Industry Canada | Industrie Canada

Industrial Technologies Office | Office des technologies industrielles

Program Highlights 2007–09

Accelerating Innovation

ito.ic.gc.ca

SADI / *Strategic Aerospace and Defence Initiative*

Canada

For a print copy of this publication, please contact:

Publishing and Depository Services
Public Works and Government Services Canada
Ottawa ON K1A 0S5

Telephone (toll-free): 1-800-635-7943 (Canada and U.S.)
Telephone (local): 613-941-5995
TTY: 1-800-465-7735
Fax (toll-free): 1-800-565-7757 (Canada and U.S.)
Fax (local): 613-954-5779
Email: publications@tpsgc-pwgsc.gc.ca
Website: www.publications.gc.ca

This publication is available upon request in accessible formats. Contact:

Multimedia Services Section
Communications and Marketing Branch
Industry Canada
Room 265D, West Tower
235 Queen Street
Ottawa ON K1A 0H5

Telephone: 613-947-5177
Fax: 613-947-7155
Email: production.multimedia@ic.gc.ca

This publication is also available online in HTML at http://ito.ic.gc.ca/eic/site/ito-oti.nsf/eng/h_00723.html.

Permission to Reproduce

Cat. No. Iu156-1/2009E-PDF
ISBN 978-1-100-13559-5
60652

Aussi offert en français sous le titre *Faits saillants du programme 2007–2009*.

Contents

Introduction

Canada's aerospace, defence, space and security (A&D) industries are major contributors to our nation's economy. The aerospace industry alone is made up of more than 400 firms across the country and employs approximately 80 000 Canadians.[1] The country's defence and security industries employ more than 70 000 Canadians and generate $10 billion in annual revenues.[2]

These industries are also important contributors to the global economy. Canada ranks third in the world in civil aircraft production, earning a reputation for quality, value, performance and reliability, while roughly 50 percent of Canadian defence and security industry revenues come from international sales.[3]

In the global marketplace, research and development (R&D) is a key driver of economic growth, and innovative companies are more likely than others to be part of that growth. R&D allows Canada to compete in new markets and industries and helps Canadian businesses offer their customers new or improved products, processes and services.

Innovative R&D benefits individual Canadians too, through economic development, employment opportunities and the potential environmental and safety benefits of new or improved technologies (e.g., better fuel efficiency, reduced emissions or enhanced emergency communications capabilities).

Canadian companies must invest in innovation to maintain and increase their global market shares. Unfortunately, Canadian business expenditures in R&D tend to be low compared to those in other developed countries, putting the country at risk of losing economic competitiveness.[4] In times of economic uncertainty, companies may reduce their R&D expenditures, potentially slowing the pace of innovation and "making it difficult to stay on the leading edge."[5]

The Strategic Aerospace and Defence Initiative (SADI) helps accelerate innovation within Canadian A&D companies to produce economic, technological and social benefits for all Canadians. The program provides repayable funding in support of strategic industrial and pre-competitive A&D research and development projects. SADI was launched in 2007 as the flagship program of the Industrial Technologies Office (ITO), a special operating agency of Industry Canada.

This report covers the first two years of the SADI program, from April 2, 2007, to March 31, 2009, and highlights the work completed during this time to support the R&D efforts of Canadian industries while ensuring the transparency and accountability of the program.

1 Aerospace Industries Association of Canada (http://www.aiac.ca), information obtained April 2009.
2 Canadian Association of Defence and Security Industries (CADSI) (https://www.defenceandsecurity.ca), information obtained May 2009.
3 Canadian Association of Defence and Security Industries (CADSI) (https://www.defenceandsecurity.ca), information obtained May 2009.
4 Organisation for Economic Co-operation and Development, *OECD Science, Technology and Industry Outlook 2008*, p. 110.
5 Science, Technology and Innovation Council, *State of the Nation 2008: Canada's Science, Technology and Innovation System* (2009), p. 1.

Supporting the Government of Canada's Science and Technology Strategy

In May 2007, the Government of Canada released its Science and Technology (S&T) Strategy, entitled *Mobilizing Science and Technology to Canada's Advantage*.

The Strategy focused on creating a business environment that encourages private sector innovation while ensuring that public funds are invested wisely. It recognized the important role that the private sector and others play in the Canadian economy and committed to investing in R&D.

SADI is an important part of the S&T Strategy. With a focus on Canada's A&D industries, the program directly supports the Government of Canada's commitments to supporting R&D, leveraging private sector investment and encouraging strategic partnerships and collaboration among companies and research institutions. These same commitments are key components of the *Industry Canada Business Plan 2009–2010*, which views science and technology, knowledge and innovation as effective drivers of a strong Canadian economy.

By making repayable investments in strategic industrial and pre-competitive R&D projects, SADI helps create a supportive environment in which Canadian companies can develop advanced technology, products and processes. These efforts benefit not only the company conducting the R&D, but also other companies throughout the A&D supply chain and the Canadian economy as a whole through job creation, technology transfer and other spillover benefits.

At the same time, by nurturing private sector R&D at home, SADI helps Canadian companies of all sizes remain competitive in the global economy.

Strategic Aerospace and Defence Initiative Overview

SADI provides repayable investments to support strategic R&D among the Canadian aerospace, defence, space and security industries. By sharing in the risks and rewards of R&D, SADI supports innovation within Canadian A&D companies. The program also encourages private sector investment in R&D by increasing the amount of capital available for eligible projects.

The three key objectives of SADI investments are to:

(1) encourage strategic R&D that will result in innovation and excellence in new products and services;

(2) enhance the competitiveness of Canadian A&D companies; and

(3) foster collaboration between research institutes, universities, colleges and the private sector.

The SADI program provides repayable contributions as opposed to grants or loans. Repayments are based on the recipient's gross business revenue and usually begin one year after the completion of the SADI project's R&D phase. Repayment periods are normally 15 years after the completion of the project.

Strategic Aerospace and Defence Initiative Overview (continued)

Application Process

All applications for SADI funding are subjected to rigorous eligibility, assessment and due diligence reviews. The eligibility review ensures a proposed project is eligible for SADI funding. Five main elements must be verified before a company can meet the eligibility criteria:

- The company must be incorporated under Canadian law, be prepared to conduct strategic R&D activities in the A&D industries and create opportunities for Canadian companies to contribute to a highly skilled and knowledge-based workforce.
- The proposal must show that the company's project will consist of eligible activities (i.e., industrial research and pre-competitive development).
- The project must include strategic R&D activities that support the development of next-generation A&D-related products or services; build on Canadian strengths in A&D technology development; enable Canadian companies to participate in major platforms and supply chains; or assist the A&D industries in achieving Canada's international obligations.
- The applicant must demonstrate that government assistance is required to meet the scope and timing of the proposed project.
- The strategic R&D or manufacturing of high value-added technologies, made possible with repayable contributions from SADI, must take place within Canada unless otherwise agreed to by the Minister of Industry.

The assessment review evaluates the company's capability to achieve the stated objectives (e.g., financial resources, management expertise, business plan, technical capability), the technological benefits that could be achieved (e.g., innovation, feasibility of the R&D) and the social and economic benefits that would likely result from the successful R&D work proposed by the company (e.g., economic benefits, technology spillover and diffusion, collaborative partnerships).

The due diligence review further evaluates the claims made in the proposal and the findings of the assessment review.

Approved Strategic Aerospace and Defence Initiative Projects

During SADI's first two years, more than $415 million was committed to 10 innovative projects, encouraging an additional $768.8 million in R&D investments. In other words, each SADI dollar invested leveraged an additional $1.85 in R&D investments.

SADI investments were made in the following companies during this time. More information about each project can be found on the following pages and the ITO website.[6]

Summary of Current Strategic Aerospace and Defence Initiative Projects (at March 31, 2009)

COMPANY NAME	Contract Date	Authorized Assistance ($)	Total Eligible Project Costs ($)
Diamond D-JET Corporation	2008-01-10	19 600 000	65 333 333
Integran Technologies Inc.	2008-08-27	4 596 000	11 490 000
Bristol Aerospace Limited	2008-09-01	43 391 600	108 479 000
Héroux–Devtek Inc.	2008-09-02	26 964 430	77 041 229
Norsat International Inc.	2008-09-05	5 975 200	17 072 000
Esterline CMC Electronics Inc.	2009-01-13	52 287 784	149 393 669
EMS Technologies Canada Ltd.	2009-03-03	8 718 634	29 062 113
TransCore Link Logistics Inc.	2009-03-27	3 127 200	10 424 000
CAE Inc.	2009-03-30	250 000 000	714 285 714
Sputtek Inc.	2009-03-31	360 285	1 200 951
TOTAL		**415 021 133**	**1 183 782 009**

6 The ITO website is located at http://ito.ic.gc.ca

Diamond D-JET Corporation

(London, Ontario)

SADI supported a project at Diamond D-JET Corporation (Diamond) for the R&D of an all-composite, single-engine, five-passenger jet aircraft. The unconditionally repayable SADI investment of $19.6 million in this project leveraged an additional $45.7 million in R&D funding.

The SADI investment is helping Diamond build its expertise in a new class of aircraft (small business jets), while also helping maintain Canada's position as a world leader in small, all-composite aircraft. All-composite technology is in demand in the aviation industry because it reduces aircraft weight and offers a lighter, stronger and more fuel-efficient plane.

The skills and capabilities developed through this R&D project will be applicable to future aerospace projects and other markets that could benefit from advanced composite technology. The work will also help develop a highly skilled workforce and expanded composite manufacturing knowledge base in Canada.

Diamond is making significant progress toward reaching the project's goals. The company has increased its strategic R&D, continued development of the D-JET and conducted successful test flights in preparation for the aircraft's official launch and certification. The D-JET is slated for certification and initial aircraft delivery in mid-2010 at the earliest, and Diamond has already received aircraft orders from a variety of customers, including private pilots, executive taxi providers and flight schools.

This project has also allowed Diamond to strengthen its partnerships and collaborations, including those with Fanshawe College, National Research Council Canada and companies in its supply chain.

Diamond Aircraft Industries Inc. is the third-largest producer of airplanes in the under-three-ton weight class and has manufacturing facilities in Canada, Austria, China and Germany.

Integran Technologies Inc.

(Toronto, Ontario)

SADI supported a project at Integran Technologies Inc. (Integran) to research and develop next-generation nanotechnology-based coatings to improve the lifespan, durability and cost of aerospace tools used to form and shape the various parts of an airplane. The unconditionally repayable SADI investment of $4.5 million in this project leveraged an additional $6.9 million in R&D funding.

The project will help Integran develop coated aerospace tools that are lighter, less expensive, easier to make and use less energy.

The investment supports Canada's participation in the multinational Joint Strike Fighter program while helping a Canadian company remain on the leading edge of the growing nanotechnology sector. Integran will also collaborate with the University of Toronto to provide engineering graduate students with hands-on experience through this innovative nanotechnology R&D project, supporting knowledge transfer in the region.

Integran's work on this SADI-supported project is progressing well. The company has hired additional technical staff and is collaborating with a variety of industrial partners, including several A&D companies.

Integran is a privately owned metallurgical applications engineering company that is a leader in the development and commercialization of advanced nanotechnologies.

Bristol Aerospace Limited

(Winnipeg, Manitoba)

SADI supported a project at Bristol Aerospace Limited (Bristol) to research and develop new processes for composite manufacturing and complex assemblies that incorporate both composite and metallic components. The conditionally repayable SADI investment of $43.3 million in this project leveraged an additional $65 million in R&D funding.

The investment supports Canada's participation in the multinational Joint Strike Fighter program by developing innovative technology that will provide unparalleled strength to the wing and tail of the F-35 aircraft. The project builds on Canada's strengths in aviation composites while also contributing to an aerospace centre of excellence in Winnipeg. In addition to increasing the company's competitiveness, the expertise developed through this project will benefit future A&D projects and could lead to new uses for composites in other areas of aircraft design.

Since starting this SADI project, the company has begun working on pre-production development and qualification. The project is also enhancing Bristol's partnerships with industrial companies in the Winnipeg composites cluster, post-secondary institutions including the University of Manitoba and Red River College, and government and research institutions including the Government of Manitoba and Western Economic Diversification Canada.

Bristol Aerospace Limited is the largest division of the Magellan Aerospace group of companies, which has operating divisions throughout North America and the United Kingdom.

Héroux–Devtek Inc.

(Longueuil, Quebec)

SADI supported a project at Héroux–Devtek Inc. (Héroux–Devtek) to research and develop advanced landing gear technologies, with a focus on improving the reliability and performance of landing gear systems and reducing their impact on the environment. The conditionally repayable SADI investment of $26.9 million in this project leveraged an additional $50 million in R&D funding.

The investment will help Héroux–Devtek strengthen its design, development and integration capabilities to manufacture complete landing gear systems and to develop landing gear components, such as in-flight monitoring and electronic systems, for the next generation of aircraft. The company will also create and develop new software tools for the design and testing of landing gear parts and systems.

Héroux–Devtek specializes in the design, development, manufacturing and repair of aerospace and industrial products. The company has eight operating locations, six in Canada and two in the United States.

Norsat International Inc.

(Richmond, British Columbia)

SADI supported a project at Norsat International Inc. (Norsat) to research and develop the next generation of portable ground satellite telecommunications technologies. The conditionally repayable SADI investment of $5.9 million in this project leveraged an additional $11.1 million in R&D funding.

The investment will help military personnel, emergency response teams, news organizations, and disaster recovery missions communicate better during a crisis, while also improving Norsat's technological capabilities and improving the effectiveness of satellite communications used in the field. The company will develop smaller, lighter, easier-to-use and less expensive ground satellite stations.

The SADI investment in Norsat has so far helped the company announce several new additions to its product lines, offer its terminal control software in 12 additional languages, launch a vehicle-mounted satellite terminal, hire additional technical staff, and further collaborate with the existing strategic business partners and companies in its supply chain.

Norsat designs and develops ground-based satellite equipment for the high-speed transmission of data, audio and video information. Its head office is located in Richmond, British Columbia, with additional offices in Seoul, South Korea, and Rome, Italy. The company also has two wholly owned subsidiaries in the United States and the United Kingdom.

Esterline CMC Electronics Inc.

(Saint-Laurent, Quebec)

SADI supported a project at Esterline CMC Electronics Inc. (CMC Electronics) to research and develop innovative cockpit technologies. The conditionally repayable SADI investment of $52.2 million in this project leveraged an additional $97.1 million in R&D funding.

The investment will help CMC Electronics develop cost-effective cockpit technologies for next-generation business jets, helicopters and transport aircraft while building on Canada's expertise in an ever-changing industry. The goal of the project is to create a complete cockpit system with open architecture, making the cockpit components easily customizable and adaptable to changing technologies and varied aircraft platforms.

CMC Electronics designs and produces leading technology electronics products for the commercial and military markets. A wholly owned subsidiary of Esterline Technologies Corporation of Bellevue, Washington, the company is based in Montréal, Quebec, with additional offices in Ottawa, Ontario, and Chicago, Illinois.

EMS Technologies Canada Ltd.

(Ottawa, Ontario)

SADI supported a project at EMS Technologies Canada Ltd. (EMS) to research and develop next-generation mobile satellite communications technology. The conditionally repayable SADI investment of up to $8.7 million in this project leveraged an additional $20.3 million in R&D funding.

The investment will help EMS develop new products and new applications for its satellite communications technologies, including transceivers, antennas and networking devices. The technology developed will benefit a variety of users. For example, national security forces and commercial travellers will benefit from improved communications in-flight.

The new technologies will operate reliably over a wide range of environmental conditions, allowing faster data communications on more robust platforms. Aerospace and defence markets will be able to use these technologies for air transport, and business, commercial and military aviation.

Through work subcontracted to other companies, this project will also contribute to the Canadian contract manufacturing sector while facilitating technology transfer between EMS and its suppliers.

EMS specializes in the design and development of satellite-based terminals and antennas for the aeronautical market. EMS Technologies Canada Ltd. is a subsidiary of EMS Technologies Inc., based in Norcross, Georgia.

TransCore Link Logistics Inc.

(Kanata, Ontario)

SADI supported a project at TransCore Link Logistics Inc. (TransCore) to research and develop satellite-based asset tracking and monitoring products. The unconditionally repayable SADI investment of $3.1 million in this project leveraged an additional $7.3 million in R&D funding.

The investment will help TransCore develop and enhance products and applications for its GlobalWave system, which tracks and monitors goods and vehicles travelling through global supply chains, in order to improve shipping security and fleet management and performance. Both commercial and military shipments can benefit from improved safety, security and efficiency.

Through this project, TransCore will develop wireless sensors, improve the accuracy and battery life of its Global Positioning System technology, develop a new messaging product for faster data transfer, and expand the GlobalWave system for use on high-value containers transported by ship, rail and truck.

The project will also generate extensive technology transfer and spillover opportunities through TransCore's continued collaboration with Carleton University and Communications Research Centre Canada.

Based in Mississauga, Ontario, TransCore Link Logistics Inc. specializes in satellite-based tracking and communications systems for the transportation of vehicles and goods. Its all-in-one GlobalWave system is widely used for truck, trailer and rail tracking, driver communications, asset management, and fleet performance monitoring.

CAE Inc.

(Saint-Laurent, Quebec)

SADI supported a project at CAE Inc. (CAE) to research and develop innovative flight simulator technologies. The unconditionally repayable SADI investment of $250 million in this project leveraged an additional $464.3 million in R&D funding.

The investment will help CAE improve its existing modelling and simulation technologies to develop simulators for a wider range of aircraft in the civil aviation and defence markets. Flight simulator technology increases the safety of pilot training while reducing air pollution and conserving fuel.

CAE also uses a collaborative model of technological development that benefits universities. The company supports Carleton University's Centre for Advanced Studies in Visualization, Simulation and Modelling; employs interns from universities, including Concordia University, McGill University, Université de Montréal and Université du Québec à Montréal; and contributes annually to scholarship programs.

CAE has sites and training locations in 20 countries, has clients in more than 100 countries, and serves approximately 3500 airlines, aircraft operators and manufacturers around the world.

Sputtek Inc.

(Toronto, Ontario)

SADI supported a project at Sputtek Inc. (Sputtek) to research and develop advanced protective coatings that will improve the safety and durability of parts used in the aerospace and defence markets. The unconditionally repayable SADI investment of $360 285 in this project leveraged an additional $840 666 in R&D funding.

The investment will help the small Canadian company develop more cost-effective protective coatings with better anti-wear and anti-corrosion properties. The aerospace and defence sectors will benefit from the improved performance of coated materials and the potential to use lower-grade or lighter-weight materials without compromising durability.

The project builds on Canada's existing strengths in the advanced materials and coatings sector, while also encouraging collaboration with academic, federal and industry partners, including McMaster University.

Sputtek is a small, privately owned Canadian company that conducts extensive R&D in advanced materials and thin-film coatings for machinery, tooling and other industrial applications, specializing in advanced vacuum technologies. The company is based in Toronto (Etobicoke), Ontario.

Other Highlights

The Industrial Technologies Office Website

The ITO website is a key point of contact for stakeholders and the general public. It provides detailed information about the SADI program and projects announced to date.

Companies can use the website to determine their eligibility for SADI, prepare an application and submit annual information updates. Users can also subscribe to ITO's email newsletter to keep up with the latest SADI announcements.

As companies complete the R&D phases of their approved projects and begin making repayments, SADI repayment information will be disclosed on the ITO website.

The ITO website is updated regularly and benefits from ongoing improvements, such as the introduction of an enhanced search function. Web traffic has grown steadily since the site was launched in April 2007, with the SADI section becoming the second most visited part of the website, after the home page.

Conclusion

In its first two years, the SADI program has established itself as a strong supporter of Canada's A&D industries, recognizing the strategic importance of these industries to our national economy.

By investing in ten innovative aerospace and defence R&D projects during this time, SADI has been fulfilling its key objectives: encouraging innovation and R&D excellence, enhancing the competitiveness of Canadian companies and fostering collaboration between the private sector, research institutions and universities.

These SADI-supported R&D projects are not only contributing to the development of new or improved A&D products, processes and services, but they are also laying the groundwork for future innovation by expanding Canada's expertise in key fields, transferring new technologies and knowledge through collaborations with partners and supply chains, and helping develop and maintain a highly skilled Canadian workforce.

SADI is building on the success of its first two years to continue meeting its goals and help even more Canadian aerospace and defence companies take on strategic industrial and pre-competitive R&D projects that allow them to innovate, collaborate and compete, both at home and abroad.

Contact the Industrial Technologies Office

More detailed information about the SADI program or the Industrial Technologies Office can be found on the ITO website.[7] For other information, please contact:

Industrial Technologies Office
Industry Canada
235 Queen Street, 7th Floor
Ottawa ON K1A 0H5

Email: info@ito.ic.gc.ca
Toll-free (hearing impaired only) TTY: 1-866-468-1669
Toll-free (Canada): 1-800-266-7531
Fax: 613-954-5649

7 The ITO website is located at http://ito.ic.gc.ca