

Year in Review 2002–2003



Investing in Canadians
with Great Ideas



Technology Partnerships
Canada

An Agency of
Industry Canada

Partenariat technologique
Canada

Un organisme
d'Industrie Canada

Canada

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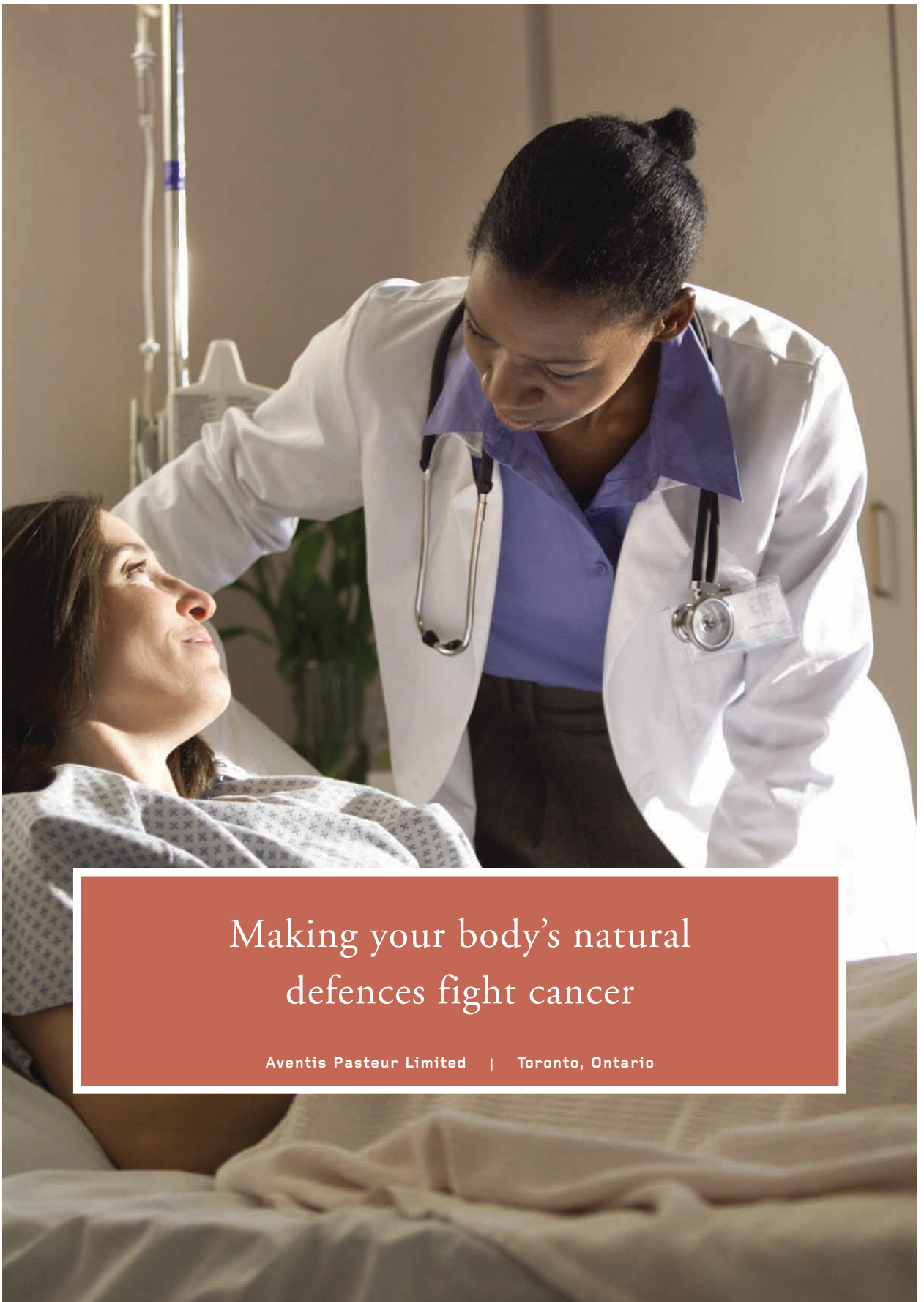
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In This Report You Will Learn About

- Technology Partnerships Canada's (TPC's) mandate and track record for making smart public investments in new technology projects to support innovations that benefit Canada and Canadians.
- How TPC helps companies develop innovations in Canada and become world class in key technology areas.
- TPC's growing portfolio, which this year included the most new investments in a single year since TPC was established in 1996.
- The challenges and achievements of TPC's client companies in 2002–2003.
- The status of repayments in TPC's portfolio in 2002–2003.
- The benefits TPC's investments have produced by stimulating private sector investments in innovation and technology solutions that boost productivity and help Canada achieve important quality-of-life goals.
- The innovation challenges Canada faces, and how TPC plans to evolve to further support innovation and help make Canada a world leader in developing leading-edge technologies and processes.

Investing in Canadians with Great Ideas

Technology Partnerships Canada (TPC) representatives meet with inventors, entrepreneurs and business people from all parts of the country and all sectors of the economy, who bring forward exciting investment opportunities in Canadian research and development. Fundamentally, TPC invests in people — energetic and visionary Canadians who dream about how to solve problems, save lives, protect the environment and change the world for the better. These brilliant, hard-working Canadians, who are determined to produce and bring to market the innovations that will help Canada's economy grow, create jobs and improve our day-to-day lives, are TPC's clients. On behalf of the Government of Canada and all Canadians, TPC is proud to be able to help them turn their ideas into solutions that benefit us all.



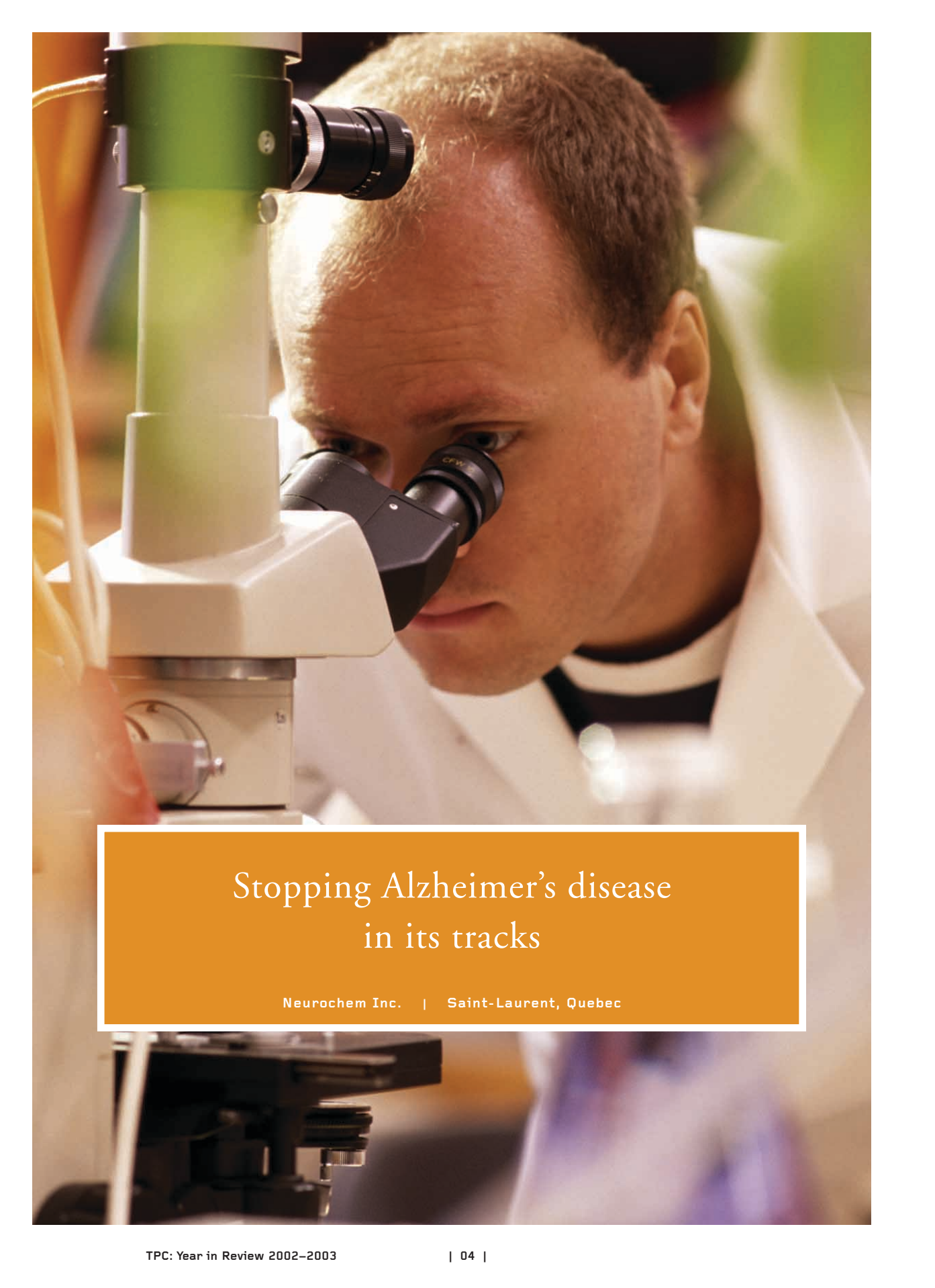
Making your body's natural
defences fight cancer

Aventis Pasteur Limited | Toronto, Ontario



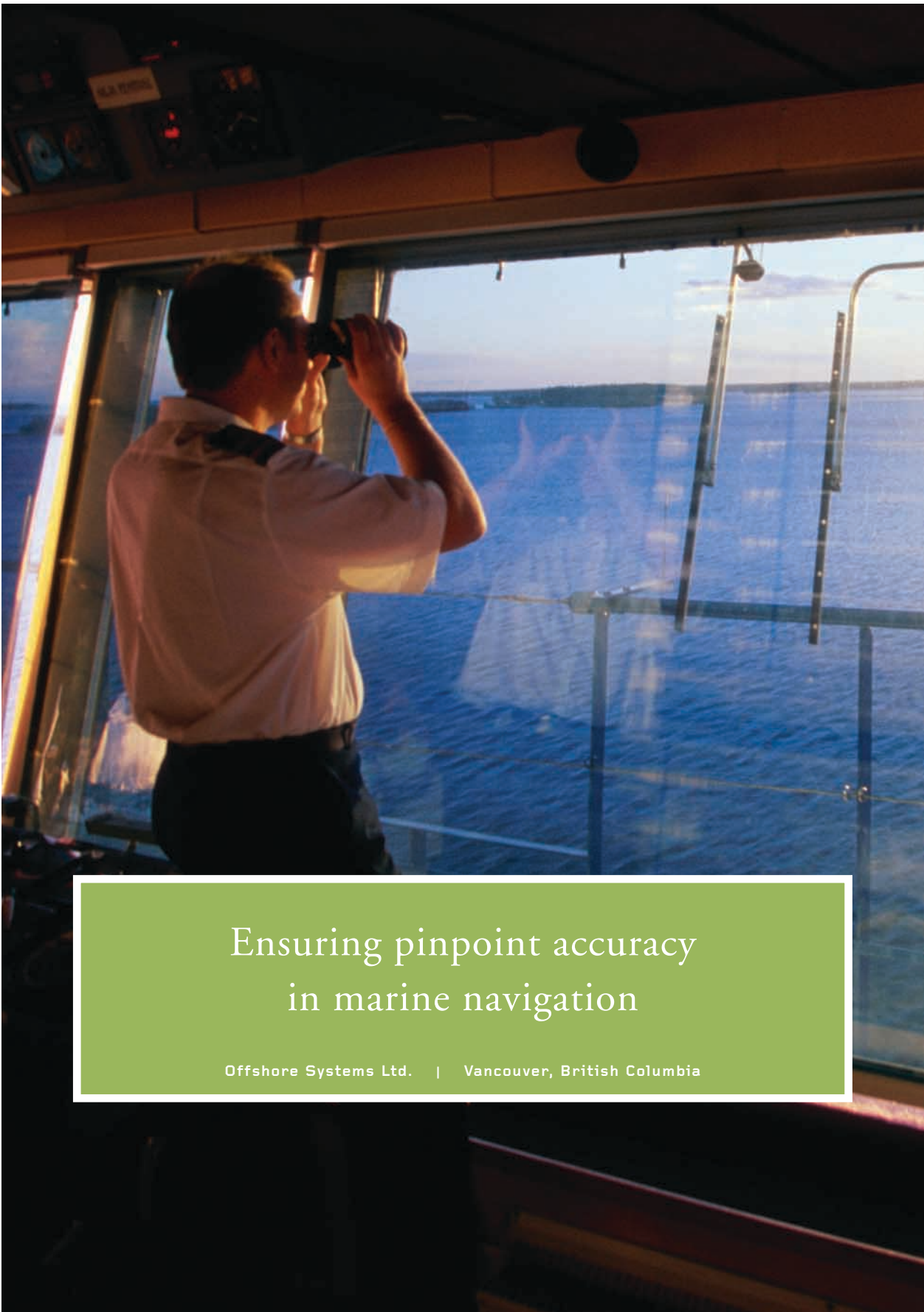
Helping satellites fly right

Bristol Aerospace Limited | Winnipeg, Manitoba



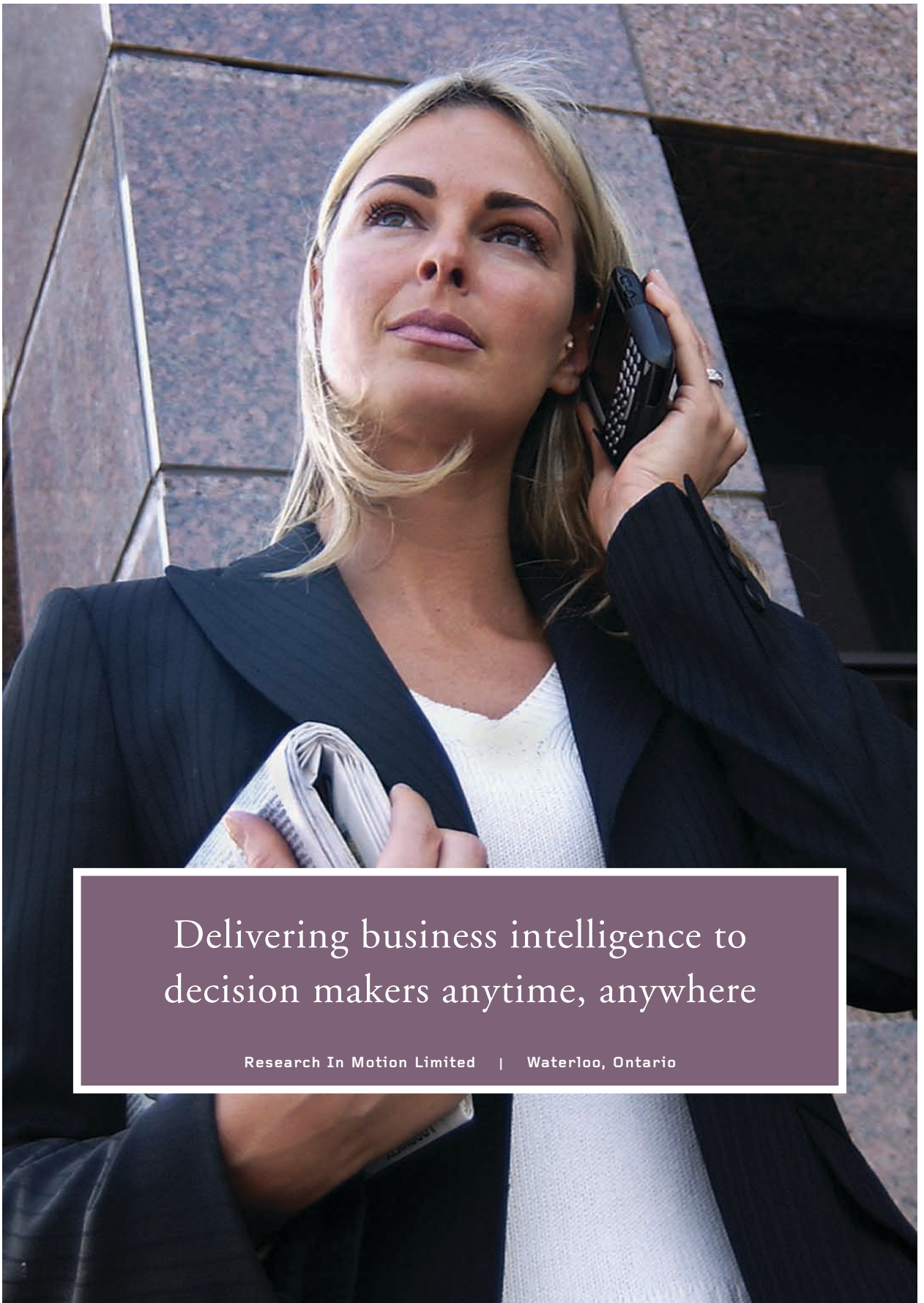
Stopping Alzheimer's disease
in its tracks

Neurochem Inc. | Saint-Laurent, Quebec



Ensuring pinpoint accuracy in marine navigation

Offshore Systems Ltd. | Vancouver, British Columbia



Delivering business intelligence to
decision makers anytime, anywhere

Research In Motion Limited | Waterloo, Ontario



Developing cleaner exhaust systems to protect our environment

Diversified Metal Engineering Limited | Charlottetown, Prince Edward Island





Message from the Minister

As the new Minister of Industry, I am pleased to release the Technology Partnerships Canada *Year in Review 2002–2003*.

Over the past year, Canadians have learned that their economy has the strength and resilience needed to withstand extraordinary global shocks and economic turbulence. Building on success, Canada must confidently continue to improve its position. The Government of Canada has set the goal of moving from 14th to among the top five countries in the world in research and development performance.

We have made great strides in strengthening Canada's science and technology sector through the funding of basic research during the past decade. My goal is to continue these efforts to ensure that Canadians enjoy the best quality of life, and that Canadian companies get the maximum economic benefit. Innovative Canadian companies continue to face great challenges in bringing their products into the marketplace. We will be more aggressive in our efforts to move intellectual property through the pre-competitive stages to commercialization. We are encouraging the private sector to lead, with the Government of Canada as a catalyst for turning great Canadian ideas into real-life applications.

A high quality of life requires an innovative economy, smart government and smart programs. The Government of Canada is creating an environment where Canadian business can easily bring new methods and ideas into the marketplace in a timely manner, and where government supports commercialization of university research and small business access to markets. Technology Partnerships Canada (TPC) is a critical part of this environment.

TPC seeks out creative technologies wherever they occur. Risk is part of innovation in the global economy, but the greater risk is *not* being at the forefront of innovation. It is only through new discoveries and new technologies that we will solve problems and protect and enhance our health, our environment and our quality of life.

In 2004, I intend to launch the TPC Strategic Review. The Review will ensure TPC is meeting its current objectives, and will identify the outcomes of its efforts. It will also ensure TPC is able to provide sufficient support to emerging new strategic transformative technologies in areas such as biotechnology, nanotechnology, and environmental and health sciences.



Lucienne Robillard
Minister of Industry and Minister responsible
for the Economic Development Agency of Canada for the Regions of Quebec



Message from the Executive Director

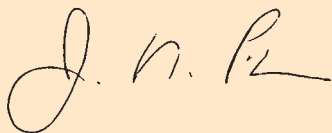
Through the Government of Canada's *Innovation Strategy*, Canadians and Canadian companies have confirmed their strong support for the work of Technology Partnerships Canada. They expect us to do more and to concentrate our efforts where they matter most to Canadians.

We made more investments in 2002–2003 than in any other single fiscal year since TPC's inception. At the same time, we enhanced our support to small and medium-sized enterprises (SMEs) — 92 percent of the projects we supported were with SMEs. Repayments have more than doubled relative to those received in 2001–2002 and will continue to grow significantly over the next several years.

As I mentioned last year, we are taking concrete steps to improve our program delivery and our decision-making processes. We are streamlining our procedures and processes to accommodate the constraints and operating realities facing our clients. As well, our assessment of results has moved beyond focussing on jobs and dollars to looking at other important public benefits for Canadians.

We at TPC are expanding our focus to better include transformative technologies with the potential to revolutionize processes in everything from health care to farming. We have also extended our reach into all regions of the country, to increase both our accessibility and the diversity of the innovation projects we support. Meanwhile, we will continue to support world-class Canadian companies in maintaining their global leadership positions, while seeking strategic opportunities for Canadian companies in traditional industries to help these industries' successful transition to the new economy.

Our main goal of supporting pre-competitive innovation excellence in Canada has not changed — we are strengthening our capacity to capture opportunities for Canadians and to ensure that the benefits of innovation extend throughout Canada's economy.

A handwritten signature in black ink, appearing to read 'J. M. P.', with a stylized, cursive script.

Jeff Parker, Executive Director
Technology Partnerships Canada

**Continuum of Investment in Innovation
by the Government of Canada**



BDC – Business Development Bank of Canada
 CCC – Canadian Commercial Corporation
 CFI – Canada Foundation for Innovation
 CSA – Canadian Space Agency

EDC – Export Development Canada
 IRAP – Industrial Research Assistance Program
 NRC – National Research Council Canada
TPC – Technology Partnerships Canada

Note: This diagram simplifies the role of each player, and attempts to position TPC in relation to other programs along the continuum.

“This TPC investment will have far-reaching benefits. Pratt & Whitney Canada has forged strong partnerships with more than a dozen universities across Canada in the various fields of research and development that exist in Canada. This is an important, essential element that is at the heart of existing research and development in Canada.”

Nabil Esmail, Dean of the Faculty of Engineering and Computer Science at Concordia University

Our Mandate

TPC makes strategic investments in precompetitive development projects. We invest in the great Canadian ideas and innovations that are key to Canada's economic health and prosperity.

TPC is a modern instrument for innovation, with the flexibility to capture emerging investment opportunities, wherever they occur, for the economic, social and environmental benefit of all Canadians.

Canadian industries take the lead in bringing innovation forward to the marketplace. TPC acts as a catalyst, investing strategically to accelerate the successful development of key technologies that will benefit Canadians in their everyday lives.

The TPC program complements other Government of Canada programs to help Canadian industry overcome the hurdles involved in bringing proof-of-concept ideas to the marketplace. The program is an important instrument in assisting Canadian industries across a wide spectrum of technological development.

Our Portfolio Approach

TPC invests in a wide array of good ideas in many sectors of the economy. This portfolio-based approach allows it to do two important things: manage risk by diversifying its activity in the economy; and select projects where there are significant benefits for both economic growth and quality-of-life enhancements.

Supporting technology is inherently risky. How and when even the most brilliant ideas become profitable is determined by a number of factors, including: the general performance of the economy; the willingness of other investors to support the testing, manufacture and marketing of the innovation; and, market demand for the product or process.

TPC manages risk by investing in a share of the costs of research and development (30 percent on average) in different projects spread across sectors ranging from environmental technology and biotechnology to aerospace, marine and wireless communications. Some investments deliver higher returns than expected; others perform on target, and a few do not. But a diversified and well-managed portfolio of investments means TPC protects the public's interests since risks are contained within the portfolio.

The portfolio approach means TPC can be strategic and target technologies which offer significant growth opportunities in terms of commercial activity and jobs, as well as broader public-policy benefits. For example, backing promising new technologies with the potential to improve the efficiency of production processes in traditional sectors means TPC's investments contribute to the Government of Canada's efforts to improve productivity performance across the entire economy. TPC also helps speed up the introduction of innovations that can improve industrial competitiveness such as innovations reducing toxic waste and emissions, and enabling workers to gain new skills so they can perform higher-value and more rewarding work.

At the same time, TPC supports innovation in emerging technologies, where companies in Canada have the potential to become world class. There are enormous potential quality-of-life benefits that can be achieved in many of these technologies. For example, in biotechnology, TPC supports a number of projects that promise a new generation of less-invasive approaches for treating diseases prevalent among the elderly, such as cancers, respiratory ailments and Alzheimer's. These innovations would not only mean better and more-effective treatments for patients, but would have a positive impact on the affordability of Canada's universal, publicly-funded health care system.

TPC also looks for opportunities to support projects that are associated with an existing or emerging industrial cluster. Clusters are typically found in a community where there is at least one established public research institution (such as a university, government lab or research hospital), a

strong entrepreneurial base, and a network of interdependent firms all working in a related industrial field. While highly localized, the result is a critical mass of innovative capabilities and entrepreneurship with extraordinary potential to grow and compete in a specific niche in the global economy.

TPC exercises a rigorous process of due diligence in selecting and evaluating projects, which means the agency learns about the technologies Canadian companies are developing, what these companies need to excel, and where and how government can play a supportive role.

For a country with Canada's comparatively small population but an open, dynamic knowledge-based economy, and highly educated workforce, TPC is an international model of a public instrument encouraging investment in innovation.

Furthermore, TPC selects projects balancing a range of potential benefits and considerations beyond just commercial viability and the creation and maintenance of high-quality jobs. Advancing Canada's knowledge base, improving the technological and strategic positioning of firms involved in R&D, strengthening the Canadian innovation system, broadening and deepening Canada's R&D capacity, and making advancements in health and safety are but a few examples of key policy benefits targeted by the TPC program. This focus helps ensure that innovation in Canada supports important areas and has lasting effects, which will, in turn, contribute to improving industrial productivity and competitiveness, sustainable development, quality of life, and the quality of our environment.

Key Drivers for TPC Investment Decisions:

- The potential to strengthen Canadian capabilities in critical strategic sectors, such as aerospace and defence, where companies developing innovations in Canada are already considered, or are becoming, world class.
- The potential to meet key goals that affect quality of life in areas such as climate change, sustainable development and health.
- The potential to attract investments in areas that can lead to productivity improvements and innovation in other sectors of the economy — for example, boosting agricultural production through biotechnology, and improving production and distribution processes through the rapid exchange of large amounts of data via broadband wireless communication technologies.

“This cooperation will help transform our research into concrete, economically viable energy alternatives.” (re: TPC investment in Westport Innovations Inc.)

Dr. Philip Hill, Professor Emeritus, Department of Mechanical Engineering at UBC

TPC Investments in 2002–2003

TPC investments were critical in helping keep Canada’s R&D activities going through a difficult year. For example, the lack of available risk capital had an impact across high-technology sectors. Here, TPC made a significant contribution in sustaining the pace of R&D in Canada. As a result of TPC’s support, many Canadian companies that might not have persevered through the downturn are now poised to capitalize on the long-awaited high-technology market recovery.

During the 2002–2003 fiscal year, TPC approved 120 multi-year R&D projects, with investment commitments of \$431 million. Through these investments, TPC was able to leverage an additional \$1.4 billion in innovation spending from its private sector partners.

In 2002–2003, TPC continued to deliver on its commitment to support SMEs. TPC made investment commitments of \$145 million to 110 SME projects — 92 percent of the total number of projects it supported during that period.

TPC approved 49 projects in Western Canada in 2002–2003, with a multi-year investment commitment of about \$78.8 million and approved 33 projects in Ontario, worth a total of \$164.5 million. A further 27 projects totalling \$127.3 million were approved in Quebec, while 11 projects in Atlantic Canada received a total investment commitment of \$60.2 million.

Over the life of the investments made during the year, it is projected that more than 7600 high-quality jobs will be created and/or maintained.

Total repayments to TPC in the 2002–2003 fiscal year amounted to \$19 million, almost \$11 million more than the previous year’s repayment of \$8.3 million.

The table on pages 18–21 lists the investments TPC made in 2002–2003 (excluding TPC–IRAP investments*) and identifies the companies and their locations, the innovations supported, and the values of the investments.

* For more information on TPC–IRAP projects, visit the website: <http://irap-pari.nrc-cnrc.gc.ca>

TPC Portfolio Investment Highlights (from Inception to March 31, 2003):

- 537 projects (TPC and TPC-IRAP)
- \$2.3 billion in TPC funds approved for investment
- Total public and private investment of \$11.9 billion
- Every dollar of public investment leveraged more than \$4 in private investment
- About 87 percent of TPC projects are with SMEs and account for 34.7 percent of total funds invested
- More than 75 percent of projects are in environmental, information and communications technologies, and biotechnology fields
- Total cash repayments to the Crown = \$49.3 million
- Forecasted job creation and maintenance (not including spin-off jobs) = more than 43 000 jobs.

Advanced Processing Inc.
Concord, Ont.

Developing advanced non-destructive testing, anodic coating, cadmium plating, and other specialized aerospace-related coatings services.

\$367 335 SDI

Aérospatiale Hemmingford Inc.
Hemmingford, Que.

Enabling the company to expand from a manufacturing source to an integrator of turbine-engine subsystems in the aerospace industry.

\$330 750 SDI

Ceyba Corp.
Kanata, Ont.

Developing super high-speed optical network components for the long-haul data market that will reduce long-haul network capital and operating costs.

\$9 000 000

(Project cancelled — no disbursements made)

Aéro Mécachrome Inc.
(formerly Atelier d'usinage Aéro Ltée.)
Montréal, Que.

Improving the quality of the company's products with the implementation of a quality management system that makes the company a Tier 3 supplier to the aerospace industry.

\$177 300 SDI

Atlantic Turbines International Inc.
Summerside, P.E.I.

Undertaking R&D in state-of-the-art engine repair techniques in gas turbine maintenance and restoration.

\$5 085 300

Composites Atlantic Limited
Lunenburg, N.S.

Updating design and manufacturing processes to accommodate production of advanced, large, complex geometrical composite panels for aircraft interior panel linings.

\$877 950 SDI

AeroMechanical Services Ltd.
Calgary, Alta.

Advancing airborne automated flight information systems and flight data management systems for the aerospace industry.

\$127 415 SDI

Avcorp Industries Inc.
Delta, B.C.

Developing the design and engineering skills necessary to create advanced flight control surface structures such as wings, centre wing box structures and vertical stabilizers with rudders.

\$3 193 215

CS Communication & Systems Canada Inc.
Montréal, Que.

Enabling the company to set up world-class resource management, quality control, design and production systems to supply systems integration and software in the aerospace industry.

\$246 000 SDI

Aero-Safe Technologies Inc.
Fort Erie, Ont.

Developing and applying an automated chemical finishing system and laboratory for treatment of aerospace components.

\$664 472 SDI

Canadian Shipbuilding & Engineering Ltd.
St. Catharines, Ont.

Developing a state-of-the-art, specialized multi-purpose vessel design to replace and modernize the Great Lakes fleet of ships.

\$4 950 000

DALSA Corporation
Waterloo, Ont.

Developing a standard for digitally-captured motion pictures for the emerging digital cinema market replacing the existing standard for 35mm.

\$1 738 070

Electrovaya Inc.
Mississauga, Ont.

Developing small-format batteries for portable wireless communication devices, and large-format batteries for electric vehicles, helping reduce air and land pollution.

\$9 870 498

Firebird Technologies Inc.
(formerly Firebird Semiconductors Ltd.)
Trail, B.C.

Producing a new crystal — the indium antimonide wafer — for use in materials for industrial and military infrared imaging and seeking systems.

\$1 143 894

Futuretek-Bathurst Tool Inc.
Oakville, Ont.

Developing an integrated manufacturing system that allows the company to expand and become a full aerospace support services company.

\$871 875 SDI

GMA Cover Corp.
Guelph, Ont.

Developing lightweight multi-spectral strategic camouflage screens for advanced military camouflage equipment using infrared and thermal applications to allow users to reconfigure their camouflage to suit changes in background as users move from location to location.

\$4 758 750

Inco Limited
St. John's, Nfld. & Lab.

Developing Hydromet technology to enhance the nickel production process and reduce emissions that cause acid rain.

\$60 000 000

Intrinsyc Software International, Inc.
Vancouver, B.C.

Developing hardware for advanced enterprise network devices, and software to link devices with enterprise systems and each other.

\$6 371 351

Likro Precision Limited
Mississauga, Ont.

Developing the capacity to become an integrated supplier of component parts to the aerospace and defence industry.

\$998 514 SDI

MacDonald, Dettwiler and Associates Ltd.
Richmond, B.C.

Providing R&D for small, more affordable satellite systems, thereby opening up a range of application opportunities for using satellite technology in areas such as forestry or agriculture.

\$9 853 681

March Networks Corporation & Mitel Networks Corporation
Kanata, Ont.

Developing hardware that converges voice, video and data over a single high-speed network to accelerate the adoption of broadband multi-media communications.

\$60 000 000

McLeod Harvest Inc.
Winnipeg, Man.

Developing a highly innovative harvester and milling unit that is safe, flexible and priced competitively compared to the traditional combine.

\$3 013 500

MDS-PRAD Technologies Corporation
Summerside, P.E.I.

Developing an environmentally-friendly, erosion-resistant coating for gas turbine engines to make them safer, more durable and more fuel-efficient.

\$3 060 660

NGRAIN (Canada) Corporation
(formerly i3Dimensions Inc.)
Vancouver, B.C.

Refining a compression technology that enables common personal computers to modify and manipulate complex three-dimensional data in real time.

\$7 000 000

Novatronics Inc.
Stratford, Ont.

Designing and developing three new technologies and advanced manufacturing processes for highly specialized aerospace electro-mechanical components.

\$1 300 683

PCI Geomatics Enterprises Inc.
Richmond Hill, Ont.

Developing three prototype virtual GeoCapacity centres focusing on mapping, the environment and disaster management for public security.

\$5 563 240

Pratt & Whitney Canada Corp.
Longueuil, Que.

Enabling R&D for the next generation of smaller, lighter, more fuel-efficient, more reliable gas turbine aircraft engines.

\$99 400 000

Premier Tech Ltd.
Rivière-du-Loup, Que.

Developing products to enhance plant growth, improving mobile and fixed waste-screening systems, and improving decentralized waste-water treatment systems.

\$9 990 000

PyroGenesis Inc.
Montréal, Que.

Developing vacuum-plasma, spray-forming technology to create complex metal, ceramic and composite aerospace and defence components that are safer to use, lighter and can operate in extremely severe environments.

\$5 594 200

Raytheon Canada Limited
Richmond, B.C.

Developing advanced technology for air-traffic management products to provide increased safety to passengers, and air and ground crews.

\$5 599 110

Rolls-Royce Canada Ltd.
Lachine, Que.

Making medium-sized industrial gas turbine engines that combine competitive unit costs, high thermal efficiency and reduced emissions.

\$30 000 000

SNC Technologies Inc.
(formerly Les Technologies industrielles SNC Inc.)
Le Gardeur, Que.

Developing non-toxic training ammunition (eliminating the use of lead and heavy metals) to reduce the quantity and toxicity of hazardous emissions into the atmosphere and on land.

\$2 626 196

St. John's Dockyard Limited
St. John's, Nfld. & Lab.

Conducting R&D on advanced design and production for subsea structures for the oil and gas industry and developing the in-house capacity to design, engineer and service these structures.

\$4 042 500

TFI Aerospace Corporation
Orangeville, Ont.

Helping the company evolve into a fully integrated supplier of advanced aerospace fasteners.

\$460 300 SDI

Thales Avionique Canada
St. Laurent, Que.

Enhancing small jet navigation precision and safety through the development of advanced avionics and "fly-by-wire" flight control systems for use in regional jets and smaller aircraft.

\$9 900 000

Vanguard Aviation Corp.
Calgary, Alta.

Enhancing composite repair, overhaul capability and non-destructive testing processes for specialized services to the aerospace industry.

\$117 580 SDI

Vistar Telecommunications Inc.
Ottawa, Ont.

Developing a satellite-based telematics system for wireless asset tracking and data-transfer applications in the marine, trucking and automotive industries.

\$5 250 000

Westport Innovations Inc.
Vancouver, B.C.

Developing a new diesel engine that operates on natural gas but retains the power and fuel efficiency that has made diesel the dominant engine technology for work vehicles around the world.

\$18 912 010

Wi-LAN Inc.
Calgary, Alta.

Developing wireless telecommunications equipment to deliver “last mile” broadband data services to homes and businesses, including those in remote and rural areas.

\$8 754 648

ADVANCING TECHNOLOGY AND INNOVATION

ENABLING PRODUCTIVITY IMPROVEMENTS

ENHANCING QUALITY OF LIFE

Companies and Locations

Advances in technology and innovation

\$ = AUTHORIZED INVESTMENT VALUES

SDI: The Aerospace and Defence Supplier Development Initiative (SDI) is part of a program that assists SMEs in the aerospace and defence sectors in developing and incorporating world-class business and manufacturing practices and technologies.

WEST

ONTARIO

QUEBEC

ATLANTIC

TPC Client Innovation Milestones in 2002–2003

The most important indicator of the success of the TPC program is the success of its clients. In 2002–2003, many of TPC’s client companies reached important milestones in their R&D projects.

The following pages include some examples of the innovation achievements of firms in Canada, who, with TPC’s support, are turning great Canadian ideas into solutions that will benefit all Canadians and put Canada on the map as a world-class centre for innovation.

“This TPC investment recognizes the advanced technology inherent in shipbuilding, and the need for continuing research and development in the industry.”

(re: TPC investment in St. John’s Dockyard Limited)

Peter Cairns, President
of the Shipbuilding
Association of Canada





Aventis Pasteur

In 2002, six years after the official start of TPC's investment in the company, vaccines being developed by Aventis Pasteur Limited for melanoma and colorectal cancers moved into Phase II clinical studies. Melanoma is a highly malignant cancer of the skin, and colorectal cancer is the second-leading cause of cancer-related deaths in North America.

In 1997, TPC invested \$60 million to support a project with the Toronto company, a division of France-based Aventis, to develop the therapeutic vaccines. Also called immunotherapy, cancer vaccinations work like any other vaccine: by stimulating the body's own immune system to produce a natural defence to fight cancerous tumours. In some cases, immunotherapy has been found to work better than chemotherapy. Today, there's more hope than ever that safe, non-toxic alternative treatments that can significantly improve cancer patients' chances for positive outcomes are on the horizon.

Bristol Aerospace

In 2002–2003, Winnipeg-based Bristol Aerospace Limited successfully completed components for the Canadian Space Agency's SCISAT satellite, the first all-Canadian satellite to be launched in more than 30 years. Bristol Aerospace's components included the GyroWheel™, a highly innovative attitude-control device that keeps a satellite extremely stable and pointing precisely in its earth orbit, which is critical for gathering accurate data. Weighing only six kilograms, the GyroWheel™ eliminates the need for multiple momentum wheels and gyros, significantly reducing a satellite's mass, size, power consumption and cost.

In April 2000, Technology Partnerships Canada invested \$1.6 million in a project with Bristol Aerospace to develop the satellite components needed to help a team of Canadian and international scientists improve their understanding of the depletion of the ozone layer, including that above Canada and the Arctic. The satellite was successfully launched into space in August 2003. Depending on its performance, Bristol Aerospace's GyroWheel™ could soon become a standard component for other Earth-pointed satellites specializing in atmospheric science, communications and remote-sensing surveillance.



Neurochem

On July 2, 2003, Saint-Laurent, Quebec-based Neurochem Inc. announced that its Clinical Advisory Board for Alzhemed™, made up of leading scientific authorities from both North America and Europe in the fields of aging and dementia, had reviewed the promising preliminary findings of the drug's Phase II trial and given its unanimous recommendation to proceed with Phase III efficacy studies, pending regulatory approvals for the initiation of such trials in the United States, Canada and Europe. If successful, Alzhemed™ will not only prevent and stop the progression of Alzheimer's Disease (AD), a debilitating disease for which no cure exists, but will also place Canada at the forefront of AD research.

Although the causes of AD are not well understood, one of its hallmark features is amyloid plaque. In January 2000, TPC invested \$7.9 million to help Neurochem take its new amyloid therapy, the investigational drug Alzhemed™ for the treatment of patients with mild to moderate AD, through Phase I and II clinical trials, and to prepare for critical Phase III trials. Alzhemed™ is expected to act on two levels: preventing and breaking up insoluble deposits of proteins that cause plaque and binding to soluble protein, to prevent the inflammatory response associated with amyloid build-up in AD. Currently, about 4 million North Americans are afflicted with AD and other related dementias, significantly impeding related quality of life of the sufferers and their loved ones. The health care costs in Canada alone, estimated to be nearly \$4 billion annually, are expected to grow by 10 percent annually as the proportion of Canada's population that is elderly increases over the next several decades.



Offshore Systems

As of 2002–2003, North Vancouver-based Offshore Systems Ltd.'s electronic navigation software for warships, Electronic Chart Precise Integrated Navigation System — Military (ECPINS® — M), is pre-eminent in the field. It is now on active duty on Canadian, American, Danish and New Zealand naval ships and vessels of the Canadian and U.S. Coast Guards. The company is also in negotiation with the Royal Australian Navy after being selected as preferred tenderer. ECPINS® — M's subsurface navigation capability — a feature that has strengthened Canada's competitive position in the world electronic navigation market — is helping to navigate Canada's new submarine fleet.

In 1999, navigational errors accounted for about 46 percent of marine casualties and 65 percent of pollution-causing incidents. In the same year, Offshore Systems, with the help of a \$4 million investment from TPC, began researching ways to improve the safety and efficiency of marine military navigation, which requires higher standards than commercial vessels to meet high-performance mission requirements. ECPINS® — M combines information from ship sensors, satellites and other position-fixing sources with a sophisticated electronic chart data base to provide accurate, real-time displays of a vessel's current position and progress. Today, the Canadian Coast Guard reports that using ECPINS® has resulted in significant cost savings through accident avoidance. And there's a bonus: improved navigation is reducing the use of fuel — not only saving money, but helping to reduce greenhouse gas emissions as well.



Research In Motion

In August 2003, Waterloo, Ontario-based Research In Motion (RIM) Limited signed deals with T-Mobile USA and U.S. telephone giant AT&T to offer the newest BlackBerry™ 7200 series, featuring a crisp, high-resolution colour screen and international roaming. Until the BlackBerry™ came along, being able to use the same device for wireless voice and e-mail connectivity while travelling globally had only been a dream for business travellers. Now, “sent from my BlackBerry™” is becoming a common tag at the end of business e-mails. The hand-held wireless device, which also functions as a mobile phone and personal organizer, allows users to stay connected anytime, anywhere with secure, wireless e-mail, short messaging service that lets users exchange short text messages without adding e-mail messages to an inbox, and gives them access to corporate data and the Internet.

Recognizing the potential of e-commerce to significantly change the way both business and government operate, TPC invested \$33.9 million in April 2000 to help RIM accelerate its R&D in wireless Internet platform technologies and enhance the performance of its next-generation, hand-held communications devices. The BlackBerry™ is just one of a number of award-winning wireless mobile communications products, services and embedded technologies being developed by this Canadian company.

Diversified Metal Engineering

In 2002, Diversified Metal Engineering (DME) Limited, based in Charlottetown, Prince Edward Island, became a finalist for a Canadian Innovation Award for Sustainable Development, presented jointly by the Canadian Manufacturers & Exporters, and IRAP. The honour recognized the company’s work developing a wet muffler, called the Eco-Silencer, to clean up exhaust from diesel engines used on ocean-going ships. The technology not only extracts soot and acidic gases from exhaust fumes, but reduces engine-noise levels as well. It employs a turbulent mixing process, where seawater is mingled with the gases until the pollutants are absorbed, eliminating the black plumes typically produced by engines, boilers or incinerators. Sulphur dioxide, one of the more noxious components of those plumes, is deposited overboard in the form of sulphides and sulphates, which are among the most common naturally occurring compounds in the marine environment. Moreover, these compounds are filtered through a carbon and sand filter, so that they enter the water in as pure a state as possible.

In 2001, TPC–IRAP invested \$495 000 in DME to support precommercial research, including trial installations aboard the Canadian Coast Guard icebreaker *Louis S. St. Laurent*, and Marine Atlantic’s ferry from Sydney, Nova Scotia to Port Aux Basques, Newfoundland and Labrador. These installations helped successfully hone the Eco-Silencer’s performance. The equipment offers several advantages to commercial operators, including the ability to run engines while in port, reduce deck-cleaning expenses, and enable the use of low-cost, high-sulphur fuel while still complying with international environmental regulations. Passengers, meanwhile, appreciate the reduction of exhaust smells, diesel soot and ambient noise.



“This TPC investment will spawn growth in the broadband technology cluster and will benefit information technologies researchers, universities, and SMEs across the region.” (re: TPC investment in March Networks Corporation & Mitel Networks Corporation)

Jeffrey Dale, President and CEO, Ottawa Centre for Research and Innovation (OCRI)

TPC Program Benefits

The value of TPC in terms of benefits for Canada and Canadians is assessed in two ways.

The first set of measures is the quantitative benefits themselves. These are the high-quality jobs TPC investments maintain and/or create, the additional investment leveraged from the private sector, including foreign investment, and, finally, the repayments TPC investments generate. As illustrated on pages 27 and 28, TPC investments in 2002–2003 continued to deliver significant returns in these key areas.

The second set of benefits is qualitative and longer-term. They make a significant contribution to building Canada’s innovative capacity for the future, and include: increased technological capabilities of firms and their partners; enhanced competitiveness and productivity of firms and/or users of the technologies that TPC helps bring into the marketplace; and the well-being and quality-of-life benefits that flow from the innovations TPC invests in, such as better therapeutic alternatives for treating life-threatening diseases, or reduction of toxic emissions.

For example, as of March 31, 2003, TPC invested almost

\$357 million in 25 climate change-related projects,

which have leveraged \$1.8 billion in private sector R&D spending. These investments represent one of the largest program contributions yet made by the Government of Canada to enable a smooth transition to a more innovative, energy-efficient, and less-emission-intensive society.

In addition, TPC has invested in technology with profound potential environmental and humanitarian benefits, including

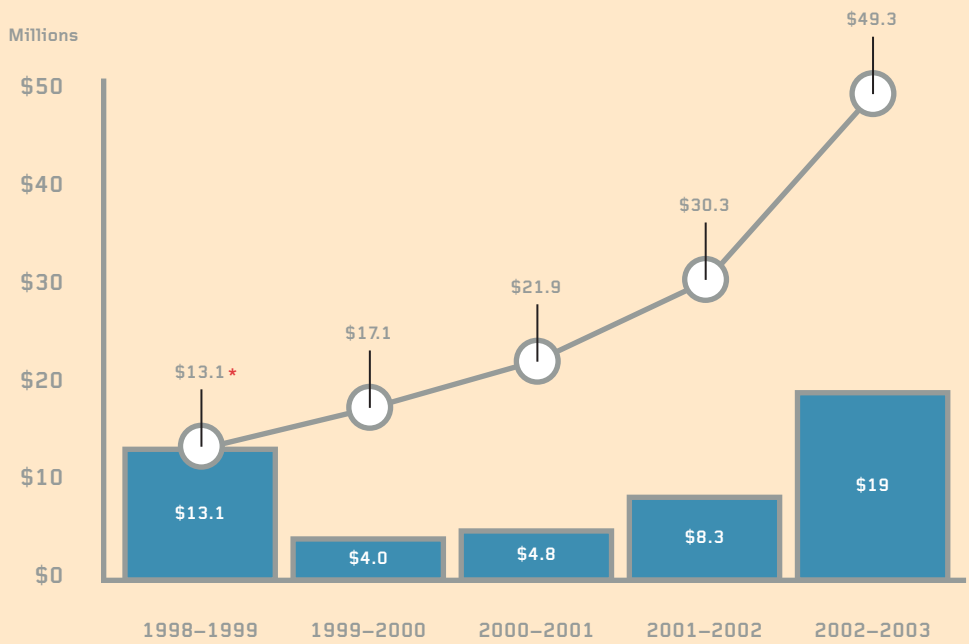
\$39.1 million in clean-water technology.



Benefits from these types of investments are by their very nature harder to measure, but no less important in assessing the overall value of the TPC program to Canadians. TPC has identified a number of key result areas to reflect these qualitative benefits, and is in the process of developing and implementing specific indicators to measure them. The system is expected to be in place in 2003–2004.

| Quantitative Benefits | 2002–2003 | Cumulative to March 31, 2003 |
|---|------------------|------------------------------|
| Jobs forecasted to be created and/or maintained over the life of the projects | more than 7600 * | more than 43 000 ** |
| Forecasted additional investment leverage | \$1.4 billion | \$9.6 billion |
| Forecasted foreign direct investment (excluding TPC contributions) | \$92.5 million | \$1.2 billion |
| Cash repayments received | \$19 million | \$49.3 million |
| Value of accepted warrants at time of receipt | \$27 million | \$34 million |
| <p>* Jobs estimated to be created and/or maintained over the life of the projects contracted in 2002–2003.</p> <p>** Jobs estimated to be created and/or maintained over the life of all projects contracted since the program's inception in 1996.</p> | | |

As TPC matures, cumulative repayments are climbing, as illustrated in the graph below:

Cumulative Repayments to 2003



 Cumulative  Annual

* Repayments in 1998-1999 include the sale of warrants, with proceeds totaling \$9.3 million, and the negotiated settlement of a TPC agreement with proceeds of \$3.5 million.

“With an overall investment in R&D of approximately \$1.5 billion, the aerospace and defence sector is one of this country’s top investors in innovation. TPC investments are critical to this industry and will help sustain Canada’s technological leadership while creating new opportunities for growth across the country.”

Peter R. Smith, President, Aerospace Industries Association of Canada (AIAC)

In TPC’s 2001–2002 *Year in Review*, five areas were identified where TPC would be working in 2002–2003 to maximize its contribution to building a more-innovative Canada. First, TPC said it would sharpen and focus its program by asking some tough questions about value and developing new measures that more effectively capture the impact TPC has on its clients, the benefits of its investments and the value delivered for tax dollars.

TPC conducted detailed consultations through a business model review process with about 30 of its clients and their industry associations to find out how to better align TPC’s contractual requirements and measurements of success with their business realities and their assessments of the benefits that matter most.

TPC confirmed that its investments in R&D projects deliver many benefits to Canada directly in line with the mandate and objectives of the program, but recognized it is not systematically recording the full breadth of these benefits, for example:

- increased technological capabilities and expertise;
- growth through partnerships with universities and other research institutes;
- expansion of R&D facilities; and,

- employment of highly skilled personnel, reducing and, in some cases, reversing the brain drain.

These findings will help TPC improve its tracking of project outcomes, and enable it to provide more complete reporting to Canadians in the years ahead on the benefits delivered by the program.

TPC also said it would increase its regional presence. Enhancing delivery capacity is essential to keeping in step with the evolving needs of a client base that will be increasingly dominated by SMEs, and will extend across both emerging and traditional sectors of the economy. In 2002–2003, working with Industry Canada’s regional offices, TPC established 15 TPC innovation officer positions across the country to promote TPC and other federal innovation programs.

Also in the 2001–2002 *Year in Review*, TPC identified the need to improve the communication of its vision, in particular by providing tangible examples of the importance of innovation to Canada’s future, and the need to invest in this innovation. TPC said it would improve how it informs Canadians about the rationale for its investment decisions, and would be more transparent about the process used to make these decisions and the results of investments.

Client companies who share the concern that the value added by TPC to Canada has not been fully communicated have offered to become active participants in delivering this message. They have agreed to highlight TPC's role in supporting critical research projects in the announcements they make about their subsequent successes, in everything from opening new buildings for expanded R&D programs and announcing new business partnerships in Canada, abroad and with universities for collaborative R&D, to receiving regulatory approval for the further development or launch of a new vaccine or therapy.

As part of fine-tuning its processes, TPC is continuing to examine its prioritization, due diligence and approval processes, and is developing a more consistent approach for all TPC components.

Furthermore, in consultation with its partners, TPC is developing benefit-reporting guidelines for recipient firms to help them articulate and report the contributions their projects make to policy benefits of primary interest to the Government of Canada and Canadians.

Finally, TPC said it would work to build partnerships for the future by fostering stronger relationships with other key players in the innovation process, particularly with other federal departments and agencies. These relationships have significant potential to leverage more benefits from TPC investments, enhance its access to technical knowledge to strengthen the strategic value of the program, and help ensure TPC supports other institutions in fulfilling their mandates to promote innovation.

By working more closely with other federal organizations, such as the Business Development Bank of Canada, the Canadian Space Agency and the Canadian Institutes of Health Research, TPC has already improved its capacity to make strategic investments and pursue collaborative funding opportunities with these partners. This saves time in terms of review and assessment, and supports more efficient use of federal resources.

“When business and government work together as partners, good things happen. This is exactly the kind of collaboration that is increasing Canada’s success, both in business and as a country.” (re: TPC investment in NGRAIN (Canada) Corporation — formerly i3Dimensions Inc.)

Shahid Hussain, President and CEO of the New Media Innovation Centre

Our Priorities

TPC is an active investor in a range of sectors where there is significant potential to fuel innovation that will deliver economic and social benefits to Canadians. TPC’s investment officers work hard to stay on top of research and technological developments, many of which are moving at breakneck speed. They analyze the potential of these developments to advance Canada’s competitiveness, productivity and quality of life.

The following are highlights of some of the types of innovative processes and technologies that TPC will focus on supporting in the coming year:

- eco-efficient and clean production technologies that embody the principles of pollution prevention, waste reduction and sustainable development;
- key platform technologies in the field of biotechnology, such as genomics, proteomics and bioinformatics, which are essential to growth;
- technologies that advance both wire-line and wireless broadband communications;

- core information and communications technology development in photonics, microelectronics and software development;
- advanced manufacturing and processing technologies and materials, including nanotechnology, for the resource and processing sectors;
- technologies that advance core capabilities in aerospace and defence; and,
- projects with significant potential to contribute to the implementation of the *Climate Change Plan for Canada* and help accelerate the commercialization of technologies that address climate change.

At the same time, as part of TPC’s forward-looking investment strategy, TPC will examine how its program can best act as an instrument to support innovation in a wider variety of sectors, including traditional sectors, by improving manufacturing and distribution processes, and using best practices to enhance competitiveness.

To Contact TPC National Network

TPC has 25 investment officers in Ottawa and 15 TPC innovation officers across Canada to provide helpful advice on accessing support from TPC and other federal programs. These officers draw upon Industry Canada expertise on trends in industries, sectors and markets, and information available from industry associations and outside analysts in order to assess project submissions. TPC officers also consult extensively with a network of appropriately qualified experts in other Government of Canada departments and agencies such as Natural Resources Canada, Health Canada and Environment Canada, and experts in universities across the country. Through these consultations, TPC can provide the best assessment of the technical merits of any proposal it receives.

In addition, through the TPC–IRAP partnership, TPC taps into a network of more than 260 Industrial Technology Advisors located in 90 communities across Canada. These advisors are chosen for their experience in business, and their skills in technology and science. In addition to advising on potential TPC support, they help SMEs increase their innovative capabilities by offering advice on financial services, programs, information tools and resources offered by governments, industry associations, the private sector, R&D institutions, technology brokers and technology transfer centres.

TPC

Tel.: 1 800 266-7531

Web site: <http://www.tpc.ic.gc.ca>

TPC–IRAP

Tel.: 1 877 994-4727

Web site: <http://irap-pari.nrc-cnrc.gc.ca>

TPC National Network



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TPC-IRAP
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Saskatchewan:
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Saskatoon, Sask. S7K 7E6

Financial Statements

STATEMENT OF OPERATIONS

(FOR THE YEAR ENDED MARCH 31, 2003)

(\$000)

| TPC | 2002–2003 | 2001–2002 |
|-----------------------------------|---------------|---------------|
| SALARY | | |
| Regular Salaries | 5 136 | 4 205 |
| Employee Benefits | 1 027 | 841 |
| Total Salary | 6 163 | 5 046 |
| NON-SALARY | | |
| Transportation and Communications | 360 | 461 |
| Information | 832 | 851 |
| Professional and Special Services | 1 909 | 2 052 |
| Other | 1 412 | 1 421 |
| Total Non-salary | 4 513 | 4 785 |
| TPC Operations | 10 676 | 9 831 |
| | | |
| TPC–IRAP | 2002–2003 | 2001–2002 |
| SALARY | | |
| | 1 688 | 1 413 |
| EMPLOYEE BENEFITS | | |
| | 337 | 282 |
| NON-SALARY | | |
| | 661 | 620 |
| TPC–IRAP Operations | 2 686 | 2 315 |
| | | |
| TOTAL OPERATIONS | 13 362 | 12 146 |

Financial Statements

STATEMENT OF CONTRIBUTION FUNDING

(FOR THE YEAR ENDED MARCH 31, 2003)

(\$000)

| | 2002–2003 | 2001–2002 |
|--|----------------|----------------|
| CONTRIBUTION DISBURSEMENTS UNDER TPC | | |
| Environmental Technologies | 37 602 | 33 428 |
| Enabling Technologies | 82 070 | 72 412 |
| Aerospace and Defence | 179 872 | 184 022 |
| Industrial Research Assistance Program (TPC–IRAP) | 28 226 | 29 711 |
| Total Contributions under TPC | 327 770 | 319 573 |
| CONTRIBUTION DISBURSEMENTS UNDER SUNSETTED PROGRAMS | | |
| Defence Industry Productivity Program | 0 | 84 |
| Total Contributions Under Sunsetting Programs | 0 | 84 |
| Total Contribution Disbursements During Fiscal Year | 327 770 | 319 657 |
| Funds Carried Forward to Future Years | 41 498 | 40 611 |
| TOTAL CONTRIBUTION FUNDS AVAILABLE | 369 268 | 360 268 |

Financial Statements

STATUS OF CONTRIBUTION PORTFOLIO

(\$'000)

| | <u>ACTUAL</u> | | <u>PLANNED SPENDING</u> | | |
|--|----------------|----------------|-------------------------|----------------|----------------|
| | 2002–2003 | 2003–2004 | 2004–2005 | 2005–2006 | 2006–2007 |
| ANNUAL PROGRAM FUNDING | 300 000 | 300 000 | 300 000 | 300 000 | 300 000 |
| Funding from Other Government Departments (1) | 15 378 | 15 000 | 15 000 | 15 000 | 15 000 |
| Allocation for Program Operations | (13 362) | (10 500) | (10 500) | (10 500) | (10 500) |
| Funds Reprofiled to Future Years | 76 359 | 41 092 | 41 379 | 20 400 | 400 |
| Funds Lapsed in 2002–2003 Carried Forward | (41 498) | 0 | 23 274 | 18 224 | 0 |
| Repayments (2) | 6 410 | 16 500 | 23 600 | 52 200 | 110 100 |
| Transfers to DND/DFAIT | (367) | 0 | 0 | 0 | 0 |
| Program Reductions | (6 000) | (6 000) | (6 000) | (6 000) | (6 000) |
| Transfer for <i>Innovation Strategy</i> | (12 000) | 0 | 0 | 0 | 0 |
| Other Adjustments — Operations Actual/Proposed | 2 850 | (9 127) | (10 619) | (10 619) | (10 619) |
| AVAILABLE CONTRIBUTION FUNDING | 327 770 | 346 965 | 376 134 | 378 705 | 398 381 |
| COMMITMENTS UNDER TPC AS OF MARCH 31, 2003 | | | | | |
| Environmental Technologies | 37 602 | 61 276 | 58 306 | 45 152 | 14 812 |
| Enabling Technologies | 82 070 | 65 938 | 57 993 | 32 296 | 34 406 |
| Aerospace and Defence | 179 872 | 156 925 | 92 096 | 40 028 | 25 638 |
| Industrial Research Assistance Program (TPC–IRAP) | 28 226 | 19 288 | 1 840 | 0 | 0 |
| TOTAL COMMITMENTS UNDER TPC | 327 770 | 303 427 | 210 235 | 117 476 | 74 856 |
| TOTAL FUNDS AVAILABLE FOR NEW CONTRIBUTIONS IN FUTURE YEARS | 0 | 43 538 | 165 899 | 261 229 | 323 525 |
| FUNDS AVAILABLE FOR NEW | | | | | |
| TPC–IRAP CONTRIBUTIONS | | 12 122 | 29 046 | 26 112 | 26 112 |
| FUNDS AVAILABLE FOR NEW DIRECT | | | | | |
| TPC CONTRIBUTIONS | | 31 416 | 136 853 | 235 117 | 297 413 |
| | 0 | 43 538 | 165 899 | 261 229 | 323 525 |

Note (1) Includes funds for the Canadian Landmine Fund and the National Research Council Canada's Industrial Research Assistance Program (TPC–IRAP).

Note (2) Figures are one year after receipt: for 2002–2003 and 2003–2004, the amounts are net of the operating portion for the administration of repayments. For 2004–2005 and future years, the amounts include the operating portion, to be determined at a later date.