table B: Technology Readiness Level (TRL) Rubric  13
   - 2.2 Changes to Defence Offset Policies  14
      - Table C: Redeemable Credit Scheme of IRB Obligations  15
   - 2.3 Changes to Defence Procurement Administration Practices  15
      - Table D: Key Comparisons between the IRB and TB Policies  16
   - 2.4 Conclusion  17

3. Methodology  18
   - 3.1 Literature Review  18
   - 3.2 Jurisdiction Scan  18
   - 3.3 Research Interviews  18
   - 3.4 Deliverables  19
   - 3.5 Strengths, Limitations, and Strategies for Addressing Limitations  19

4. Literature Review  21
   - 4.1 Key Players in Canada’s Defence Industry and Issues Shared  21
   - 4.2 The Industry Perspective  22
      - Figure C: Industry Executive Responses on Sectors with Growth Potential  23
   - 4.3 The Policy Expert Perspective  24
   - 4.4 DSME Participation and Opportunities in the Defence Market  25
   - 4.5 Business Modelling, Development, and Operations in the Defence Market  25
   - 4.6 Conclusion  27

5. Jurisdiction Scan: Australia  28
   - 5.1 Planning Future Capability Needs for the Australian Defence Forces  28
   - 5.2 Increasing Australian DSME Visibility in the Global Defence Industry  29
   - 5.3 DSME Business Development Approach  30
   - 5.4 Defence Industry Performance and Quality Assurance Programs  30
   - 5.5 Conclusion  30

6. Jurisdiction Scan: United Kingdom  32
   - 6.1 Changes in Strategic Policy Direction  32
   - 6.2 Industry-Government Dialogue  34
   - 6.3 Changes to the Government’s Role in the British Defence Industry  34
   - 6.4 Conclusion  35

7. Jurisdiction Scan: United States  36
   - 7.1 DSME Market Opportunity Programs  36
   - 7.2 DSME Research and Development Programs  37
   - 7.3 Conclusion  38

8. Jurisdiction Scan: Sweden  39
   - 8.1 Shifting Policy from the Consumer to the Market  39
   - 8.2 Driving an Innovative and Competitive Domestic Industry  39
   - 8.3 Conclusion  40
9. Interview Findings and Challenges

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1 Challenges Encountered</td>
<td>41</td>
</tr>
<tr>
<td>9.2 Public Sector Respondent Feedback – Public Sector Informant</td>
<td>41</td>
</tr>
<tr>
<td>9.3 Conclusion</td>
<td>43</td>
</tr>
</tbody>
</table>

10. Findings in Perspective: Summary and Themes

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1 Literature Review</td>
<td>44</td>
</tr>
<tr>
<td>Australia: A Comprehensive, Competitive, and Balanced Approach</td>
<td>45</td>
</tr>
<tr>
<td>United Kingdom: Balancing Free Competition and Domestic Industrial Development</td>
<td>46</td>
</tr>
<tr>
<td>United States of America: Conventional Market Practices in an Unconventional Market</td>
<td>47</td>
</tr>
<tr>
<td>Sweden: Transitioning from a Reactive to Proactive Defence Industrial Policy</td>
<td>47</td>
</tr>
<tr>
<td>Interview Findings</td>
<td>48</td>
</tr>
<tr>
<td>10.2 Discussion: Themes to Consider</td>
<td>48</td>
</tr>
<tr>
<td>Finding a Direction for Industry: Lessons from Partner Nations</td>
<td>49</td>
</tr>
<tr>
<td>Reducing Reactive Risk Aversion, Promoting Proactive Innovation and Risk-Conscious Approaches</td>
<td>50</td>
</tr>
<tr>
<td>Rigid Offset Policies and Contract Conditions</td>
<td>51</td>
</tr>
<tr>
<td>10.3 Conclusion: Strategic Implications of Findings</td>
<td>52</td>
</tr>
</tbody>
</table>

11. Options and Recommendations

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1 Options to Realize the Strategic Vision</td>
<td>54</td>
</tr>
<tr>
<td>Option 1: Recurring Roundtable Discussion with Key Defence Policy Players</td>
<td>54</td>
</tr>
<tr>
<td>Option 2: Setting the Agenda at the 2016 Ottawa Conference on Defence and Security</td>
<td>54</td>
</tr>
<tr>
<td>Option 3: Coordinating Recurring Research with Think-Tank Partners</td>
<td>55</td>
</tr>
<tr>
<td>Option 4: CDA Institute Taking on a Broader Speaking Event Role</td>
<td>55</td>
</tr>
<tr>
<td>Evaluation of Options</td>
<td>55</td>
</tr>
<tr>
<td>Table E: Evaluation Criteria for Client Options</td>
<td>56</td>
</tr>
<tr>
<td>11.2 Recommendation and Implementation</td>
<td>57</td>
</tr>
<tr>
<td>11.3 Final Words: Options and Recommendations</td>
<td>58</td>
</tr>
</tbody>
</table>

12. Conclusion | 59 |

13. References | 61 |

Appendix

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure D1: ADMN 598 Invitation Letter for Research Interview Participation</td>
<td>64</td>
</tr>
<tr>
<td>Figure D2: ADMN 598 Participant Consent Form</td>
<td>65</td>
</tr>
<tr>
<td>Figure D3: ADMN Research Interview Questions for Public Sector Informants</td>
<td>68</td>
</tr>
<tr>
<td>Figure D4: ADMN Research Interview Questions for Industry Informants</td>
<td>70</td>
</tr>
</tbody>
</table>
1. Introduction

Defence procurement has become a relatively low-priority issue, as the Conservative government under Harper has undertaken the first visible actions on changing the defence procurement process since the Chrétien Liberals made a defence industry policy statement in 1994 (Stone, 2008, p. 344). Although there have been recent government reform efforts, Canada remains without a formal defence industrial policy (i.e. White Paper). Considering that the defence industry has not undergone major changes since 1994, a review and modernization of said policies in partnership with industry would promise to improve future outcomes for industry.

Industry critics cite a recent lack of development for new products, stating that a significant challenge to increasing industrial capability is inadequate support for innovative research (AIAC, 2011, p. 11). One factor creating this challenge is misaligned interests with research partners, such as universities (AIAC, 2011, p. 11). The Aerospace Industry Associations of Canada (AIAC) have recommended adopting granting programs to higher-risk and longer-term projects and increased funding for universities for aerospace and defence research initiatives (AIAC, 2011, p. 11).

The consolidation of defence firms is another factor affecting the competitiveness and capacity for developing capabilities of smaller defence firms. Decreased defence budgets and demand for materiel also affects industrial competitiveness and capabilities, as well as public perception and political will behind industrial policy. This is particularly reflected in European and North American defence markets, as defence industry executives from leading global aerospace and defence firms anticipated decreases in Western market opportunities, as evidenced by Figure A below.

Figure A: Anticipated Spending Changes in World Defence Markets

Government-commissioned working groups have attempted to address defence capability needs. The Emerson Aerospace Review of 2012 addressed the broader concerns of the aerospace and defence firms. In 2013, the Jenkins panel conducted a review of defence procurement and its influence to develop the Canadian defence industry, which outlined the Key Industrial Capabilities (KICs) that are most relevant to the needs of the Department of National Defence (DND) and the Canadian Forces (CF). The reason that these elements are important to the issue of defence procurement and industrial development is the fact that defence sector small and medium enterprises (DSMEs) comprise the majority of the domestic defence industry, who are typically Tier 2 and Tier 3 subcontractors (see Figure B below) (Stone, 2008, p. 353). This fact is also important since DSMEs are leading Canadian niche/specialized technology capabilities, as compared to OEM/Prime/Tier 1 contractors who are capable of constructing major platforms (military vehicles, aircraft, etc.) and other large-scale materiel (see Figure B below).

**Figure B: Tier Structure of the Canadian Aerospace Industry**

Adapted from “Aerospace Review, Volume 1 – Beyond the Horizon: Canada’s Interests and Future in Aerospace” by D. Emerson, 2012b, p. 13.

This research project is designed to examine ways in which to improve KIC development of DSMEs and develop ways forward with the development of the Canadian defence industry. In specific, this research will offer a background on Canadian defence procurement processes affecting DSMEs, academic perspectives on defence procurement and industrial policies, jurisdiction scans on Canada’s partners, first-hand feedback from technical experts, analysis of data gathered on DSME procurement participation and industrial capabilities, and finally recommendations for the CDA Institute to generate discussions and considerations for policy revisions on moving Canadian DSMEs forward.
1.1 Project Overview

The project will first familiarize readers with the current situation in Canadian defence procurement, offsets, and contracting policies and their impact on the defence industry. These impacts will be tied back to Canadian DSMEs and where the government has or is currently taking action on major policy problems.

Technical expert perspectives and critiques will then further examine Canada’s defence procurement and industry policy problems. Industry and policy experts will weigh in on the specific issues facing smaller aerospace and defence firms and identify areas where government can improve its support to DSMEs in technological capabilities, business operational planning, tax incentives and funding, and market access. Academic perspectives will also weigh in on best practices for defence procurement processes such as buyer-contractor relations, risk-sharing business models, foreign market opportunities, and supply chain access. The literature and views gathered within these sources will inform the next steps of the project, including the actions of Canada’s partners regarding defence procurement and DSMEs.

The project reviewed the policies of Australia, the United Kingdom, the United States, and Sweden which seek to improve DSME performance in the aerospace and defence industry. This review included involved examining the programs, policy statements (e.g. white papers), and services offered to DSMEs. This informed the research on possible solutions to defence procurement policy problems. These findings complemented those of the literature reviewed, along with the feedback of a Canadian defence procurement expert within the federal public service. These findings were then analyzed to identify major issues and trends, leading to the synthesis of a strategic vision and its components.

A list of options was developed for the client from this vision to begin discussions and consideration on addressing major policy problems identified in the Discussion section. Select client options for the Conference of Defence Associations Institute were forwarded as recommendations with details on its implementation for the CDAI to undertake. Conclusions were drawn from the entirety of the research gathered and solutions proposed for possible ways forward to improve Canadian DSME KIC development and competitiveness through discussion and revision of policy issues.
2. Background

The research project addresses the obstacles that industry and public sector officials face when supporting the KIC development of DSMEs in Canada. The importance of this issues lies within the Canadian defence industrial policy of the government, as well as the procurement regulations that govern the requirements of defence goods and services. This background section will cover the chief departments responsible for defence procurement, defence industrial production contracts, expert responses and critiques of procurement and defence contracting practices, describing the Key Industrial Capabilities (KICs), and recent developments in defence procurement policy.

2.1 Key Players, Programs, Processes, and Problems

In Canada, three departments handle defence acquisitions and procurements: the Department of National Defence (DND), Industry Canada (IC), and Public Works and Government Services Canada (PWGSC). Section 36 of the National Defence Act gives the Minister of National Defence the exclusive power to determine the defence equipment needs of the military, with Section 4 of the same legislation placing responsibility on the DND Minister for the management of defence resources, programs and operations (Davies, 2015, p.10). Sections 10 and 12 of the Defence Production Act identifies the Minister of Public Works and Government Services Canada as the responsible Cabinet member, as well as their role in managing the defence industrial capabilities of Canada (Davies, 2015, p. 10). Industry Canada handles the industrial base components of contracts through offset policies known as the Industrial & Regional Benefits (IRB) policy and the Industrial and Technological Benefits (ITB) policy, which outline the obligations for contractors to successfully earn a government contract award. These offset policies usually come into effect for contract values equal to or exceeding CAD$100 million and require prime contractors to invest the entire contract value back into the Canadian economy (Industry Canada, 2013). These policy responsibilities fit within the scope of the Department of Industry Act, which designates the Minister of Industry as the responsible minister for industry, science, technology, small businesses, and intellectual property (Davies, 2015, p. 10). The structure of the contracting process primarily relies upon a single point of accountability (SPA) basis, meaning that only one firm/contractor is awarded a contract and held accountable for the execution of the contract’s terms (Jenkins, 2013, p. 17). In the case of systems contracts, the contractor would be given to large firms known as primes or Original Equipment Manufacturers (OEMs) (Jenkins, 2013, p. 17). However, readers should note that the term of “single point of accountability” used by Jenkins (2013) mainly refers to bundled contracts (i.e. combined product purchase and service/maintenance plan contract), the latter of which will be discussed in the literature review.

The combination of SPA contracting and IRB policy obligations adversely affect smaller firms to compete in the defence market due to smaller budgets, scales of production, and small consumer base (Jenkins, 2013). Though the government has proposed changes to offset policies contracting, challenges remain for DSMEs. This concern stems from the limited nature of DSME partnership opportunities with larger firms, especially for DSMEs with no commercialized products.

Decreasing defence budgets in Canada and partner nations has also limited the prospects for DSMEs due to financial and production constraints. This makes it difficult for them to compete against primes who usually have greater access to larger-scale global supply chains and intellectual property (IP) protection resources. This has larger implications for Canadian DSMEs since defence industry demand is growing in countries with evolving procurement policy processes, such as India and China. These growing overseas markets favour primes and OEMs, yet there are still some niche
defence capability needs that the larger firms have difficulty fulfilling on their own. These difficulties can be met through collaboration with DSMEs, which can in turn develop Canada’s KICs.

The KICs of the defence industry pertain to six major areas (Jenkins, 2013, pp. 28-32). PWGSC and the National Research Council of Canada (NRC) have recognized these KICs identified in the Jenkins Report (2013) as a broad outline of priority capability areas of industry. The NRC and PWGSC are key players in the defence procurement and Science/Technology and Innovation programs with particular concentrations on small and medium enterprises. Among these programs is the Build in Canada Innovation Program (BCIP) of PWGSC, which assists in the testing and funding of innovative technologies from small to medium enterprises (PWGSC, 2014). In particular, the BCIP program has expanded into the KIC known as Protecting the Soldier, and is outlined in Table A with the other 5 KIC areas.

**Table A:** List of Key Industrial Capabilities (KICs) outlined in the 2013 Jenkins Report

<table>
<thead>
<tr>
<th>Priority Area</th>
<th>Description</th>
<th>Example Application(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arctic and Maritime Security</td>
<td>Ability to gather intelligence and conduct operations in unpopulated regions of Canada.</td>
<td>Military platforms, such as arctic patrol ships, frigates, transport planes, etc.</td>
</tr>
<tr>
<td>Protecting the Soldier</td>
<td>Capability to improve the protection and performance of the individual soldier.</td>
<td>Night-vision equipment, armoured vehicles, anti-explosives protection, reduced weight of body armour.</td>
</tr>
<tr>
<td>Command and Support</td>
<td>Capacities to improve C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) suite systems. Specifically, these target advanced systems integration, mobility and logistics, and ensuring interoperability with allies’ systems.</td>
<td>Geographical information systems, systems integration software, communications technology, pattern recognition/”intelligent” software, etc.</td>
</tr>
<tr>
<td>Cyber-Security</td>
<td>Protect civilian and military electronic systems and infrastructure from cyber and online threats, while hindering enemy access to Canadian systems and infrastructure.</td>
<td>Encryption software systems, data collection, failsafe/risk mitigation technology, etc.</td>
</tr>
<tr>
<td>Training Systems</td>
<td>Providing leading technologies to the military through means of simulations, visualization techniques, human factor prediction, modelling etc.</td>
<td>Pilot/flight simulations, situational modelling, predictive/pattern-based software, etc.</td>
</tr>
<tr>
<td>In-Service Support</td>
<td>The maintenance, repair, and support of equipment to maintain or extend the lifetimes of key platforms and complex technologies that support the military and its operations.</td>
<td>Renewal of naval ships, life extensions of fighter planes, repair of submarines, etc.</td>
</tr>
</tbody>
</table>

Adapted from “Canada First: Leveraging Defence Procurement Through Key Industrial Capabilities” by T. Jenkins, 2013, pp. 28-32.
Current government programs capable of covering these KICs for DSMEs are primarily the Strategic Aerospace and Defence Initiative (SADI), the Industrial Research Assistance Program (IRAP), the Technology Demonstration Program (TDP), the Build in Canada Innovation Program (BCIP) – formerly the Canadian Innovation Commercialization Program (CICP), the Defence Research and Development Canada (DRDC) Defence Industrial Research Program (DIRP) and the DRDC version of the Technology Demonstration Program. With exception to the SADI and DRDC programs, the remainder of programs primarily cover civilian technology. To add, the programs are fragmented in terms of funding eligibility concerning Technology Readiness Levels (TRLs), seen in Table B. For example, the BCIP will only take on products at a minimum level of TRL-7; the SADI accepts all technologies, and Industry Canada’s TDP takes on technologies up to TRL-6.

Table B: Technology Readiness Level (TRL) Rubric

<table>
<thead>
<tr>
<th>Technology Readiness Levels (TRLs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 9:</strong> Actual technology proven through successful deployment in an operational setting. At this level there is actual application of the technology in its final form and under real-life conditions, such as those encountered in operational test and evaluations. Activities include using the innovation under operational conditions.</td>
</tr>
<tr>
<td><strong>Level 8:</strong> Actual technology completed and qualified through tests and demonstrations. At this level the technology has been proven to work in its final form and under expected conditions. Activities include developmental testing and evaluation of whether it will meet operational requirements.</td>
</tr>
<tr>
<td><strong>Level 7:</strong> Prototype ready for demonstration in an appropriate operational environment. At this level the prototype should be at planned operational level and is ready for demonstration of an actual prototype in an operational environment. Activities include prototype field-testing.</td>
</tr>
<tr>
<td><strong>Level 6:</strong> System/subsystem model or prototype demonstration in a simulated environment. At this level a model or prototype is developed that represents a near desired configuration. Activities include testing in a simulated operational environment or laboratory.</td>
</tr>
<tr>
<td><strong>Level 5:</strong> Component and/or validation in a simulated environment. At this level the basic technological components are integrated for testing in a simulated environment. Activities include laboratory integration of components.</td>
</tr>
<tr>
<td><strong>Level 4:</strong> Component and/or validation in a laboratory environment. At this level basic technological components are integrated to establish that they will work together. Activities include integration of &quot;ad hoc&quot; hardware in the laboratory.</td>
</tr>
<tr>
<td><strong>Level 3:</strong> Analytical and experimental critical function and/or proof of concept. At this level active research and development is initiated. Activities might include components that are not yet integrated or representative.</td>
</tr>
<tr>
<td><strong>Level 2:</strong> Technology concept and/or application formulated. At this level invention begins. Once the basic principles are observed, practical applications can be invented. Activities are limited to analytical studies.</td>
</tr>
<tr>
<td><strong>Level 1:</strong> Basic principles of concept are observed and reported. At this level scientific research begins to translate into applied research and development. Activities might include paper studies of a technology's basic properties.</td>
</tr>
</tbody>
</table>

2.2 Changes to Defence Offset Policies

The Industrial and Regional Benefits (IRB) policy team announced in October 2013 that there would be changes made to improve industry participation in defence procurement projects (Industry Canada, 2013a). One proposal was through the integration of industry-government-academia consortia projects into defence procurements and industrial capability development. This IRB component required primes to partner with one Canadian firm and a research institution. This component allowed all primes to invest up to 50 percent the value of the partnership consortia project in question, which carried a value multiplier of 5 to the initial investment (Industry Canada, 2013a). This component aimed to drive technology and knowledge transfer of early-stage research, thereby increasing technology spillover opportunities.

Another key component of these changes was the emphasis on driving technology spillover and early stage development of new goods and services. This component was the Investment Framework (IF) mechanism of the IRB Policy regime, which applied multipliers to the value of defence contracts proportionate to prime contractor investments made into DSMEs. Specifically, these multipliers targeted investment in R&D (9x), Intellectual Property licensing and transfers (9x), purchase in-kind transfers for equipment (7x), and business expertise (4x, for marketing strategies, business intelligence, etc.). However, the total of the multiplied values (i.e. all R&D, IP, and business expertise-related investments) could not exceed 5 percent of the contract value, as per Section 8.7 of Industry Canada’s Model IRB Terms and Conditions (Industry Canada, 2013a). This would mean that at the lowest possible IRB-eligible contract value, the multipliers would not exceed $5 million from a $100 million contract. Furthermore, the IRB policy on IF activities stated that prime contractor investment activity must last at least 5 years with recipient domestic DSMEs.

Building upon IF changes, the valuation of IRB credits had also undergone changes in higher-value contracts of CAD$1 billion or more (Industry Canada, 2013a). Long-term projects (exceeding 5 years) gave businesses the option to submit a Strategic Plan outlining business activities related to each IRB obligation. These plans are regularly reviewed and discussed with IC officials for medium and long-term company plans and how they integrated with IRB strategic activities and goals (Industry Canada, 2013a). These Strategic Plans carried the intent of further developing the domestic defence industrial base as well as to address potential future capability needs of the DND and Canadian Forces (e.g. innovative technology, R&D, global supply chain access, consortia-based activities) (Industry Canada, 2013a).

Industry Canada also amended contract valuation conditions of prime contractors transferring excess IRB credits to current or upcoming eligible projects. The transfer of excess IRB credits, known as banking, would apply to new or current projects and have various levels of eligibility amounts depending on the length of time between projects, bid price, and obligation values. For IRB transfer credits of completed projects, primes could transfer these credits to new or current IRB projects for up to 15 percent of the bid price (Industry Canada, 2013a). For overachieved obligations, the prime could take the excess obligation credits over to the current IRB project to a maximum of 10 percent of the obligation value (i.e. $100 million) and/or a maximum of half of an obligation (Industry Canada, 2013a). These credits carry depreciation rates, as seen in Table C below.
### Table C: Redeemable Credit Scheme of IRB Obligations

<table>
<thead>
<tr>
<th>% Redeemable Credits</th>
<th>Timespan since Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Less than 3 Years</td>
</tr>
<tr>
<td>75</td>
<td>3 to 4 Years</td>
</tr>
<tr>
<td>50</td>
<td>4 to 5 Years</td>
</tr>
<tr>
<td>0</td>
<td>More than 5 Years</td>
</tr>
</tbody>
</table>

Adapted from “Industrial and Regional Benefits Policy: Model IRB Terms and Conditions” by Industry Canada, 2013a, [https://www.ic.gc.ca/eic/site/042.nsf/eng/00074.html#a8.7](https://www.ic.gc.ca/eic/site/042.nsf/eng/00074.html#a8.7)

#### 2.3 Changes to Defence Procurement Administration Practices

In February 2014, the government announced a substantial change to defence procurement practices through the creation of the Defence Procurement Strategy (DPS). In particular, the decision-making process of defence procurements was altered to include additional ministers (Fisheries & Oceans, International Trade) to create comprehensive information-sharing and integrate an industrial perspective. An additional support body of Deputy Ministers was proposed for the ministerial working group and will carry out the implementation of the DPS under the oversight of the Minister of PWGSC. The team responsible for the implementation of the DPS under the Deputy Ministers Governance Committee (DMGC) reports on progress made, which is known as the Defence Procurement Secretariat (PWGSC, 2014a). The Defence Procurement Secretariat proposed roles included early engagement with industry and government entities in the procurement process, integrating Value Propositions into procurement, support decision-making through trade-off evaluations, seeking independent advice on procurement, oversee interdepartmental coordination, effective and quick resolutions to problems, and assessing and evaluating DPS performance (PWGSC, 2014a).

A key measure that the government is considering via the DPS is increased DND spending authority. The current threshold is set at a limit of CAD $25,000 for procuring defence-related goods. Any product beyond this threshold lies in the exclusive authority of the Minister of PWGSC under the Defence Production Act (1985). John Turner, while serving as the Assistant Deputy Minister (ADM) for DND Materiel in November 2014, reported that this amount will increase to $5 million (Canadian Government Executive, 2014).

PWGSC, IC, Fisheries & Oceans (DFO), and the DND are also attempting to further integrate industry interests into the procurement process. To maximize efficiency, the DPS plans to engage industry early in the procurement process for improved outcomes through a third-party review process (Canadian Government Executive, 2014). However, James Cudmore of the Canadian Broadcasting Corporation (CBC) criticized these changes as alienating the DND in defence procurement (CBC, 2014). Key points to take away from this measure are more transparent and competitive processes, clear identification of buyer’s selection options, and clearer long-term forecasting for future buyer capability needs. Long-term forecasting of industrial capability needs from government is underway to increase investment and resourcing predictability for industry. In June 2014, the DND published the first annual Defence Acquisitions Guide (DAG), which outlines upcoming acquisitions and future DND operational needs for the next 5 to 20 years (PWGSC, 2014a). In addition, industry feedback on options available for future procurements will add significant value to the outcomes in terms of capabilities, costs and domestic benefits (e.g. economic).
The DPS also weighs the benefits that will potentially affect Key Industrial Capabilities. The assessments on the impacts and support to KICs are to be carried out via government-industry discussions, along with detailed plans for investments and activities surrounding KIC areas and industrial bases. This is partly meant to oversee improving government understanding on technologies that are domestically created, innovative and exhibit significant potential to appeal to buyer needs.

The DPS prompted official changes to Canadian defence offset policies, as the IRB policy was replaced by the Industrial and Technological Benefits (ITB) policy. In December 2014, the key ITB feature introduced value propositions into defence bid evaluations. This insertion of a value proposition into a contract bid score marked the replacement of the IRB policy (Industry Canada, 2014). Another distinct development from the IRB is the introduction of four major technical criteria that contractors are scored on at the time of bidding and is in Table D under “Scoring at Time of Bid”. The ITB has also removed mandatory contract value obligations (5 percent of contract value) on government-priority technology (Industry Canada, 2014). For all comparisons, see Table D below.

**Table D: Key Comparisons between the IRB and ITB Policies**

<table>
<thead>
<tr>
<th>Scope of Coverage</th>
<th>Industrial and Regional Benefits (IRB) Policy</th>
<th>Industrial and Technological Benefits (ITB) Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Applied to all procurements exempt or excluded from international trade agreements over $2 million ~ 6 procurements per year</td>
<td>Applies to: all eligible defence procurements over $100 million; all eligible Coast Guard procurements over $100 million and for which the National Security Exception applies; and eligible defence procurements over $20 million, subject to a review. ~ 15 procurements per year</td>
</tr>
<tr>
<td>Overall Obligation</td>
<td>Undertake business activity in Canada = 100 % of the contract value</td>
<td>Undertake business activity in Canada = 100 % of the contract value</td>
</tr>
<tr>
<td>Transaction Types</td>
<td>• business activity directly related to the product or service being procured (direct) • other work not directly tied to the procurement (indirect)</td>
<td>• business activity directly related to the product or service being procured (direct) • other work not directly tied to the procurement (indirect)</td>
</tr>
</tbody>
</table>
| Scoring at Time of Bid | N/A | Rated Evaluation Criteria: 1) Defence Sector 2) Canadian Supplier Development 3) R&D 4) Exports  
Weighted: generally 10% of overall evaluation score. |
<p>| Identified Activities at Time of Bid | Generally 30% of the IRB obligation. | Generally 30% of the ITB obligation. |
| SME Obligation | Generally 15% of the IRB | Generally 15% of the ITB obligation. |</p>
<table>
<thead>
<tr>
<th>Plans</th>
<th>Assessed as pass/fail:</th>
<th>Assessed as pass/fail:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• IRB Management Plan</td>
<td>• ITB Management Plan</td>
<td></td>
</tr>
<tr>
<td>• Company Business Plan</td>
<td>• Company Business Plan</td>
<td></td>
</tr>
<tr>
<td>• SME Plan</td>
<td>• SME Plan</td>
<td></td>
</tr>
<tr>
<td>• Regional Plan</td>
<td>• Regional Plan</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enhanced Priority Technology List</th>
<th>At least 5% of contract value</th>
<th>N/A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Contractual Commitment</th>
<th>Yes</th>
<th>Yes + stronger performance guarantees</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Policy/administrative features of IRB Policy</th>
<th>Multipliers, banking, verification, etc.</th>
<th>Retain, review and streamline where appropriate</th>
</tr>
</thead>
</table>


2.4 Conclusion

While these actions are improvements to industry interests, the policy problems still remain for DSMEs, as these improvements are primarily geared towards large firms. The introduction of value propositions is a significant leap forward for Canadian defence offset policy, but the obstacle of contract value requirements (i.e. $100 million) continues to hinder meaningful DSME participation. If the Canadian government’s DPS intends for any progress to be made for DSMEs, using existing small and medium enterprise programs as a template would most likely do it, though no specific commitments have yet been made.

This lack of clear commitment to smaller firms may originate from the current government focus on fleet renewal and life cycle extension of defence platforms (e.g. jets, ships, tanks, etc.), which is an area that benefits large firms. Based upon the findings of this project, the lack of political will to explore DSME niche technological capabilities may prove to be a lynchpin barring significant DSME contract participation in the future, as the risk-averse approach to defence procurement has remained relatively untouched under the DPS. This perpetuation of time-consuming risk aversion is evident from DPS mechanisms reducing the role of DND in defence procurement and increasing time delays, despite government press releases touting a new and improved procurement process (CBC, 2014).
3. Methodology

The research project implemented a mixed method approach to data gathering. Methods included a jurisdiction scan, literature review, scan of current government practices and regulations, as well as first-hand research interviews from industry public sector procurement experts. An important note for the methodology is that this report primarily relies upon the data gathered from all but the research interviews due to limited interview responses from research participant candidates.

3.1 Literature Review

The research component of the project will begin with a literature review examining the challenges that DSMEs encounter throughout the public procurement process. This review will take perspectives from academic, public and private sector entities on challenges facing DSMEs. These issues include but are not limited to: product demand, cost, competitive practices, and compliance. This component sets out the findings of literature exploring the experiences and roles that small and medium enterprises (SMEs) have in the defence industry with other contractor parties (i.e. firms and suppliers) and the buyers (i.e. governments). Research was obtained through using online searches through the UVic Libraries database, foreign and domestic government websites, non-partisan public policy organization websites (e.g. CDA Institute website, etc.), and industry association websites. From the literature examined the broad challenges and opportunities for DSMEs will be identified and analyzed for synthesizing strategies for KIC development and improved DSME competitiveness.

3.2 Jurisdiction Scan

A jurisdiction scan will compare domestic defence procurement strategies from other countries. It will examine how other nations address DSME procurement problems such as but not limited to: defence offset policies, accountability in contracting processes, and scale of production. Comparisons will be made to Canada to identify potential strengths, weaknesses and solutions.

The scan examines foreign DSME procurement strategies and industrial policies. The scan will cover Australia, the United Kingdom (U.K.), the United States (U.S.), and Sweden. Australia in particular will be extensively researched due to their highly articulated and publicly available information. The U.K. was chosen due to its recent changes in defence industrial policies from free-market practices to a more active role in assisting DSMEs. The scan will also cover the U.S., which plays a significant role in industrial opportunities for Canadian DSMEs as a key ally, neighbour, and large potential market. Sweden will be the final jurisdiction, which is transitioning from a “made-to-order” procurement system to a more pro-active and longer-term policy approach.

The jurisdiction scan sources are acquired directly from government websites, academic, and industrial experts on defence industry policy. This section will summarize the programs and key policies that target DSME participation in defence industrial development and procurement processes. The scan of each jurisdiction will vary in length according to the amount of information that is publicly available and is a contributing factor in the size of the Australian jurisdiction scan.

3.3 Research Interviews

After receiving ethical research review approval, interviews with technical experts will be conducted to gain private and public sector feedback on Canadian defence procurement practices.
The interview questions will be listed and read in their prescribed order with a focus on DSMEs, though larger enterprise perspectives will be considered. The responses will be incorporated into the findings and for developing options and recommendations.

### 3.4 Deliverables

The research is primarily qualitative as it compares policies of selected jurisdictions, as well as obtaining information from parties grappling with these issues. The client seeks a report setting out the research findings and identifying options to generate discussion and interest in defence and security policy in Canada, as well as provide unique insight into specific aspects of Canada's defence and security policy issues (e.g. defence industrial policy).

Meeting the objectives of this project will require the following:

- Research on the history, legislation, and policies of defence procurement in Canada and its relation to the topic issue,
- An introduction of the issue and findings on recent actions on defence procurement and offset policies in Canada and its impact on defence firms, specifically small and medium enterprises,
- A literature review of DSME participation in public procurement will examine the challenges and issues faced when seeking defence contracts and industrial development,
- A jurisdiction scan researching procurement and industrial development practices and issues faced by other nations in relation to DSME participation and industrial capabilities,
- Interview substantive experts from private and public sectors that deal with defence procurement for interviews. These interviews will focus on strategies to improve key industrial capabilities and competitiveness of Canadian DSMEs,
- An analysis of research findings and its implications for Canadian DSMEs, industrial base, and relevant policy frameworks that affect industry and the shaping of options,
- Developing a strategic vision and its subsequent components to an improved policy environment regarding DSME capability development,
- A presentation of client options and recommendations made from the strategic vision and implications identified from the research for the most viable solutions to discussing and revising policy problems facing Canadian DSMEs.

### 3.5 Strengths, Limitations, and Strategies for Addressing Limitations

The strengths of this project flow from the review of academic literature and jurisdiction scans of allied and partnered nations, along with the seeking of first-hand expert perspectives on the emerging government strategies to encourage broader involvement in defence procurement.

This methodology derives strength from tapping the expertise of diverse perspectives. First, the perspectives from technical experts from the federal public service, specifically those handling defence and procurement issues, will add value to the research by identifying the strengths, weaknesses and opportunities in improving DSME capacities, such as the Jenkins and Emerson publications. Second, industry perspectives will be accounted for from private sector publications such as the AIAC and CADSI. Third, the literature review will focus on small and medium enterprises and their place in the aerospace and defence sector along with the policies and programs aimed at industrial capabilities. Finally, independent third-party research (i.e. think tanks, non-profit organizations) will provide useful views on trends and issues of Canadian defence procurement, how they affect industry, and how recent changes in relevant policy provides DSME opportunities.
In addition, government interviewees was limited to key departments handling procurement or affected by defence procurement policies (i.e. PWGSC, IC, and DND). The research will be focused on the potential policy sectors to improve KICs for DSMEs primarily dealing in building private capacity for Research and Development (R&D) in science, technology and innovation. These sectors are highly relevant to offsetting the research limitations since the competitiveness of smaller suppliers relies upon its ability to demonstrate and develop innovative products (Emerson, 2012).

Limitations of this project centre on limited timeframes for conducting interviews from a wide range of sources (e.g. DSME ownership/management, IC, DND, PWGSC, CADSI, AIAC, etc.). Other limitations are that some certain elements of the literature are no longer relevant due to recent changes in procurement by the federal government (e.g. weighting of KICs in contracting, etc.). The candidate pool for interview respondents proved a significant limitation, as only one respondent was obtained from DND, with the remaining candidates not responding to further contact attempts.

These limitations were addressed in several ways. Given the recent changes to the defence procurement process, the literature review will primarily focus on the challenges to DSME improvement to fulfill the federal government’s KIC needs. Given the time constraints, information will not be sought through Access to Information and Privacy (ATIP) requests to avoid delays. This project will instead rely on publicly available perspective-based information to gauge potential changes in defence procurement, such as the John Turner interview transcripts from the Canadian Government Executive website on the Defence Procurement Strategy and the impact of its changes on the DND. These interviews obtained are to compensate for the limited first-hand feedback given during this research project.
4. Literature Review

Sources were selected for their unique insights into Canadian defence procurement and contracting, defence industrial base policy, aerospace and defence innovation and technology development, market behaviour in a sole-buyer industry, as well as market or contract entry for defence firms (with an emphasis on smaller scale enterprises). Industrial association literature sources were reviewed to contextualize the strengths, weaknesses, opportunities and challenges facing DSMEs in the defence procurement process and its subsequent effects on KIC development and competitiveness. This review will also identify key issues facing the defence contracting and industrial processes for DSMEs and familiarize the reader to nature of transactions within the defence industry, known as procurements. Information on the methods used for gathering the research in this section are found in this report’s Methodology section.

This section has six parts. The first part identifies the key players in the Canadian defence industry. The second component will then examine the industry sector perspective, followed by the third component centering on the policy expert perspective. The fourth portion of the literature review will look at the issues and research on DSME participation and opportunities in the defence market. The fifth component will then look at the business modelling and operational concerns of defence firms, followed by the sixth and final component drawing conclusions on the major trends and patterns found within the literature reviewed.

4.1 Key Players in Canada’s Defence Industry and Issues Shared

The term of “procurement” denotes the process by which the public sector acquires goods and services to perform its necessary functions. In the case of the Department of National Defence (DND), these acquisition activities cover a broad range of military-purposed items such as software and support systems, vehicle/platform purchases, maintenance/renovation/repairs of military vehicles/platforms, and so forth. The parties which provide the goods or services of defence procurement acquisitions are composed of the following groups:

- Large firms (Primes, Original Equipment Manufacturers (OEMs), Tier 1 firms)
- Small/Medium Firms (Defence Small and Medium Enterprises (DSMEs), Tier 2 and 3 firms)
- Suppliers (Tier 3 firms)

Craig Stone (2008) states that a key challenge for the Canadian defence industry and competitiveness is that Canada has no official defence industrial policy, nor formal defence industrial base plan (pp. 344-350). This is particularly challenging since the government has recently adopted the KICs in February 2014 into their future procurement decisions. Stone (2008) examines the case of Canadian defence procurement and its lack of an official update to federal defence industrial policies (pp. 347-352). Experts from think-tank organizations such as the Strategic Studies Working Group (SSWG) and private industry associations such as the Canadian Association of Defence and Security Industries (CADI) have cited a lack of clarity in accountability structures and contracting requirements (usually in the form of offset policy requirements) as a common obstacle in the defence contracting process. Furthermore, the intent of government remains difficult to interpret or anticipate for defence firms and subsequently affects the means by which defence firms and their suppliers make future business and investment decisions. This is particularly evident in cyber-security capabilities, since its early emerging status has made it difficult for defence industry executives to determine regulatory limitations, size of the competition pool, and market maturity (Dowdy & Oakes, 2015, p. 4). Stone (2008) stated that governments with clear defence industrial policies and industrial base strategies have long-term benefits for the
defence industry and procurement process due to an articulated direction and understanding of future government needs (pp. 349-352).

4.2 The Industry Perspective

Industrial associations such as the Aerospace Industry Association of Canada (AIAC) have made similar recommendations to government for creating a clear policy framework or planning process for the Canadian defence industry through a Defence Industrial Base Plan (2011). The AIAC research centred on this plan would state that buyer and contractor parties benefit from early governments involvement with industry in the procurement process to give defence firms a clear idea of the immediate and future government needs on safety and security (AIAC, 2011, p. 3). Based upon these findings, this creates an opportunity to transition away from the pre-existent “one-off” acquisition approach of buyers to a longer-term acquisition planning approach by creating more predictable and routine-based procurement processes. For example, the Joint Strike Fighter (JSF) Program would be an ideal opportunity for developing a defence industrial policy, as Canada is one of nine participant nations in this program, which helps to keep costs down through cost-sharing. The key difference, however, is that partner nations like the United Kingdom’s government have pre-existing defence industrial policy frameworks that allow defence firms to plan for the F-35 jet acquisition with less cost and production-time variances than their Canadian counterparts (Stone, 2008, pp. 351-352).

Although, Industry Canada (2012) points out that Canada benefited from the co-development of the F-35 joint strike aircraft, which has generated millions of dollars in contracts, university research, and laboratory research nationwide. For larger firms (also known as primes or OEMs), the JSF Program yielded significant benefits such as increased demand and a stake in upcoming procurement projects from buyers (i.e. governments). Unlike the United States and the United Kingdom, Stone (2008) indicates that the Canadian defence industry is primarily composed of SME high-technology suppliers that deal in niche sectors of the industry with highly specific competencies (p. 353). These SMEs encounter greater difficulty in such complex procurement projects as their capacity for efficient production scale and innovative research are limited when compared to that of OEMs or primes (e.g. Lockheed Martin, General Dynamics, and Bombardier) due to their high level of specialization and industrial experience.

Industry critics claim that difficulties encountered by DSMEs concerning adequate capacity to produce innovative technology, efficient production scale, and maintain significant research capacities is partly due to limited assistance they receive in mid-spectrum development phases (i.e., after research and design finalization) of the technology production process. In terms of the assistance available to DSMEs in the post-design phase of technologies, they have greater difficulty acquiring public sector assistance. This is because technology assistance programs tend to focus on the early or late stages of technology development, which the AIAC classify as Scientific Research and Experimental Development (SR&ED) programs (AIAC, 2011, p. 4). David Emerson (2012) has coined this gap of support between the early and late stages of technology development phases in the supply chain as the technological “Valley of Death” (Emerson, 2012, p. 9). Emerson (2012) will go on to state that business capacities and government coordination for technology demonstration phases (i.e. mid-production phases) are key factors to the success of promising technology (p. 12). One example of this is the loss of opportunity for the DND on Augmented Visionics System (AVS) technology for military helicopters (in situations of low visibility) presented by contractors CAE and Neptec. The DND stated a need for this technology but did not have the funds for CAE to further develop this technology into production for domestic market (Emerson, 2012, p. 33). This resulted in a net cost to the DND as it could not sustain funding past the early development and design phase.
of production and thus could not procure this product, a situation that could be remedied through government-industry cost-sharing (Emerson, 2012, pp. 24-33).

Furthermore, SR&ED tax incentive programs offer limited cash-flow mobility to businesses and this rigidity on conditions has greater impact on small and medium enterprise applicants (AIAC, 2011, pp. 4-5). The AIAC (2011) claims that if these tax incentives could be reinvested into the applicant’s business, conduct new research projects, or carry over these credits to cover non-income taxes, then the decreased expenses could foster business growth, cost savings, and increase capacities for innovative technological demonstrations (p. 5). Emerson (2012) highlights the importance of cost savings by stating that sectors such as aerospace have significant capital cost requirements when it comes to research and design capabilities, and is especially difficult for smaller businesses without larger partners (pp. 9-11).

Cost concerns are echoed by the 2015 (Dowdy & Taylor, 2013) and 2017 (Dowdy & Oakes, 2015) defence industry outlook survey of defence industry executives commissioned by McKinsey & Company. The majority of respondents in both outlook surveys said they anticipate their customers looking for more affordable products, prompting the need to reduce prices and production costs. This concern of cost and affordability has prompted executives to focus more on service-based cost reduction and shifting to emerging market sub-sectors (e.g. cyber-security) to maintain competitive in defence contracting competitions (Dowdy & Oakes, 2015, p. 4). Figure C below displays executive responses of the 2015 and 2017 outlooks.

**Figure C: Industry Executive Responses on Sectors with Growth Potential**

![Figure C](image)


### 4.3 The Policy Expert Perspective

On the contracting side of this issue is the SPA regime used in Canada to award a major contract to a defence firm, as well as the power that large firms can exert via supply chain management to give themselves an advantage. The SPA regime designates one contractor as the primary responsible party, which is usually a larger firm or OEM that can delegate production as it pleases. Although DSMEs can earn some revenues from the Industrial and Technological Benefits (ITB) policy
(formerly the IRB-Industrial and Regional Benefits policy) that mandate small-medium enterprise investment, OEMs retain the majority of the profits. This is because the ITBs/IRBs are geared towards off-the-shelf equipment that large firms have readily available, thus limiting DSME supply chain opportunities by “cutting out the middle man” (Emerson, 2012a, p. 16). This combination of SPA practices, offset policies, and sporadic purchases of complex defence acquisitions (e.g. platforms) limits the ability and opportunity for domestically owned enterprises (particularly DSMEs) to participate (Jenkins, 2013, pp. 12-17).

Furthermore, large firms may choose to withhold intellectual property (IP) rights from smaller contractors within the same contract to maintain an advantage, despite a contractual partnership. These IP rights may be part of crucial technologies necessary for the procurement project as a whole and confers an unfair advantage to the larger firms as they can select which other companies may access this data or IP. Emerson (2012a) states explicit and clear negotiated terms allowing equal IP/data access among all participating firms in a contract is necessary for improved small enterprise competitiveness in future procurements (pp. 18-19). However, there is no binding obligation for larger firms to share their IP rights with other companies for procurement contracts. This is due to comparatively small contract values to the value of IP rights and a potential loss in long-term competitiveness, business and profit for large firms.

Emerson (2012a) also states that “Bundled” or “Bundling” contracts are another key challenge for DSMEs (pp.14-15). These contracts are under one firm or company that encompasses a multitude of products, such as In-Service Support. These contracts are high in monetary value and typically beyond the capacities of DSMEs to meet buyer needs. Bundled contracts give no assurances to DSMEs for the opportunity to compete in a contract, regardless if they have successfully provided goods or services to the buyer in the past (Emerson, 2012a, p. 15). In light of these challenges faced by smaller firms, Emerson (2012a) has proposed that contracting processes be amended to accommodate smaller firms in set-aside policies, accommodating joint venture contracts, as well as affording opportunities for DSMEs to bundle their services with a larger firm/contractor for upcoming contracts (pp. 15-17).

The Jenkins Report (2013) further articulates that preclusive contracting practices on sole-source accountability be eliminated in order to give domestic firms a more significant role in the contracting process. While Jenkins (2013) does not endorse Emerson’s proposal for possible set-aside programs or policies, he does propose for bundled contracts to be changed to allow smaller firms the opportunity to have a greater participatory role in the contracting process, possibly as partners. This in turn would allow DSMEs to establish market visibility, access larger supply chains, as well as seek opportunities to expand their scale of production. However, this recommendation states that it will require action on the part of government in order to increase Canadian business presence.

Access to technology demonstration would further bolster Canadian DSME business presence and market visibility. Although this carries more risk, the Emerson (2012) Working Group Report documents state that demonstrations help to reduce risk and increase the credibility of technology producers to potential buyers or partners (p. 12). This would require a targeted focus on aerospace and defence sector support, which the Aerospace Review recommends through a scaled adjustment of the Strategic Aerospace and Defence Initiative (SADI) Natural Sciences and Engineering Research Council of Canada (NSERC) to DSME requirements (Emerson, 2012, p. 23). Expansions on partnerships, such as the Green Aviation Research and Development Network (GARDN), between DSMEs and OEMs/Tier 1 firms are another proposal aimed at increasing market visibility and production scale efficiency (Emerson, 2012, p. 24).
4.4 DSME Participation and Opportunities in the Defence Market

Defence procurement critics cite SME-focused procurement programs for DSMEs as a useful means of increased participation and market presence, business growth and production capacity development. These SME programs are known as “set-aside” programs for small defence firms and typically will be lower in contract value (under USD $1 million) where these small firms are sole suppliers. Selected firms (i.e. suppliers) that qualify for set-aside procurement then attract the attention of larger suppliers and OEMs, where private cooperation is then developed (e.g. strategic partnerships) or offers for company buyouts. Alternatively, these projects also encourage outside investors or prospective joint ventures in future procurement contracts if the accountability structure of the contracting process permits more than one firm as the responsible supplier/contractor party. Assuming firms will cooperate and defence contracting processes allow joint ventures, this increase of market visibility would provide smaller firms increased access to larger supply chains through partnerships with larger firms (Emerson, 2012a, p. 15).

Considering that the largest global spender on defence is the United States, Canadian businesses have a strategically ideal location in terms of market and supply chain access. The United States constitutes over half of the defence industry in sales value and is the highest spending government on their military and other security services. The Canadian Defence and Foreign Affairs Institute (CDFAI) has stated in a report on the Canadian defence industry that linking into the larger supply chain across North America would be of great benefit to Canadian defence industrial and capabilities. However, one of the largest problems with accessing these larger supply chains stems from a lack of defence firm visibility, particularly with smaller firms or suppliers. For example, if a supplier’s location is located in an earthquake-prone region, low market visibility harms the entire supply chain due to the lack of knowledge that one firm (and hence production) is inoperable due to unforeseen occurrences (Odden and Pavlak, 2014, p. 5).

4.5 Business Modelling, Development, and Operations in the Defence Market

Additional concerns that Odden and Pavlak (2014) have with firm visibility are the ability for tenderers/buyers (i.e. governments) and partners to account for cultural differences, business practices, and distant locales along with differences in local regulatory issues and constraints. The lack of knowledge surrounding these smaller firms are all contributing factors to a general reluctance or hesitation to offer contracts to smaller firms, especially if their first buyer is a public sector entity. Firm visibility in the defence industry is a primary concern for North America, as smaller firms have access to two major markets that have a high degree of cultural similarity and business practices. One method to leverage this unique situation in North America is to articulate and develop a coherent or harmonizing regulatory framework for defence firms within the US and Canada.

Furthermore, differing procurement interests between public sector and industry parties (e.g. platform production – jets, tanks, and ships), complex capability needs, and associated technological complexities contribute to unforeseen cost increases and delays. This is due to the buyer parties’ focus on the end-result or outcome of the defence contract based upon buyer capability needs. However, industry experts are usually aware that meeting capability needs is an iterative process that incorporates greater technological complexity, which possibly means changes or modifications to original plans that increase the original price. These unforeseen circumstances are harmful to smaller firms since these price increases may decrease demand for produced units. This decrease in demand has repercussions throughout the supply chain, affecting the
manufacturers that produce the unit components for complex procurement materiel. The fluctuation in demand is unique for defence firms as opposed to other high-tech manufacturing sectors such as aerospace or automotive industries. Defence firms produce highly specialized products for specific buyers and produced in lower volumes than commercial high-tech manufacturing firms since defence purchases are less frequent.

KPMG critics Odden and Pavlak (2014) also cite that partnerships between firms and suppliers in their supply chains would greatly assist in adapting to demand fluctuations. Considering that the defence industry typically has deep supply chains (i.e. multiple suppliers) in production processes, there is significant risk to firms and suppliers if governments change the units/services demanded. An additional challenge to smaller defence firms and suppliers is that the structure of the contracting process for major acquisitions tends to have larger firms push the risks down the supply chain to suppliers and smaller firms, while simultaneously remaining the principal contractor, resulting in larger firms retaining larger profits. To remedy this imbalance, Caldwell and Howard (2014) suggest that all participants (including buyers) would benefit from a demand-driven supply chain and establish cost and risk-sharing policies associated with fluctuations in demanded goods and services to reduce overall risk (pp. 6-11). The proposed solution hinges upon transitioning to output-based approaches, as outlined by their case of problems found in past outcome-focused acquisitions (Caldwell and Howard, 2014, pp.14-15).

Caldwell and Howard (2014) proposed to implement a transition to new approaches such as an output-based plan for new defence materiel production in order to control costs and risks associated with the production of new defence materiel, particularly more complex products such as platforms (e.g. jets, personnel transport carriers, ships, tanks, etc.) (pp. 6-11). Considering that complex procurement typically consists of the buyer, OEMs, and SME manufacturers, having a structure that creates value via sharing of risks and benefits between all three major parties are necessary. This cooperative value-creating approach shares risks and benefits in order to efficiently manage outputs and ensure satisfactory outcomes. Additionally, tying the risks and benefits to both buyers and contractors reduces the likelihood of oligopolistic behaviour and practices from firms, increases the potential for DSME participation and visibility, and promote vigilant cost and risk management practices.

Further aspects examining DSME visibility and competitiveness are the concerns for having adequately skilled workforces to sustainably develop and support their industrial capability goals. Industry feedback on future concerns are not just on the financial assistance aimed at developing these capabilities, but also on having the necessary human resources for doing so. Defence industries typically do not receive much attention in terms of human resources programs or job skills training assistance from the public sector, unlike alternate sectors such as construction or civil manufacturing industries. Defence industry critics of Enterprise Partnerships Pty Ltd. (2007) suspect that this gap in a focus on human resources or talent/skills management is due to alternate risks that DSMEs must balance, such as business survival, addressing business crises (i.e. sudden changes in buyer demand levels), as well as fiscal management risks (pp. 6-28). Ultimately, this focus on more immediate challenges takes precedence for DSME owners and managerial staff and thus reduces the opportunity for achieving an efficient economy of scale for resources on training, talent management, post-secondary recruitment, and job skills training.
4.6 Conclusion

The researched literature reveals several trends. The most prevalent trend is that critics posit that partnerships and collaboration among industry entities (and in some cases, buyers) would be an effective means of improving DSME participation and KIC development. The second trend is that critics from the AIAC (2011) and Craig Stone (2008) state that a formal plan or defence industrial policy is needed for developing an industrial base, capability requirements, and future government needs. The third finding is that defence offset policies and contracting processes that place accountability onto one contractor will result in diminished DSME participation. The fourth finding is that government assistance to DSMEs requires further development, particularly in financial assistance flexibility, mid-spectrum technology development, business-to-business engagement, market and supply chain visibility, and workforce development and training.
5. Jurisdiction Scan: Australia

The Australian model for capability development of the defence industry is a transitional model from the typical "import-substitution" approach to defence procurement towards an "export-promotion" model. This transition is driven by Australia's geostrategic position in the South Pacific region, wherein Australia lies relatively isolated from key allies, and thus has received the political and social will necessary to sustain said transition to an export-focused industrial strategy. Prior import-substitution models relied on using domestic manufacturers and suppliers in place of foreign firms that produce similar or the exact same goods necessary for completing procurement contracts. Although this provides short-term benefits for local firms, the OEM runs additional costs for changing supply chain flows, scales of production, and search costs for new suppliers in the buyer nation. The export-promotion model by contrast encourages foreign firms to invest or partner with domestic firms.

Australia's strategy is based upon policy instruments driving value-for-money innovation in companies, reducing export controls, removing guaranteed business and assistance to domestic firms, and promoting entry into global supply chains (Berkok et al., 2012, p. 4). Australia designed a new defence industrial policy in 2010 absolving government from selecting winners and losers. Instead, the new policies allow the market to determine the best firms to meet capability needs. This approach towards conventional market practices generated programs designed to adapt to these practices. These programs assist domestic firms in longer-term business sustainability needs, such as talent management and recruitment programs, training programs, and business mentorships outlined in Australia's Workforce Strategy Plan. The job skills and training programs are relevant to the Australian Defence Forces (ADF) due to plans to extend the service terms or “through-life” cycles of their equipment (mostly platforms) due to tighter defence spending.

5.1 Planning Future Capability Needs for the Australian Defence Forces

Workforce, engineering, and technological capabilities training needs also factor into new acquisition projects. The Future Submarine Program is a major acquisition project by the ADoD to create replacement units for their current fleet and a workforce capable of maintaining them. These initiatives are linked to the labour market and the post-secondary education sector. Acknowledging future capability requirements, ADoD programs on workforce and technical capabilities training focuses on market trends (e.g. which sectors compete for the same applicants as the ADoD) that require these specific areas of expertise. This led to the Australian government supporting student recruitment of local defence firms to mentor and train post-secondary applicants through partnerships between industry and academia. These training programs are particularly significant to DSMEs since most in-service support procurements are awarded to domestic firms.

Aside from assistance to local industry, the Australian government has also taken significant steps in designing their policies to better equip business to innovate and adapt to changes in demand. Rather, the design of the policy regime of Australia means to encourage and offer support to what Berkok et al. (2012) call “vertical innovation” (p. 9). Rather than trying to encourage a further diversification of technology for defence industry firms (i.e. “horizontal innovation”), the framework of their industrial policy aims to improve production cost, quality, and technology of pre-existing products. This is a large component of the 2013 Defence White Paper. The 2013 Defence White Paper cites that defence industry goods and services are subject to an assessment against the current off-the-shelf (OTS) goods and services, which serve as a challenge function in the early contracting process (Australian Department of Defence, 2013, p. 116).
To increase predictability for industry and their success in meeting contracting challenge measures, the ADoD produces two major documents outlining future ADF needs within a 4-year window (Australian Department of Defence, 2013, p.118). These plans are Defence Capability Plans (DCPs), which come in two versions (one for government, and one for the public) and are publicly available on the ADoD website. These DCPs also have matching planning timelines with the budgetary Forward Estimates to align departmental spending and acquisition goals (Australian Department of Defence, 2013, p.118). Furthermore, the latest DCP publication is significant as the government initiated joint consultation with industry of the DCP’s formulation to appreciate defence industry needs and concerns. There are also accompanying publications that delineate longer-term goals and requirements of the ADF for a 6-year span beyond the Forward Estimates, known as Defence Capability Guides (DCGs) (Australian Department of Defence, 2013, p. 118).

5.2 Increasing Australian DSME Visibility in the Global Defence Industry

Firms that may not have the same level of market attractiveness as their competitors prompted the development of a technology demonstration program for new technologies called the Priority Industrial Capability Innovation Program (PICIP). The PICIP explores technologies that fulfil a particular ADF capability need but are considered unorthodox in comparison to conventional bid proposals (Berkok et al. 2012, p. 11). Bidders are mostly DSMEs and the program matches investments into innovations through loans (Berkok et al., 2012, p. 11). The key component is the venture-capital approach where the government shares risk with the firm on a conditional payment/loan structure hinging on the innovation’s success in acquiring a buyer or exporter (Berkok et al., 2012, p. 11). If the product secures a buyer, the firm repays the loan (Berkok et al., 2012, p. 11). If the product fails, the costs are shared between the firm and government.

The most prominent of the defence industrial programs centring on collaboration with DSMEs is the Global Supply Chain Program (GSCP). The key difference is that this program targets and encourages business-to-business collaboration and interaction. The GSCP is a partnership between local DSMEs and multinational defence firms with the goal being to grant DSMEs access to the global supply chain. These partnerships are not imposed upon larger firms by government, but rather these firms are free to choose which local firms that they wish to establish partnerships. These multinational firms have access to government-provided lists of firms that have specialities in specific PICs and SICs in order to more easily search for partners that can fulfil the needs of the buyer and at an adequate production capacity. The significance of these DSMEs listed by the government to larger multinationals is that these local defence firms have undergone a preliminary vetting process in order to be a registered member on the solicited list of local firms.

The list of firms provided to primes for defence contracts are registered under the ADoD Defence Industry e-Portal. The criteria for making this list depends upon meeting the requirements for export potential, potential barriers to subcontracting roles, productivity, and workforce skills and capabilities (Berkok et al., 2012, p. 12). Furthermore, this portal acts as an extension of the Defence Capability Plan (DCP) and updates both suppliers (i.e. smaller firms) and prime contractors on changes to the DCPs (Berkok et al., 2012, p. 12). To add, the portal provides detailed information on suppliers for potential partners wishing to bid on Australian defence contracts. This portal tool is also a means of providing defence industry feedback to government, in the form of a scorecard document (Berkok et al., 2012, p. 12). Similarly, the government has a scorecard document of their own to evaluate the industrial capacities of DSMEs seeking defence contracts on grounds such as abilities to meet ADF capability needs, production scale, and export potential and readiness.
Regarding export potential and readiness of Australian firms, the domestic defence industry has specialized support from the Defence Export Unit (DEU) of ADoD. The DEU’s chief activities are developing marketing plans for the Australian defence industry to international markets, identifying barriers to conducting foreign business, coordination between industry and foreign buyers, and Minister-backed endorsements of products used by the ADF to potential foreign buyers. A significant activity of the DEU is its demonstration program for Australian firms on ADF equipment in order to generate international interest and market visibility of Australia’s defence industry to foreign governments (Berkok et al., 2012, p. 14). The DEU therefore implements a great deal of coordination-based activities with the ADF to access their military assets.

5.3 DSME Business Development Approach

The Australian government also provides additional services for domestic DSMEs that are in the formative stages of entering international defence markets. The entity rendering these services is the Defence Industry Innovation Centre (DIIC), located in each major city nationwide. The DIIC offers free advice from experts known as Defence Industry Business Advisers (DIBAs) to improve a DSME’s international competitiveness and issue grants to implement their recommendations. Other grants also facilitate private, public, and academic partnerships to create new product concepts with commercialization potential (Berkok et al., 2012, p. 17). Other DSME services include but are not limited to: group innovation projects, business intelligence/advice on new technologies, products and processes, networking events, and testing facility access (Berkok et al., 2012, p. 17).

As mentioned above, Australian DSMEs receive assistances in accessing technology demonstration to potential buyers or improve existing pre-commercialized products. However, to address technology gap issues, the Australian government created the Capability and Technology Demonstration (CTD) Program. The CTD Program demonstrates DSME products with other advanced technologies that could advance ADF capabilities and grants competitive funds for potential capability advancements (Berkok et al., 2012, p. 17). These funds cover seed funding, project sustainment, and definition funding of CTD proposals (Berkok et al., 2012, p. 17). The Capability Technology Demonstration Extension (CTDE) Program also bridges gaps between mid and late-stage phases while suitability for ADF use is determined (Berkok et al., 2012, p. 18).

5.4 Defence Industry Performance and Quality Assurance Programs

While the Australian government provides a diverse and comprehensive array of services and assistances to defence firms, they implement key review programs to maintain efficiency in the defence contracting process to maintain a “Value for Money” approach. A prominent program that acts as a review mechanism is the Company ScoreCard Program. This program regularly and comprehensively evaluates contractor performances currently in business with the Defence Materiel Organization (DMO) (Berkok et al., 2012, p. 18). Contractor parties have the option to challenge DMO assessments of their performance and may choose to continue a dialogue with the DMO to improve the contesting points of the evaluation. However, the key tenet of the program is to determine future sources for procurement based on transaction costs for services delivered.

5.5 Conclusion

The overall approach from the Australian government is a policy direction that targets underinvestment risks. Due to the clear contrast in geostrategic position to Canada (which has a strong neighbouring ally), Australia must address current and potential future challenges in its defence capabilities and subsequently must support its defence industrial base to prevent
underinvestment. This problem of underinvestment is a concern that other governments have had (e.g. Canada), as initial investment or support to underdeveloped sectors of the industry would not yield immediate direct benefits or satisfactory outcomes.

A key risk that the Australians have identified was the underdevelopment of their broader agency problems in relations to industry-government business in defence. The Australian government has addressed these agency problems by providing a clear, consistent and consolidated strategy of marketing and business advice to companies when it comes to defence market needs and competitiveness (i.e. how to market to other buyers), instead of industry advising the government on how to best market their needs to companies. By giving the contractor entities direct business advice and supports on buyer needs domestically and internationally, the Australian government has provided companies with the means to be more competitive and by consequence, increase the value of defence products to make defence purchases more attractive to potential buyer parties.
6. Jurisdiction Scan: United Kingdom

The United Kingdom (U.K.) has a significant defence industrial base proportionate to its domestic purchase needs as one of the chief defence exporters in the world. A key political driver to defence industrial development was the Cold War era, as Britain was one of the key Western nations dedicated to containing Soviet influence and power and protecting its interests abroad (e.g. the Suez Canal) alongside other key allies such as the United States. One of its strongest firms, BAE Systems, is a global Prime competitor in defence exports, with strong aerospace capabilities. These capability strengths are derived from the British principle of using competition among domestic and foreign firms as a driver of success, as BAE Systems is the result of multiple consolidated firms into one large prime contractor. This had previously led Britain to allow the defence market to regulate itself in terms of industry consolidation and businesses operations. However, the reduction in defence budgets adversely affected their comparative aerospace and research advantages under the Cameron administration. To offset these reductions in funding, the government has attempted to balance these hindrances in financial resources by increasing government resources and advice to small and medium firms (which the British government defines as 250 or less employees) and relying upon off-the-shelf defence products to meet cost and capability needs (Ward & Rhodes, 2014, p. 3).

These austerity measures drove a paradigm shift on market competition in the domestic defence industry. The British government typically supported competitiveness as a key driver of lower prices and higher product quality in the defence industry, but has recently taken a more active role in regulating industry consolidation (e.g. mergers, buyouts). This was due to changes in cost needs and productivity concerns as the defence budget shrunk. The lack of necessary capital for defence procurements prompted government to seek lower cost and greater reliability, typically found in prime/OEMs and Tier 1 firms. Furthermore, Berkok et al. (2012) argue that the defence industry consolidation was to boost production scales as fewer, larger contractors means higher product output rather than smaller production rates from many small and medium firms.

These conditions make the British defence industry policy a unique case, with a peculiar balance between liberal market practices and public intervention within the defence industry. This balance of interests is largely due to the increased budget constraints across the British government, with science, research and development (R&D) capabilities receiving the brunt of budget reductions. The 2012 U.K. Ministry of Defence (UKMOD) White Paper National Security Through Technology states that despite reductions in research and development, the Ministry of Defence will maintain a baseline of 1.2 percent of the defence budget to fund science and technology development (UKMOD, 2012, p. 9). The British R&D defence sector once stood as the second-most effective sector worldwide, but is now falling behind its competitors.

Despite the cuts to science and technology development, the British government has launched a renewed effort to reinforce domestic DSMEs. The theory behind this reinforcement is that these enterprises will compensate for the lack of direct investment in R&D defence capabilities via competition as the key driver. Given that most of the smaller firms have niche capabilities in the domestic industry, it is assumed that increase business support will increase the pool of competition and thus improve innovative outputs and outcomes from businesses.
6.1 Changes in Strategic Policy Direction

To improve SME assistance, the 2012 White Paper states that the government will offer greater assistance to SMEs in defence contracting. This measure plans to improve SME contract participation through the appointment of Crown representatives to directly interact with SMEs and implement selective marketing enablement to those companies that have distinctively innovative products and services (UKMOD, 2012, p. 57). Supplementary measures to market visibility (i.e. marketing) of SMEs also include reducing threshold costs (decreased from £40,000 to £10,000) to advertise through and to the government via the Contracts Finder database (UKMOD, 2012, p. 57). The 2012 White Paper also states that the contracting entry requirements will also undergo changes to increase accessibility to SMEs. In specific, the pre-qualification practices of government will tailor itself more closely to the capacities of smaller firms and suppliers. This has included a “common-core” questionnaire format for contract pre-qualification, as well as reducing their use in low-value contracts. The implementation of strict “Company Asset/Sales-vs.-Contract Value” ratios in the early contracting phases will also undergo revisions to more closely consider a company’s present capacity and potential (UKMOD, 2012, p. 57).

The UKMOD are making their processes simpler in order to address SME concerns of time and financial costs. SMEs in both civil and defence sectors sometimes lack the necessary resources to sustain themselves throughout the concept-to-programme process of government that assists or does business with SMEs.

In the case of defence, the UKMOD has proposed the following reforms:

- E-procurement with simplified, streamlined contract templates for low value procurement acquisitions
- Increase use of e-procurement to expedite billing and invoicing in acknowledgement of cash flow concerns from SMEs
- Reinforce the role of a “Supply Network Champion” with a specific responsibility to ensure procurement strategies maximize SME participation at the prime or subcontract level within the investment process of procurements
- Clarify in Possible Future Purchase notices and Invitations to Tender on considering requests for interim payments on its contracts, cognizant of the level of expenditure required according to contract size and duration. (MOD will, however, must balance its interests and comply with Government policy on outcome-based payment)
- Reform the FATS (Framework Agreement on Technical Support – a one-stop-shop program that contracts out technical support services to national departments/ministries) in the following areas:
  - Clarify that FATS contracts are short-term only for technical support services
  - Splitting FATS into “General” and “Duty of Care” (i.e. airworthiness, seaworthiness, etc.) areas of tech support to guide companies to matching government requirements
  - Stronger selection criteria to ensure adequate addressing of government needs
  - Greater oversight to increase competition for FATS contracts
  - Evaluate potential of an e-bulletin board allowing suppliers with appropriate capabilities visibility of all potential FATS requirements in their field of expertise

The White Paper also includes pledges towards increased ministry to supplier interaction in order to better assist SMEs in contract participation concerning defence procurements. A key proposed change in contracting processes is the compartmentalization of contracts and payments into smaller phases that have criteria with “Yes/No” decisions from the ministry determining a contractor’s ability to move forward with the procurement. This change is designed to reduce risk
and financial exposures among buyer and contractor parties through organizing the contract into smaller increments (UKMOD, 2012, p. 59). Support resources such as helpdesk and online support services are an additional proposal from government to SMEs in the defence sector to increase their market visibility and opportunities with prime firms, as well as acquire assistance from SME-focused programs from alternate public agencies (UKMOD, 2012, p. 59). It should be noted that the government has made it clear that it will not intervene as an intermediary or integrator between SMEs and prime contractors. Instead, the UKMOD has proposed that prime contractors share possible subcontracting plans for contract values exceeding £1 million, though there are no binding auspices for primes to disclose their intentions regarding delegation of production activities via subcontractors (UKMOD, 2012, p. 60).

6.2 Industry-Government Dialogue

Smaller firms also wish to have prior concerns voiced in the Green Paper consultation on addressing Prime-Subcontractor tensions. A chief concern is intellectual property (IP) and ownership rights. If the government is to implement an export-driven defence industry, the demand for innovative products on a large scale will require firms to protect their technologies to safeguard their revenues and clientele bases. In order to increase SME confidence in expanding their scales of production and supply chains, the UKMOD is collaborating with their IP Office are developing new measures to address the challenges that smaller firms and suppliers face when protecting their IP. Key points include the development of a Code of Conduct for primes to protect supplier intellectual property, contractually oblige companies of all sizes to protect and respect intellectual property rights of subcontractors at all stages of the contracting process, and promote technology transferring and licensing to increase SME participation and innovation.

6.3 Changes to the Government’s Role in the British Defence Industry

In 2013, the UKMOD expanded upon the 2012 White Paper’s effort to stem the loss of domestic industry competitors by teaming with other national departments in a joint initiative known as the Defence Growth Partnership (DGP). The DGP has a tripartite decision structure similar to Canada’s concerning defence procurement acquisitions process. The three departments are the Department of Business Innovation and Skills, U.K. Trade and Investment, and the UKMOD (operating in a supporting role as the buyer party) (DGP, 2014, pp. 19-23). A key difference between the Australian defence industry strategy on industrial capabilities is that the DGP chooses to concentrate on its industrial capability strengths instead of attempting to maintain the firms that spanned diverse defence industrial capabilities (i.e. to address underinvestment).

In particular, these capability strengths were in Air Capabilities (i.e. Aerospace) and Intelligent Systems (e.g. software, systems integration) (DGP, 2014, p. 15). These two capabilities are supported by teams (listed below) of experts in conjunction with six business-focused teams assembled by the government that cover international business and marketing, intellectual property, workforce and labour skills, industry-government coordination, competitiveness, and value and supply chains (DGP, 2013, p. 15).

- Air Capabilities Team
- Intelligent Systems Team
- Engagement Team
- Strategy Team
- International Business Team
- Technology & Enterprise Team
- Value Chain Competitiveness Team
- Skills Team

Source: Defence Growth Partnership, 2013, pp. 9-14
6.4 Conclusion

In complement with the strategic direction of the 2012 White Paper, *National Security Through Technology*, the British government is creating a strategy that merges industrial expertise from alternate departments and feedback from defence primes and suppliers (including SMEs) to create an industry more conducive to competition and technological development and innovation. A key element of this strategy is creating an industry that can adapt and leverage technological spill-over from the civil commercial technology industries (e.g. aerospace, robotics, etc.) over to the defence sector. Second, the British government is making the transition towards concentrating on their major industrial strengths to maintain global competitiveness in the defence industry and resourcing relevant programs to support these strengths (e.g. business expertise, supply chain analysis, business intelligence, etc.). Finally, the increased integration between government and industry (including smaller firms) allows for increased transparency and predictability for industry experts to adapt to the changing future needs and resourcing as seen through the establishment of industry-government joint teams mentioned in the DGP.

This strategy of the DGP initiative with guidance from the 2012 White Paper balances both government and industry interests in the future of the domestic defence industry, yet differs from their Australian counter-parts. However, the British strategy does not have the same depth or breadth in handling global supply chain concerns, off-the-shelf challenge mechanisms, or an articulated plan to address constraints on innovation and R&D in the defence sector.
7. Jurisdiction Scan: United States

The defence industrial policy approach to business development and procurements are primarily based upon conventional market practices of free competition and a “hands-off” government policy. This is partly due to the level of demand generated by the United States Armed Forces alone, as it is currently the largest spender on defence compared to any other nation. Part of this stems from its Cold War era capability needs, as America sought to contain the Soviet reach of influence and power worldwide. This increasingly expensive and diverse set of demands for capabilities led to an increasing reliance upon private industry to develop new and/or improved capabilities, leading to a gradual institutionalization of defence procurement as a core operation of the United States government. Defence procurement expansion and the increasing dependence on private industry even prompted a cautionary speech from former U.S. President Dwight D. Eisenhower on the risks of a "Military-Industrial Complex". The American defence industry has since expanded to such a degree that the American industrial base has produced a significant amount of global industry leaders such as Colt, Smith and Wesson, Boeing, Lockheed Martin, and General Dynamics. Industry size very much influences their defence procurement policy approaches, as seen in their key difference to Canadian defence industrial policy regimes, such as its formal statement that it will not impose defence offset policies on foreign and domestic firms as per the *Presidential Policy on Offset of 1990*, which declared the following:

“No agency of the United States Government shall encourage, enter directly into, or commit United States firms to any offset arrangement in connection with the sale of defense service to foreign governments”.

Source: Kane, 2009, p. G-53

Alternatively, the United States government will not involve itself in the administration or management of offset requirements imposed upon an American defence firm if it wishes to sell its goods and services to foreign governments. While it does not condone the implementation of offset requirements for defence sales, it will not restrict an American firm from managing its own business with foreign governments. Furthermore, the US government does not restrict foreign firm participation in defence contract bids or sale of American defence goods to foreign governments, save for only a few areas of procurement (e.g. Abrams battle tank production) (Kane, 2009, pp. G-53). The relatively low amount of policy restrictions on defence firms allows for a larger competition pool and as such, accommodates a diverse amount of support and assistance programs for defence firms seeking government contracts.

The United States Department of Defense (USDOD) has a diverse array of procurement/acquisition processes that span from small arms to large military platforms. Due to the magnitude of the policy frameworks and steps taken in these acquisitions processes, this scan will focus on the programs, initiatives and resources that the USDOD has available and applicable to small and medium enterprises seeking business with the USDOD. The USDOD even has specific subsections outlining the acquisition regulations and eligibility requirements for small businesses such as set-aside programs, mentorship initiatives, accountability and reporting structures for their Office of Small Business Programs, determining and defining the status of a small business, and subcontracting programs. These regulations on small business acquisitions and contracting are located within the Defense Federal Acquisitions Regulation Supplements (DFARS) policies, under Subsection 219 (Defense Procurement and Acquisition Policy, 2015).
7.1 DSME Market Opportunity Programs

One key program mentioned in DFARS Subsection 219 is the Mentor-Protégé Program under the Department of Defense Office of Small Business Programs (OSBP) (U.S. Department of Defense Office of Small Business Programs, 2014). The Mentor-Protégé (MPP) Program is a broad initiative that accommodates both civil and defence enterprises categorized as "small disadvantaged businesses". The United States government defines these entities as: small businesses that are 51 percent owned by one or few individuals and primarily comprised of visible minorities (i.e. Black, Pacific-Asian, Sub-continental Asian, Latino, and Women).

The objective of the MPP program is to increase SME market participation through partnerships with larger firms to successfully receive prime contract or subcontract awards. In exchange, the mentoring larger firms have the opportunity to improve, develop and expand their sourcing options and supply chains with their protégé partners. Recently, the MPP program agreements have turned their focus to corrosion engineering, robotics, circuit board and metal component manufacturing (U.S. Department of Defense Office of Small Business Programs, 2014). This program does not yet extend into explicit defence applications, but the USDOD is currently exploring bids from participating businesses that have potential technological “spill-over” applications for the military.

The USDOD also has programs assisting small business in identifying and promoting supply chain, sourcing and subcontracting opportunities with larger firms (e.g. prime contractors). To reduce the administrative burden on industry when concerning subcontracting work, the USDOD launched the Comprehensive Subcontracting Plan Test Program (CSPT). This purpose of this program is to streamline the accounting, reporting and administration of subcontracting work on a company-wide basis. The subcontracting process would involve the submission of documentation for each product that the prime delegates to smaller firms (e.g. subcontract for armour plating to Subcontractor A, subcontract for drive-train assembly to Subcontractor A, etc.). The CSPT Program would allow primes to bundle all subcontracts that it issues into one document, if it is under the same company (e.g. one subcontract for the armour plating and drive-train assembly to Subcontractor A) (U.S. Department of Defense Office of Small Business Programs, 2014a).

7.2 DSME Research and Development Programs

Similar to previous jurisdictions covered, the United States government also devotes a portion of its resources to technological innovation and development. The USDOD implements two key R&D and innovation programs for SMEs, the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. The mutual objectives of these programs are to stimulate technological innovation, increase private sector commercialization of federal R&D, increase small business participation in federally funded R&D, and promote participation disadvantaged firms in technological innovation (U.S. Department of Defense SBIR/SBTT, 2010).

The SBIR program has over USD$2 billion in funds administered by the Small Business Administration through 11 agencies and comprises of 13 major components of US government defence entities (Army, Navy, Air Force, Missile Defense Agency, Defense Advanced Research Projects Agency, etc.). The SBIR operates in three major phases and funds up to USD$1.15 million in R&D and early stage technologies fulfilling USDOD needs.

- **Phase I** (project feasibility): determines scientific, technical and commercial merit and feasibility of the ideas submitted. Phase I contracts are typically $150,000 over a period of six months.
• **Phase II** (project development to prototype) is the major R&D effort, funding prototyping and demonstration of front-runner Phase I projects. Phase II contracts are up to $1 million and usually span 24 months.

• **Phase III** (commercialization) is the goal of the SBIR program. SMEs are expected to obtain funding from non-SBIR sources to commercialize the Phase II project for sale in the military and defence markets.

Source: U.S. Department of Defense SBIR/SBTT, 2010

The STTR program is another 3-phase program with some differences. The STTR program funds up to USD$850,000 in R&D funding that directly goes to SMEs, post-secondary research institutions or private researchers. Another key difference is that the STTR only receives annual funding of $100 million from the US government (U.S. Department of Defense SBIR/SBTT, 2010).

7.3 Conclusion

The programs aimed at DSMEs in the United States are flexible yet broad in its requirements. This may be due to their defence industrial approach that aligns more closely with conventional market practices of open and free competition. This approach reappears in the no-offset policy position of the United States. As such, this creates a large pool of competition for defence firms to drive their capacity to innovate and offer the best products to the USDOD. This idea of competition applies to the assistance and support programs applicable to American DSMEs, as large competition pools are designed to seek out only the strongest firms that can fulfill USDOD needs. However, this makes it significantly more difficult for some DSMEs to remain in contract competitions.
8. Jurisdiction Scan: Sweden

The Swedish government is in a state of policy transition concerning their defence industrial base. Before adopting a more international approach to defence industry opportunities, Sweden focused on self-sufficiency to meet domestic defence needs, with their strongest capabilities in aircraft production and flight systems technology. However, as the defence industry began shrinking, the Swedish government focused on increasing export opportunities to the global defence market. An example of this shift in policy approach is Sweden’s participation in the OCCAR (Organisation Conjointe de Coopération en Matière d’Armement – Organisation for Joint Armament Cooperation) initiative of the European Defence Agency (EDA). Additionally, Sweden engages with other major defence producer countries such as the U.S. to address weaker areas of their defence industrial capabilities in joint research and development (R&D) projects.

8.1 Shifting Policy from the Consumer to the Market

A key change in Swedish defence industrial policy is the shift from a consumer-driven approach to defence procurement to a market-driven approach (Börjesson & Elmquist, 2008, p. 6). The Swedish government previously had a system that was the equivalent of a made-to-order system for defence industrial production. This system primarily focused on Sweden maintaining a self-sufficient defence industry that specifically met domestic defence needs (Börjesson & Elmquist, 2008, p. 6).

However, the shrinking defence industrial base along with rising costs and cheaper foreign goods and services, the Swedish government sought a policy solution that moved closer to the market-based approaches of foreign defence manufacturers. Although there has been some progress made in creating a more market-friendly policy regime, Sweden still relies upon offset policies to boost domestic firm participation in the defence market and local industry.

8.2 Driving an Innovative and Competitive Domestic Industry

The Swedish offset policy regimes specifically leverage technology transfers, SME participation, and research and development support. In addition, Sweden is aiming to maintain a comparative advantage in its aerospace capabilities. However, scarce indirect investment options dissuade foreign primes from seeking contracts. Key concerns from primes are potential disputes over the valuation of technologies used, as well as costs for domestic co-production (i.e., hiring a Swedish SME to produce part of the order in conjunction with the prime, as opposed to the prime producing it through a cheaper foreign firm or within its own facilities)(Berkok et al., 2012, pp. 46-47). The government has determined in the case of offset policy rigidity that the longer-term benefits of domestic industrial development and export opportunity expansion outweigh the immediate costs of foreign investment dissuasion to current co-production and technology transfer requirements (Berkok et al., 2012, p. 48). The long-term goal is ultimately to have a more innovative and competitive defence industry on a global scale through leveraged technology spill-over and transfers from partner foreign firms serving as a foundation for future innovative technologies and services produced by domestic firms.

The emphasis on increased innovation and competitiveness through increased research and development and technology transfer was a key driver to policy working groups in Sweden, especially for the aerospace sector (Kane, 2009, p.G-34). In 2004, a working group of government and industry experts released six key measures by which to increase the competitiveness of the
Swedish defence industry via increased coordination between government and industry (Kane, 2009, p. G-35). These enabling strategy measures were:

- Government-Industry coordination of defence industrial policy and policy impact assessments, with a focus on the aerospace sector, and research and technology capabilities;
- Integrated interaction between Government, Industry, and Research entities for increased participation in civil aviation, security and space research projects in the European Union;
- Develop international cooperation and boost Swedish industry competitiveness through new financial models for businesses, increase collaboration with industry to leverage aviation strengths to the world market, increase market participation in the United States, and increase joint procurement activities with partner nations (i.e. joint maintenance service programs, etc.);
- Develop the capacity to deal with changes and security threats such as increased collaboration between industry, academia and government as well as increase market access to American defence industries and security capabilities;
- Develop the current domestic defence industry through collaboration between prime contractors and SMEs to diversify defence capabilities;
- Create synergies between civil and military aerospace applications through increased joint industry-government export promotion activities, R&D resourcing, procurement opportunities and set-aside arrangements for maintenance projects to increase participation of domestic firms on an international scale.

Source: Kane, 2009, pp. G35-G36

8.3 Conclusion

These measures are meant to establish a regulatory framework that is conductive to the interests of government and industry. Instead of completely adopting a completely liberalized market for defence industries, the Swedish government is creating a means by which the defence industry is more market-friendly, but still maintains a measure of risk reduction. Given that the government is increasing its involvement with the industry to expand its market opportunities, they are creating safeguards to reduce market failures should a failure occur. This is evident in their goals to increase export production, policies which stand to benefit smaller firms since their niche capabilities are desirable to both buyers and prime contractors. The key themes behind these actions were transitions to a more proactive approach to fulfilling current and future defence capability needs as well as encouraging defence sector investment in technological development and innovation.
9. Interview Findings and Challenges

9.1 Challenges Encountered

Offers were made to both defence industry experts and public sector experts in defence procurement and acquisitions policy to participate in this project’s research. Seven contacts were established within the public sector, but only one had agreed to participate. The remaining six potential contacts from the public sector had either not responded to e-mails and telephone calls or had declined to participate. Those that declined did so out of concern for employer reprisal or to avoid any risk of breaching confidentiality requirements that their position demands. The seven potential contacts were from the following departments: The Department of National Defence (DND), Public Works and Government Services Canada (PWGSC), and Industry Canada (IC). The one participating respondent was from the DND.

Nine industry participants were contacted to participate in research interviews for this project. Two had declined, one had not responded to further e-mails despite initial interest in research, and the remaining six had not responded to e-mails and phone calls. Of the two industry experts that declined, one had referred the researcher to a provincial government representative of British Columbia but an industry perspective was required. Despite the need for public sector feedback, the government contact in British Columbia is at the provincial level, not the required federal level. One of the nine industry candidates had been referred to the researcher by the one participating public sector informant, known as Public Sector Informant (PSI) but did not respond. PSI is the sole respondent in this interview.

9.2 Public Sector Respondent Feedback – Public Sector Informant

PSI is an employee of the DND with 1 to 5 years of experience in their coordination role conducting technology procurements and testing. PSI has a total of 5-10 years of experience in defence policy and procurements.

*Barriers to more public sector assistance to develop DSME KIC capacities*

PSI states that a key barrier is that multiple departments involved, but once a DSME has received a contract award, there is some flexibility to create synergy between the involved departments. This raises another key barrier, which is the ability to first receive a contract (i.e. market entry). This barrier lies in a DSME’s candidacy for R&D funding eligibility and Build in Canada Innovation Program (BCIP) eligibility screening processes (provided there is a matching department to the technology). PSI also states that even within one department, there are a multitude of officials that oversee the procurement and testing process, and having the right team at the right time is crucial to the success of the contractor’s bid. One of these crucial team members is the Assistant Deputy Minister’s (ADM) Office of Materiel at the DND headed by ADM John Turner.

*Changes to Improve DSME participation and KIC Development*

PSI responded that this was very challenging as defence firms would require the right program for the right industry, especially for smaller competitors. The informant also stated that formalized requirements for products would improve the current procurement process, since products cannot move forward in the procurement process without a matching need or requirement for it. Compliance is another key factor PSI mentions, stating that DSMEs often lack the necessary skill-set
within their staff to meet contract requirements and thus cannot "get through the door" without meeting their need for knowledgeable and experienced staff in government contracting processes.

**Best ways to improve KIC development and DSME participation**

Wide support would be required from the public sector, and DSMEs would need to maintain a willingness to succeed in obtaining a contract award whilst competing against larger companies that have more experience in contracting processes. Typically, DSMEs go through business developers when pursuing a contract, but the contract itself leaves no ambiguity in its requirements so compliance is key. Although a successful smaller firm may go on to be the sole provider of a product for government if awarded a contract, PSI states that contracts challenge each item of a requirement, and DSMEs often put all their eggs in one basket when pursuing a contract, leaving them at risk. This risk is further amplified by the depth of involved public sector parties in contracting processes, as the Canadian Forces Materiel Group has 8 divisions alone, along with the Materiel Group of the DND.

**Changes to help DSMEs in defence procurement contracting processes**

Increased access to Standing Offer contracts would provide security for bidders. These contracts are long term and have some flexibility in process requirements. However, most standing offers are for minor materiel, such as office supplies.

**Current government resources/programs most useful to defence firms**

Research and Development (R&D) programs would be the most helpful to firms, especially the BCIP for smaller firms. Other programs are available through the National Research Council (NRC) and Defence Research and Development Canada (DRDC). However, some of these programs are also offered to larger firms.

**How government can build from successful programs and initiatives**

Addressing the match between a need and a product is key. The public sector cannot create a need for product, the product must be created to suit the need. This requires a long term presence from DSMEs in the contracting process in order to improve their compliance and ability to gain market entry via contract award.

**Assessment on current R&D and innovation assistance given to defence firms**

PSI responds that the support for R&D programs is increasing through greater allocation of resources (e.g. staff and funding) to research programs and agencies. The NRC and DRDC are among its beneficiaries due to this change in the business environment of the public sector regarding technological development. This has included a shift in staffing processes within such entities as DRDC and NRC, as departments are now more receptive to the merits of technological R&D.

**Feedback on improving competitiveness and other issues**

PSI states that the people seeking government contracts have to learn how to “navigate the maze” of requirements through the contracting process. The informant will repeat their previous statement that it comes down to having the right people at the right time to move things along in the contract process. This is again due to multiple players within the public sector with a role in
procurement, which PSI suggested to further research, since the military works closely with the ADM of Materiel for the DND. PSI suggested to conduct further research on the role of the Materiel Branch of the DND and the John Turner interview in the Canadian Government Executive website.

9.3 Conclusion

Although only one respondent resulted from the attempts to acquire interview feedback, the value of PSI’s feedback proved invaluable to this project’s research. Obtaining further feedback from substantive experts on procurement from both public and private sectors would prove highly valuable to experts outside of industry and governments in order to generate further dialogue for stronger and sustainable solutions. Implications suggest that obtaining these perspectives requires future interviews with potential respondent candidates by gathering sufficient rapport and trust with potential contacts within industry and government, as well as a rigorous approach to ensure confidentiality and privacy concerning respondents’ identities.

Other factors to consider for gathering a larger pool of respondents is the location and context in which the research takes place. It should be noted that PSI had met the researcher in person prior to the participation request for research interview feedback in Ottawa. An additional note is that of the candidates that kept in contact with the researcher but ultimately declined an interview were also individuals that the researcher had met in person in Ottawa prior to the interview requests. Remaining candidates were either referred to the researcher from contacts established in Ottawa by the researcher or through the researcher obtaining contact information via the Company Capabilities Directory website of Industry Canada.
10. Findings in Perspective: Summary and Themes

This section will highlight the major patterns, trends and overall key research findings from the background information, jurisdiction scan, literature review and research interview feedback obtained. These findings will fit into major themes, which will then feed into a strategic vision for an improved defence industrial base, including improved DSME industrial capabilities.

10.1 Summary of Findings

This section reports on the findings of the research conducted from literature reviews, jurisdiction scans, and research interview feedback. The findings from these sections of the report will inform the direction that the Options section will take on proposing potential courses of action to address Canadian DSME issues on KIC development and competitiveness. These findings are presented in an order that will take on the broad problems facing the aerospace and defence sector of Canada, narrowing the focus to the DSME approaches of Canada’s partners, followed by a revision of specific feedback on DSME KIC development in Canada from PSI via research interview.

Literature Review

The literature indicates the need for a clear and predictable defence industrial policy for the Canadian defence procurement process. Industry perspectives state that clear and long-term industrial policies will help aerospace/defence firms to more easily predict and adapt to changing defence capability needs. Craig Stone (2008) also indicated the need for policy to reflect the Canadian defence industrial base, which is composed primarily of DSMEs (pp. 353-357).

Research and development (R&D) assistance is another key concern of the AIAC. According to the AIAC (2011) report, R&D assistance requires a more comprehensive approach to all production phases of DSME technology (i.e. all TRLs). Emerson will expand upon this by stating that most small firms encounter mid-spectrum challenges in technology production (Emerson, 2012, p. 9). Tax incentives also have limited mobility, which requires increased cash flow (AIAC, 2011, pp. 4-6).

Expert panels on Canadian defence industries and procurement also indicated that contracting process requires greater DSME participation. Jenkins (2013) indicates that the defence contracting process favours OEMs/primes since the contract designates one firm as the responsible party for contracts exceeding $100 million. Emerson (2012a) reflects this statement because high-value contracts are usually large-scale procurements like platforms (e.g. tanks, ships, jets) (p. 15). The sharing of products and information also favour large firms in contracts. OEMs can withhold the right to share IP with partners and take on bundled contracts, which combines sales and service agreements (e.g. In-Service Support). Emerson (2012a) suggested joint venture contracts between DSMEs and primes or offset policy “set-aside” amendments (p. 15).

Craig Stone (2014) points out Canadian businesses have a strategically ideal location to U.S. markets and supply chain access (p. 22). Stone (2014) stated that Canadian defence industries accessing larger continental supply chains would optimize production (pp. 22-23).

Sharing of risks between buyers and contractors presents an opportunity for DSME participation in large supply chains. Caldwell and Howard (2014) posited that risk-sharing would reduce oligopolistic behaviour. Output-based models of contracts would control costs and needs as both buyer and contractor would track contract costs and timeframes and make adjustments if any
changes arise. The Emerson (2012) report on technology demonstration echoes this position in its recommendation for a public-private sharing of costs and risks of promising technologies (p. 25) The researched literature reveals that the industrial base of the Canadian aerospace and defence sector lacks a key direction under which industry to follow, largely due to the absence of a defence industrial policy. This lack of direction seems to have created an industrial environment where the government will occasionally give focus to during times of major purchases, such as the recent F-35 jet purchase proposal and its unforeseen complexities in increasingly long lists of capability requirements as the project progressed, totalling to almost 130 subsystems as of March 2013 (Shimooka, 2013, pp. 4-5). The current approach to defence procurement, expenditure management and industrial development led to an environment favouring larger firms, in which the contracting process leaves little opportunity for DSMEs to significantly participate or expand their capabilities due to escalating costs beyond DSME budgets. This lack of participation is seen through the relatively sparse network of assistance and funding programs available for DSMEs in the aerospace and defence sector, leaving significant challenges for competitiveness in defence markets. This is particularly problematic since larger firms would be more likely to subcontract systems integration work to smaller firms with niche capabilities due to unforeseen increases in technological complexity to suit evolving defence capability needs (Shimooka, 2013, pp. 5-6).

Australia: A Comprehensive, Competitive and Balanced Approach

The Australian jurisdiction had the most comprehensive approach, with a diverse array of programs supporting their defence industrial policy regime. The Australian approach is based upon conventional market practices, where competition is encouraged, as the policy structure removes government from selecting winners and losers. The implementation of free-market approaches via competition encourages an “export-promotion” model of defence procurement, encouraging foreign participation and prime/OEM investment in domestic defence firms. Australia also invests into future workforce needs in the defence industry through development and mentorship programs. These future capability needs are outlined in Australia’s Workforce Strategy Plans.

Another key element of the policy regime of Australia is encouraging and supporting what Berkok et al. (2012) call “vertical innovation” that aims to improve unit cost, quality, and technology of pre-existing products (p. 9). This is a large component of the Australian 2013 Defence White Paper, which assesses products against current off-the-shelf (OTS) products (Australian Department of Defence, 2013, p. 116). Australia also uses four-year plans called Defence Capability Plans (DCPs), which were developed in consultation with industry. These documents are accompanied by Defence Capability Guides (DCGs) (Australian Department of Defence, 2013, p. 118).

Australia’s Priority Industrial Capability (PIC) Innovation Program is the key component of Australia’s innovation capacity for exploratory technologies (Berkok et al, 2012, p.11). This program has a cost-sharing venture-capital approach between the government and DSMEs, with the government funds treated as a loan and repayment/losses are based on a pass/fail basis. Australia’s Global Supply Chain (GSC) Program is another prominent program, which encourages collaboration between DSMEs and primes. Primes can freely choose local firms through government-provided lists. Market access is further expanded through the Defence Export Unit (DEU), which develops marketing plans for Australian defence firms to international markets, identifies barriers, sets up industry-buyer meetings, and issues endorsements of goods used by the ADF along with a demonstration program (Berkok et al, 2012, p. 14).

The ADoD also provides DSME services about to enter global markets via the Defence Industry Innovation Centre (DIIC), which provides advisers on international competitiveness to DSMEs who
issue grants to carry out their recommendations. The Australian Capability and Technology Demonstration (CTD) Program facilitates DSME technology demonstrations with other technologies to potentially advance ADF capabilities, and also grants competitive funds to advance ADF capabilities (Berkok et al., 2012, p. 17). Additional support is provided through the Capability Technology Demonstration Extension (CTDE) Program (Berkok et al., 2012, p. 18).

Overall, Australia’s approach to defence industrial development and procurement is comprehensive yet competitive. The diverse array of programs and services available to DSMEs may result from a reduced government role in contracting requirements criteria, as market-driven forces determine winners and losers. This arms-length approach in bidder selection may have allowed Australia to divert resources away from more interventionist approaches like defence offset policies, instead focusing on targeting industrial under-investment in order to create a foundation of business infrastructure for new and innovative defence capabilities should they arise. This is seen through the covering of business development services, marketing, supply chain access, technological development, venture capital/risk-sharing funding, and so forth.

**United Kingdom: Balancing Free Competition and Domestic Industrial Development**

The United Kingdom (U.K.) has a significant defence industrial base proportionate to its domestic purchase needs as a chief global exporter. However, smaller defence budgets adversely affected their comparative advantages under the Cameron administration, especially in research and development outcomes. The government tried to balance this by increasing resources to DSMEs and rely upon off-the-shelf products to meet cost and capability needs (Ward & Rhodes, 2014, p. 3). The U.K. also shifted its policy from open competition as a driver for lower costs and higher quality by regulating industry consolidation out of cost and productivity concerns.


The UK MOD Green Paper consultation cites Prime-Subcontractor tensions. A contested point is IP rights. To boost DSME confidence in production and supply chain expansion, the UKMOD collaborates with the IP Office to address concerns of IP rights and protection. In 2013, the UKMOD expanded domestic market competition preservation via the multi-departmental Defence Growth Partnership (DGP) initiative to maintain and expand industrial strengths.

In particular, these industrial capability strengths were in Air Capabilities (i.e. Aerospace) and Intelligent Systems (e.g. software, systems integration technology and electronics) (U.K. Ministry of Defence, 2013, p. 6). Two expert teams, along with six supporting teams (Engagement, Strategy, International Business, Technology & Enterprise, Value Chain Competitiveness, and Skills), support these capabilities (U.K. Ministry of Defence, 2013, pp. 9-14). These teams cover areas such as international business and marketing, IP, workforce and labour skills, industry-government coordination, competitiveness, and value and supply chains (U.K. Ministry of Defence, 2013, p. 6).

The U.K. model appears to be a transitional model from a policy environment that focused on open competition to drive industrial capability improvement to a more interventionist role. The decrease in defence budgets and comparative advantages in R&D prompted this shift in policy, as the U.K. sought to bolster its remaining capability strengths in aerospace and intelligent systems as well as
extend assistance to DSMEs to leverage their niche capabilities. This model seems to be a cross of the U.S. model that endorses market competition and the export-promotion model of Australia, as seen through their Defence Growth Partnership initiative.

United States of America: Conventional Market Practices in an Unconventional Market

The United States Department of Defense (USDOD) has a diverse array of procurement/acquisition processes that span from small arms to large military platforms. The USDOD also has specific subsections outlining the acquisition regulations and eligibility requirements for small businesses. A key program mentioned is the Mentor-Protégé Program under the USDOD Office of Small Business Programs (OSBP), which is a broad initiative accommodating civilian and defence enterprises known as “small disadvantaged businesses” (comprised of 51 percent visible minority ownership). The objective is to increase SME participation through partnerships with primes.

The U.S. government also values technological innovation and development. These programs are the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Their mutual objectives are technological innovation, commercialization of federal R&D, increased SME participation in federally funded R&D, and promoting technological innovation (US Department of Defense SBIR/STTR, 2014). The STTR program funds up to USD$850,000 in R&D, while the STTR provides USD$100 million in funding (USDOD SBIR/STTR, 2014).

To reduce administrative burdens, the USDOD launched the Comprehensive Subcontracting Plan Test Program (CSPT), which streamlines subcontracting work. This allows primes to bundle all subcontracts into one document if it is under the same company. The U.S. DSME programs are flexible and broad in capability requirements. This may be due to their conventional market practices of open and free competition via a no-offset policy position (Kane, 2009, p. G-53). As such, this increases competition among firms for USDOD assistance.

The United States model offers a flexible yet competitive environment for DSME supports. This may be due to their practices of free-market competition. This is reflected in their explicit opposition to defence offset policies. This model largely seems to rely on the principle of equality of opportunity between all small and medium enterprises, as most programs under the U.S. system deem both military and civilian firms to compete for funding or contracts. While this model of “Survival of the Fittest” yields the ideal results for the USDOD in terms of capability needs, this environment makes it significantly more difficult for DSMEs to receive contract awards.

Sweden: Transitioning from a Reactive to Proactive Defence Industrial Policy

The Swedish government is transitioning its defence industrial base policy. Sweden previously focused on self-sufficiency to meet defence needs, with their strongest capabilities in aviation. However, as the defence industry shrank, Sweden focused on increasing export opportunities to international defence markets. Additionally, Sweden engages with other major defence firms to address their weaker defence industrial capabilities through joint R&D projects.

A key change in Swedish policy is the shift from consumer-driven to market-driven defence procurement (Börjesson and Elmquist, 2008, p. 6). However, the shrinking defence industrial base along with rising costs against cheaper foreign products prompted Sweden to seek market-based policy solutions similar to foreign defence manufacturers. Although there has been some progress, Sweden still relies upon offset policies to boost domestic firm participation.
The Swedish offset policy leverages technology transfers, DSME participation, and R&D. In addition, Sweden aims to maintain comparative advantages in aerospace. However, this policy dissuades foreign investment. Sweden has determined that the longer-term policy benefits outweigh the immediate costs of foreign dissuasion (Berkok et al., 2012, p. 48). The long-term goal is ultimately to have a more innovative and competitive defence industry through technology development.

The Swedish government is creating a more proactive and market-friendly industrial policy, but still maintains a measure of protectionism, with the defence offset policy as a strong deterrent to foreign investment. This is a situation similar to Canada, with the exception that Sweden has a resident OEM. However, the offset policies emphasize technology spill-overs and R&D, suggesting that Sweden is interested in building a domestic industrial base with high-technology capability strengths over the long-term. This is a marked difference from Canada, as the ITB policy chiefly focuses on reinvestment into Canada without specific focus on the aerospace and defence sectors.

Interview Findings

First-hand feedback from Public Sector Informant (PSI) states that firms must have a product that matches buyer or end-user needs. These needs are subject to rigorous "maze" of review and scrutiny processes throughout the contract, which many smaller scale firms find difficult in terms of compliance. The right people within the federal departments (e.g. DND, PWGSC) and the time in which they enter the contracting process are also crucial to a company's success in receiving contract awards. PSI also states that experienced and knowledgeable workforces in public sector contracting are another factor for a firm's success, as PSI states that most small companies have little or no experience in seeking government contracts or navigating its processes.

Overall, the literature reviewed demonstrates that industry needs initial direction to guide them and improve help to smaller firms instead of focusing on large firms. Of all jurisdictions, Australia offers the most promising and balanced regime of competitive programs and services. The U.K. and U.S. have policies relying on competition to encourage innovation and better prices, but the U.K. government takes a more active role in accessing global markets. Sweden resembles the Canadian situation, insofar as its relied on a reactive approach, which changes into a long-term proactive approach. This shift to a more proactive approach is echoed by interview feedback, as PSI states that firms do not receive compliance help beforehand, but only may receive said help if they happen to be assigned to a DND employee with the right skillset who is willing to help. However, this process is largely determinate on a firm's prior knowledge and available resources (e.g. staff, hired consultant) of contracting processes and gives larger firms a systemic advantage in contract bids.

10.2 Discussion: Themes to Consider for a Strategic Vision

Overall, a key principle to retain from this section is establishing a strategic vision that achieves a defence procurement and contracting system that grants sufficient flexibility and mobility for DSMEs to significantly participate. This will require a committed effort to creating a sustainable defence industrial base by first setting a strategic direction for all industry leaders, large to small. This direction will make government needs more predictable and thus easier to plan for. This direction requires guides to maintain momentum through creating a capable infrastructure around industry, such as workforce/skillset needs, and business development services. To reflect the resident defence market constituency, offset policies must accommodate DSMEs to significantly participate in high value contracts since the majority of Canada's defence market is DSMEs (Stone, 2008, p. 353).
Considering that these DSMEs are also niche capability leaders in Canada, components should also reflect the need to develop and support these technological endeavours to improve KICs throughout the production process. To sustain this capability development, DSMEs must improve their business operations at minimal costs, requiring expertise from both government, market and contracting experts. Using these experts on business development and contracting compliance, it would provide the necessary foundation for expansion into global markets and production lines.

Finding a Direction for Industry: Lessons from Partner Nations

There was no articulated Canadian government plan for accessing supply chains. Scanned jurisdictions immediately pointed to the importance of global supply chains, seen most clearly in the 2013 Australian Defence White Paper. Sweden also noted the importance in accessing global supply chains, as it had transitioned from a made-to-order procurement approach of acquisitions to one that was more proactive and seeks a longer-term strategy for defence capability needs. Stone (2014) stated that Canada can learn from Australia and access supply chains by leveraging its unique location and industrial access to the U.S. defence market (pp. 22-23). Similarly, Canada can also learn from Sweden in transitioning from a made-to-order system to a proactive and longer-term strategy for fleet renewal and technological innovation concerning defence capability needs.

Emerson (2012) and the AIAC (2011) cite inadequate sector-specific assistance or support. Although there are programs that target small and medium enterprises (SMEs), there are limited amounts of funding and support services programs that assist aerospace and defence firms concerning doing business with the government and foreign buyers. These findings are consistent with the feedback from PSI, indicating that smaller firms have difficulty complying with the contracting process to adequately demonstrate the match of their product to a capability need. Australia has articulated and developed its capability needs through DSME supports such as the Defence Export Unit (DEU), Defence Industry Innovation Centre (DIIC), Priority Industrial Capabilities Innovation Program (PIC), and Australian Capability and Technology Demonstration (CTD) programs (Berkok et al., 2012, pp. 9-17). These programs foster “vertical innovation”, which aims to improve technological strengths (Berkok et al., 2012, p. 9).

The American and British models centre on competition to optimize sector performance. However, this principle is more evident in the U.S., as their funding and support programs rely on competition between bidders just to qualify. The U.K. began revising this principle in reaction to reduced defence budgets. Although the U.K. wishes to retain a competitive environment between firms, it nonetheless turned towards supporting the domestic industrial base. The Defence Growth Partnership (DGP) initiative is an example of government attempts to bolster the industrial base by exploiting its pre-existent strengths (e.g. Air Capabilities, Intelligent Systems, R&D). The 2012 UK MOD White Paper served as the foundation for the DGP and contained auspices to assist domestic DSMEs. The simplification of contract criteria and lower costs greatly assisted British DSMEs, and renewed commitments to protect their IP rights from larger competitors.

Based upon these findings, the following components of a strategic vision for the Canadian defence industrial base and its relevant policy frameworks will support establishing and maintaining the strategic direction for Canada’s aerospace and defence sector:

- **Formalizing a Defence Industrial Policy in Canada**
  In consultation with industry, government should formalize a defence industrial policy through clearly stated commitments and goals (e.g. programs, services) for the defence industry. This increases market predictability and clarity on long-term government aims.
and capability needs. This can be achieved through a long-term commitment on policy development from policymakers and senior public management. In addition, greater detail on capability planning through enhancing Defence Acquisitions Guide (DAG) specifications would establish a clear reference point for industry. In specific, the DAG should have a copy of detailed DAG follow-up documents for industry of the predicted level of complexity of operational requirements, schedule, technical difficulties or company capability for upcoming contract opportunities. Furthermore, there should be articulated spending forecasts coinciding with timelines stated on the DAG contract listings. This would allow industry to adequately prepare for contracts that fall within their budgets and capabilities. This long-term approach would strengthen the Canadian defence industrial base by increasing awareness and ability to monitor market responses to policy changes.

• **Planning for a Capable Workforce**

  Increased partnerships between industry and academia are needed to produce and maintain a competitive defence industrial base. Industry Canada, universities, colleges and DSME leaders should coordinate and initiate work programs for active students and new graduates with educations in required capabilities (e.g. mechanical engineering, nanotechnology, etc.). To remain competitive against rival employers, Industry Canada would provide labour market analyses of key competitors (e.g. oil and gas, etc.) and develop best practices for attracting job seekers to KIC-related industries, such as In-Service Support. The Australian model of the Workforce Strategy Plan would be a viable setup to follow. Such actions should be formalized into post-secondary institutions through co-op programs, government internship opportunities, alumni groups, and work/study programs to promote awareness among job seekers.

• **Business Development, Compliance Support and Supply Chain Access for DSMEs**

  Export Development Canada (EDC), Public Works and Government Services Canada (PWGSC), the Business Development Bank of Canada (BDC) and Industry Canada should form a program assisting DSMEs in accessing supply chains worldwide and contracting compliance. This initiative would be for technologies in the TRL 6 stage or later (See Table B, Page 13). PWGSC would be the primary department on contracting compliance requirements to increase potential for market entry. BDC, EDC and Industry Canada would provide business development services such as business intelligence, advice, business plans and processes, market analysis, in-house consulting, financial planning and networking awareness events to help DSMEs leverage foreign supply chain access opportunities.

**Reducing Reactive Risk Aversion, Promoting Proactive Innovation and Risk Conscious Approaches**

The emerging pattern from the key findings is that transitioning from a reactive risk-averse approach towards a longer-term proactive approach with industry consultation would benefit the industrial base as a whole. This is particularly significant for DSMEs, as increased predictability can help address compliance issues with capability needs as per PSI feedback. Furthermore, programs policies that offer technological and business development and supply chain access resources stand a greater chance of producing competitive and capable industrial bases. This is particularly evident in Australian and U.K. models that ease market access through reducing barriers (e.g. simplified UKMOD contracting processes) or increasing innovation and technological development support (e.g. Australia’s CTD and PIC Innovation Program). Canada’s approach relies upon large firms to generate opportunities and KIC development, which contrasts to allied nations scanned. Acknowledging that the defence capability needs of Canada may differ from its allies, the defence
offset policies seem more "Stick" than "Carrot". Furthermore, the Canadian approach is based upon reactive structures similar to the old Swedish approach.

To effect such a transition towards the strategic vision of a competitive Canadian defence industrial base, this report developed the following components for a proactive yet risk-conscious approach to capability development:

- **Venture Capital Demonstration Programs**
  Venture capital programs for DSMEs that possess promising technologies would be of great benefit through direct government assistance and interaction. Funding in the form of loans would be disbursed to the DSMEs with unconventional and ready-for-demonstration technologies with repayment hinging on the acquisition of a buyer from within or outside of the defence industry. Loans would be granted on a competitive basis between DSME applicants based on DRDC screening. Buyers interested in negotiating IP access, unit purchase or further investment in these products would result in DSMEs repaying the loan to government with the buyer-acquired funds. If the venture is unsuccessful, the losses are shared equally between government and the DSME applicant.

- **Risk-Conscious Funding for Aerospace/Defence Industry Applicants**
  Considering the cost-intensive nature of the aerospace and defence sector when concerning innovation research and development, SMEs within this sector should be granted longer repayment periods for funding and favourable interest rates. In particular, small businesses (up to 249 employees) should also be granted loans with fewer restrictions (Emerson, 2012, p. 23). This option is in complement to Option 3.

- **Allocating Gap Funding Programs for Aerospace/Defence Technologies**
  Reduce “Valley of Death” phenomena from occurring to promising technologies through targeted funding aimed at aerospace and defence technologies at TRL 4 to TRL 6 (See Table B, Page 13). The technologies should be categorized by KIC classification and prioritized based upon clear end-user (CF and DND) needs. To avoid previous cases such as the CAE AVS demonstration, government should invite potential investors (i.e. primes, OEMs, Tier 1 firms) to review the most promising technologies from DSME applicants.

**Rigid Offset Policies and Contract Conditions**

Findings obtained from the literature review point towards an overall risk-averse structure towards supporting DSME KICs. Despite the combination of ongoing and prospective changes to Canadian defence offset policy, the regulatory framework of defence procurement emphasizes primes/OEMs and Tier 1 suppliers as the driver for DSME involvement. IRB/ITB policy places the onus of defence industrial development upon larger firms, inviting potential downloading of responsibilities to smaller firms. IRB/ITB obligations of investment (including unit mass production subcontracting) upon OEMs/primes are a reactive approach to industrial development and would better serve manufacturers who mass-assemble pre-determined designs. In essence, offset policies confine DSMEs to clone pre-existent products en masse without innovation potential.

The recommendations and critiques of policy experts cite unclear direction on industrial development. Current defence industrial development initiatives are limited in scale and often rely on offsets to drive economic activity. Craig Stone (2008) notes that this lack of clarity hinders defence firms in predicting and meeting present and future government needs, which constrains firm resources due to shorter, unpredictable time windows. This unpredictability incites industry
leaders to seek out foreign buyers, potentially losing promising new technologies that offer tactical advantages, such as the lost opportunity of AVS technology developed by CAE to the Department of National Defence (Emerson, 2012, p. 33). This lack of predictability also stems from underinvestment in capability and business development, which triggers the technological “valley of death” (Emerson, 2012, p. 9). Subsequently, lack of business experience and KIC development resources affects a DSME’s ability to participate in potential contracts (Public Sector Informant, personal communication, 2015). Jenkins (2013) suggests that the Sustainable Development Technology Canada (SDTC) program model be followed to cover these gaps (p. 40).

Bundled contracting hinders DSME participation, as large firms are more visible to buyers (Jenkins, 2013, pp. 12-13). This diminishes DSME market visibility and reduces opportunities for participating DSMEs to demonstrate their KIC strengths. This is problematic since defence procurements are higher in contract value due to the cost-intensive nature of the aerospace and defence sectors. Cost is the foremost issue that Emerson (2012) addresses concerning industrial capacity, especially innovation. The research findings point to increased joint projects and ventures between primes and DSMEs to address cost concerns, bundled contracting, and DSME market visibility.

Based upon said findings for joint projects and ventures, the following component for a strategic vision of a competitive Canadian defence industrial base addresses the challenges of offset policy requirements on large firms and its impacts on DSMEs:

- **ITB/IRB Contract Value Eligibility for Recent DSME-to-Prime/OEM/Tier 1 projects**
  Active or recently completed undertakings between large firms and DSMEs should be considered for entry into IRB-eligible high-value contracts (exceeding $100 million) up to two years prior to an IRB contract taking effect. Specifically, any recent or active venture, project, or technology demonstration that is relevant to and used in the high-value or complex acquisition contract will be factored into the value of an IRB-eligible contract. For example, a joint venture on avionics subsystems research between a DSME and a Prime that produced a new innovative technology in June 2014 should be factored into consideration for the value of an IRB-eligible helicopter fleet (i.e. platform) acquisition contract that begins June 2016.

10.3 Conclusion: Strategic Implications of Findings

The analysis led to identifying key strategic objectives for Canada to address on KIC development and competitiveness of DSMEs. These objectives are: a need for a formal defence industry policy (e.g. a white paper on defence industry); industry-specific business development services (e.g. compliance, staffing); competitive, risk-conscious technological funding support (e.g. technology gap funding); supply chain access (e.g. foreign supplier and market access); equitable offset policies (e.g. ITB/IRB policies for DSMEs); and inclusive contracting (e.g. joint venture mechanisms). The findings indicate that a formal, more risk-tolerant strategic direction must first be taken to create a more competitive industrial base among Canadian DSMEs.

The next section proposes options which seek to generate serious discussion and consideration of defence and security. The analysis suggests they should: address multiple key issues instead of one; fit with CDAI’s planning time-frame and resource capacity; and respect CDAI’s charitable status, as they must not demonstrate political advocacy as per Canada Revenue Agency requirements.
11. Options and Recommendations

The objective of these options is to have the Conference of Defence Associations Institute establish an initial point of dialogue between academic and policy experts, industry representatives, and the federal government towards effecting industrial base development through improved industrial and technological capabilities for Canadian DSMEs. This dialogue will act as an initial means of further discussing the key themes highlighted in Section 10 to address current defence procurement and contracting processes, capability development and industrial practices.

Sustaining sufficient will (i.e. political, social, economical) to support this policy direction will be very important, as Canada’s partners and allies generate a concerted, long term, and thoughtful effort to improve the industrial policies and bases of their defence sector. Four options were developed to address strategic objectives of the vision that involve recurring panel discussions, annual conference topic agendas, recurring policy research, and greater visibility through speaking event presentations. Each will be discussed below. These options will be weighed against the criteria of effectiveness, efficiency and sustainability. A recommended option will be identified along with a high-level implementation plan.

11.1 Options to Realize the Strategic Vision

Option 1: Recurring Roundtable Discussions with Key Defence Policy Players

Host and arrange for buyer-contractor roundtable discussions on an annual or semi-annual basis between senior management officials from Industry Canada, Public Works and Government Services Canada, the Department of National Defence, senior industry representatives (foreign and domestically-based), and policy experts to discuss best practices on improving current procurement/contracting systems and relevant practices.

This option offers a relatively lower-key alternative than a very publicized event such as a conference, which is beneficial to policymakers considering the current sensitivity of defence-related policy in the public domain. The value of these roundtables offer a candid environment for perspectives to be given and articulated, while offering insight into the particular responsibilities, constraints, and opportunities for improved domestic defence industrial development. Furthermore, the recurring nature of these roundtable discussions would allow for public and private sector parties to gain a greater understanding of current practices and develop ways forward on enhancing DSME capacities and the defence industrial base as a whole.

Option 2: Setting the Agenda at the 2016 Ottawa Conference on Security and Defence

Set at least one daily agenda topic of the next annual Conference on Security and Defence on the Canadian aerospace and defence industry and the industrial capabilities of domestic firms with specialized expert panel group discussions. Each panel could then explore the finer subtopics such as technological development and demonstration, current procurement and contracting processes, industrial policy direction, offset policy impacts, innovation funding and capacity, supply chain and market access, and defence capability planning. Public and private sector stakeholders would be invited to attend this annual event.

The value offered by Option 2 is the increased visibility of this policy issue to generate social/public, academic, industry and political interest. The conference offers a unique opportunity
for outreach to key players in defence procurement policy as well as substantive and technical experts on the finer machinations of its processes, such as defence industrial policy, offset policies, capability requirements, and so forth. Furthermore, the setting of a daily topic to domestic defence firm capabilities with panel subtopic groups could generate insightful and valuable knowledge and advice to attending policymakers on best ways forward to improve the industrial capabilities of DSMEs.

Option 3: Coordinating Recurring Research with Think-Tank Partners

Coordinate and partner with think-tank organizations such as the Canadian International Council and the Canadian Defence and Foreign Affairs Institute (CDFAI) on a publication (e.g. a Vimy Paper) to improve domestic technological capabilities in the defence sector (i.e. DSME capabilities) through obtaining direct feedback from government and industry sources. This option is particularly significant due to past efforts from the CDFAI via Craig Stone publications to improve defence procurement processes and industrial policy. An annual update piece would follow from the initial publication to assess the state of defence industrial policy, procurement and contracting, and industrial capability progress for DSMEs offered by government.

Option 3 offers a more research-based recourse to generating a discussion on improving the industrial capabilities of Canadian DSMEs. This option offers a less intensive effort of event coordination between multiple parties (e.g. booking a hotel, inviting guests, arranging for press attendance, etc.). Prior work conducted from partner organizations would also establish a rudimentary direction on the purpose of the publication and the intent of the research. Feedback from expert sources (e.g. senior public managers in DND, PWGSC, DSME and Prime executives) would also contribute to the value of the research by establishing the direct responses and perspectives of buyer and contractor parties. There is additional benefit to having this publication becoming a recurring piece in order to maintain attention on this policy issue as well as provide updates on incremental progress made and potential ways forward.

Option 4: CDA Institute Taking on a Broader Speaking Event Role

Partnering with other nonpartisan policy organizations such as the Canadian International Council and Canada 2020 to further discuss the state of Canada’s defence industry and its impact on procurement and domestic firms through speaking events. In specific, partnering with such organizations will expand opportunities for CDA Institute to further discuss other issues in the defence and security policy sector. This option is particularly significant due to the relatively longer-term focus of the discussions and speaker events held by the Canadian International Council or Canada 2020. For example, the topic could read “Innovation in Canada’s Aerospace and Defence Sector” or “Domestic Industry Development in the Defence Sector”.

This option is a relatively low cost option for the CDA Institute and offers a diverse audience due to the relatively flexible event RSVP and attendance systems that CIC and Canada 2020 employ (through event notice websites such as Eventbrite.ca, which offer online payment options if event fees are required). Furthermore, both organizations hold events within the same downtown Ottawa area as the CDA Institute. However, a drawback to this option is that the topic of defence procurement and defence industry policy will be fewer and further between since these nonpartisan organizations have a broad spectrum of policy interests and events.
**Evaluation of Options**

Given the current saliency of defence procurement policy, the four options proposed have been evaluated against three key criteria (rated as high, moderate, or low):

- **Sustainability** – the likelihood that the topic or issue can be maintained over a long period of time
- **Effectiveness** – ability to produce a meaningful consideration and interest in the policy issues discussed
- **Efficiency** – resources required to generate discussion and maintaining interest in DSME capability development

**Table E: Evaluation Criteria for Client Options**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainability</strong></td>
<td><strong>Moderate</strong>: The recurrent mechanism adds to the continuity of discussion on the policy issue, but turnout from all key players may fluctuate</td>
<td><strong>Low</strong>: Since the 2016 Conference is an annual event, the likelihood of the same topic being discussed is unlikely. Furthermore, repetition may lead to a loss of interest from attendees.</td>
<td><strong>High</strong>: Maintaining regular updates on the issues allows for a sustained discussion. The recurrence mechanism is a key feature and this publication would feed into the cyclical nature of CDAI publications (e.g. ON TRACK updates, Vimy Paper, etc.).</td>
<td><strong>High</strong>: The likelihood of returning to partners’ speaking events is high. However, the pool of partners must increase to maximize public interest.</td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td><strong>Moderate</strong>: the less publicized environment may encourage more public sector involvement in the discussion and allow for direct interaction with stakeholders on policy issues surrounding DSME and industrial development</td>
<td><strong>High</strong>: The 2016 Conference would grant the widest and possibly most influential group of players in the defence policy sector, such as senior policymakers, industry executives, and academic experts. Invaluable insight and knowledge could be gathered from panel discussions.</td>
<td><strong>Low-Moderate</strong>: Publications may soon be overshadowed by newer, more pressing issues in the defence and security sector. To bolster relevancy, this publication will recur annually to update readers on progress made and potential solutions or ways forward on improving domestic industrial capabilities for DSMEs.</td>
<td><strong>Low</strong>: diverse audiences reaches across demographics (e.g. public sector officials, students, industry experts), but also means that security and defence would compete with other policy sector topics</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td><strong>Moderate</strong>: The roundtable events are already held by the CDA Institute, but attracting the right players (e.g. public sector, large industry, small-medium industry, academia) will require greater coordination.</td>
<td><strong>Low-Moderate</strong>: costs to book an event space and accommodate guests and experts depend on sponsorship and funding. However, this risk may be limited due to the regular recurrence of this annual conference.</td>
<td><strong>High-Moderate</strong>: Coordination of research efforts will be the most intensive area among partner think-tanks. Coherency to the message of the research and its methodology will require an agreed upon peer review process. However, the monetary costs remain low.</td>
<td><strong>High</strong>: low-cost solution with access to diverse audiences, flexible RSVP/attendance structures</td>
</tr>
</tbody>
</table>
11.2 Recommendations and Implementation

Based upon the evaluation criteria, Options 1 and 3 would be the recommended options for moving forward the strategic vision of having a stronger defence industrial base in Canada through developing the industrial capabilities of DSMEs in Canada.

Option 1 has the steadiest overall result against the evaluation criteria, as the roundtable discussion events are already a core aspect of the CDA Institute’s operations. A key challenge will be arranging for participants to attend given that the roundtable discussion will seek to represent all key parties (e.g. government, big industry, small/medium industry, academics, retired public servants with relevant experience). This challenge was the reason that all criteria was set to “Moderate”, as the availability of all parties may always be guaranteed on a recurrent basis. However, the CDA Institute’s previous experience and pre-existent structure of discussion (e.g. Chatham House Rule) in coordinating roundtable events were key factors that recommended this option.

Option 3 also had a relatively steady result with an overall “Moderate” to “High” evaluation. The recurrent research publication in coordination with other non-partisan policy advocacy organizations such as the CDFAI and Canadian International Council could serve to the CDA Institute’s benefit. Given that these organizations have previous experience in the defence and security policy sector, there is already a knowledge base of policy expertise. Furthermore, the regular analyses, critiques, and update to progress made on improving the industrial capabilities of Canada’s DSMEs would produce a timeline of policy efforts and actions from government. The only caveat would be the ability to maintain issue saliency as this publication may soon be overtaken by other publications dealing in other defence and security matters, or possibly being overshadowed in the news cycle or public attention by separate policy issues (e.g. homelessness, decriminalized substances, etc.).

Implementation Considerations

Option 1 provides an annual or semi-annual roundtable discussion between senior public management of relevant federal departments (PWGSC, IC, and DND), industry executives (large and smaller-scale firms), and policy/academic experts to discuss major issues facing the Canadian defence industry. Given that the client regularly holds roundtable discussions, the meeting between key players may offer a more direct environment of interaction between experts and thus generate valuable knowledge on the challenges and opportunities for developing the industrial capabilities of Canadian DSMEs.

May 2015: Contact industry, government, and academic/policy experts for participation in a November roundtable discussion for Canadian defence industrial capability development issues such as DSME technology development, demonstration, offset policy obligations, supply chain access, etc.

August 2015: Confirm attendees for the roundtable discussion and distribute agenda for the roundtable discussion and discussion rules (e.g. Chatham House rules), determine method of attendance (e.g. teleconference, telephone call, in person)

Oct. 2015: Issue public notification of roundtable discussion to subscribers and general audience through online notifications, mail-outs, etc.

Nov. 2015: Hold roundtable discussion event.
Option 3 proposes a recurring research publication among non-partisan think-tank organizations to regularly report on an annual basis on defence industrial policy and its impacts on Canadian DSMEs. In specific, this publication would cover industrial and technological capability concerns such as technology demonstration, research funding, and so forth. This option is recommended due to its overall moderate evaluation of performance as it is not too resource-intensive but does not generate as much visibility as speaking events or conferences.

May 2015: Contact partner non-partisan organizations (Canadian International Council, CDFAI) on producing an annual research publication on defence industrial policy and impacts on DSMEs in Canada.

June 2015: Coordinate and discuss scope of the research, research requirements, government and industry sources to obtain feedback from, peer review process, develop research questions for expert sources, and scheduling of biweekly meetings on progress. Meetings to be conducted either via teleconference, phone or in person.

July 2015: Begin research of second-hand sources (e.g. journal articles, etc.) for the upcoming annual publication

August 2015: Contact/invite industry and government sources for feedback on research for upcoming 2016 publication on defence industrial policy and its impacts on Canadian DSMEs. Finalize agreed upon peer review process.

Oct. 2015: Begin conducting research interviews from first-hand expert sources.

Dec. 2015: Finalize research interview feedback and relevant confidentiality measures (e.g. consent forms, identity anonymity assurances), and begin consolidating research into one document. Conduct peer review on research gathered for initial consolidated draft.

Feb. 2016: Final edits to draft document on research publication.

March 2016: Public release of research publication on Canadian defence procurement and industrial policy and its impact on Canadian DSMEs.

11.3 Final Words: Options and Recommendations

While Options 2 and 4 demonstrated potential for generating a discussion amongst the public and policy experts given the current policy window on defence procurement reform, the costs exceeded the benefits either out of resource, effectiveness or sustainability concerns. A key caveat to consider for Options 2 and 4 is that these options are most viable during times of issue saliency and thus grants a window of opportunity for further discussion for an unknown period of time before competing policy issues begin to grab public attention.

Based upon the resources (i.e. time, finances) available and the need to maintain a steady and committed effort to effecting policy changes in current defence procurement and industrial policy, Options 1 and 3 present the best overall courses of action for the CDA Institute. Given the relatively volatile nature of the policy issue saliency and the public interest, the recurring research events of roundtables and coordinated publications offer a more secure recourse. Both options are within the CDA Institute’s control and remain a more palatable option for relevant parties (i.e. policymakers,
industry executives) that wish to remain “out of the spotlight” during this time of issue saliency around Canadian defence procurement policy. It was due to the relatively low risk and high familiarity of these options to the client’s knowledge base, mandate and expertise that Options 1 and 3 are the recommended courses of action.
12. Conclusion

The findings and research indicate that current efforts aimed to address the current situation in Canadian defence procurement and defence industry at large that favours large firms. This study aimed to identify what policies hindered DSME KIC development in contract processes, what resources constraints existed for DSMEs, determine opportunities and demand for DSMEs, the major strengths and weaknesses of Canada’s defence industry, and to determine the industry perspective on procurement processes. To achieve these objectives, the research incorporated a literature review of public and private expert perspectives, a jurisdiction scan to determine what Canada’s partners were doing to meet the research project objectives, as well as obtain first-hand feedback from public sector and industry experts on DSME involvement in the defence procurement process.

There were some limitations on contractor perspectives due to a very low response rate (only one public sector respondent), but the alternate research incorporated industry perspectives from AIAC and Emerson Review publications into discussing and synthesizing options and recommendations.

Main findings presents Canada as a unique case of defence procurement system, offset policy regimes, and industrial base by comparison to its partners, as evidenced by the literature review material compared to the scan of partnered nations. Canada is especially behind in technological development, offset policy criteria, and formal industrial policy, which are all key elements that hinder DSME development operationally and capability-wise, reducing potential competitiveness.

Based upon the identified issues, a strategic vision for creating flexible, long-term, equitable and risk-tolerant industrial activity was developed to determine client options. This vision requires a sustained and articulate approach to effecting policy changes, yet falls within the client’s means and influence. Four options were developed from this vision:

- Option 1: establishing a recurring series of roundtable discussions between key defence policy players to discuss defence industry policy issues.
- Option 2: setting of a daily agenda topic on defence industrial policy and its impacts upon smaller-scale firms for the 2016 Ottawa Conference on Security and Defence.
- Option 3: commissioning a recurring research publication with partner policy research organizations on defence industry policy issues and impacts on smaller-scale defence firms.
- Option 4: encouraging CDAI take on a broader speaking event role throughout the National Capital Region.

Options 1 and 3 were recommended, as they balanced the criteria of sustainability, effectiveness, and efficiency.

This research project has several limitations, namely the limited number of respondents to requests for interviews, perhaps due to the sensitive topic of defence procurement. Accordingly, additional studies should focus on securing a larger number of interviews with procurement experts, from industry and beyond, to provide perspectives on strategic ways forward for industrial capability development of small and medium defence firms in Canada. It will be critical to provide assurances of confidentiality and to develop strategies to generate larger samples of respondents (i.e. snowball samples). The CDAI should be able to ensure the success of such a study because of its network of active (i.e. still working) industry and public sector experts.

The research has far-reaching impacts domestically and abroad since present defence capabilities influences the decisions made on acquisitions and its end-users. DSMEs are the primary component of the domestic defence industry and contain niche technological capabilities, which larger firms
find challenging to produce on their own. This unique sector requires further assistance from the government not only to improve military performance, but also to create an efficient and long-term defence procurement and industrial development policy regime. Considering the costly delays of the past, it is paramount to look for innovative and long-term solutions, especially given the aging nature of the CF fleet and slow procurement process. A new defence procurement policy regime must be long-term, industry-conscious, and effective. However, there are signs that government is shifting towards these attitudes in defence capability development, and may yet be the first step in a potential policy transformation. It is therefore important for the CDA Institute to encourage and capitalize on this shift in interest in areas such as technology demonstration, which will be a critical component to capability development for DSMEs.
13. References


Appendix

Figure D1: ADMN 598 Invitation Letter for Research Interview Participation

Dear Sir or Madam:

My name is Jonathan Holder and I am a graduate student at the University of Victoria’s MPA program researching the defence procurement process in Canada and its effects on small and medium enterprises as part of my capstone research project for the Conference of Defence Associations Institute. Specifically, the research will seek to find strategies to develop small and medium enterprises. I am contacting you to ask if you would be willing to share your insights based on your experience in the field of defence procurement by responding to interview questions for this study.

You participation will entail answering no more than 8 questions concerning small and medium enterprise involvement in Canadian defence procurement and how to improve their industrial capacities. Your identity will remain confidential, with only your company and/or department name being used (e.g. Participant 1 works at Industry Canada). Your participation would add significant value to the research and its findings could benefit your organization in its efforts to improve defence procurement in Canada. Please note that if you have had a previous relationship (either professionally or by acquaintance) that there is no obligation for you to participate and you may withdraw at any time from the research project with all your information subsequently erased.

The client organization for this research is the Conference of Defence Associations Institute (CDAI). The CDAI is a nonpartisan and non-profit organization that researches and deliberates issues affecting the Canadian defence policy sector, while fostering productive public debate of issues. To reiterate, your identity will not be shared in any capacity with the client organization (the CDAI); your anonymity will be protected during and on completion of the research project.

This research project has received approval from the University of Victoria’s Human Research Ethics Board. Next steps will involve the researcher distributing a consent form and arranging for an interview time with participants.

If you should have any questions or concerns, please feel free to contact me by my mobile phone at (780) 782-5633 or by email at holderj@uvic.ca. I look forward to hearing from you.

Sincerely,

Jonathan Holder
Developing Key Industrial Capabilities for Canadian Defence Small and Medium Enterprises

You are invited to participate in a study entitled “Developing Key Industrial Capabilities for Canadian Defence Small and Medium Enterprises” undertaken by Jonathan Holder, a graduate student in the School of Public Administration at the University of Victoria. As a graduate student, I am required to conduct research for a client organization called the Conference of Defence Associations Institute (CDAI) as part of the requirements for a Master’s of Public Administration. It is being carried out under the supervision of Professor Evert Lindquist, Director of the School of Public Administration.

Purpose and Objectives
The purpose of this research project is to create strategies and solutions for improving participation of Canadian Defence Small and Medium Enterprises (DSMEs) in the public procurement and contracting process through developing their Key Industrial Capabilities (KICs). The objectives are the identification of and response to:

- Challenges for DSMEs in the tendering/contracting process
- Resource/Fiscal constraints
- Demand & procurement opportunities
- Strengths/Weaknesses of the Canadian defence industry
- Contractor and tenderer perspectives on current procurement processes

Importance of this Research
Recent changes in the defence procurement process in Canada have had a wide-reaching impact on defence contractors. These changes include reductions in defence budgets and military personnel, new emerging security issues, changes to defence offset policies, global supply chains, and defence procurement and contracting processes. Support to DSMEs is important due to the majority of the Canadian defence industry consisting of small and medium enterprises that have niche, highly specialized technological and industrial capabilities. This research will contribute to finding solutions for more fully involving DSMEs in defence procurement, which will have benefits for both public servants and industry experts in the defence industry.

Participant Selection and Benefits
You are being asked to participate in this study because of your knowledge and expertise in defence procurement in Canada and small-medium defence firms. Your participation in this study will allow insights based on your experience, knowledge and vantage point to provide background on the challenges and possibilities for moving forward. The project may also shed light on areas of the policy process in defence acquisition that is useful to your department and/or organization. Please note that you are in no way obligated to participate in this research project, regardless of any relationship you have had with the researcher.
What is Involved
If you consent to voluntarily participate in this research, your participation will involve an interview conducted by telephone. The interview will consist of questions concerning current challenges to defence procurement, such as policy/regulations, industry concerns, current strengths and weaknesses of the procurement process, current strengths and weaknesses of industries, as well as possible solutions/improvements to help small-medium enterprise participation in the defence procurement process. Your interview responses will be documented by means of hand-written notes. No identifiable information will disclose your identity. Your anonymity will be maintained; only your department and/or company name will be disclosed (e.g. Industry Canada, Canadian Association of Defence Security Industries). The interview will take no longer than 45 minutes of your time.

Risks and Inconvenience
Participation in this study will require that you take time out of your daily schedule (e.g. 45 minutes). Should you feel that the nature of the questions pose any risk to you, please contact the researcher at your soonest convenience with no less than 24 hours in advance of the scheduled interview time.

There are no known or anticipated risks to you by participating in this research. There is no risk of a conflicting role or power relationship that the researcher has with the client organization (the CDAI). Your observations will remain confidential with solely the researcher and there will be no attribution of your comments to your name. If you should wish to withdraw from participating in the research project, you may do so immediately and the information you have provided will be destroyed. Your confidentiality will be maintained throughout the entirety of the research project and afterward if you should so wish. The only descriptions of your identity will only be to state the approximate seniority/length of your experience (e.g. if you have 7 years of experience, it will be stated as 5-10 years experience), your role (absent a specific title) in the organization (e.g. member of senior management in a small/medium enterprise that specializes in the KIC of Cyber-Security), and field of expertise within defence procurement policy and/or industry.

Voluntary Participation
Your participation in this research will be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be destroyed.

Confidentiality and Disposal of Data
The confidentiality of the data will be protected by secure access and storage via password protected files. In the event of “snowball” sampling occurring, the researcher will ask for a list of potential candidates from pre-existent willing informants, and select candidates without the knowledge of the preceding participants (i.e. the participants that gave a list of names). These participants will then be recruited through means of first obtaining their permission either directly (researcher to snowball participant) or by obtaining their contact information (provided it is publicly available). Since snowball sampling poses a challenge to the confidentiality of an informant (i.e. a fellow participant nominating your candidacy for participation), the risk is perceived to be minimal as the pre-existent participants have an equal stake in maintaining their confidentiality. The files containing your responses will remain on the computer of the primary researcher and will remain in their custody for the entirety of the research project’s duration. Upon the successful defence of this project, all information regarding your responses will be disposed of via erasure. Data from this study will be disposed of through complete erasure of any electronic files recording participant responses via deletion. Any hard copies will be shredded upon the conclusion of the project defence.
Dissemination of Results
The results of this study will be shared in several ways. A report will be prepared, which will presented and defended in an oral examination. It will be shared with the client organization, once it has been reviewed and approved by a committee comprised of the client and designated faculty reviewers (none of whom will have direct access to the data from interviews). This research will not lead to a commercial product or service.

Contacts
If you wish to contact me, Jonathan Holder, you can reach me by email at holderj@uvic.ca or mobile phone at (780) 782-5633. You may contact my supervisor, Professor Evert Lindquist, Director of the School of Public Administration at the University of Victoria, at 1-250-721-8082 or at evert@uvic.ca. If you wish to verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

__________________________________  ___________________________  ______________
Name of Participant                   Signature                          Date

Future Use of Data PLEASE SELECT STATEMENT:

I consent to the use of my data in future research upon my identity remaining undisclosed: ______________ (Participant to provide initials)

I do not consent to the use of my data in future research: ______________ (Participant to provide initials)

I consent to be contacted in the event my data is requested for future research provided my identity remain undisclosed: ______________ (Participant to provide initials)

A copy of this consent will be left with you, and a copy will be taken by the researcher.
Figure D3: ADMN Research Interview Questions for Public Sector Informants

Interview Questions for Public Sector Informants: Defence Procurement and KICs for DSMEs

Thank you for agreeing to participate in this research project on the participation of Canadian small and medium enterprise in the defence procurement process.

The purpose of this research is to find potential solutions for challenges facing smaller defence firms in Canada when seeking procurement contracts from the government. In particular, the focus is on improving the Key Industrial Capabilities (KICs) of these smaller firms.

Before beginning, I would like to confirm that you are voluntarily consenting to participating in this interview and answering the following questions via verbal consent answering either “Yes” or “No”. If you should feel uncomfortable at any point in participating, you may withdraw at any time so long as the researcher is informed as soon as possible. In the event that you wish to have your responses retained in this project, please inform the researcher at your soonest convenience, otherwise all of your data and information will be erased and destroyed. If you have answered “Yes” to confirming your willingness to participate, this interview shall proceed. The questions will be asked in sequential order as per the copy that was sent for your revision. This interview will take approximately 45 minutes.

There are a few preliminary questions before the interview begins:

- Could you tell me what your role and responsibilities are within your organization? Please remember that your position/rank will be generalized (e.g. senior management, mid-level management at the Department of National Defence dealing in technological research and development, etc.)

- How long have you been in your current role? The length of your experience will be measured in five-year intervals (e.g. 1-5 years, 5-10 years, etc.).

- How long have you worked in the defence procurement or defence industry/policy field?

Public Sector Questions

1. What are the most significant barriers that hinder further public sector assistance to defence SME capacities to develop KICs?

2. What changes would best improve SME participation and KIC development?

3. If said changes were to be implemented, what is the best way to bring about these improvements?

4. For the contracting process of defence procurement, what changes would you believe would best help SMEs?

5. What government resources/programs already provided do you believe are the most useful to defence firms?
6. How can government build upon the successful programs or initiatives to help SMEs and their KICs?

7. How would you assess the current level of research and development/innovation assistance given to defence firms?

8. From your experience, what would be your key feedback to defence firms and industry experts on improving their competitiveness? Are there any other issues or perspectives you believe should be addressed in this study?

9. Thank you for responding to my questions. Are there any other observations which you might like to share or issues which I may have missed?

Thank you for time, your insights, and your participation in this study.
Thank you for agreeing to participate in this research project on the participation of Canadian small and medium enterprise in the defence procurement process.

The purpose of this research is to find potential solutions for challenges facing smaller defence firms in Canada when seeking procurement contracts from the government. In particular, the focus is on improving the Key Industrial Capabilities (KICs) of these smaller firms.

Before beginning, I would like to confirm that you are voluntarily consenting to participating in this interview and answering the following questions via verbal consent answering either “Yes” or “No”. If you should feel uncomfortable at any point in participating, you may withdraw at any time so long as the researcher is informed as soon as possible. In the event that you wish to have your responses retained in this project, please inform the researcher at your soonest convenience, otherwise all of your data and information will be erased and destroyed. If you have answered “Yes” to confirming your willingness and consent to participate, this interview shall proceed. The questions will be asked in sequential order as per the copy that was sent for your revision. This interview will take approximately 20 to 45 minutes.

There are a few preliminary questions before the interview begins:

- Could you tell me what your role and responsibilities are within your organization? Please remember that your position/rank will be generalized (e.g. senior management, mid-level management at a small/medium software firm dealing in the KIC of Cyber-Security, etc.)

- How long have you been in your current role? The length of your experience will be measured in five-year intervals (e.g. 1-5 years, 5-10 years, etc.).

- How long have you worked in the defence procurement or defence industry/policy field?

Industry Representative Questions

1. In your experience, what are the major strengths and weaknesses for small and medium defence firms in the industry?

2. What are the most significant barriers that prevent SME capacities to develop KICs?

3. What challenges or issues do SMEs face in participating in the defence procurement process?

4. In your opinion, what changes would best suit industry needs for their KIC development and contract participation?

5. From your experience, where is the greatest potential for small and medium defence firms to receive procurement contracts?
6. What resources provided by the public sector do you find the most useful to defence industry enterprises?

7. How would you assess the current state of government assistance with innovation/research and development for defence firms?

8. What key pieces of feedback would you have to the public sector procurement experts for improving small/medium defence firm participation and KIC development? Are there any other issues or perspectives you believe should be addressed in this study?

9. Thank you for responding to my questions. Are there any other observations which you might like to share or issues which I may have missed?

Thank you for time, your insights, and your participation in this study.